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December 30, 2014

Dr. Susan Hedman
Regional Administrator
U.S. Environmental Protection Agency, Region 5
77 West Jackson Boulevard
Mail Code: R-19J
Chicago, IL 60604-3507

RE: Minnesota's Five-Year Regional Haze Progress Report State Implementation Plan (SIP) Revision

Dear Dr. Hedman:

The Minnesota Pollution Control Agency (MPCA) hereby submits to the U.S. Environmental Protection Agency (EPA) a request for revision of Minnesota's State Implementation Plan (SIP).

The enclosed SIP revision addresses requirements of the Regional Haze Rule (40 Code of Federal Regulations Part 51.308(g)) that States provide a progress report every five years to assess whether the approved regional haze SIP is being implemented appropriately and whether reasonable visibility progress is being achieved consistent with the projected visibility improvement in the SIP. In providing this progress report, the MPCA notes that we have made no substantive revisions to Minnesota's Regional Haze SIP, as we have determined the SIP to be sufficient to achieve 2018 reasonable progress goals for Minnesota's Class I areas.

We believe this submittal meets the requirements of the Regional Haze Rule, and the guidance provided by EPA in its April 2013 document, "General Principles for the 5-Year Regional Haze Progress Reports for the Initial Regional Haze State Implementation Plans (Intended to Assist States and EPA Regional Offices in Development and Review of the Progress Reports)." Please contact Melissa Andersen Kuskie of our staff at 651-757-2512 or melissa.kuskie@state.mn.us if you have any questions regarding Minnesota's SIP.

Sincerely,

John Linc Stine
Commissioner

JLS/MAK:je

Enclosures

Five-Year Regional Haze Progress Report
State Implementation Plan
December 2014

Minnesota Pollution
Control Agency

Executive summary

The Clean Air Act (CAA) § 169A and B requires the protection of visibility in 156 Class I Federal Areas. The United States Environmental Protection Agency's (EPA) 1999 Regional Haze Rule, 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 "man-made air pollution," or regional haze.

Minnesota submitted its Regional Haze SIP on December 31, 2009, and updated it in May 2012. EPA approved Minnesota's Regional Haze SIP as satisfying all applicable requirements, except for Best Available Retrofit Technology (BART) emission limits for taconite facilities, effective July 12, 2012.

The Regional Haze Rule also requires states 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 Minnesota Pollution Control Agency (MPCA) hereby submits this five-year progress report to evaluate implementation of the SIP requirements and the resulting emissions reductions and visibility improvements. The report documents Minnesota's determination that its current Regional Haze SIP is adequate and requires no further substantive revision at this time to achieve 2018 visibility goals.

Minnesota's Regional Haze SIP

Minnesota is home to two federal Class I areas, the Boundary Waters Canoe Area Wilderness (Boundary Waters) and Voyageurs National Park (Voyageurs), located along the state's border with Canada. Minnesota'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, included a visibility monitoring strategy, and documented consultation with other states and federal land managers (FLMs) in developing its plan.

Minnesota's SIP relies on Cross-State Air Pollution Rule (CSAPR) emission reductions determined by EPA to be "better than BART," for BART - subject electric generating units (EGUs). Legal challenges to the rule had postponed implementation, though the U.S. Supreme Court has upheld the rule and issued administrative actions to formally implement CSAPR beginning in 2015. EPA finalized a Federal Implementation Plan (FIP), effective March 8, 2013, for BART for subject taconite facilities. Implementation of EPA's BART FIP has been stayed, pending resolution of subsequent litigation.

Minnesota's multi-prong long term strategy includes the implementation of several federal programs in Minnesota and surrounding states, and sets a target for a 30% reduction in combined nitrogen dioxide (NO_X) and sulfur dioxide (SO_2) emissions by 2018 from permitted sources in Northeastern Minnesota that emit over 100 tons per year of either NO_X or SO_2. Data from 2012 show a combined NO_X and SO_2 reduction of 45% from the 2002 base year, largely due to reductions from the utility sector. The long term strategy also required the BART - subject taconite facilities to demonstrate modeled compliance with the one-hour nitrogen dioxide (NO_2) and SO_2 National Ambient Air Quality Standards (NAAQS), and implement any work practices or controls needed to ensure modeled compliance, by June 30, 2017.

Summary of progress report elements

The Regional Haze Rule requires states to submit a SIP revision to the EPA every five years evaluating progress towards 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 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 MPCA has determined that Minnesota's current Regional Haze SIP is adequate and requires no further substantive revision at this time to achieve 2018 reasonable progress goals.

Status of control strategies in the Regional Haze SIP

Controls identified in Minnesota's Regional Haze SIP have either been implemented, or are expected to be implemented by 2018 (including CSAPR and potential controls at taconite facilities under the Northeast Minnesota Plan and/or BART).

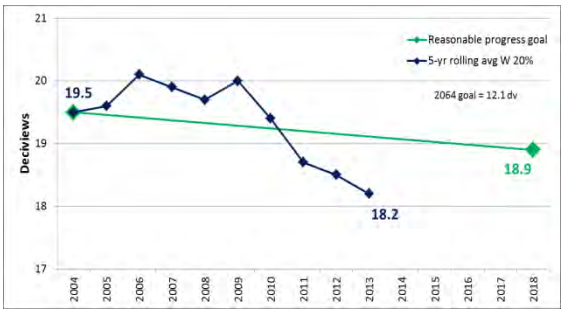
Emissions reductions from Regional Haze SIP strategies

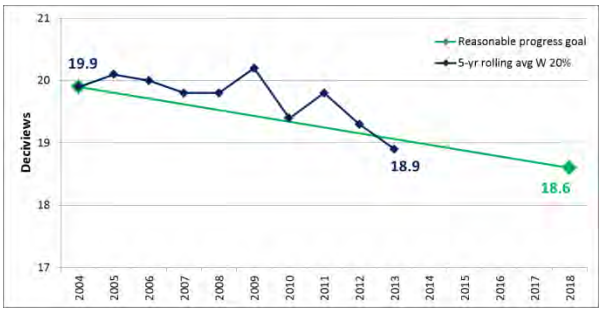
Though some of the Regional Haze SIP strategies have not yet produced quantifiable emissions reductions, to date, Minnesota emissions are currently below the goal level identified in the Northeast Minnesota Plan portion of the Long Term Strategy. Additionally, though CSAPR has not yet been implemented, Minnesota's power plants have reduced emissions to levels below those identified in CSAPR budgets.

Visibility progress

Both of Minnesota's Class I areas have seen improvements in worst-day visibility conditions. Minnesota has achieved the reasonable progress goal for Voyageurs, and is on track to meet the 2018 goal for Boundary Waters, based on 2013 monitoring data, which became available after the close of this progress report's public comment period.

Measured progress toward meeting the 2018 reasonable progress goal at Voyageurs (left) and Boundary Waters (right) for the 20% worst visibility days.





Emissions progress

Minnesota achieved its statewide modeled 34% emissions reduction goal for total SO_2 emissions (2002-2018) by 2008, and saw a 61% reduction by 2011. Minnesota achieved a 38% reduction in total NO_X emissions by 2011, nearly reaching its entire (2002-2018) modeled emissions reduction goal of 41%.

Assessment of changes impeding visibility progress

Minnesota 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

Based on already-achieved emissions reductions and reasonable progress goals, and the anticipation of further emissions reductions, Minnesota believes its current Regional Haze SIP strategy to be sufficient.

Review of visibility monitoring strategy

Minnesota 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

Minnesota submits a negative declaration that further revision of the existing implementation plan is not needed at this time.

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List of acronyms

AO	Administrative Order
BART	Best Available Retrofit Technology
Boundary Waters	Boundary Waters Canoe Area Wilderness
CAA	Clean Air Act
CAIR	Clean Air Interstate Rule
CAMD	Clean Air Markets Division
CENRAP	Central Regional Air Planning Association
CENSARA	Central States Air Resource Agencies
CFR	Code of Federal Regulations
CSAPR	Cross-State Air Pollution Rule
D.C.	District of Columbia
EGU	electric generating unit
EPA	United States Environmental Protection Agency
FIP	Federal Implementation Plan
FLMs	Federal Land Managers
IMPROVE	Interagency Monitoring of Protected Visual Environments
LADCO	Lake Michigan Air Directors Consortium
lbs/MMBtu	pounds per million British thermal units
MACT	Maximum Achievable Control Technology
MATS	Mercury and Air Toxics Standards Rule
Mm^{-1}	Inverse megameters
MPCA	Minnesota Pollution Control Agency
MRPO	Midwest Regional Planning Organization
µm	Micrometers
NAAQS	National Ambient Air Quality Standard
NEI	National Emissions Inventory
NH_3	ammonia
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
PM	particulate matter
$PM_{2.5}$	particulate matter with diameter of 2.5 micrometers or less, or fine PM

RICE	Reciprocating internal combustion engines
RPG	reasonable progress goal
RPO	Regional Planning Organization
RRF	Relative Response Factors
Sherco	Xcel Energy, Sherburne County Generating Station
SIP	State Implementation Plan
SO_2	sulfur dioxide
URP	Uniform Rate of Progress
VOC	volatile organic compounds
Voyageurs	Voyageurs National Park

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Chapter 1: Regional haze program requirements

Background

In amendments to the CAA in 1977, Congress added Section 169 (42 U.S. Code § 7491), setting forth a national visibility goal of restoring pristine conditions in national parks and wilderness areas. These areas were designated as Class I areas, because of their general nature as areas most free from air pollution and visibility problems. Section 169 states: "Congress hereby declares as a national goal the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory Class I Federal areas which impairment results from man-made air pollution."

EPA's Regional Haze Rule was adopted July 1, 1999, and went into effect on August 30, 1999. The Regional Haze Rule is intended to achieve national visibility goals by 2064. The rulemaking addressed the combined visibility effects of various pollution sources over a wide geographic region, meaning that many states – even those without Class I areas – are required to participate in haze reduction efforts. EPA designated five Regional Planning Organizations (RPOs) to assist with the coordination and cooperation needed to address visibility and haze issues. Minnesota was originally designated as a member of the Central Regional Air Planning Association (CENRAP), which was affiliated with the Central States Air Resource Agencies (CENSARA), along with other states and tribes that make up the midsection of the country. Minnesota has since joined the Lake Michigan Air Directors Consortium (LADCO), which was designated to receive federal funds for air quality technical assessments and assistance on behalf of the Midwest Regional Planning Organization (MRPO). The LADCO member states include Minnesota, Wisconsin, Illinois, Indiana, Michigan, and Ohio.

Minnesota's Regional Haze SIP

The MPCA submitted to EPA its initial SIP addressing the requirements of the Regional Haze Rule on December 31, 2009. The 2009 Regional Haze SIP identified visibility conditions and set 2018 visibility goals ("Reasonable Progress Goals," or RPG) for Minnesota's Class I areas (Boundary Waters and Voyageurs), and determined that Minnesota may contribute to visibility impairment at Isle Royale National Park in Michigan. The SIP also outlined control strategies intended to ensure achievement of RPGs in Class I areas affected by Minnesota's emissions, including controls for older sources, known as BART, a requirement of the Regional Haze Rule. Minnesota developed its SIP with extensive consultation with stakeholders, including FLMs, Tribal representatives, industry representatives, CENRAP, LADCO/MRPO, individual states, and the Ontario Ministry of the Environment.

Minnesota's SIP analysis indicated that the main pollutants contributing to visibility impairment in Minnesota's Class I areas are ammonium sulfate, ammonium nitrate, and organic carbon. Modeling indicates that the organic carbon is biogenic, so the MPCA chose to focus control measures on the anthropogenic emissions of NO_X and SO_2 that lead to formation of nitrate and sulfate. The main contributors of SO_2 emissions are EGUs, while the main contributors of NO_X are motor vehicles, both on and off road. The main states whose emissions contribute to visibility impairment in Boundary Waters and Voyageurs are: Minnesota, Wisconsin, Illinois, Iowa, Missouri, and North Dakota.

MPCA supplemented its Regional Haze SIP in 2012, updating its BART strategies for both power plants and the taconite industry, as well as its Long Term Strategy focused on the taconite industry. The EPA approved nearly all elements of Minnesota's Regional Haze SIP, effective July 12, 2012, deferring action

on Minnesota's BART determinations for the taconite industry. EPA subsequently promulgated a FIP incorporating revised taconite BART determinations.

Figure 1-1: Minnesota's Class I Areas

Five year progress report requirements

The Regional Haze Rule requires states to complete a comprehensive Regional Haze SIP revision in 2018 (and every 10 years thereafter), and a progress report every five years. The five-year progress report provides states the opportunity to assess, and if necessary, strengthen and/or correct their Regional Haze SIP; it also provides the "opportunity for public input on the state's (and the EPA's) assessment of whether the approved regional haze SIP is being implemented appropriately and whether reasonable visibility progress is being achieved consistent with the projected visibility improvement in the SIP."[1]

[1] EPA Office of Air Quality Planning and Standards, Air Quality Policy Division. "General Principles for the 5-Year Regional Haze Progress Reports for the Initial Regional Haze State Implementation Plans (Intended to Assist States and EPA Regional Offices in Development and Review of the Progress Reports." April 2013.

The report is intended to review plan elements as specified in section 51.308(g) of the Regional Haze Rule:

- Status of control strategies in the Regional Haze SIP
- Emissions reductions from Regional Haze SIP Strategies
- Visibility progress
- Emissions progress
- Assessment of changes impeding visibility progress
- Assessment of current strategy
- Review of visibility monitoring strategy
- Determination of adequacy

The progress report must be in the form of an implementation plan revision that complies with SIP procedural requirements outlined in 40 CFR 51.102 and 51.103.

The submittal of Minnesota's Regional Haze SIP to EPA in 2009 set the deadline for submittal of this five year progress report: December 31, 2014.

Chapter 2: Five-year progress report elements

A. Status of control strategies

A description of the status of implementation of all measures included in the implementation plan for achieving reasonable progress goals for mandatory Class I Federal areas both within and outside the State.

This section includes a summary and status of control measures in Minnesota's Regional Haze SIP that apply to sources within the state that Minnesota relied upon to meet the requirements of the Regional Haze program. Because certain control strategies changed from the 2009 Regional Haze SIP to the 2012 Supplement, not all were included in the SIP's modeling inventory. Controls modeled in the 2009 Regional Haze SIP are noted.

The summary identifies control measures regulated explicitly for the purposes of the regional haze program, as well as additional control measures not specifically developed for the regional haze program that were expected to take effect in the first planning period (the time period between the 2009 SIP submittal and the end of 2018) for sources and source categories located within the state.

Regional haze controls

The EPA's 1999 Regional Haze Rule required two specific approaches for reducing visibility-impairing pollutants, implementation of BART, which targets certain older emission sources not otherwise regulated under other CAA provisions, and implementation of a Long Term Strategy that includes enforceable measures designed to meet reasonable progress goals.

Minnesota's BART - subject sources include EGUs and taconite facilities. Minnesota will continue to work towards implementation of BART requirements, though the determination and implementation of BART for Minnesota sources has been slowed by changing regulatory requirements, litigation, and federal actions.

BART for EGUs. Minnesota's 2009 Regional Haze SIP included source-specific BART determinations for subject EGUs, with the intent to add BART requirements to affected facilities' Title V permits. At the time modeling was conducted in support of the Regional Haze SIP, however, Minnesota intended to rely on the Clean Air Interstate Rule (CAIR) EGU emissions cap and trade program, finalized May 12, 2005,[2] which had been determined by EPA as "better than BART,"[3] and so modeling included CAIR reductions for EGUs, rather than unit-specific BART determinations. Future-year EGU emissions projections (based on known controls) without CAIR in place were nearly identical to projections with CAIR in place, however, so Minnesota continued to rely on the modeling including the CAIR projections. CAIR was remanded by the Court of Appeals for the District of Columbia (D.C.) Circuit in December 2008, and stayed by the EPA in Minnesota, effective December 3, 2009.[4] Therefore, Minnesota's 2009 Regional Haze SIP relied on the source-specific BART determinations performed by the MPCA.

[2] 70 FR 25162
[3] EPA. "Demonstration that CAIR Satisfies the "Better-than-BART" Test As proposed in the Guidelines for Making BART Determinations," EPA Docket Number: OAR-2003-0053-YYYY, March 2005.
[4] 74 FR 56721

EPA finalized the CSAPR, also known as the "CAIR replacement rule," effective October 7, 2011[5]. Like CAIR, CSAPR is a cap and trade program that targets power plant emissions of SO_2 and NO_X emissions in 27 eastern states. CSAPR is estimated to result in a 71% reduction in SO_2 and a 52% reduction in NO_X emissions from 2005 levels. Minnesota was regulated under CSAPR for contributions to fine particulate ($PM_{2.5}$) nonattainment and interference with maintenance in downwind states, and was provided a budget for annual SO_2 and NO_X emissions.

EPA proposed a rule to approve CSAPR as an alternative to determining source-by-source-specific BART for SO_2 and NO_X emissions from power plants in December 2011,[6] when Minnesota was developing a supplement to its 2009 Regional Haze SIP. Minnesota subsequently modified its EGU BART strategy, replacing source-specific BART determinations at subject facilities with participation in CSAPR. MPCA also included an Administrative Order (AO) implementing source-specific limits for Units 1 and 2 at Xcel Energy's Sherburne County Generating Station (Sherco), as an enhancement to the CSAPR as BART strategy. The EPA approved Minnesota's EGU BART strategy, with the exception of the limits for Sherco, effective July 12, 2012[7]. The EPA deferred action on source-specific BART for Sherco (resulting from Sherco's certification by the National Park Service as a source of "reasonably attributable visibility impairment," or RAVI, for Isle Royale National Park and Voyageurs), but approved emission limits from the AO as a "SIP strengthening measure." [8]

The Sherco AO, signed on May 2, 2012 and approved by EPA in July 2012, establishes NO_X, SO_2 and PM emission limits for Sherco Units 1 and 2, and requires initial compliance with the established limits no later than January 1, 2015. Sherco will comply with the January 1, 2015 deadline.

On August 21, 2012, the Court of Appeals for the D.C. Circuit vacated CSAPR, keeping CAIR in effect while EPA developed a replacement rule. The EPA appealed the ruling to the U.S. Supreme Court, which upheld CSAPR in a final decision issued April 29, 2014. On October 23, 2014, the Court of Appeals granted EPA's motion to lift the stay of CSAP, and on November 21, 2014, EPA issued a ministerial rule that aligns the dates in the CSAPR rule text with the revised court-ordered schedule, including implementation of Phase I beginning in 2015.[9]

Though considerable regulatory uncertainty has delayed implementation of programs in both the 2009 Regional Haze SIP and the 2012 Regional Haze SIP Supplement, Minnesota's electricity generating industry has undertaken many projects to reduce emissions (largely in preparation for both CAIR and CSAPR), resulting in a significantly cleaner fleet today. As a result of these projects, the MPCA believes that it will be able to enact CSAPR in a straightforward manner beginning in 2015. As shown in Table 2B-1 in the next section, the MPCA's most recent EGU emissions data reported to EPA's Clean Air Markets program demonstrates that Minnesota's current EGU emissions of SO_2 and NO_X currently fall below the levels set by Minnesota's CSAPR emissions budgets.

Taconite BART. Minnesota's 2009 Regional Haze SIP included partial BART determinations for subject taconite facilities; the corresponding emissions rates representing BART and method of enforceable controls were provided with the 2012 Regional Haze SIP Supplement. The MPCA determined that, generally, BART for the taconite facilities consisted of operation of existing scrubbers to control SO_2 emissions, good combustion practices to control NO_X emissions, and continued implementation of the taconite Maximum Achievable Control Technology (MACT) standard for control of particulate matter

[5] 76 FR 48208
[6] 76 FR 82219
[7] 77 FR 34801
[8] 77 FR 34806
[9] 79 FR 71663

(PM) emissions. The MPCA issued AOs in May 2012 that contained BART emission limits and compliance methods for SO_2, NO_X, and PM BART requirements.

On February 6, 2013, EPA finalized a FIP with BART determinations and enforceable limits for Minnesota's subject taconite facilities for control of SO_2 and NO_X emissions[10]. The EPA published final disapproval of Minnesota's taconite BART determinations on September 30, 2013[11]. The EPA's FIP proposal had included language that "EPA also agrees with the states' determination that BART for direct PM is satisfied by the taconite [MACT] rule," but no language on PM BART for the subject taconite facilities was explicitly provided in the EPA's rules.

Compliance deadlines in the EPA's FIP ranged from a few months (for most SO_2 limits) to five years from the FIP's effective date of March 8, 2013; however, the U.S. Court of Appeals for the 8th Circuit stayed the EPA's FIP (effective June 14, 2013), pending resolution of litigation by the affected facilities. The MPCA is not a party to the FIP litigation and will await resolution of court actions before assessing any necessary taconite BART actions, but the MPCA understands that settlement talks are proceeding.

Table 2A-1: EPA Taconite BART Determinations (FIP) – LITIGATION PENDING

Facility	Unit		NO_X BART Limit (30-day rolling average)*	NO_X BART Compliance Deadline	SO_2 BART Limit (30-day rolling average)	SO_2 BART Compliance Deadline
Arcelor Mittal	Indurating Furnace	EU026	1.5 pounds per million British thermal units (lbs/MMBtu) 1.2 lbs/MMBtu when only natural gas is used	May 8, 2016	38.16 lbs/hr	September 8, 2013
Hibbing Taconite	Line 1 Pelletizing Furnace	EU020	1.5 lbs/MMBtu 1.2 lbs/MMBtu when only natural gas is used	May 8, 2015	Aggregate emission limit of 247.8 lbs/hr	September 8, 2013
	Line 2 Pelletizing Furnace	EU021		May 8, 2016		
	Line 3 Pelletizing Furnace	EU022		May 8, 2017		
Northshore Mining	Indurating Furnace 11	EU100/ EU104	1.5 lbs/MMBtu 1.2 lbs/MMBtu when only natural gas is used	May 8, 2015	Aggregate emission limit: 39 lbs/hr	September 8, 2013
	Indurating Furnace 12	EU110/ EU114		May 8, 2016		
	Process Boiler #1	EU003	0.085 lbs/MMBtu	March 8, 2018	NA	NA
	Process Boiler #2	EU004		March 8, 2018		

[10] 78 FR 8706
[11] 78 FR 59825

Facility	Unit		NO_X BART Limit (30-day rolling average)*	NO_X BART Compliance Deadline	SO_2 BART Limit (30-day rolling average)	SO_2 BART Compliance Deadline
United Taconite	Line 1 Pellet Induration	EU040	1.5 lbs/MMBtu 1.2 lbs/MMBtu when only natural gas is used	May 8, 2016	Aggregate emission limit: 529.0 lbs/hr	September 8, 2017
	Line 2 Pellet Induration	EU042		May 8, 2015		
U.S. Steel – Keetac	Phase II Grate-Kiln Pelletizing Furnace	EU030	1.5 lbs/MMBtu 1.2 lbs/MMBtu when only natural gas is used	March 8, 2016	225 lbs/hr	June 8, 2013
U.S. Steel - Minntac	All Indurating Furnaces	EU225	1.5 lbs/MMBtu 1.2 lbs/MMBtu when only natural gas is used	February 8, 2018	Aggregate emissions limits: -498 lbs/hr when all lines produce flux pellets -630 lbs/hr for Lines 3-7 when Lines 3-5 are producing acid pellets and Lines 6-7 produce flux pellets -800 lbs/hr for lines 3-7 when all lines produce acid pellets	June 8, 2013
		EU261		March 8, 2016 or 2017		
		EU282		March 8, 2016 or 2017		
		EU315		March 8, 2014		
		EU334		March 8, 2015		

*Though EPA did not explicitly require any specific NO_X BART controls, it did indicate that "To meet these limits, the sources will essentially be required to install low NO_X burners on each indurating furnace."

Northeast Minnesota Plan – Non-binding Emissions Reduction Goal. The 2009 Regional Haze SIP included, as part of the Long Term Strategy, the Northeast Minnesota Plan to reduce emissions of SO_2 and NO_X from large sources in the six county (Carlton, Cook, Itasca, Koochiching, Lake, and St. Louis) northeast portion of Minnesota. This area, sometimes known as the Arrowhead or Iron Range, contains several industrial sources that emit high levels of the two primary haze-producing pollutants, SO_2 and NO_X, including EGUs and the taconite industry. The proximity of such sources to Minnesota's Class I areas (both located in the Northeastern region of the state), along with the potential for new sources in the area, made a regionally-specific emission reduction target a valuable strategy for addressing regional haze.

The Northeast Minnesota Plan creates a two-step, non-binding target for emissions reductions (as compared to the 2002 base case emissions inventory) of combined SO_2 and NO_X emissions from facilities that emit, or have the potential to emit, over 100 tons per year of either pollutant. The targets were included in modeling for the 2009 Regional Haze SIP, and seek a reduction of combined SO_2 and NO_X emissions from the subject sources of 20% by 2012 and 30% by 2018. Though the emissions reduction goal is not enforceable upon the facilities, it provides an incentive for continued progress in the region.

Minnesota has met (and exceeded) the 20% emission reduction goal for 2012, and expects to meet (and exceed) the 30% reduction goal for 2018. See Figure 2B-2 in the following section, and Appendix B for further detail.

Northeast Minnesota Plan - Taconite NAAQS compliance. MPCA determined in its 2009 Regional Haze SIP that, based on the BART analyses, the subject facilities were potentially under-controlled, with few emission control technologies known to be effective for the industrial processes involved in taconite production. A second component of the 2009 SIP's "Northeast Minnesota Plan" SIP therefore required facilities to investigate control technologies and pollution prevention practices for their indurating furnaces through pilot tests and report to MPCA on the feasibility and cost-effectiveness of said technologies and practices, with those controls determined reasonable being incorporated into Minnesota's current Long Term Strategy (with installation of controls beginning in 2015) in support of the 2018 Reasonable Progress Goal.

In 2010, the EPA finalized revisions to the NAAQS for both NO_2 and SO_2, promulgating new one-hour primary standards for both pollutants. The original implementation timelines for both NAAQS appeared to be able to drive more stringent controls for taconite facilities, and on a faster timeline, than envisioned by the pilot testing. The MPCA therefore revised its Long Term Strategy/Northeast Minnesota Plan in the 2012 Regional Haze SIP Supplement, replacing the pilot testing approach with a NAAQS-based approach. The SIP requires taconite facilities to demonstrate modeled compliance with the one-hour SO_2 and NO_2 NAAQS using enforceable emission limits, and the work practices or controls needed to meet such limits.

The MPCA implemented the revised approach via Administrative Orders (AOs) issued on May 2, 2012 (and revised December 20, 2012) with five taconite facilities: ArcelorMittal-Minorca Mine, Hibbing Taconite Company, U.S. Steel Corporation – Minntac, Northshore Mining Company, and United Taconite, LLC. The MPCA is currently working to implement the AOs and has worked closely with stakeholders to provide clarification regarding modeling procedures and ensure that all emission rates that would demonstrate modeled NAAQS compliance are or can be made enforceable. The MPCA expects that AO-subject facilities will achieve necessary emissions reductions in support of the 2018 reasonable progress goals.

On-the-books modeled controls

In developing the future year (2018) emissions inventory for modeling, Minnesota considered federal "on-the-books" controls with implementation expected between 2002 and 2018.

Tier 2 Vehicle and Gasoline Sulfur Program[12]. The Tier 2 Program set federal emission standards for passenger vehicles, including sport utility vehicles, minivans, vans, and pick-up trucks, as well as passenger cars. The program created fleet-averaging emission standards for NO_X, allowing manufacturers to produce vehicles with varying emissions, as long as the fleet of vehicles produced by a manufacturer had average NO_X emissions at or below the federal standards. The standards were phased in from 2004 to 2009 (beginning with the 2005 model year), and reduced new vehicle NO_X emissions to an average of 0.07 grams per mile. The program continues to provide emissions reductions from mobile sources as older sources in the fleet are replaced with new sources subject to the emissions standards.

Heavy-Duty Highway Diesel Program[13]. EPA finalized the Highway Diesel Rule, a program to reduce emissions from heavy-duty trucks and buses by more than 90%, in January 2001. The rule was phased in between 2007 and 2010, and set emissions standards for PM, NO_X and non-methane hydrocarbons, for new heavy-duty diesel engines. Additionally, the rule required a 97% reduction in the sulfur content of highway diesel fuel, to enable the use of more modern pollution-control technology on the heavy-duty

[12] 40 CFR Part 80, Subpart H; 40 CFR Part 85; 40 CFR Part 86
[13] 40 CFR Part 86, Subpart P

vehicles. The Highway Diesel Rule requirements were implemented in accordance with EPA's intended regulatory timeline.

Clean Air Nonroad Diesel Rule (Tier 4)[14]. The EPA's Nonroad Diesel Emissions Program set NO_X and PM emissions standards for nonroad engines and required the reduction of sulfur levels in fuel by more than 99%. The emissions standards, which initially went into effect in 2004, apply to diesel engines used in most construction, agricultural, industrial, and airport equipment, and were fully phased in by 2014. The diesel fuel requirements mandated the reduction of sulfur levels in most nonroad diesel fuel by 2010, and in locomotive and marine diesel fuel by 2012.

MACT Programs[15]. Regional Haze SIP modeling also included controls on future year emissions resulting from certain MACT regulations for volatile organic compounds (VOC), SO_2, NO_X, and PM. MACT standards modeled include VOC 2-, 4-, 7-, and 10-year MACT; and Combustion turbine MACT; and Industrial boiler/process heater/reciprocating internal combustion engines (RICE) MACT.

Additional measures/Emission progress not included in SIP

Though not relied upon in Minnesota's Regional Haze SIP, certain programs and source-specific planning implemented after submittal of Minnesota's SIP are expected to result in emissions reductions of visibility-impairing pollutants.

Mercury Air Toxic Standard Rule (MATS)[16]. In December 2011, the EPA finalized federal standards requiring coal and oil-fired power plants to limit emissions of toxic air pollutants, including mercury, acid gases, and non-mercury metallic toxic pollutants. Though the standards target toxic air pollutants, the controls needed for compliance are expected to provide significant SO_2 emissions reductions. Compliance is required by 2016.

Several EGUs in Minnesota have begun planning for MATS compliance, and are expected to install controls, repower from coal to natural gas, or retire certain units by the MATS-compliance deadline. Additionally, though not specifically related to the MATS rule, the Rochester Public Utilities (RPU) plans to decommission its Silver Lake plant, a 100 MW facility in Olmstead County, Minnesota, by 2015. RPU ceased burning coal at the Silver Lake plant on November 14, 2013.

Table 2A-2: MN EGU MATS Planning

Facility	Control Strategy	Date Announced	Compliance Date	Operating capacity (MW)
Minnesota Power – Laskin 1,2	Repowering from coal to natural gas	June 2013	Expected by 2015	110 (55MW from each unit)
Minnesota Power Taconite Harbor Unit 3	Retiring unit	Jan 2013	Expected by 2015	75
Minnesota Power Boswell Energy Center, Unit 4	Installing SO_2 scrubber	June 13, 2013	Expected by 2015	585
Ottertail Power, Hoot Lake Units 2,3	Upgrade electrostatic precipitators (PM control)	2013	Expected 2015	138
Xcel Energy, Black Dog Units 3, 4	Repowering from coal to natural gas	2011	Expected by 2016	278 (108 MW at Unit 3, 170 MW at Unit 4)

[14] 40 CFR Part 89
[15] 40 CFR Part 63
[16] 40 CFR Parts 60 and 63

SO_2 NAAQS compliance. The EPA strengthened the primary NAAQS for SO_2 on June 2, 2010, finalizing a standard of 75 parts per billion averaged over one hour. Implementation of the revised NAAQS was delayed for areas not monitoring violations of the standard while EPA reconsidered its approach to the designation process. An EPA strategy paper released in February 2013 identified the "next steps" for area designations and implementation of the SO_2 NAAQS[17] and EPA proposed the SO2 Data Requirements Rule in the spring of 2014[18]. The EPA's designation strategy for states intending to rely on SO_2 modeling will require enforceable emissions limits for facilities that would otherwise contribute to a modeled violation of the NAAQS in order to avoid a nonattainment designation. The emission limits must provide for NAAQS compliance, and be submitted to EPA in 2017. Minnesota does not have any areas designated nonattainment for the SO_2 NAAQS (all monitors currently show compliance with the standard), but expects to conduct modeling on some sources, and potentially require emissions limits, as needed, in accordance with the EPA's finalized designations strategy.

Tier 3 Vehicle Emission and Fuel Standards Program. On April 28, 2014, the EPA published its final rule establishing more stringent vehicle emissions standards and reducing the sulfur content of gasoline beginning in 2017. The Tier 3 program is part of a comprehensive approach to reducing the impacts of motor vehicles on air quality. The vehicle standards are expected to reduce emissions from passenger cars, light-duty trucks, medium-duty passenger vehicles, and some heavy-duty vehicles. The fuel standard will help to enable the more stringent vehicle emissions standards and will make the emissions control systems more effective.

Other states' new controls. Minnesota did not rely on new Regional Haze program-specific control strategies (beyond modeled "on the books" controls) from other states' in developing its Regional Haze SIP Reasonable Progress Goals. However, the implementation of beyond "on-the-books" control measures in states contributing to visibility impairment in Minnesota's Class I areas could result in further improvements to visibility conditions in Minnesota. Appendix E includes tables outlining planned (or already-implemented) controls in LADCO states.

B. Emissions reductions from regional haze SIP strategies

> *A summary of the emissions reductions achieved throughout the State through implementation of the measures described in paragraph (g)(1) of this section.*

The controls identified in the previous section vary with respect to their known or expected compliance deadlines, and most of the Regional Haze SIP-specific strategies have not yet been implemented. For this reason, it is difficult to describe specific emissions reductions associated with each strategy. In focusing on SO_2 and NO_X emissions, which contribute to sulfate and nitrate formation – the main pollutants contributing to visibility impairment in Minnesota's Class I areas, Minnesota has identified certain large scale emissions reductions achieved both from the 2002 emissions base year, and also since the submittal of the SIP. Reductions associated with "on-the-books" controls are not identified in this section, but the Emissions Progress section of this report does capture emissions trends affected, in part, by such controls.

EGU emissions. Though Minnesota's EGU BART strategy CSAPR is not yet in effect, Minnesota's EGUs have made considerable progress toward reducing SO_2 and NO_X emissions. Several EGUs have already

[17] EPA, "Next Steps for Area Designations and Implementation of the Sulfur Dioxide National Ambient Air Quality Standard," February 7, 2013
[18] 79 FR 27446

installed controls in preparation for the requirements of CSAPR and its predecessor, CAIR. Based on emissions data from EGUs reporting to EPA's Clean Air Markets Division (CAMD), Minnesota's EGU emissions are below Minnesota's state-level CSAPR emissions budget (i.e., Minnesota has likely achieved the emissions levels required by its approved EGU BART strategy). Figure 2B-1 and Table 2B-1 show total emissions from EGUs reporting to CAMD in Minnesota, with a comparison of overall reductions from 2002 to 2013, as well as a comparison of reductions since Minnesota's original SIP submittal. Appendix B includes additional information for Minnesota's BART-subject EGUs.

Figure 2B-1: MN EGU Emissions Reported to CAMD as Compared to CSAPR Budgets

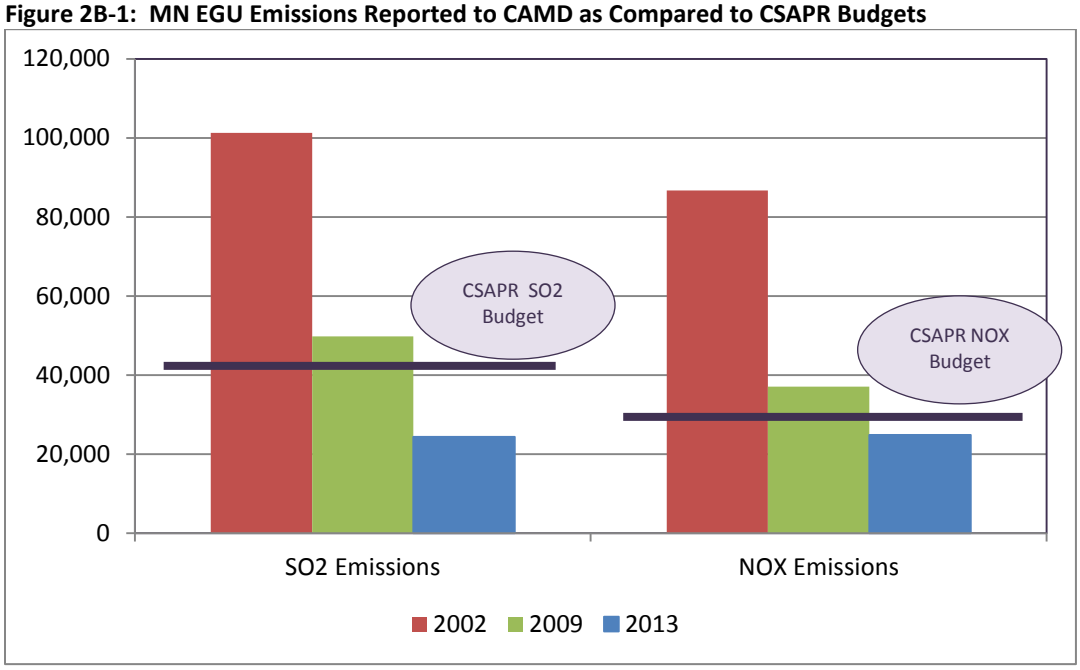
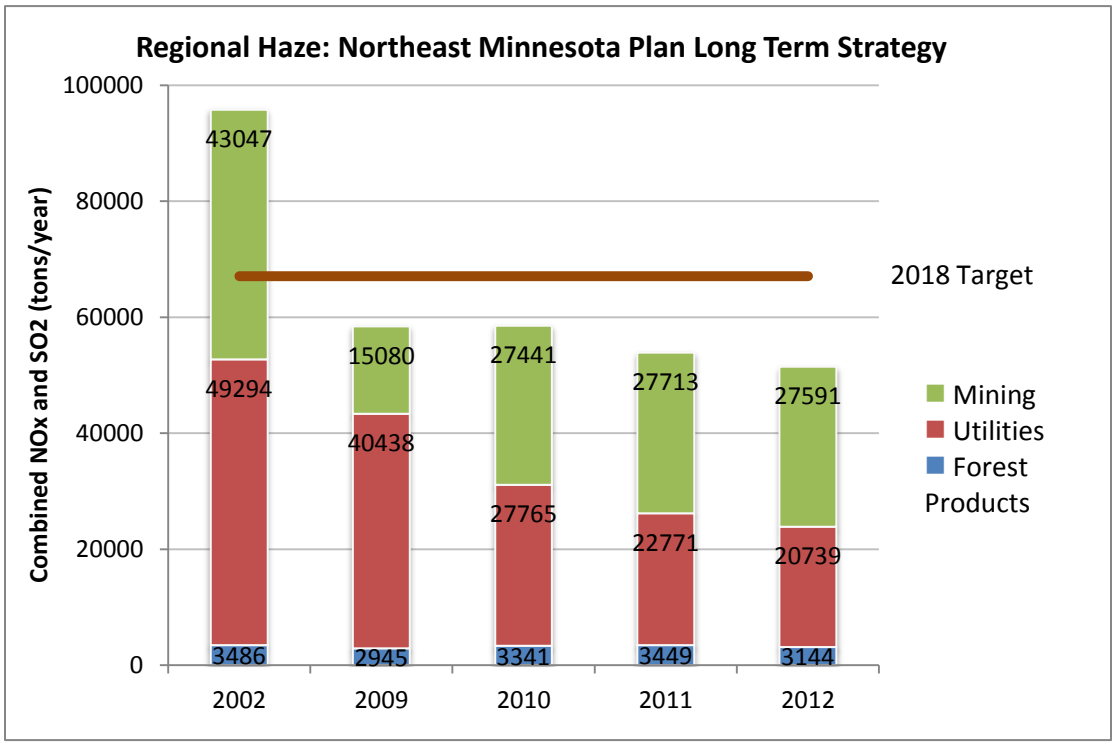


Table 2B-1: MN EGU Emissions Reported to CAMD as Compared to CSAPR Budgets

	SO_2 Emissions (tons)			NO_X Emissions (tons)			CSAPR Budget (tons/allowances)	
	2002	**2009**	**2013**	**2002**	**2009**	**2013**	**SO_2**	**NO_X**
Statewide Emissions	101,283	49,807	24,366	86,663	37,091	24,855	41,981	29,572
Tonnage Reduction (2002-2013)			76,917			61,808		
Percentage Reduction (2002-2013)			76%			71%		

Northeast Minnesota Plan. Minnesota has met (and exceeded) the Northeast Minnesota Plan's 20% emission reduction goal for 2012, and expects to meet (and exceed) the 30% reduction goal for 2018. See Appendix B for emissions reductions from all subject sources. Figure 2B-2 on the following page shows total emissions (broken down by sector) over time, as compared to the 30% reduction goal.

Figure 2B-2: Northeast Minnesota Plan Emissions



C. Visibility progress

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 of5-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 Regional Haze Rule requires states to "establish goals that provide for reasonable progress toward achieving natural visibility conditions for each Class I area within a state"[19]; improving visibility on the most impaired days and not degrading visibility on the least impaired days. Minnesota has two federal Class I areas within its borders, the Boundary Waters and Voyageurs. Both Minnesota Class I areas are located along the State's Northern border, shared with Canada.

The core of the visibility assessment is the baseline and natural visibility conditions based on measurement data collected at IMPROVE monitors. The baseline conditions are developed from five years of monitoring data, and represent the starting point from which reasonable progress is measured. The Regional Haze Rule prescribes the baseline period as the years 2000-2004[20], and defines baseline

[19] 40 CFR 51.308(d)(1)
[20] 40 CFR 51.308(d)(2)

visibility conditions as the average of the most impaired — or the 20% worst — visibility days, calculated from the monitoring data for each year of the baseline, and then averaged over the five-year baseline period. The ultimate goal is to reach natural visibility conditions in 2064. Reasonable progress goals are established as interim goals representing progress toward that end. The year 2018 is the initial year for developing a reasonable progress goal.

Models are used to establish the reasonable progress goal by simulating the future visibility conditions that will result from future emissions estimates. Emissions from a "base", or known, year (i.e. 2002) representing the baseline period and from a year in the future (i.e. 2018) are each modeled. The model results are used to estimate the air concentration change from base year to future year inventories. These air concentration changes are in the form of ratios of the future year air concentrations to the base year concentrations predicted near a monitor location and averaged over the same 20% worst and 20% best days in the base year, which were also used to establish baseline visibility conditions. These ratios, called Relative Response Factors (RRF), are applied to baseline monitoring conditions for the future visibility condition estimate, or reasonable progress goal.

The Regional Haze Rule requires states to measure interim progress toward reaching the reasonable progress goal using monitor data[21]. The rule requires visibility to be expressed in deciviews. A deciview is a unit of measurement of haze, or the haze index.

Publicly available quality assured data is available through 2013 at the time of this report. Current visibility conditions at both Boundary Waters and Voyageurs have improved compared to baseline conditions. The current visibility at Boundary Waters as of 2013 is 0.3 deciview above the 2018 reasonable progress goal, a 1.0 deciview improvement from baseline conditions. Visibility improvement at Boundary Waters was hampered by a large wildfire in 2011 (additional information on the effect of the wildfire on visibility impairment is provided in Figure 2C-5). Absent the wildfire, visibility improvement at Boundary Waters would be expected to look similar to that at Voyageurs. The current visibility at Voyageurs is 0.7 deciview below the 2018 reasonable progress goal, exceeding expectations with a 1.3 deciview improvement from baseline conditions. No degradation of visibility on the clearest days at Boundary Waters and Voyageurs has occurred.

Figures 2C-1 through 2C-4 show the change in visibility conditions for the most impaired and least impaired visibility days over the last decade at Boundary Waters and Voyageurs. The five-year rolling average deciview values for each year is placed in relation to a straight line connecting the baseline deciview value to the 2018 reasonable progress goal for each Class I area. This line does not represent interim-year goals, but helps the reader measure the current visibility progress toward the 2018 goal. Table 2C-1 contains the underlying data shown in the Figures.

[21] 40 CFR 51.308(g)(3)

Figure 2C-1: Measured progress toward meeting the 2018 RPG at Boundary Waters for the 20% worst visibility days

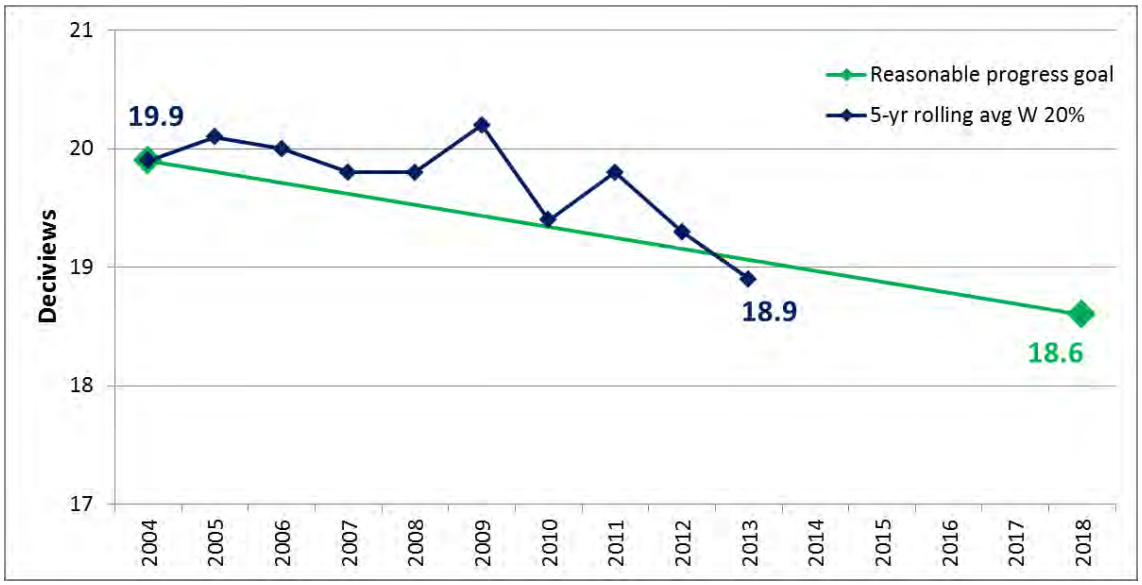


Figure 2C-2: Measured progress toward showing no degradation of visibility at Boundary Waters for 20% best visibility days

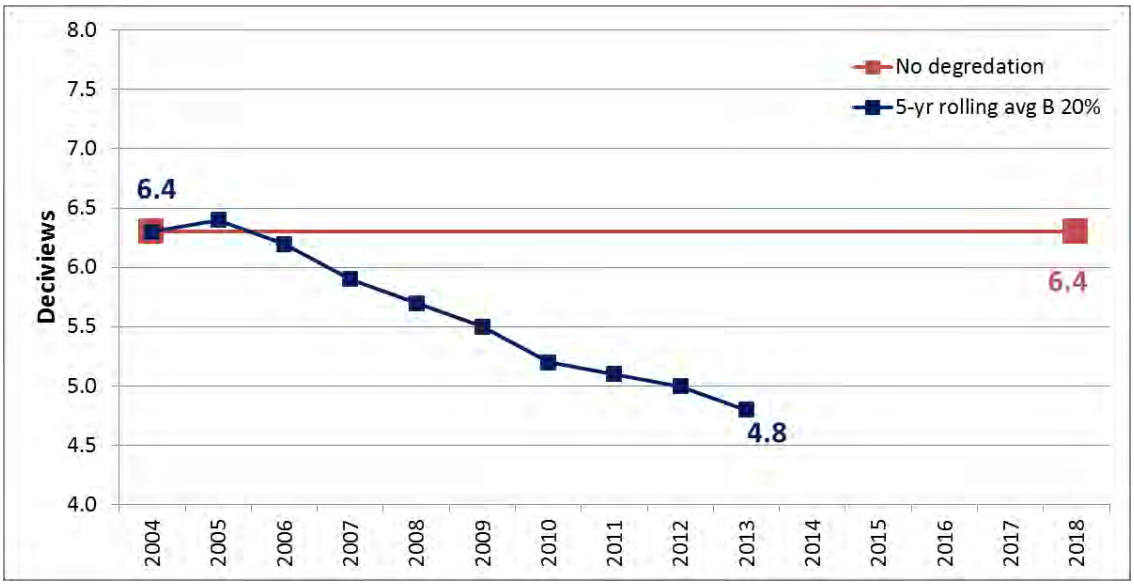


Figure 2C-3: Measured progress toward meeting the 2018 RPG at Voyageurs for the 20% worst visibility days

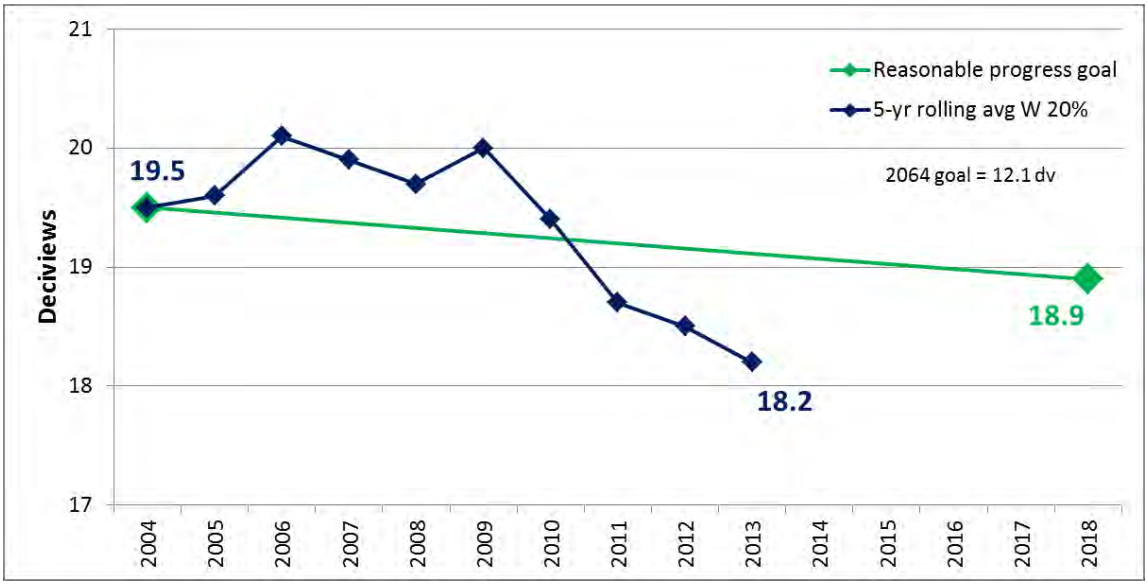


Figure 2C-4: Measured progress toward showing no degradation of visibility at Voyageurs for the 20% best visibility days

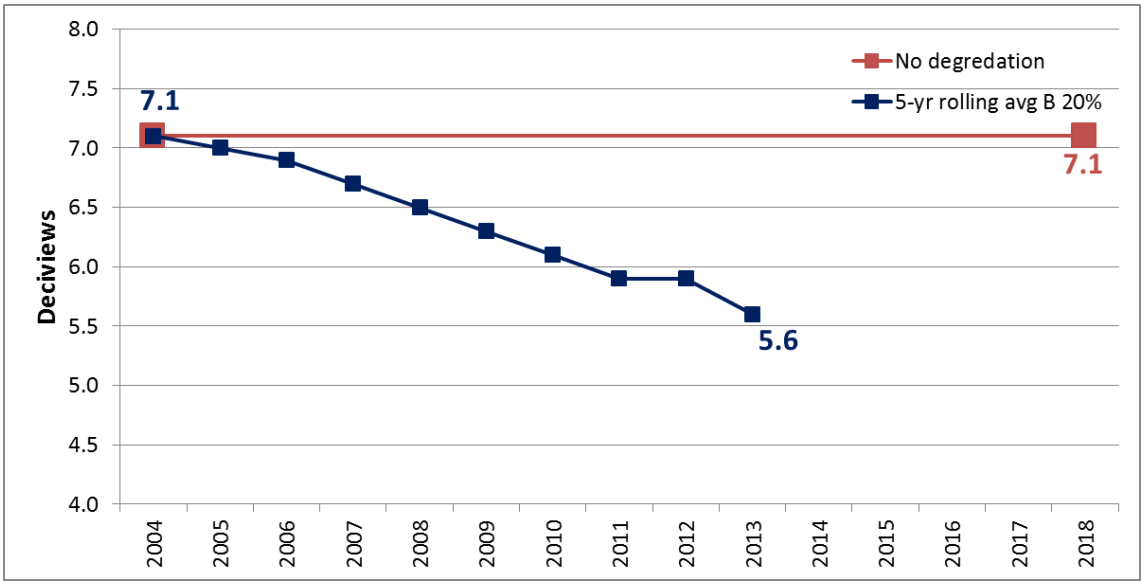


Table 2C-1: Underlying data for Figures 2C-1 through 2C-4

Site	Year	Worst visibility conditions		Best visibility conditions	
		annual	5-year rolling average	annual	5-year rolling average
Boundary Waters	2000	20.2		5.9	
	2001	20.0		6.8	
	2002	20.8		6.9	
	2003	20.1		6.3	
	2004	18.2	19.9	5.7	6.3
	2005	21.3	20.1	6.3	6.4
	2006	19.6	20.0	5.6	6.2
	2007	19.8	19.8	5.6	5.9
	2008	20.2	19.8	5.4	5.7
	2009	20.1	20.2	4.6	5.5
	2010	17.3	19.4	4.8	5.2
	2011	21.7	19.8	4.9	5.1
	2012	17.4	19.3	5.3	5.0
	2013	17.9	18.9	4.4	4.8
Voyageurs	2000	19.4		6.9	
	2001	18.6		7.0	
	2002	20.1		7.5	
	2003	20.3		7.6	
	2004	18.9	19.5	6.3	7.1
	2005	20.3	19.6	6.8	7.0
	2006	20.9	20.1	6.4	6.9
	2007	19.2	19.9	6.6	6.7
	2008	19.2	19.7	6.4	6.5
	2009	20.2	20.0	5.4	6.3
	2010	17.5	19.4	5.8	6.1
	2011	17.5	18.7	5.5	5.9
	2012	18.0	18.5	6.2	5.9
	2013	18.0	18.2	5.1	5.6

The haze index, in deciviews, is a conversion of the solution to the IMPROVE equation, expressed as ambient light extinction coefficients ((b_{ext}). The IMPROVE algorithm used was adopted by the IMPROVE Steering Committee in December 2005[22]. Extinction is calculated using the IMPROVE algorithm with individual fine particle mass components measured by the IMPROVE monitors. Particulate matter with a diameter of 2.5 micrometers (µm), or less, ($PM_{2.5}$) is primarily responsible for impaired visibility.[23] $PM_{2.5}$ is composed of several pollutant species; nitrate, sulfate, organic carbon, elemental carbon, fine soil, sea

[22] http://vista.cira.colostate.edu/views/Web/RHR/RHR_Planning.aspx
[23] Malm (2000)

salt (which at Minnesota Class I area monitors may be attributable to road salt) and water. Coarse particulate mass (>2.5 µm, but ≤ 10 µm diameter) is also included in the visibility equation, but is an insignificant component of visibility impairment at Boundary Waters and Voyageurs. The same can be said for the $PM_{2.5}$ component, fine soil. Nitrate and sulfate in the IMPROVE equation are assumed to be fully neutralized by ammonia (NH_3), and are expressed as ammonium nitrate and ammonium sulfate.

A break-down of the visibility measure into its individual components provides context for the visibility conditions at Boundary Waters and Voyageurs. Figures 2C-5 and 2C-6 show the component — ammonium sulfate, ammonium nitrate, organic carbon and elemental carbon — break-down of the five-year rolling average for each year of measured progress. Component visibility is shown in units of extinction (inverse megameters, Mm^{-1}), as opposed to deciviews, because any values less than 10 Mm^{-1} will appear as negative in deciviews. This would be confusing. The Figures illustrate that, in general, ammonium sulfate consistently causes most of the visibility impairment in both Class I areas. For the worst visibility days, ammonium nitrate is the next largest contributor to visibility impairment, with organic carbon generally in third place. At Boundary Waters, organic carbon contribution took a huge leap to first place contributor for the five-year average starting in 2011, due to the Pagami Creek wildfire, which burned 145 square miles of forest that year. The effect of that fire will be apparent in the five-year rolling average progress goals for Boundary Waters through 2015. Voyageurs, located west of the wildfire, was not impacted, as shown in the five-year rolling averages in Figure 2C-6. More information on the Pagami Creek wildfire is provided in Appendix C.

Excluding the effect of the Pagami Creek wildfire, these Figures illustrate that visibility improvement on the 20% worst days is associated with a significantly reduced contribution of ammonium sulfate. Ammonium nitrate contribution has remained relatively steady. Organic carbon trends downward, as shown at Voyageurs.

Figure 2C-5: Five-year rolling-average component break-down at Boundary Waters for worst visibility days

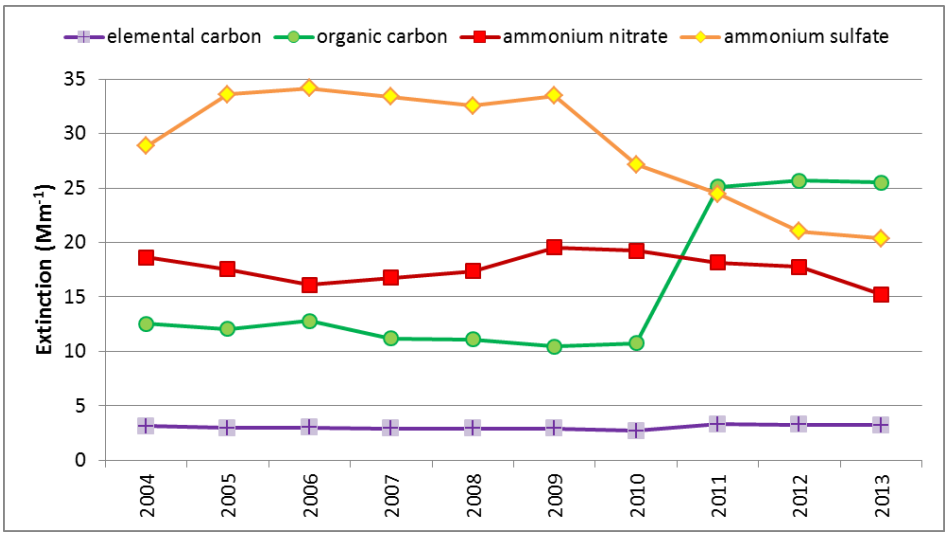
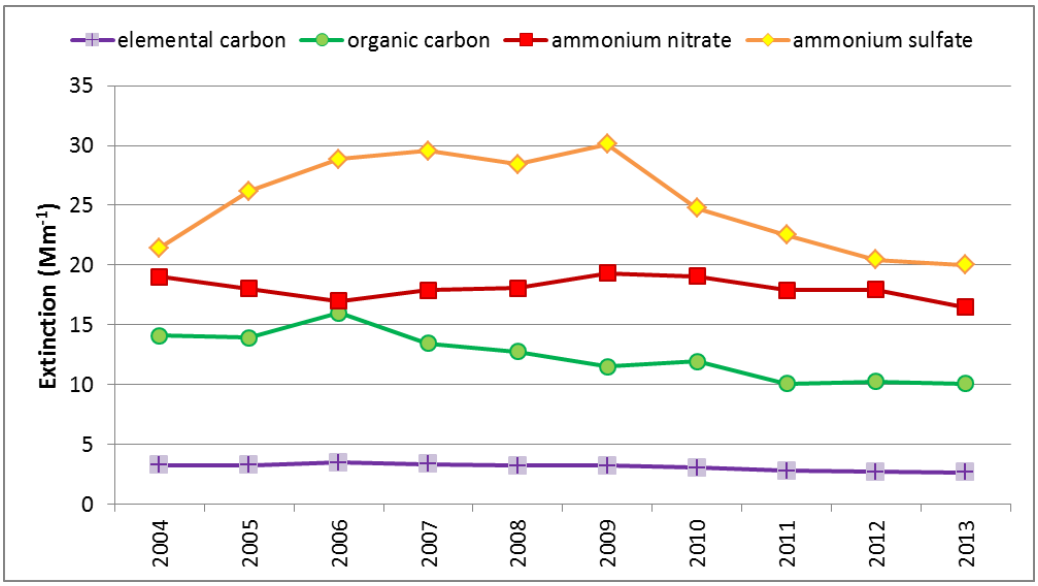


Figure 2C-6: Five-year rolling-average component break-down at Voyageurs for worst visibility days



While trending downward in recent years, ammonium sulfate contribution increased in the years following the baseline period (2000-2004). Yearly average data for both Class I areas, shown in Figures 2C-7 and 2C-8, show a significant increase in ammonium sulfate in 2005, which has affected the five-year rolling averages through 2009.

Figure 2C-7: Annual average component break-down at Boundary Waters

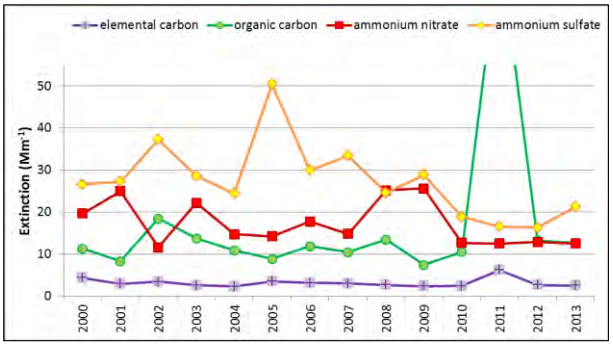
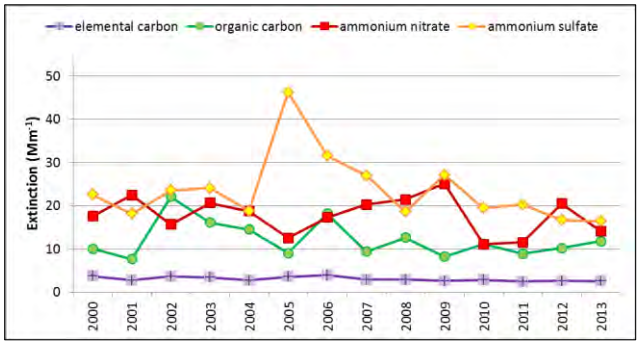


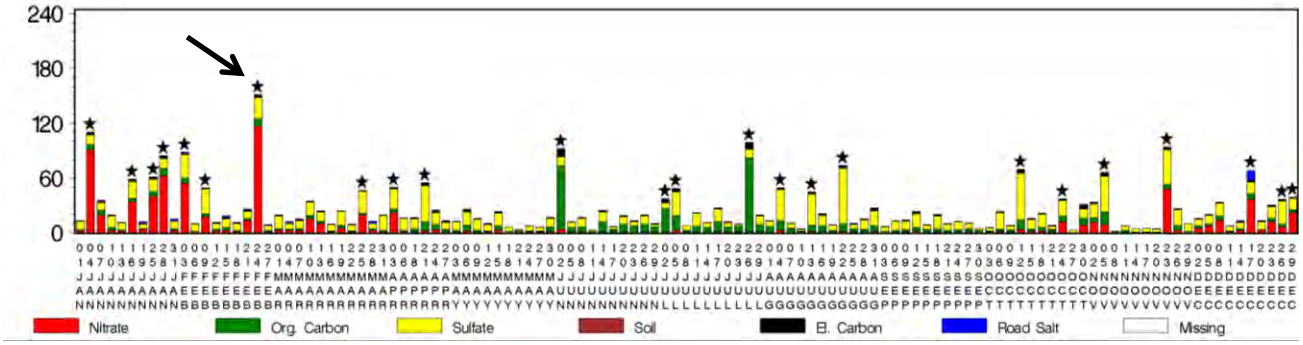
Figure 2C-8: Annual average component break-down at Voyageurs



Dr. Donna Kenski, LADCO, conducted an analysis of measured sulfate to understand the cause for the unusually high 2005 values. Dr. Kenski's analysis (available in Appendix C) determined that the ammonium sulfate concentrations at Boundary Waters and Voyageurs during the three days of highest observed ammonium sulfate in 2005 were largely the result of long-range transport from more significantly polluted areas across the central portion of the U.S., and not due to local sources.

Bar charts that show the extinction component break down for each day of the monitoring period from 2000-2012 are provided in Appendix C. The days included in the 20% worst visibility calculations are starred. The official IMPROVE dataset excludes data from the 20% worst days because of incomplete capture of individual components, sometimes insignificant contributors to visibility. For example, coarse mass and soil/crustal material are missing, while the remaining components — notably sulfate and nitrate — are present at levels that would cause those days to be on the list of 20% worst. The dataset used in this Visibility Progress section contains recalculated data that captures this officially excluded data. Figure 2C-9 shows daily extinction component data for 2008 at Boundary Waters. The official dataset excludes February 24 (arrow). The dataset used for this report includes February 24, the worst visibility day of that year.

Figure 2C-9: Daily extinction at Boundary Waters, 2008



source, D. Kenski

D. Emissions progress

> *An analysis tracking the change over the past five years in emissions of pollutants contributing to visibility impairment from all sources and activities within the State. Emissions changes should be identified by type of source or activity. The analysis must be based on the most recent updated emissions inventory, with estimates projected forward as necessary and appropriate, to account for emissions changes during the applicable five-year period.*

As described in the Visibility Progress section, the reasonable progress goal is determined using base year and future year emissions inventories. Emissions from the "base," or known, year that represent the baseline period were developed for 2002. Emissions were projected using growth and control analyses to estimate emissions in 2018. The Regional Haze Rule requires states to measure interim progress toward reaching the projected emissions estimate.

As evident in the Visibility Progress section, the precursors to formation of ammonium sulfate, ammonium nitrate and organic carbon are the most significant contributors to visibility impairment. Human-generated emissions of SO_2, NO_X and ammonia contribute to the formation of ammonium sulfate and ammonium nitrate, with SO_2 from EGUs having been a primary source impacting Minnesota's Class I areas. On days where organic carbon is highest, wildfires are typically the cause. VOC have a role in organic carbon formation, however, the level of VOC naturally present in the air often overwhelm those that are human-generated. This section contains the change in human – generated emissions of each of the pollutants contributing to visibility impairment and the progress toward reaching the future emissions levels relied on in Minnesota's 2009 Regional Haze SIP.

Emissions from large facilities that emit pollutants through stacks, or point sources, are estimated every year. The most recent point source emissions are available for the year 2012. Emissions from on-road and off-road vehicle (mobile) sources and other sources not emitted through stacks, or non-point sources, are calculated on a three-year cycle. The most recent complete mobile and non-point emissions are available for the year 2008. An early draft version of mobile and non-point emissions are available for 2011 at the writing of this report. Minnesota believes these emissions estimates may significantly change in subsequent drafts, however, the draft estimates are provided here as they are readily available to the public.

Although mobile and nonpoint emissions are calculated every three years, trend data in this section shows linearly interpolated values in the off-years between 2002 and 2005, between 2005 and 2008, and between 2008 and 2011. Emissions of each pollutant contributing to visibility will be discussed separately in the following sub-sections.

Sulfur dioxide

SO_2 emissions in Minnesota have been steadily decreasing. Coal-burning EGUs are the main source of SO_2 emissions. Since 2005, Xcel Energy's Allen S. King coal-fired power plant was renovated with state-of-the-art pollution controls, and the High Bridge and Riverside power-plants were converted from coal to cleaner burning natural gas. Minnesota Power installed modern air pollution controls at its Boswell coal-fired power plant.

Although more coal was burned at the Xcel Energy Allen S. King plant in 2008 than 2004, pollution controls decreased SO_2 emissions by over 26,000 tons. The Xcel High Bridge plant completed the conversion to natural gas in February 2008, dropping SO_2 emissions from a high of nearly 4,000 tons in 2004 to just over one ton in 2008. The Xcel Riverside conversion to natural gas in 2009 resulted in an SO_2 emissions decrease of over 10,000 tons. The installation of controls — and decreased coal burning during renovation — at Minnesota Power Boswell in 2009 decreased SO_2 by over 8,000 tons.

In addition, the Sherco plant decreased tons of coal burned in 2010. In 2011, SO_2 emissions continued to decrease due to reduction of coal use by EGUs, such as the Minnesota Power Taconite Harbor Energy Center and North Shore Mining — Silver Bay. Verso Paper Corp — Sartell permanently shut down because of a fire, reducing emissions of all pollutants, including SO_2. A power boiler shutdown for the duration of the 2012 calendar year at Sherco also resulted in a drop in all emissions, including SO_2. Emissions are also decreasing at non-point sources. Figure 2D-1 shows the SO_2 emissions trend in Minnesota from 2002 to 2012. A table with data used to create Figure 2D-1 is located in Appendix D.

In Minnesota's 2009 SIP, the 2018 reasonable progress goal is based on a projected 34% reduction in SO_2 from 2002 levels. The Minnesota emissions inventory shows that a 61% reduction in SO_2 was reached in 2011. Point source SO_2 reductions far exceeded the 36% reduction projected in the 2009 SIP, reaching a 67% reduction by 2012. The steep decrease in Minnesota SO_2 emissions, also reported in some other nearby States' progress reports, is evident in the visibility trends in Section C. Table 2D-1 shows the annual SO_2 emissions from both the 2009 SIP and the emissions inventory. Emissions are aggregated into all point sources, and all point sources plus mobile and non-point.

Figure 2D-1: SO_2 annual emissions in Minnesota 2002 to 2012

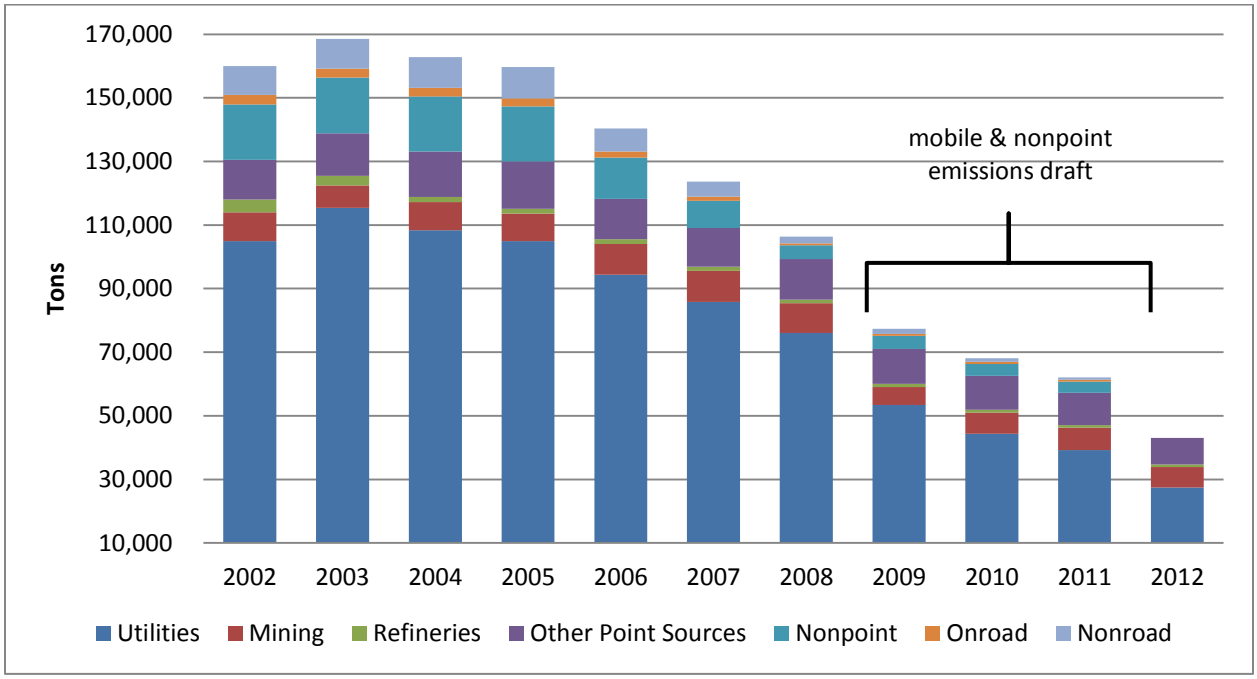


Table 2D-1: SO_2 annual emissions (tons) in Minnesota emissions inventory and the 2009 SIP[24]

SO_2			2009 SIP	
Year	**Annual point source**	**Annual total**	**Annual point source**	**Annual total**
2002	130,000	160,000	131,000	163,000
2003	139,000	168,000		
2004	133,000	163,000		
2005	130,000	160,000		
2006	118,000	140,000		
2007	109,000	124,000		
2008	99,300	106,000		
2009	71,000	77,400		
2010	62,500	68,100		
2011	57,200	62,100		
2012	43,100			
≈				
2018			83,500	108,000

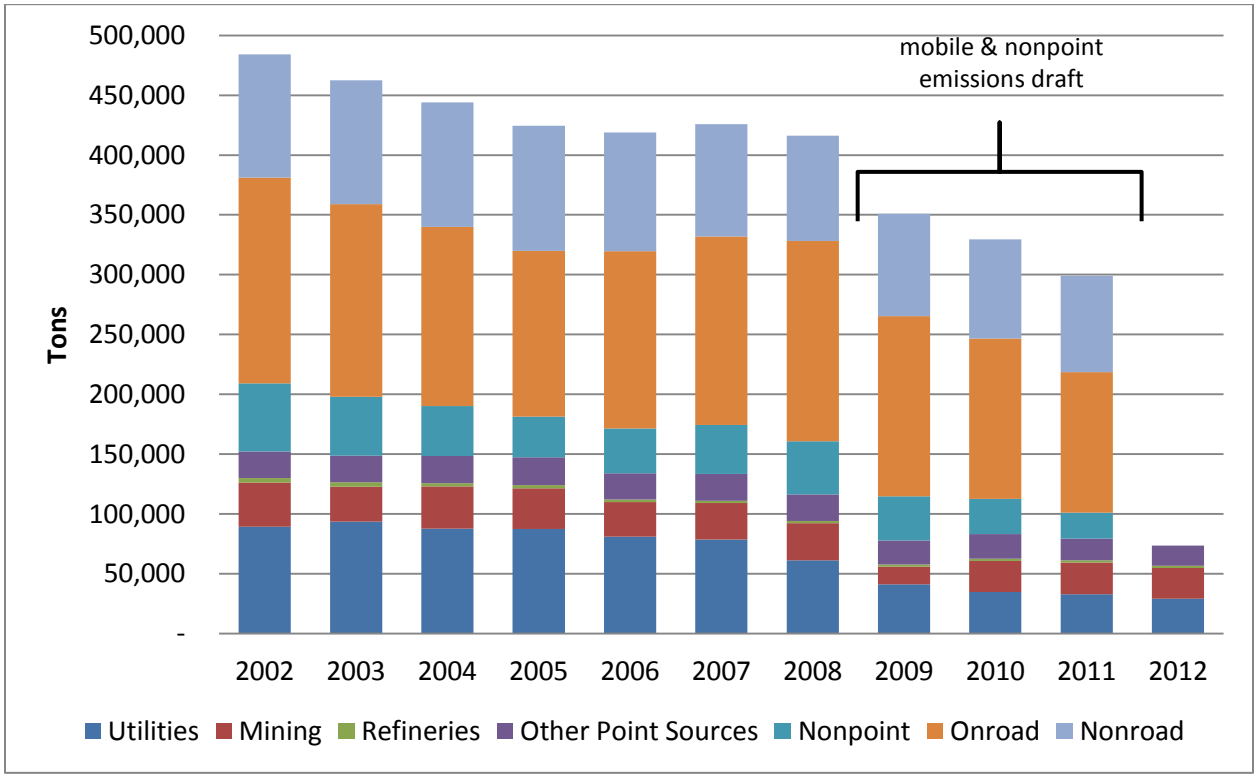
[24] Differences between the base year (2002) emissions totals for the NEI and the 2009 SIP may be attributed to the emissions summation methodology. In some cases, data for some source categories reported in the NEI were replaced with revised data in the modeling platform.

Nitrogen oxides

NO_X emissions in Minnesota are decreasing, but less so than SO_2. On-road and non-road mobile sources emit the majority of NO_X in the state. Trends in on-road mobile source emissions are difficult to actualize, because there was a significant methodology change when MOVES replaced MOBILE6. The MOVES model tends to estimate higher NO_X in 2008, than MOBILE6 did in 2005.

NO_X point source emissions have decreased since 2002. The same measures described above at Minnesota EGUs to reduce SO_2, also reduced NO_X. Mining emissions vary annually depending on the demand for taconite pellets. In 2009, there was a significant reduction in production at several taconite plants, resulting in a decrease in NO_X emissions. However, a production rebound in 2010 resulted in a corresponding increase in NO_X emissions. Figure 2D-2 shows the NO_X emissions trend in Minnesota from 2002 to 2012. A table with data used to create Figure 2D-2 is located in Appendix D.

Figure 2D-2: NO_X annual anthropogenic emissions in Minnesota 2002 to 2012



In Minnesota's 2009 SIP, the 2018 reasonable progress goal is based on a projected 41% reduction in NO_X from 2002 levels. The Minnesota emissions inventory shows that a total 38% reduction in NO_X was reached in 2011. The point source NO_X reductions far exceeded the 25% reduction projected in the 2009 SIP, reaching a 52% reduction by 2012. The National Emissions Inventory (NEI) version 1 ("draft") estimates for 2011 show appreciable reductions of NO_X for other categories: 62% of non-point, 32% of on-road mobile, and 22% of non-road mobile. Table 2D-2 shows the annual NO_X emissions from both the 2009 SIP and the emissions inventory. Emissions are aggregated into all point sources, and all point sources plus mobile and non-point.

Table 2D-2: NO_X annual emissions (tons) in Minnesota emissions inventory and the 2009 SIP

NO_x			2009 SIP	
Year	Annual point src	Annual total	Annual pt src	Annual total
2002	152,000	484,000	155,000	487,000
2003	149,000	462,000		
2004	148,000	444,000		
2005	147,000	424,000		
2006	134,000	419,000		
2007	133,000	426,000		
2008	116,000	416,000		
2009	77,800	351,000		
2010	83,200	330,000		
2011	79,300	299,000		
2012	73,500			
≈				
2018			117,000	288,000

Ammonia

To form ammonium sulfate and ammonium nitrate in the atmosphere, there must be readily available ammonia (NH_3) in which to react. By far the most significant source of ammonia is the non-point source, agriculture livestock manure management, which includes the application of manure as fertilizer. In the 2009 SIP, the state (EPA-derived) agricultural ammonia inventory was replaced with an alternate inventory developed by LADCO. The future year projection to 2018 in the SIP was based on a just over 2% per year increase, resulting in an overall increase in ammonia of 37%. EPA-derived data for Minnesota shows a 10% increase from 2002 and 2011. At this stage the growth rate of ammonia is uncertain, however, it does appear to be increasing at a lower rate than estimated in the 2009 SIP.

Figure 2D-3 shows the proportion of ammonia emissions from point, non-point and mobile sources. Although the point source inventory is calculated every year, the emissions from this category are so minimal that the off-years were not graphed. Table 2D-3 shows the annual ammonia emissions from both the 2009 SIP and the emissions inventory. Emissions are aggregated into all point sources, and all point sources plus mobile and non-point.

Figure 2D-3: Ammonia annual anthropogenic emissions in Minnesota 2002 to 2012

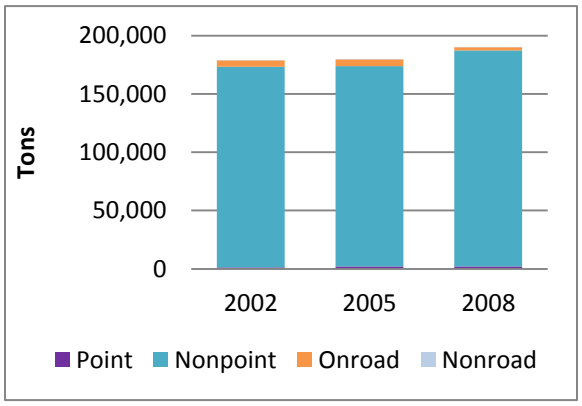


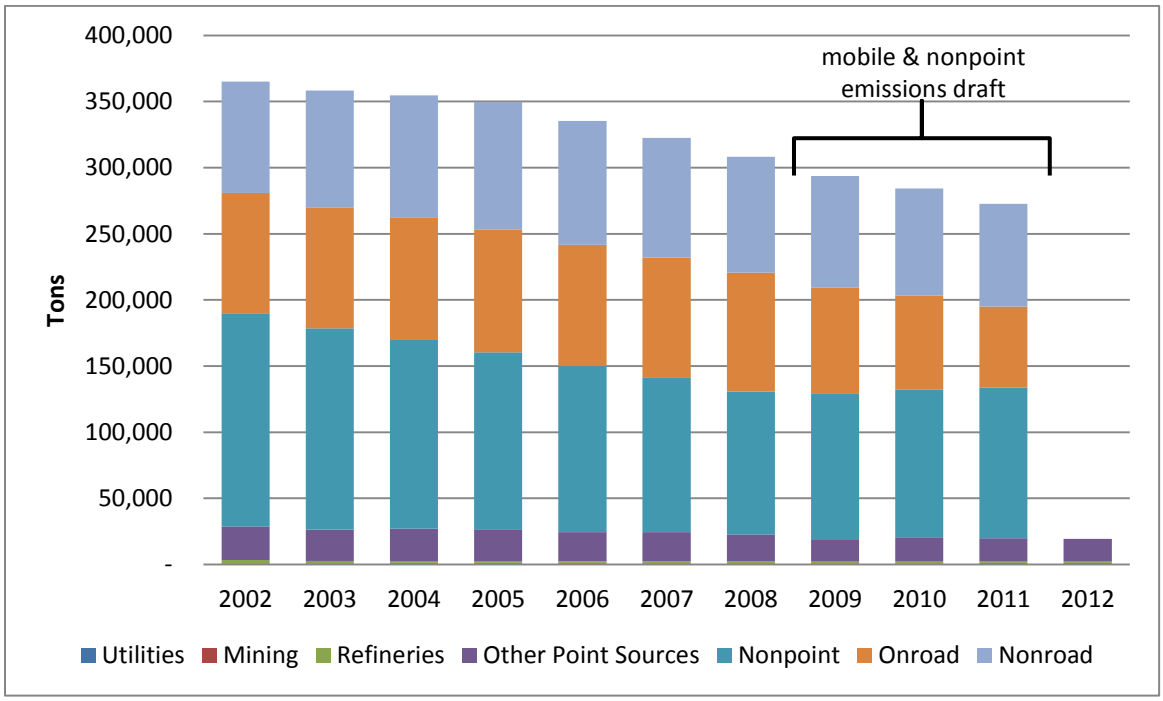
Table 2D-3: Ammonia annual emissions (tons) in Minnesota emissions inventory and the 2009 SIP

	NH_3		2009 SIP	
Year	Annual point source	Annual total	Annual point source	Annual total
2002	1,270	179,000	2,310	185,000
2005	2,080	180,000		
2008	2,140	190,000		
2011	2,210	197,000		
≈				
2018			3,420	253,000

Volatile organic compounds

The natural environment in Minnesota emits nearly three times more VOC than emitted by human activity. Most of the human-generated VOC comes from mobile and non-point sources. Emissions from these sources are decreasing. Point sources account for a small portion of the human-caused VOC emissions, and are gradually decreasing. Figure 2D-4 shows the VOC emissions trend in Minnesota from 2002 to 2012.

Figure 2D-4: VOC annual anthropogenic emissions in Minnesota 2002 to 2012



The Minnesota 2009 SIP projected a 23% reduction of human-generated VOC in 2018 from 2002 levels. The Minnesota emissions inventory shows that a total 25% reduction in VOC was reached in 2011. The point source VOC reductions exceed the 27% reduction projected in the 2009 SIP, reaching a 33% reduction by 2012. Table 2D-4 shows the annual VOC emissions from both the 2009 SIP and the emissions inventory. Emissions are aggregated into all point sources, and all point sources plus mobile and non-point.

Table 2D-4: VOC compound (human-generated) annual emissions (tons) in Minnesota emissions inventory and the 2009 SIP

VOC			2009 SIP	
Year	Annual point source	Annual total	Annual point source	Annual total
2002	28,900	365,000	33,700	361,000
2003	26,300	358,000		
2004	27,000	355,000		
2005	26,000	349,000		
2006	24,400	335,000		
2007	24,400	323,000		
2008	22,700	308,000		
2009	19,000	294,000		
2010	20,600	284,000		
2011	19,900	273,000		
2012	19,500			
≈				
2018			42,800	279,000

Direct $PM_{2.5}$

Direct $PM_{2.5}$ has very minimal impact on visibility in Boundary Waters and Voyageurs, and less time was dedicated to analysis of this pollutant for the 2009 SIP. Visibility levels for direct $PM_{2.5}$ are so small that they do not appear in the component breakdown figures in the Visibility Progress section. The modeling platform for the 2009 SIP contained significantly less total direct PM than the emissions inventory. The modeling platform adjusted these emissions to account only for the transportable fraction. Otherwise, direct $PM_{2.5}$ was unreasonably high when comparing modeled with measured values within the entire Midwestern United States. The future year projection to 2018 in the SIP was based on a 24% increase of direct $PM_{2.5}$ in Minnesota. The Minnesota emissions inventory shows a 27% decrease from 2002 to 2011. Figure 2D-5 shows the proportion of $PM_{2.5}$ emissions from point, non-point and mobile sources. Although the point source inventory is calculated every year, the emissions are so minimal that the off-years were not graphed. Table 2D-5 shows the annual $PM_{2.5}$ emissions from both the 2009 SIP and the emissions inventory. Emissions are aggregated into all point sources, and all point sources plus mobile and non-point.

Figure 2D-5: PM2.5 annual anthropogenic emissions in Minnesota 2002 to 2012

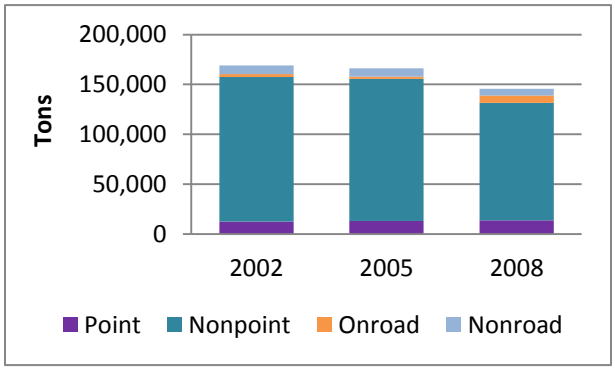


Table 2D-5: PM2.5 annual emissions (tons) in Minnesota emissions inventory and the 2009 SIP

	$PM_{2.5}$		2009 SIP	
Year	Annual point source	Annual total	Annual point source	Annual total
2002	12,500	169,000	12,500	39,900
2005	13,000	166,000		
2008	13,600	146,000		
2011	14,300	124,000		
≈				
2018			25,100	49,600

Emissions progress summary

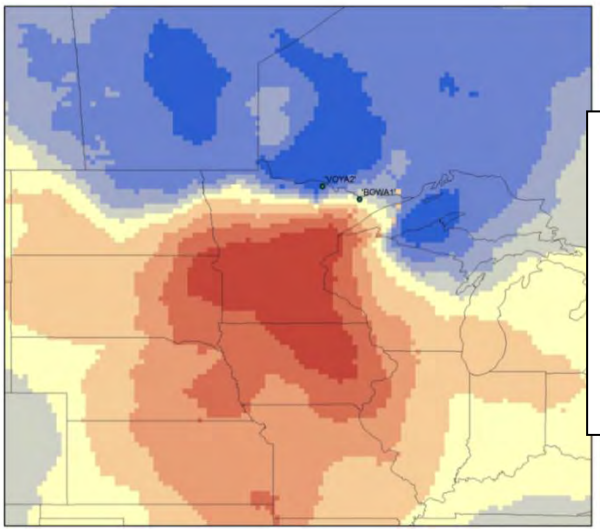
In conclusion, Minnesota reductions of SO_2 have far exceeded the goals set for 2018 by 2011. SO_2 from point sources have reduced even further by 2012. Minnesota reductions of NO_X are in position to achieve the goals set for 2018. This depends on how well the EPA emission estimates for non-point and mobile (both on-road and non-road) in the NEI version 1 compare with the final version. As point source NO_X reductions in 2012 are more than twice that projected for 2018, any potential lag in NO_X emissions reductions would be attributed to the non-point and mobile source sector even when accounting for emission calculation methodology changes between 2005 and 2008. Minnesota ammonia emissions are increasing, though not as significantly as originally projected. This is a positive development, because less available ammonia equates to less formation of ammonium sulfate and ammonium nitrate, the main causes of visibility impairment in Boundary Waters and Voyageurs. Because peak organic carbon levels in Boundary Waters in Voyageurs are caused by wildfire, human-generated emissions of VOC are not a focus of the visibility assessment. Emissions data do show that human-generated emissions of VOC are well on the way to meeting the projected 2018 goal. Directly emitted $PM_{2.5}$ has such little impact on visibility impairment in Boundary Waters and Voyageurs, it will not be addressed further.

E. Assessment of changes impeding visibility progress

An assessment of any significant changes in anthropogenic emissions within or outside the State that have occurred over the past 5 years that have limited or impeded progress in reducing pollutant emissions and improving visibility

The 2009 SIP identified, through modeling, states that contributed 5% or more to impaired visibility at Boundary Waters and Voyageurs. These states, in addition to Minnesota, are Illinois, Iowa, Missouri, North Dakota and Wisconsin. An evaluation of observational data from 2010-2012 suggests that these states likely continue to be the main contributors, besides Minnesota, to impaired visibility at Boundary Waters and Voyageurs. Figure 2E-1 shows the incremental probability that Minnesota and the five other states remain the main contributors to visibility at Boundary Waters and, by extension, Voyageurs. The warmer colors (red – yellow) indicate areas that are probable contributors to poor visibility, while the cooler colors (blues) indicate areas that probable contributors to the best visibility.

Figure 2E-1: Incremental probability of poor visibility at Boundary Waters, 2010 - 2012



- warm (reddish) color: probable source of worst visibility
- cool (bluish) color: probable source of best visibility

Source: D. Kenski

Minnesota, being the host state to Boundary Waters and Voyageurs, is the greatest contributor to visibility impairment. As neighboring states decrease emissions, the contribution of the host state can become proportionally larger. Because visibility impairment in Boundary Waters and Voyageurs is mainly attributable to ammonium sulfate and ammonium nitrate, this section will focus on the three emitted pollutants, SO_2, NO_X and NH_3.

Table 2E-1 shows emissions estimated in the 2009 SIP for each state contributing 5%, or more, to impaired visibility, and the expected emissions change reflected in the reasonable progress goal. As identified in Section D, Emissions Progress, Minnesota has already reached the emissions reductions goal used for reasonable progress goal modeling for SO_2, appears to be on-track for the 2018 NO_X emissions reduction goal and does not appear to be generating as much ammonia as specified in the 2009 SIP.

Table 2E-1: Annual human-generated emissions in tons for the significant contributing states in 2002 and 2018

State	2002			2018			Difference (2018-2002)		
	SO_2	NO_X	**NH_3**	SO_2	NO_X	**NH_3**	SO_2	NO_X	**NH_3**
Illinois	536,000	896,000	136,000	262,000	400,000	196,000	-274,000	-496,000	60,000
Iowa	192,000	340,000	254,000	173,000	193,000	371,000	-19,000	-147,000	117,000
Minnesota	163,000	487,000	185,000	108,000	288,000	253,000	-55,000	-199,000	68,000
Missouri	394,000	513,000	133,000	416,000	246,000	190,000	22,000	-267,000	57,000
North Dakota	206,000	148,000	70,400	125,000	137,000	103,000	-81,000	-11,000	32,600
Wisconsin	266,000	408,000	123,000	217,000	185,000	127,000	-49,000	-223,000	4,000

As of 2011, overall statewide NO_X emissions in Minnesota have decreased 38% since the 2002 base year. Minnesota point sources have surpassed the 2018 emission projection of a 25% reduction, achieving a 52% reduction as of 2012. Minnesota anticipates that the 2018 reasonable progress goals, which rely on an overall projected 41% reduction in statewide NO_X emissions will be, in part, dependent on the implementation of federal mobile source controls.

Other states' emissions progress

Iowa submitted its Regional Haze SIP Five-Year Progress Report in April 2013. From 2002 to 2008, Iowa reports an emissions reduction of 37,400 tons SO_2, and 68,100 tons of NO_X. The 2018 reasonable progress goals in the Minnesota 2009 SIP relied on an emissions reduction of 19,000 tons SO_2 and 147,000 tons of NO_X. Iowa's reported 2008 emissions reductions surpass those projected in Minnesota's SIP for SO_2 and fall short of the 2018 NO_X emissions reduction goal. This finding is similar to Minnesota's reported emissions progress. Because Iowa implemented CAIR beginning in 2009 (and is included in the CSAPR program expected to replace CAIR), continued improvements in SO_2 and NO_X emissions may have occurred. Additionally, because Iowa has a designated nonattainment area for the 2010 SO_2 NAAQS (with an attainment demonstration SIP revision due by April 2015 and monitored attainment required by October 2018), additional reductions in SO_2 emissions may occur.

Missouri is expected to submit its Regional Haze SIP Five-Year Progress Report by August 2014. A draft version of Missouri's report, released for public notice in May 2014, compares emissions data from 2005 to 2011. In that six-year time-span, Missouri reports an emissions reduction of 147,000 tons SO_2 and of 53,200 NO_X. Because Missouri did not report emissions changes from the base year, Minnesota is unable to compare the values Missouri reports to the values Minnesota relied on in the 2009 SIP. However, the modeling inventory in Minnesota's SIP projected a 22,000 ton increase in SO_2 in Missouri from 2002 to 2018. Based on information made available to date, including Missouri's participation in CAIR and inclusion in CSAPR, an increase in emissions is improbable. Additionally, because Missouri has a designated nonattainment area for the 2010 SO_2 NAAQS (with an attainment demonstration SIP revision due by April 2015 and monitored attainment required by October 2018), further reductions in SO_2 emissions may occur. Finally, because Missouri also has a designated nonattainment area for the 2008 ozone NAAQS with an attainment deadline of July 2015, it may choose to implement controls on NO_X-emitting sources, as needed.

Both Iowa and Missouri reported increases in emissions of NH_3, but such increases were already accounted for in the development of Minnesota's reasonable progress goal.

Although North Dakota has not reached its March 2015 deadline for submitting a five-year progress report SIP, the state's Department of Health provided emissions information to Minnesota, and the MPCA has reviewed North Dakota's draft five-year progress report[25]. North Dakota reports a total emissions reduction of 67,000 tons (38%) of SO_2 and 51,000 tons (22%) of NO_X from 2002 to 2011. SO_2 emissions from EGUs specifically have decreased 85,000 tons (60%) from 2002 to 2013. NO_X emissions from EGUs decreased 28,000 tons (38%) from 2002 to 2013. The 2018 reasonable progress goals in Minnesota's 2009 Regional Haze SIP relied on an emissions reduction of 81,000 tons SO_2 and 11,000 tons of NO_X. North Dakota's reported 2011 emissions reductions surpass those projected in Minnesota's SIP for NO_X and fall short of the 2018 SO_2 emissions reduction goal. There is not enough available information to determine whether North Dakota intends to further reduce additional SO_2 emissions by 2018. Minnesota does not anticipate this will be an issue because other states contributing to visibility impairment to Boundary Waters and Voyageurs have already surpassed SO_2 emissions reduction projections relied on in Minnesota's SIP. The significant expansion of oil production in North Dakota over

[25] https://www.ndhealth.gov/AQ/Dockets/Regional_Haze/RH%20Progress%20Report%20Complete.pdf

the past several years could potentially result in increased area source emissions. However, North Dakota's emissions data suggests that, to date, these emissions have not significantly impeded NO_X emissions reductions progress. While the increase in oil and gas development could lead to increased VOC emissions (not assessed here), as VOC are not considered a primary factor in the development of haze in Minnesota's Class I areas, any associated emissions increases are not anticipated to impede visibility progress at this time.

Both Illinois and Wisconsin are required to submit their Regional Haze SIP Five-Year Progress Reports in the summer of 2016, and so have not compiled the required emissions comparison data. However, Minnesota received information from Illinois, Indiana, Michigan, Ohio and Wisconsin outlining Regional Haze controls currently in place or expected by 2018, as well as additional controls not documented in Regional Haze SIPs (See Appendix E). No significant increases in anthropogenic emissions are currently expected.

A table of CAMD-reported SO_2 and NO_X emissions from Minnesota and neighboring states showing significant emissions progress between 2005 and 2013 is located in Appendix E.

F. Assessment of current strategy

> *An assessment of whether the current implementation plan elements and strategies are sufficient to enable the State, or other States with mandatory Federal Class I areas affected by emissions from the State, to meet all reasonable progress goals.*

In light of emissions and visibility trends, Class I areas affected impacted by emissions from Minnesota are on track to meet 2018 RPGs.

Control strategies and emissions reductions

As described in the Status of Control Strategies section, controls relied upon in Minnesota's Regional Haze SIP have either been implemented, or are expected to be implemented by 2018.

Minnesota has exceeded projected SO_2 emissions reductions modeled in establishing the reasonable progress goals its Class I areas. Minnesota's reasonable progress goals had relied upon a projected 34% reduction of SO_2 emissions statewide from the 2002 base case; by 2008, Minnesota had already achieved (and exceeded) the statewide reduction goal. By 2011, Minnesota had achieved a 61% reduction in statewide SO_2 emissions. Continued implementation of Long Term Strategy controls are expected to provide further reductions.

Statewide NO_X emissions in Minnesota have also decreased since the 2002 base case, exceeding modeled reduction targets for point sources, while seeing a less significant decrease in mobile source emissions. By 2011, Minnesota achieved a 38% reduction in statewide NO_X emissions – nearly achieving the 41% reduction relied upon for the 2018 reasonable progress goals.

MPCA also expects to see further emissions reductions in both SO_2 and NO_X from controls not yet implemented, including BART and the taconite NAAQS compliance element of the Long Term Strategy.

Although Minnesota impacts visibility at Isle Royale National Park in Michigan, the focus of this document is on Boundary Waters and Voyageurs, as Minnesota has the greatest visibility impacts on these two Class I areas. However, emissions progress supporting reasonable progress goals in Minnesota's Class I areas can be expected to support the achievement of the reasonable progress goal for Isle Royale. Michigan, in developing their reasonable progress goals, did not specifically seek additional controls/emissions reductions from contributing states, instead relying on expected

reductions from CAIR (and/or CSAPR) to address other states' reasonable progress obligations. Though Minnesota is not a participant in CAIR, as shown in the Emissions Reductions from Regional Haze SIP Strategies section, emissions from EGUs reporting to EPA's CAMD are currently below the levels prescribed by CSAPR budgets. Because Minnesota has achieved SO_2 reductions greater than anticipated by both its own, as well as Michigan's, Regional Haze SIPs, and expects to see further emissions reductions by 2018, it is reasonable to conclude that current SIP controls and emissions reduction progress are sufficient to support reasonable progress goals at all Class I areas impacted by emissions from Minnesota.

Visibility progress

Current visibility conditions at both Boundary Waters and Voyageurs have improved compared to baseline conditions. Visibility conditions at Voyageurs have exceeded expectations, with visibility 0.7 deciview below the 2018 reasonable progress goal, while visibility conditions at Boundary Waters, though on track to meet the 2018 goal, currently show a smaller improvement due to the effects of the 2011 Pagami wildfire. Excluding the effects of the Pagami wildfire, however, visibility improvement at Boundary Waters would be expected to be similar to that seen at Voyageurs. No degradation of visibility on the clearest days at Boundary Waters and Voyageurs has occurred. Minnesota expects to meet and maintain 2018 reasonable progress goals.

Minnesota concludes that its current Regional Haze SIP strategies are sufficient to achieve reasonable progress goals for Class I areas within Minnesota and those impacted by Minnesota.

G. Review of visibility monitoring strategy

> *A review of the State's visibility monitoring strategy and any modifications to the strategy as necessary.*

Interagency Monitoring of Protected Visual Environments (IMPROVE). The Regional Haze Rule requires a monitoring strategy for measuring, characterizing, and reporting regional haze visibility impairment representative of all mandatory Class I areas.[26] Minnesota continues to rely upon participation in the IMPROVE program to meet its monitoring strategy requirements with no modifications to the strategy determined necessary at this time.

The IMPROVE Aerosol Network is a cooperative air quality monitoring effort between federal land managers; regional, state, and tribal air agencies; and the EPA. The program was established in 1985 to aid in developing Federal and State implementation plans for the protection of visibility in Class I areas. The network began with 42 sites at or near Class I areas. At the time of promulgation of the Regional Haze Rule in 1999, there were 80 monitors. In 2000 and 2001, an additional 30 sites were added to Class I areas, and 34 to non-Class I areas. (IMPROVE monitors operated outside of Class I areas are "Protocol" monitors, operated for FLMs, states, and tribes). The IMPROVE network presently comprises 175 monitoring sites nationally.

The objectives of the IMPROVE network are:

- To establish current visibility and aerosol conditions in Class I areas
- To identify chemical species and emission sources responsible for existing man-made visibility impairment
- To document long-term trends for assessing progress towards the national visibility goal

[26] 40 CFR 51.308(d)(4)

- With the enactment of the Regional Haze Rule, to provide regional haze monitoring representing all visibility-protected federal class I areas where practical.

The IMPROVE sites also provide $PM_{2.5}$ speciation data; therefore, they are a key component of the EPA's national fine particle monitoring and are critical to tracking progress related to the Regional Haze Regulations.

In Minnesota, IMPROVE sites are located in the two Class I areas, at Boundary Waters (monitor BOWA1) and Voyageurs (monitor VOYA2). IMPROVE Protocol sites are located in the southern areas of the state, near Blue Mounds State Park (BLMO1) and Great River Bluffs State Park (GRRI1). Minnesota commits to meeting the requirements under 40 CFR 51.308(d)(4)(iv) to report to EPA visibility data for each of Minnesota's Class I areas annually.

The filter samples from the IMPROVE modules are sent for analysis to the Crocker Nuclear Laboratory of the University of California in Davis and the analysis data is posted to the IMPROVE website and the VIEWS website. This fulfills Minnesota's requirement for electronic reporting of visibility data.

Continued operation of the IMPROVE network is contingent upon continued federal funding to measure, characterize and report regional haze visibility impairment. In the event of a complete loss of federal funding, the MPCA will attempt to provide support for the operation of at least one of its two Class I IMPROVE sites.

Figure 2G-1: IMPROVE Monitor Sites in MN

Should the IMPROVE monitoring network be disbanded or reduced, Minnesota could use information from $PM_{2.5}$ monitoring sites in the state to make some estimates of $PM_{2.5}$ concentrations, and thus visibility impairment, in Class I areas. Minnesota evaluates its monitoring network periodically, including evaluation of technology changes and the need for new monitors. More information about the monitoring networks in place in Minnesota, and any future planned changes, can be found in the *Annual Air Monitoring Network Plan for the State of Minnesota*.[27]

[27] MPCA, 2014.

H. Determination of adequacy

Determination of the adequacy of existing implementation plan. At the same time the State is required to submit any 5-year progress report to the EPA in accordance with paragraph (g) of this section, the State must also take one of the following actions based upon the information presented in the progress report:

(1) If the State determines that the existing implementation plan requires no further substantive revision at this time in order to achieve established goals for visibility improvement and emissions reductions, the State must provide to the Administrator a negative declaration that further revision of the existing implementation plan is not needed at this time.

(2) If the State determines that the implementation plan is or may be inadequate to ensure reasonable progress due to emissions from sources in another State(s) which participated in a regional planning process, the State must provide notification to the Administrator and to the other State(s) which participated in the regional planning process with the States. The State must also collaborate with the other State(s) through the regional planning process for the purpose of developing additional strategies to address the plan's deficiencies.

(3) Where the State determines that the implementation plan is or may be inadequate to ensure reasonable progress due to emissions from sources in another country, the State shall provide notification, along with available information, to the Administrator.

(4) Where the State determines that the implementation plan is or may be inadequate to ensure reasonable progress due to emissions from sources within the State, the State shall revise its implementation plan to address the plan's deficiencies within one year.

Based on the analyses presented in previous sections, the MPCA has determined that its existing, EPA-approved Regional Haze SIP (the 2009 Regional Haze SIP and the 2012 Regional Haze SIP Supplement) is adequate to meet the requirements of the Regional Haze Rule and to ensure achievement of the established reasonable progress goals for Minnesota's Class I areas (Boundary Waters and Voyageurs) and the Class I area in Michigan impacted by Minnesota emissions (Isle Royale National Park). The plan requires no further substantive revision to achieve established goals for visibility improvement and emissions reductions. Minnesota will continue to implement the measures of its existing SIP, and begin preparation for the next scheduled Regional Haze SIP revision due on July 31, 2018.

Minnesota submits a negative declaration that further revision of the existing implementation plan is not needed at this time.

Chapter 3: Procedural requirements

Administrative process

The public notice for the SIP revision was published in the State Register on July 28, 2014 with the public comment period commencing on March July 28, 2014 and ending August 27, 2014. During the public comment period, a copy of the SIP revision was made available at the MPCA office located in St. Paul and on the MPCA's website. A copy of the public notice is attached (Appendix F).

The public notice stated: "As this progress report SIP revision does not include any substantive changes to Minnesota's SIP, a public information meeting will only be held if one is requested by 4:30 p.m. on Wednesday, August 27, 2014. If such a meeting is requested, it will be held on Friday, August 29, 2014 at 10 a.m. at the MPCA Saint Paul Office, 520 Lafayette Road North, Saint Paul, Minnesota 55155-4194. To find out if a public information meeting will be held, please contact Melissa Andersen Kuskie at (651) 757-2512 or melissa.kuskie@state.mn.us after Wednesday, August 27, 2014 at 4:30 p.m. The public information meeting, if one is requested, will provide information, receive public input, and answer questions about the proposed progress report SIP revision."

No public meeting was requested.

MPCA received seven comment letters prior to the close of the public comment period and one late comment letter in relation to this SIP action. The comment letters and MPCA's responses are included in Appendix F.

Consultation with Federal Land Managers

(1) The State must provide the Federal Land Manager with an opportunity for consultation, in person and at least 60 days prior to holding any public hearing on an implementation plan (or plan revision) for regional haze required by this subpart. This consultation must include the opportunity for the affected Federal Land Managers to discuss their:

(i) Assessment of impairment of visibility in any mandatory Class I Federal area; and

(ii) Recommendations on the development of the reasonable progress goal and on the development and implementation of strategies to address visibility impairment.

(2) In developing any implementation plan (or plan revision), the State must include a description of how it addressed any comments provided by the Federal Land Managers.

The MPCA regularly consults with FLMs, typically on a monthly basis, regarding regional haze and permitting program concerns and developments. The MPCA held a teleconference with FLMs on June 10, 2014, to discuss the elements of Minnesota's draft Five-Year Regional Haze Progress Report, and provided an early draft to the FLMs (as well as to tribal government representatives) on June 20, 2014, 68 days prior to the close of the MPCA's public notice and comment period for the SIP, and 70 days prior to the scheduled date for the public hearing.

Comments received by FLMs regarding the Five-Year Regional Haze Progress Report, as well as the MPCA's responses, are included in Appendix F.

Checklist

Table 3-1 - Five-Year Progress Report Submittal Checklist Submitted under 40 CFR 51.308(g)-(h) and 40 CFR 51.309(d)(10)

Y/N	Regulation Citation	Regulation Summary	Location in Report	Comments
Y	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? *(all states)*	Pages 4-10	
Y	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? (*all states)*	Pages 10-12 Appendix B	
Y	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? (*states with Class I areas only)*	Pages 12-19 Appendix C	
Y	51.308(g)(4) 51.309(d)(10)(i)(D)	Emissions Progress: Does the report provide emissions trends across the entire inventory for a 5-year period as required by the Regional Haze Rule? *(all states)*	Pages 19-26 Appendix D	
Y	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? (*all states)*	Pages 26-29 Appendix E	
Y	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? *(all states)*	Pages 29-30	
Y	51.308(g)(7) 51.309(d)(10)(i)(G)	Review of Monitoring Strategy: Does the report review the monitoring plan including any non-IMPROVE monitors the state is using? (*states with Class I areas only)*	Pages 30-32	
Y	51.308(h) 51.309(d)(10)(ii)	Determination of Adequacy: Does the report (or the transmittal materials) provide the explicit determination required by the Regional Haze Rule? *(all states)*	Page 33	

Appendix A

Completeness Review

A. Administrative Materials (40 CFR pt. 51, Appendix V, Part 2.1)

The EPA's Criteria for Determining the Completeness of Plan Submittals, published at 40 CFR part 51, Appendix V, requires states to provide the basic documents that show that the State has properly followed the administrative requirements called for by the CAA for the adoption of SIPs. The requirements, and how this SIP revision complies with these requirements, are discussed here:

1) Formal Letter of Submittal:

> "A formal letter of submittal from the Governor or his designee, requesting EPA approval of the plan or revision thereof."

Attached to this SIP revision request is a formal letter of submittal from the MPCA Commissioner, John Linc Stine, to the EPA Region V Administrator, Susan Hedman. The office of the Commissioner of the MPCA is statutorily created in Minnesota Statute § 116.03, subd. 1 (a). The Commissioner is appointed by the Governor, and the duties of the position include acting as the state agent to "apply for, receive, and disburse federal funds made available to the state by federal law or rule and regulations promulgated thereunder for any purpose related to the power and duties of the MPCA or the Commissioner. The Commissioner shall comply with any and all requirements of such federal law or such rules and regulations promulgated thereunder to facilitate application for, receipt, and disbursement of such funds." Minn. Stat. § 116.03 subd. 3.

2) Evidence of State Adoption of Plan and Issuance of Orders in Final Form

> "Evidence that the State has adopted the plan in the State code or body of regulations; or issued the permit, order, consent agreement (hereafter 'document') in final form. That evidence shall include the date of adoption or final issuance as well as the effective date of the plan, if different from the adoption/issuance date."

All state-specific controls addressed in this submittal have previously been incorporated into Minnesota's Regional Haze SIP. This SIP revision assesses progress achieved by previously incorporated SIP measures, but does not incorporate new regulations, permits, orders or other agreements.

3) Legal Authority Documentation:

"Evidence that the State has the necessary legal authority under State law to adopt and implement the plan."

This SIP revision is an update to the MPCA's Regional Haze SIP. The Regional Haze SIP was originally submitted by the MPCA in December 2009, and approved by EPA in the *Federal Register* on June 12, 2012

(77 FR 34801). Appendix 2.1 of the initial Regional Haze SIP submittal documents the MPCA's legal authority to submit SIP revisions.

4) Compliance with State Procedures:

> "Evidence that the state followed all of the procedural requirements of the State's laws and constitution in conducting and completing the adoption/issuance of the plan."

MPCA complied with all relevant state procedures for finalizing the SIP revision, including a public notice period and the opportunity to request a hearing (see Appendix F).

5) Public Notice:

> "Evidence that public notice was given of the proposed change consistent with the procedures approved by the EPA, including the date of the publication of the notice."

The public notice for the SIP revision was published in the State Register on July 28, 2014 with the public comment period commencing on March July 28, 2014 and ending August 27, 2014. During the public comment period, a copy of the SIP revision was made available at the MPCA office located in St. Paul and on the MPCA's website. A copy of the public notice is attached (Appendix F)

6) Public Hearing Certification:

> "Certification that public hearing(s) were held in accordance with the information provided in the public notice and the State's laws and constitution, if applicable."

The public notice states: "As this progress report SIP revision does not include any substantive changes to Minnesota's SIP, a public information meeting will only be held if one is requested by 4:30 p.m. on Wednesday, August 27, 2014. If such a meeting is requested, it will be held on Friday, August 29, 2014 at 10 a.m. at the MPCA Saint Paul Office, 520 Lafayette Road North, Saint Paul, Minnesota 55155-4194. To find out if a public information meeting will be held, please contact Melissa Andersen Kuskie at (651) 757-2512 or melissa.kuskie@state.mn.us after Wednesday, August 27, 2014 at 4:30 p.m. The public information meeting, if one is requested, will provide information, receive public input, and answer questions about the proposed progress report SIP revision."

No public meeting was requested.

7) Public Comments and State Response:

> "Compilation of the public comments and State's response thereto."

MPCA received seven comment letters prior to the close of the public comment period and one late comment letter in relation to this SIP action. The comment letters and MPCA's responses are included in Appendix F.

B. Technical Support:

1) Pollutants Regulated:

> "Identification of all regulated pollutants affect by the plan."

This SIP submission addresses regional haze, which contributes to visibility impairment. Haze has multiple component pollutants, which include nitrogen dioxides, sulfur dioxide, particulate matter, volatile organic compounds and ammonia.

2) Source Identification

> "Identification of the locations of affected sources including the EPA attainment/nonattainment designation of the locations and the state of the Attainment Plan for the affected area(s)."

Does not apply to this SIP submittal.

3) Emissions Quantification:

> "Quantification of the changes in the plan; allowable emissions from the affected sources; estimates of changes in current actual emissions from affected sources or, where appropriate, quantification of the changes in actual emissions through calculations of the differences between certain baseline levels and allowable emissions anticipated as a result of the revision."

Emissions quantification information is contained in Chapter 2 of the SIP submittal, and in Appendices B and D.

4) NAAQS Protections:

> "The State's demonstration that the NAAQS, prevention of significant deterioration increments, reasonable further progress demonstration, and visibility, as applicable, are protected if the plan is approved and implemented."

The purpose of this SIP submittal is to demonstrate the adequacy of Minnesota's approved Regional Haze SIP in achieving 2018 visibility goals.

5) Modeling Information

> "Modeling information required to support the proposed revision, including input data, output data, models used, justification of the model selections, ambient monitoring data used, meteorological data used, justification for use of off-site data (where used), modes of models used,

> assumptions, and other information relevant to the determination of adequacy of the modeling analysis."

Contained in Chapter 2, Section C of the SIP submittal, as well as Appendix C.

6) Continuous Emission Reduction

> "Evidence, where necessary, that emission limitations are based on continuous emission reduction technology."

Does not apply to this SIP submittal.

7) Emission Level Assurance

> "Evidence that the plan contains emission limitations, work practice standards and recordkeeping/requirements, where necessary, to ensure emissions levels."

The purpose of this SIP submittal is to demonstrate the adequacy of Minnesota's approved Regional Haze SIP in achieving 2018 visibility goals. Emission limitations and other assurances are contained in the existing Regional Haze SIP.

8) Compliance/Enforcement

> "Compliance and enforcement strategies, including how compliance will be determined in practice."

The purpose of this SIP submittal is to demonstrate the adequacy of Minnesota's approved Regional Haze SIP in achieving 2018 visibility goals. Compliance and enforcement strategies, where needed, are contained in the existing Regional Haze SIP.

9) Special Economic and Technological Justifications:

> "Special economic and technological justifications required by any applicable EPA policies, or an explanation of why such justifications are not necessary."

Does not apply to this SIP submittal.

Appendix B

Minnesota's BART-subject EGU Information

Table 1 CAMD and CSAPR Data for BART-subject EGUs in Minnesota

Facility	2009 Data (Original SIP Submittal)			2013 Data			CSAPR Budgets (allocations = tons)		Controls/ Operations Update
	SO2 Emissions (tons)	NOX Emissions (tons)	Heat Input (mmBtu)	SO2 Emissions (tons)	NOX Emissions (tons)	Heat Input (mmBtu)	SO2	NOX	
Taconite Harbor Unit 3	1400	900	2,950,000	1400	900	5,110,000	639	431	Retiring unit 2015
Boswell Unit 3	6900	3500	20,000,000	78	900	29,000,000	3174	2142	Wet limestone scrubber; LNB, SCR
RPU Silver Lake[1] Unit 4	60	70	500,000	80	80	510,000	215	145	Decommission by 2015 (ceased coal burning at the plant November 2013)
Sherco[2] Units 1 & 2	13000	9300	99,000,000	6300	7800	87,000,000	11579	7815	AO compliance (Units 1 & 2) by 2015
Northshore Mining[3] Unit 2							587	396	Expected to finalize major permit amendment installing LNB in 2015

1- RPU has 2 BART-subject units (3 & 4) but Unit 3 does not report to CAMD (nor is it subject to CSAPR), so data is provided only for Unit 4

2- Sherco has 2 BART-subject units (1 & 2), so data has been combined for both units.

3- Northshore Mining does not report emissions to CAMD, so only CSAPR allowance information and controls information is provided

Northeast Minnesota Plan Emissions Tracking

Northeast Minnesota Plan Emissions tables are included as Attachment 1 to this Appendix.

Northeast Minnesota Plan Emission Tracking Spreadsheet																															
			2002 Base Year Emissions			2005 Emissions			2006 Emissions			2007 Emissions			2008 Emissions			2009 Emissions			2010 Emissions			2011 Emissions			2012 Emissions			*2018 Emission Projections*		
Source Name	Permit ID	Previous Name	NOx (tons)	SO2 (tons)	Combined Tons	NOx (tons)	SO2 (tons)	Combined Tons	NOx (tons)	SO2 (tons)	Combined Tons	NOx (tons)	SO2 (tons)	Combined Tons	NOx (tons)	SO2 (tons)	Combined Tons	NOx (tons)	SO2 (tons)	Combined Tons	NOx (tons)	SO2 (tons)	Combined Tons	NOx (tons)	SO2 (tons)	Combined Tons	NOx (tons)	SO2 (tons)	Combined Tons	*NOx (tons)*	*SO2 (tons)*	*Combined Tons*
Existing Facilities in 2002																															
Itasca Eco Industrial Park (Ainsworth Engineered Grand Rapids)	06100010		105	2	107	93	2	95	50	1	51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*0*	*0*	*0*
Hill Biomass Inc (Ainsworth Engineered - Cook)	13700083	Ainsworth Engi	224	20	244	207	20	227	163	14	177	145	12	157	63	5	68	0	0	0	0	0	0	0	0	0	0	0	0	*69*	*6*	*75*
Arcelor Mittal Mining Co	13700062		3254	155	3409	2849	147	2996	2946	160	3106	2918	42	2960	2655	150	2805	1809	55	1864	3272	101	3373	3349	103	3452	3418	105	3523	*2461*	*82*	*2543*
Blandin Paper/Rapids Energy Center	06100001		416	44	460	458	69	527	546	66	612	576	140	716	539	115	654	538	119	657	728	341	1069	522	123	645	480	124	604	*772*	*405*	*1176*
Boise White Paper LLC - Intl Falls	07100002		846	68	914	832	82	914	870	51	921	829	95	924	839	84	923	824	65	889	853	62	915	840	62	902	801	69	871	*831*	*81*	*912*
Duluth Steam Cooperative Assoc.	13700022		329	285	614	355	294	649	509	385	894	420	429	849	354	398	752	383	403	786	331	363	694	336	372	708	333	358	690	*386*	*410*	*771*
Georgia-Pacific - Duluth Hardboard	13700031		68	307	375	104	306	410	95	216	311	90	200	290	94	184	278	47	60	107	63	6	69	62	7	69	40	5	45	*0*	*0*	*0*
Hibbing Public Utilities	13700027		283	257	540	405	371	776	371	399	770	589	593	1182	595	799	1394	689	1012	1701	610	595	1205	481	345	826	480	379	859	*624*	*801*	*1426*
Hibbing Taconite Co	13700061		6203	593	6795	6217	447	6664	5550	402	5952	4114	386	4500	4539	417	4956	984	95	1079	3628	618	4246	4758	827	5585	4837	835	5672	*3212*	*299*	*3512*
Minnesota Power - Taconite Harbor	03100001		2309	3112	5422	3217	5235	8452	3220	5387	8607	2988	5062	8050	2351	4720	7071	1664	3562	5226	1706	3928	5634	1505	3358	4863	1169	2655	3824	*2061*	*1563*	*3624*
Minnesota Power Inc - Boswell	06100004		14528	21170	35698	14257	19962	34219	13370	20407	33777	14430	21580	36010	15464	21525	36989	11217	13442	24659	6177	6656	12833	4584	3967	8551	4282	4646	8928	*4845*	*9218*	*14063*
Minnesota Power Inc - Laskin Energy	13700013		2176	1608	3784	2530	1841	4371	2247	1611	3858	932	1341	2273	905	1441	2346	650	1254	1904	638	561	1199	575	539	1114	424	262	686	*795*	*1465*	*2260*
Minnesota Power Inc - ML Hibbard	13700015		414	132	546	693	323	1016	767	357	1124	727	354	1081	794	442	1236	642	354	996	847	460	1307	549	219	768	499	163	662	*721*	*383*	*1104*
Northshore Mining Co - Silver Bay	07500003		3911	2291	6202	4201	2672	6873	3724	2780	6504	3897	2935	6832	3646	2312	5958	2986	1756	4742	3873	1644	5517	3533	2251	5784	2971	2250	5221	*2752*	*1708*	*4460*
Sappi Cloquet LLC	01700002		1196	190	1386	982	383	1365	1155	211	1366	1216	268	1484	1182	182	1364	1113	179	1292	1222	66	1288	1663	170	1833	1418	207	1625	*1211*	*143*	*1420*
United Taconite LLC - Fairlane Plant	13700113		1771	3222	4994	3774	2467	6241	3384	3312	6696	4263	3654	7917	3540	3726	7266	1968	2936	4904	4057	2493	6550	4355	2009	6364	3924	1430	5353	*5347*	*3687*	*9034*
US Steel Corp - Keewatin Taconite	13700063		6049	704	6753	5803	759	6562	3387	791	4178	3619	788	4407	3471	791	4262	46	46	92	3588	358	3946	3151	398	3549	3312	550	3862	*2350*	*399*	*2920*
US Steel Corp - Minntac	13700005		14924	1946	16870	9660	2020	11680	8543	2056	10599	10247	1811	12058	12253	1912	14165	5963	578	6541	6668	1283	7951	6420	1362	7782	6772	1564	9552	*7300*	*1434*	*8734*
Virginia Dept of Public Utilities	13700028		327	386	713	307	354	661	271	320	591	467	572	1039	445	805	1250	384	640	1024	348	403	751	394	405	799	256	205	461	*432*	*672*	*1104*
Facilities and Major Modifications Permitted Since 2002																															
Mesabi Nugget, Phase I	13700318																	0	0	0	102.8	37.47	140.27	335	4	339	249	5	253.54	*955*	*417*	*1372*
Essar Steel Minnesota (MSI)	06100067																													*1627*	*728*	*2355*
TOTAL COMBINED EMISSIONS			**59334**	**36493**	**95826**	**56944**	**37754**	**94698**	**51168**	**38926**	**90094**	**52467**	**40262**	**92729**	**53729**	**40008**	**93737**	**31907**	**26556**	**58463**	**38712**	**19975**	**58687**	**37412**	**16521**	**53933**	**35665**	**15810**	**52691**	***38751***	***23903***	***62654***
PERCENT OF 2002 TOTAL						96.0%	103.5%	98.8%	86.2%	106.7%	94.0%	88.4%	110.3%	96.8%	90.6%	109.6%	97.8%	53.8%	72.8%	61.0%	65.2%	54.7%	61.2%	63.1%	45.3%	56.3%	60.1%	43.3%	55.0%	*65.3%*	*65.5%*	*65.4%*
GOAL - 20% Reduction in Total by 2012, 30% Reduction by 2018																															**Goal Met?**	***Yes***
Potential Future Projects																															
Polymet Mining																														*48*	*18*	*66*
Mesabi Nugget, Phase 2																											*0*	*0*	*0*	*0*	*0*	*0*
Excelsior Mesaba Energy, Phase I																														*695*	*1436*	*2131*
Excelsior Mesaba Energy, Phase II																														*695*	*1436*	*2131*
Magnetation																														*350*	*144*	*494*
TOTAL COMBINED EMISSIONS																											**35665**	**15810**	**52691**	***40189***	***26793***	***66982***
PERCENT OF 2002 TOTAL																											60.1%	43.3%	55.0%	*67.7%*	*73.4%*	*69.9%*
GOAL - 20% Reduction in Total by 2012, 30% Reduction by 2018																												**Goal Met?**	**Yes**		**Goal Met?**	***Yes***

Northeast Minnesota Plan Emission Tracking Spreadsheet																												
		2002 Base Year Emissions			2007 Emissions			2008 Emissions			2009 Emissions			2010 Emissions			2011 Emissions			2012 Emissions			*2018 Emission Projections*		
Source Name	Permit ID	NOx (tons)	SO2 (tons)	Combined Tons	NOx (tons)	SO2 (tons)	Combined Tons	NOx (tons)	SO2 (tons)	Combined Tons	NOx (tons)	SO2 (tons)	Combined Tons	NOx (tons)	SO2 (tons)	Combined Tons	NOx (tons)	SO2 (tons)	Combined Tons	NOx (tons)	SO2 (tons)	Combined Tons	*NOx (tons)*	*SO2 (tons)*	*Combined Tons*
Forest Products																												
Itasca Eco Industrial Park (Ainsworth Engineered - GR)	06100010	105	2	107	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	shutdown	shutdown	shutdown	*0*	*0*	*0*
Hill Biomass (Ainsworth Engineered - Cook)	13700083	224	20	244	145	12	157	63	5	68	0	0	0	0	0	0	0	0	0	shutdown	shutdown	shutdown	*69*	*6*	*75*
Georgia-Pacific - Duluth Hardboard	13700031	68	307	375	90	200	290	94	184	278	47	60	107	63	6	69	62	7	69	40	5	45	*0*	*0*	*0*
Sappi Cloquet LLC	01700002	1196	190	1386	1216	268	1484	1182	182	1364	1113	179	1292	1222	66	1288	1663	170	1833	1418	207	1625	*1211*	*143*	*1355*
Blandin Paper/Rapids Energy Center	06100001	416	44	460	576	140	716	539	115	654	538	119	657	728	341	1069	522	123	645	480	124	604	*772*	*405*	*1176*
Boise White Paper LLC - Intl Falls	07100002	846	68	914	829	95	924	839	84	923	824	65	889	853	62	915	840	62	902	801	69	871	*831*	*81*	*912*
Utilities																									
Duluth Steam Cooperative Assoc.	13700022	329	285	614	420	429	849	354	398	752	383	403	786	331	363	694	336	372	708	333	358	690	*386*	*410*	*796*
Hibbing Public Utilities	13700027	283	257	540	589	593	1182	595	799	1394	689	1012	1701	610	595	1205	481	345	826	480	379	859	*624*	*801*	*1426*
Minnesota Power - Taconite Harbor	03100001	2309	3112	5422	2988	5062	8050	2351	4720	7071	1664	3562	5226	1706	3928	5634	1505	3358	4863	1169	2655	3824	*2061*	*1563*	*3624*
Minnesota Power Inc - Boswell	06100004	14528	21170	35698	14430	21580	36010	15464	21525	36989	11217	13442	24659	6177	6656	12833	4584	3967	8551	4282	4646	8928	*4845*	*9218*	*14063*
Virginia Dept of Public Utilities	13700028	327	386	713	467	572	1039	445	805	1250	384	640	1024	348	403	751	394	405	799	256	205	461	*432*	*672*	*1104*
Minnesota Power Inc - Laskin Energy	13700013	2176	1608	3784	932	1341	2273	905	1441	2346	650	1254	1904	638	561	1199	575	539	1114	424	262	686	*795*	*1465*	*2260*
Minnesota Power Inc - ML Hibbard	13700015	414	132	546	727	354	1081	794	442	1236	642	354	996	847	460	1307	549	219	768	499	163	662	*721*	*384*	*1105*
Northshore Mining Co - Silver Bay Power	07500003	1126	851	1977	1359	1068	2427	2920	2114	5034	2510	1632	4142	2510	1632	4142	2905	2237	5142	2392	2237	4629	*1104*	*1022*	*2126*
Mining																									
Northshore Mining Co - Silver Bay Taconite Operations	07500003	2785	1440	4225	2538	1867	4405	726	198	924	476	124	600	1363	12	1375	628	14	642	579	12	592	*1648*	*686*	*2334*
Arcelor Mittal Mining Co	13700062	3254	155	3409	2918	42	2960	2655	150	2805	1809	55	1864	3272	101	3373	3349	103	3452	3418	105	3523	*2461*	*82*	*2543*
United Taconite LLC - Fairlane Plant	13700113	1771	3222	4994	4263	3654	7917	3540	3726	7266	1968	2936	4904	4057	2493	6550	4355	2009	6364	3924	1430	5353	*5347*	*3687*	*9034*
US Steel Corp - Keewatin Taconite	13700063	6049	704	6753	3619	788	4407	3471	791	4262	46	46	92	3588	358	3946	3151	398	3549	3312	550	3862	*2350*	*399*	*2749*
US Steel Corp - Minntac	13700005	14924	1946	16870	10247	1811	12058	12253	1912	14165	5963	578	6541	6668	1283	7951	6420	1362	7782	6772	1564	8336	*7300*	*1434*	*8734*
Hibbing Taconite Co	13700061	6203	593	6795	4114	386	4500	4539	417	4956	984	95	1079	3628	618	4246	4758	827	5585	4817	835	5672	*3212*	*299*	*3512*
Mesabi Nugget, Phase I	13700318										0	0	0	103	37	140	335	4	339	249	5	254	*955*	*417*	*1372*
Essar Steel Minnesota (MSI)	06100067										0	0	0	0	0	0	0	0	0	0	0	*0*	*1627*	*728*	*2355*
Polymet Mining																				0	0	*0*	*48*	*18*	*66*
Mesabi Nugget, Phase 2																				0	0	*0*	*0*	*0*	*0*
TOTAL COMBINED EMISSIONS		**59334**	**36492**	**95826**	**52467**	**40262**	**92729**	**53729**	**40008**	**93737**	**31907**	**26556**	**58463**	**38712**	**19975**	**58687**	**37412**	**16521**	**53933**	**35665**	**15810**	**51475**	***38799***	***23922***	***62721***
Forest Products Percent		4.81%	1.73%	3.64%	5.44%	1.78%	3.85%	5.06%	1.42%	3.51%	7.90%	1.59%	5.04%	7.40%	2.38%	5.69%	8.25%	2.19%	6.39%	7.68%	2.57%	6.11%	7.43%	2.65%	5.61%
Utilities Percent		36.22%	76.18%	51.44%	41.76%	76.99%	57.06%	44.35%	80.59%	59.82%	56.85%	83.97%	69.17%	34.01%	73.08%	47.31%	30.28%	69.26%	42.22%	27.58%	68.97%	40.29%	28.27%	64.94%	42.26%
Mining Percent		58.97%	22.09%	44.92%	52.79%	21.23%	39.09%	50.59%	17.98%	36.67%	35.25%	14.44%	25.79%	58.58%	24.54%	47.00%	61.47%	28.55%	51.38%	64.75%	28.46%	53.60%	64.30%	32.40%	52.13%

Appendix C
Visibility Progress

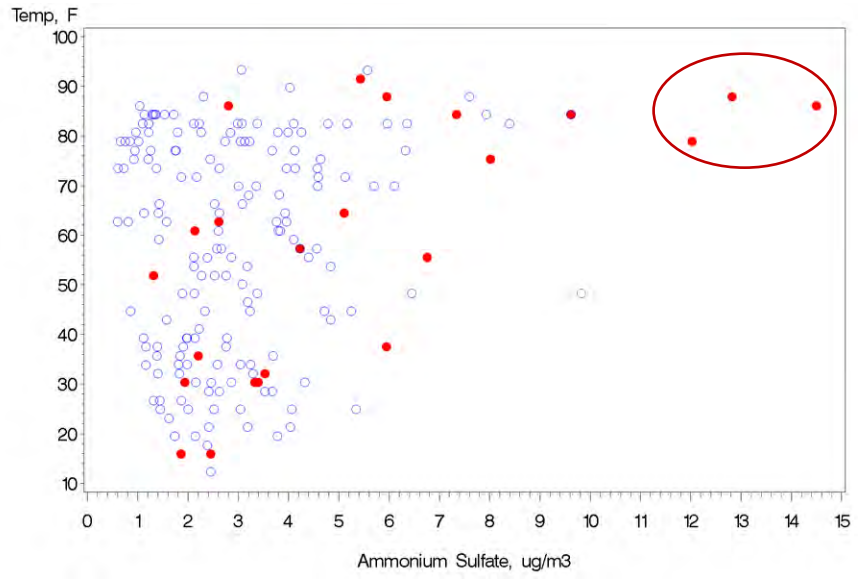
2005 High Sulfate Analysis

Dr. Donna Kenski, LADCO, more closely examined measured sulfate in order to understand the cause for the unusually high values in 2005. An analysis of meteorological factors shows that days with high sulfate are associated with the following meteorological conditions:

- High temperatures (both surface and aloft),
- High dew points,
- Southerly winds (especially southeasterly winds),
- Low mixing heights, and
- Falling air pressure

Dr. Kenski found three days of highest observed ammonium sulfate in 2005, which also exceed all values over the entire 2000-2012 period. Figure C-1 shows the relationship between temperature and ammonium sulfate concentrations over the years 2000-2012 on the 20% worst visibility days. Values for 2005 are shown in red. The three extreme values in 2005 are circled.

Temperature vs ammonium sulfate at Boundary Waters, 2000-2012, 2005 Data in Red



source, D. Kenski

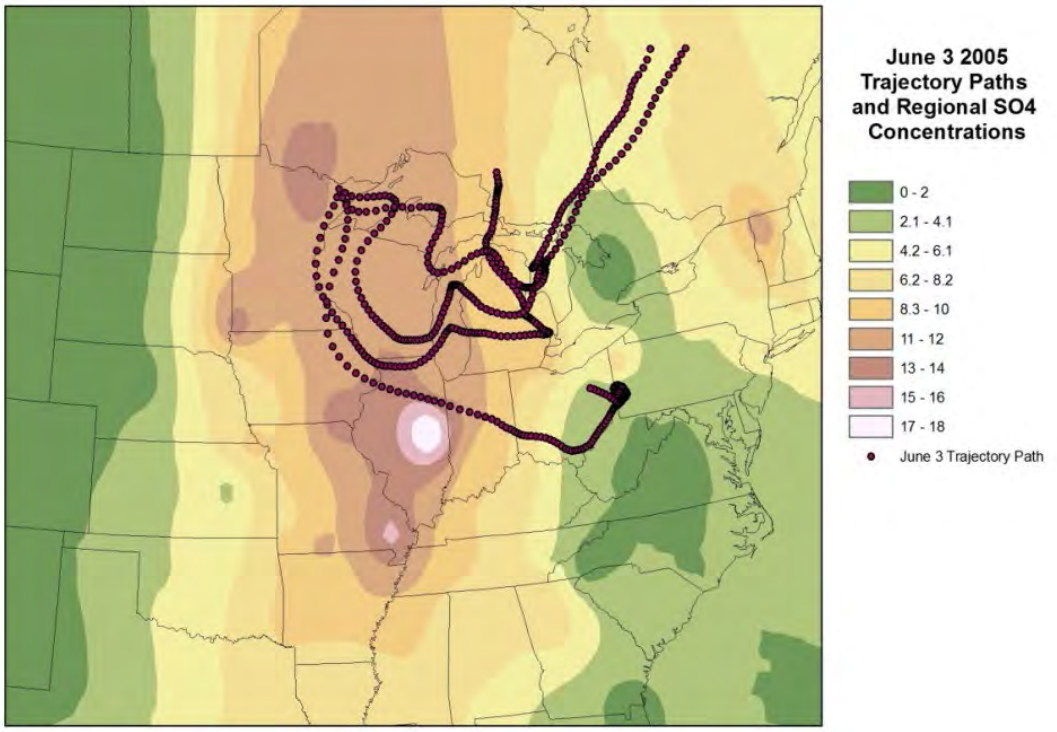
Dr. Kenski's analysis indicates that despite the extreme ammonium sulfate concentrations in 2005, the meteorological factors, listed above, that influence high ammonium sulfate were not extreme that year. When ranked by the various meteorological factors, 2005 is clustered with 2000, 2001, 2012 and 2006 in the higher tier, but is not distinctly different from those years.

Because the meteorological conditions for the three days were conducive to high ammonium sulfate, but not extreme, Dr. Kenski concludes that it is unlikely local conditions alone were driving the unusual concentrations seen those days. She examined back trajectories in conjunction with regional ammonium sulfate concentrations for the three days in 2005.

Figures C-2 through C-4 show the results of Dr. Kenski's analysis. Four trajectories are shown for each day for air masses that arrived at the Boundary Waters IMPROVE sampler at 6 am, noon, 6 pm and midnight. The entire Midwest was undergoing an extreme ammonium sulfate episode on each of these days. Air masses that were sampled at Boundary

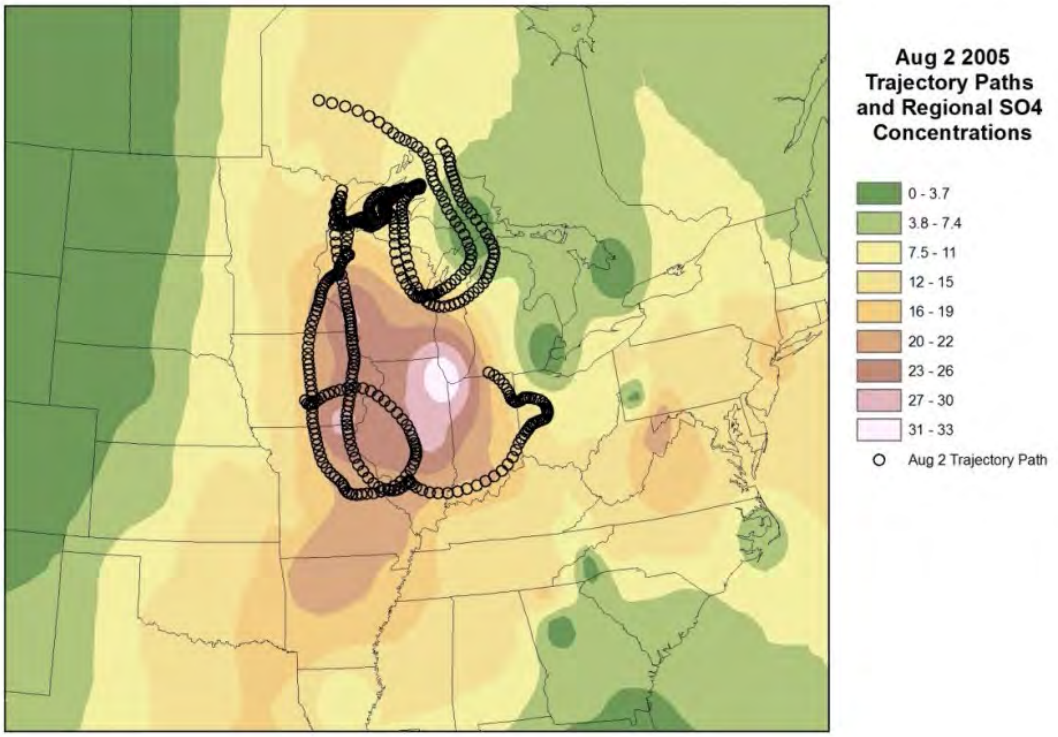
Waters on June 3, August 2 and September 10 had each traveled through areas of higher concentrations. It is reasonable to conclude that the ammonium sulfate concentrations at Boundary Waters (and Voyageurs) are largely the result of long range transport from more significantly polluted areas and not due to local sources.

Figure C-2: June 3, 2005 trajectory and regional sulfate concentrations



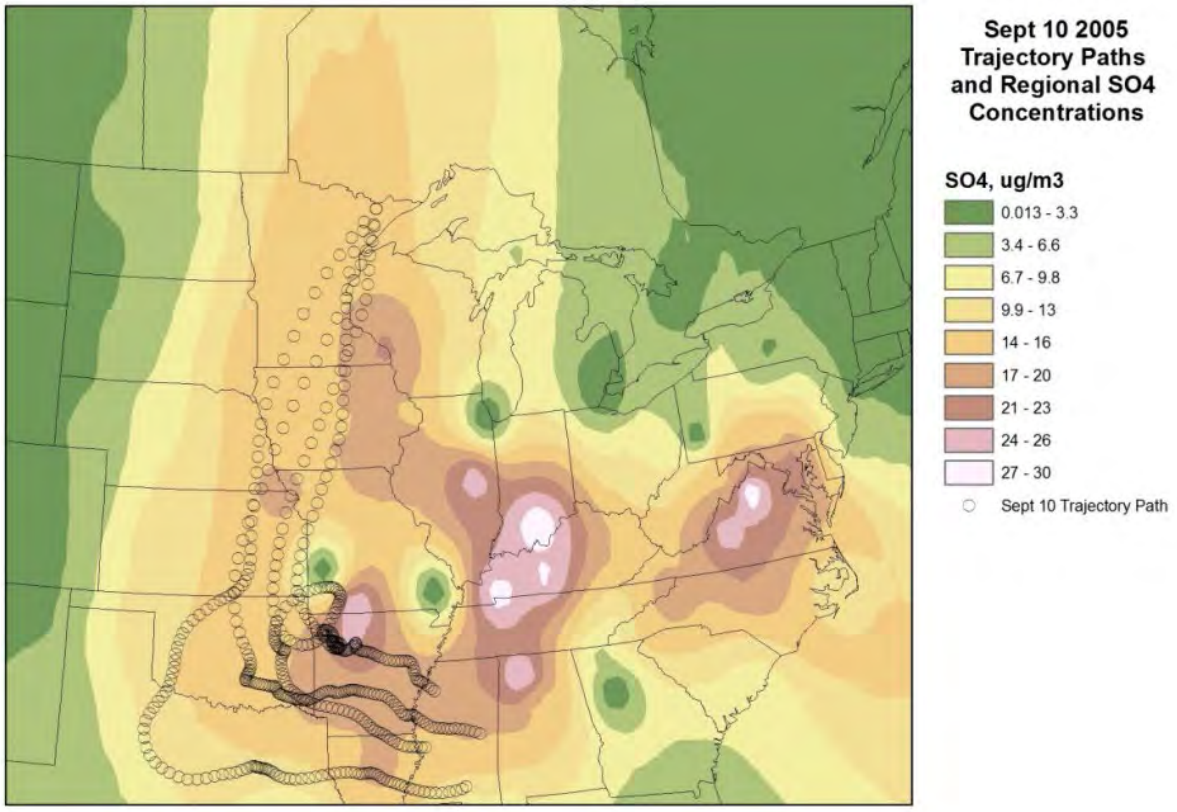
source, D. Kenski

Figure C-3: August 2, 2005 trajectory and regional sulfate concentrations



source, D. Kenski

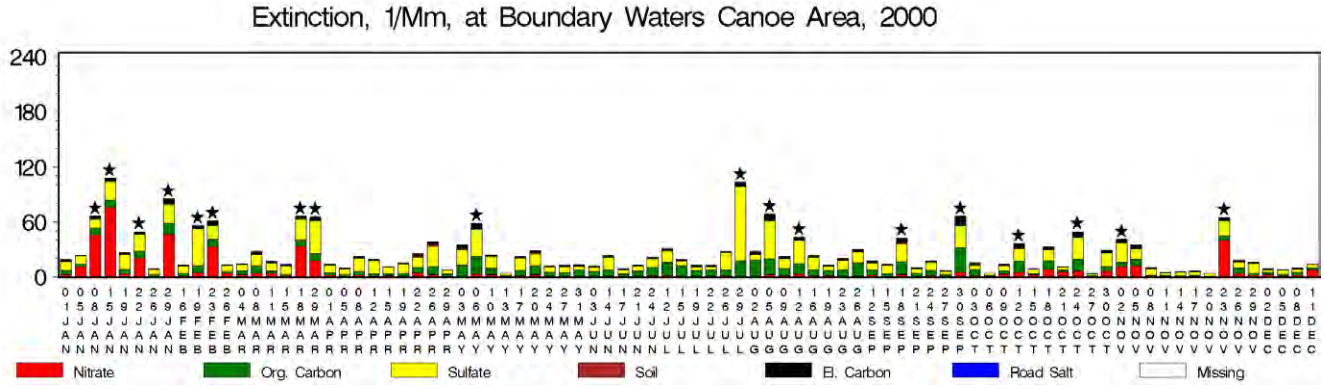
Figure C-4: September 10, 2005 trajectory and regional sulfate concentrations

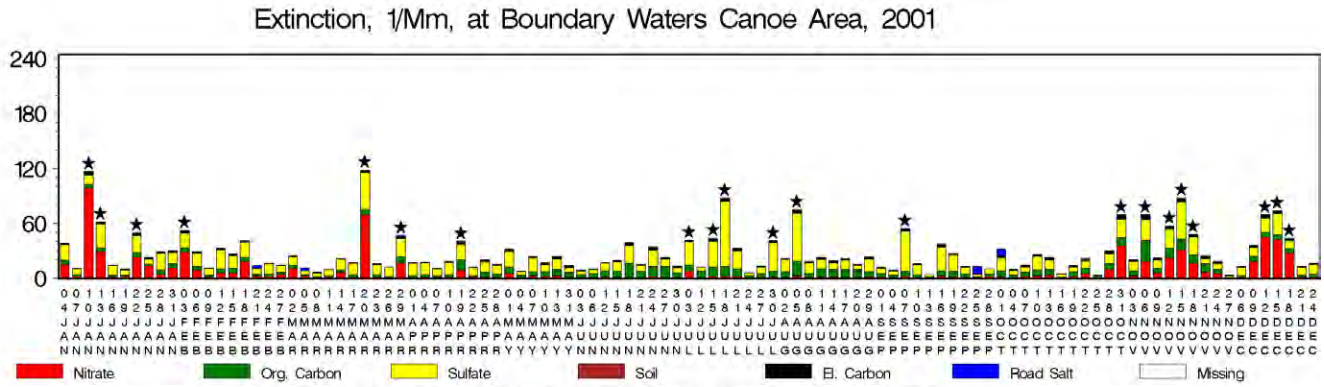


source, D. Kenski

Daily extinction coefficient component breakdown for Boundary Waters and Voyageurs (2000-2012)

These bar charts show the extinction component break down for each day of the monitoring period from 2000-2012. The days included in the 20% worst visibility calculations are starred.




Extinction, 1/Mm, at Boundary Waters Canoe Area, 2001
240
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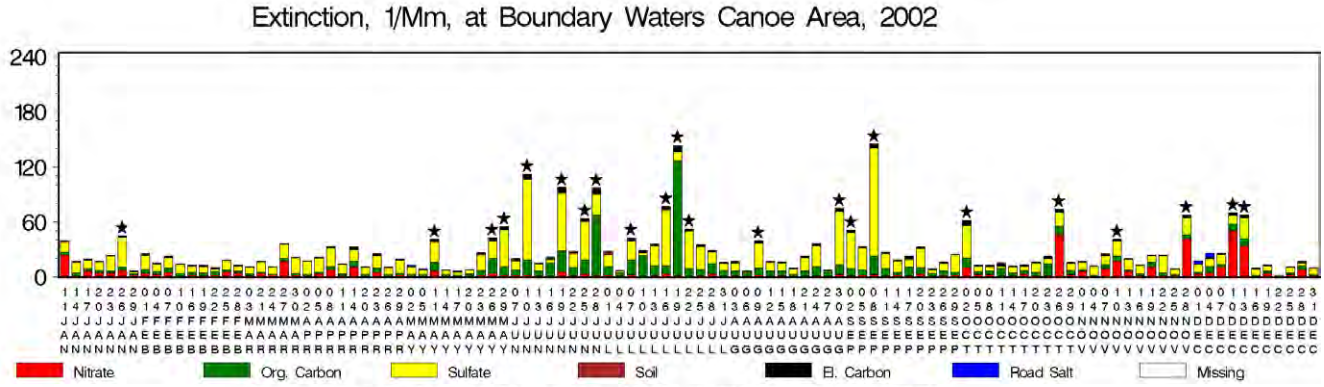
Nitrate
Org. Carbon
Sulfate
Soil
El. Carbon
Road Salt
Missing


Extinction, 1/Mm, at Boundary Waters Canoe Area, 2002
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Road Salt
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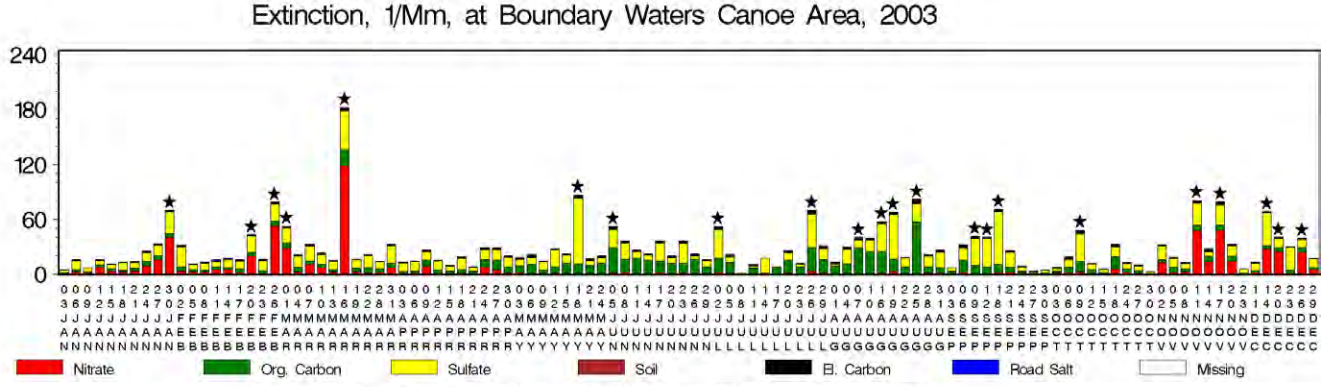
Extinction, 1/Mm, at Boundary Waters Canoe Area, 2003
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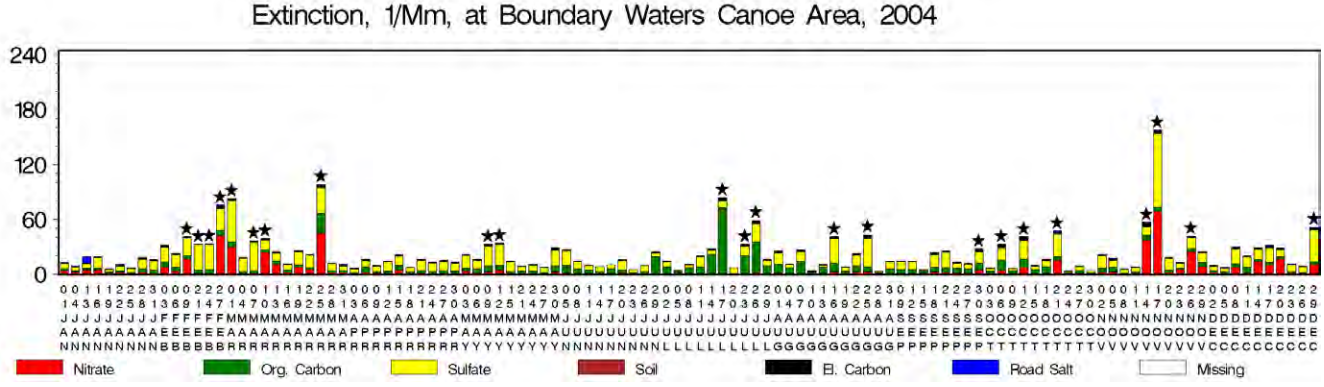
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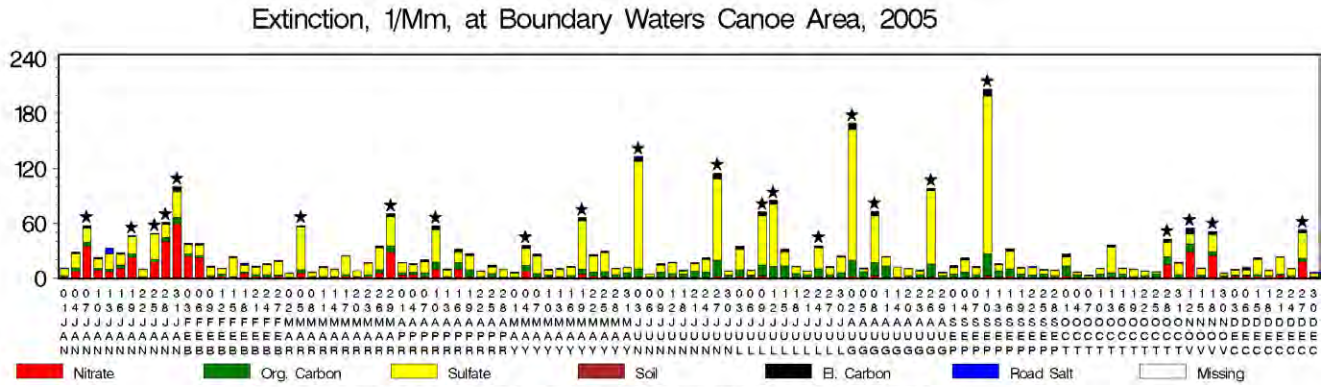
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Road Salt
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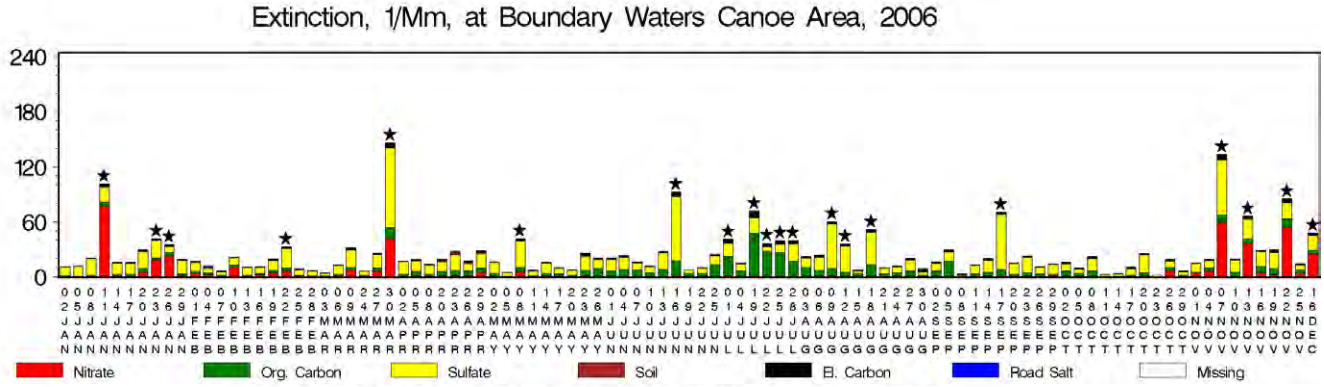
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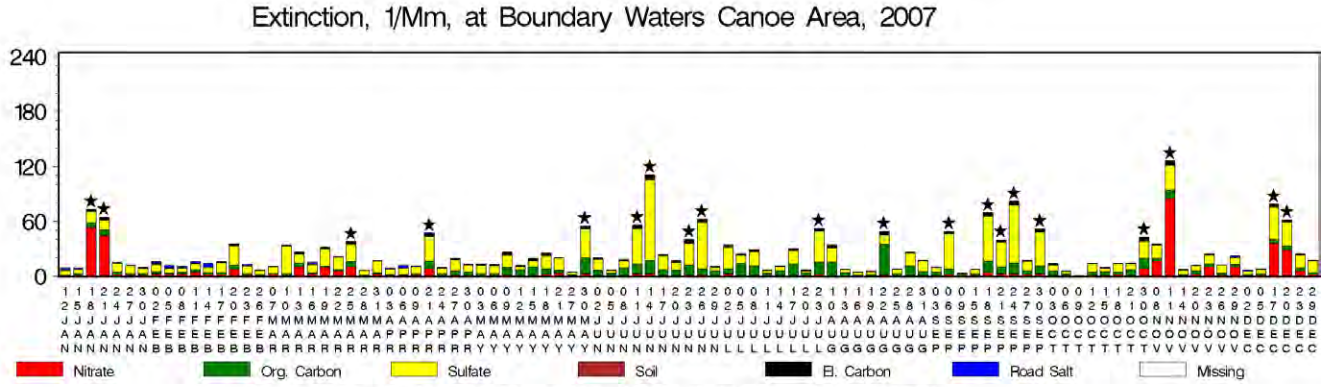
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Road Salt
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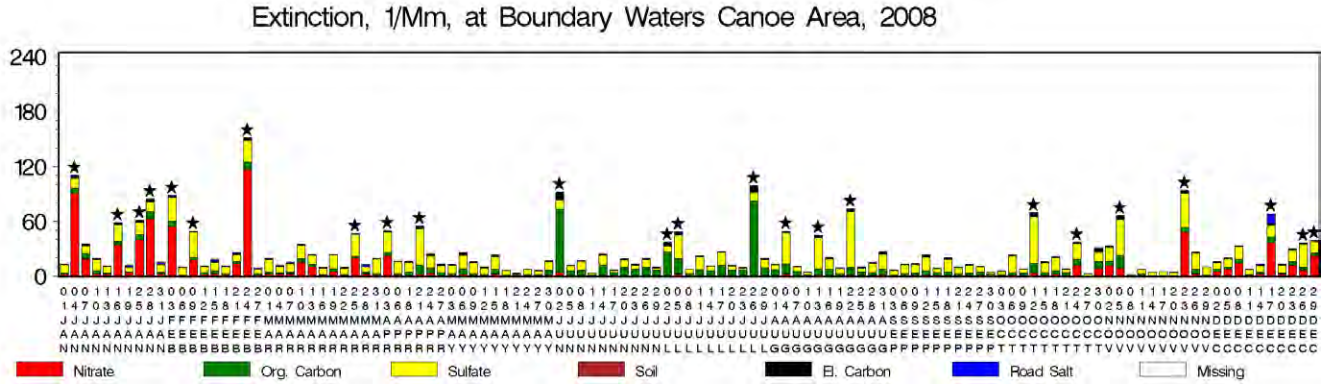
Extinction, 1/Mm, at Boundary Waters Canoe Area, 2008
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Road Salt
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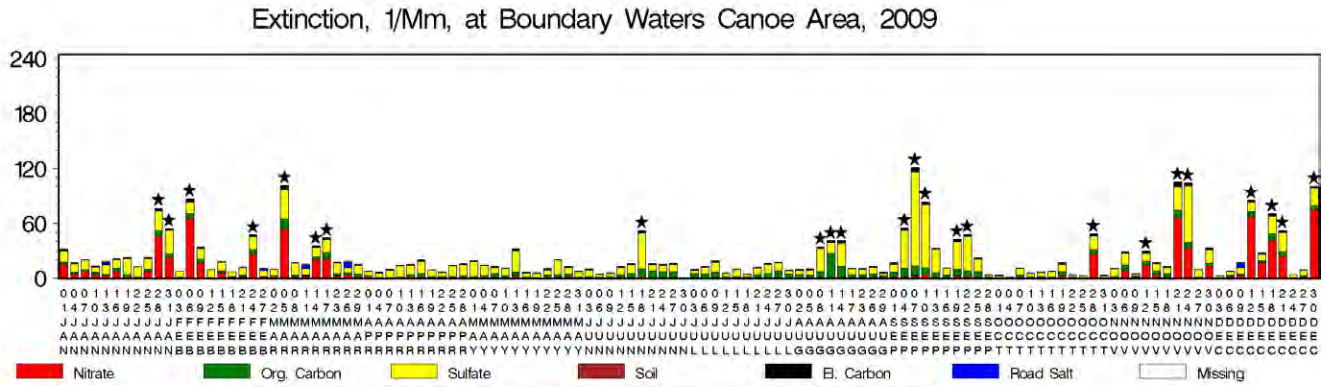
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Road Salt
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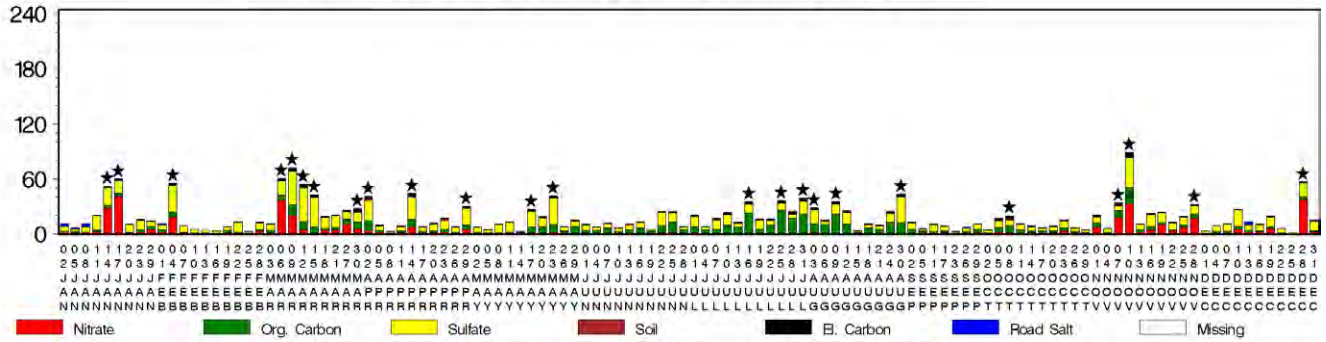
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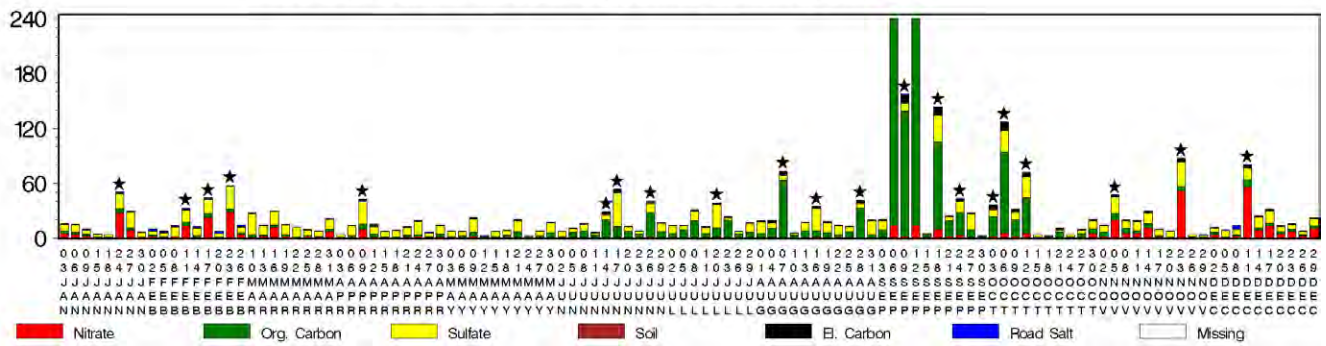
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El. Carbon
Road Salt
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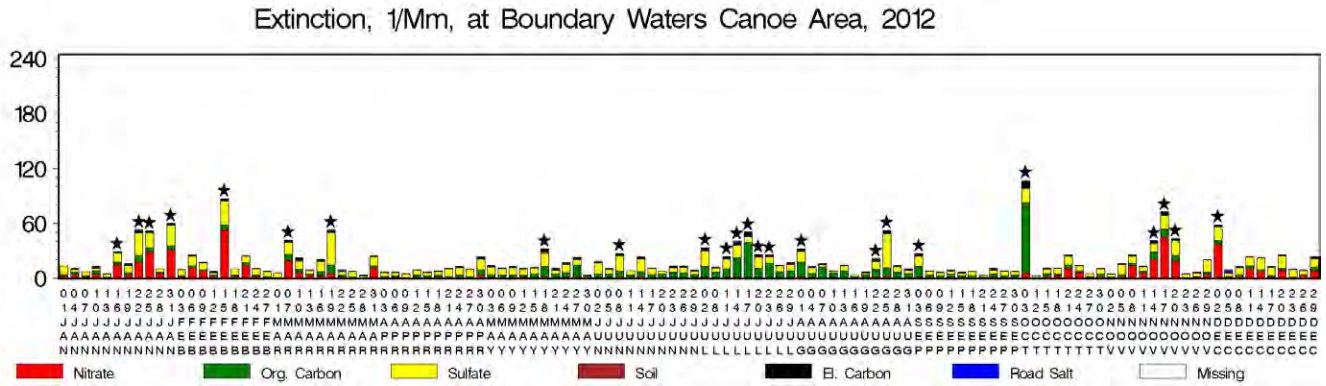
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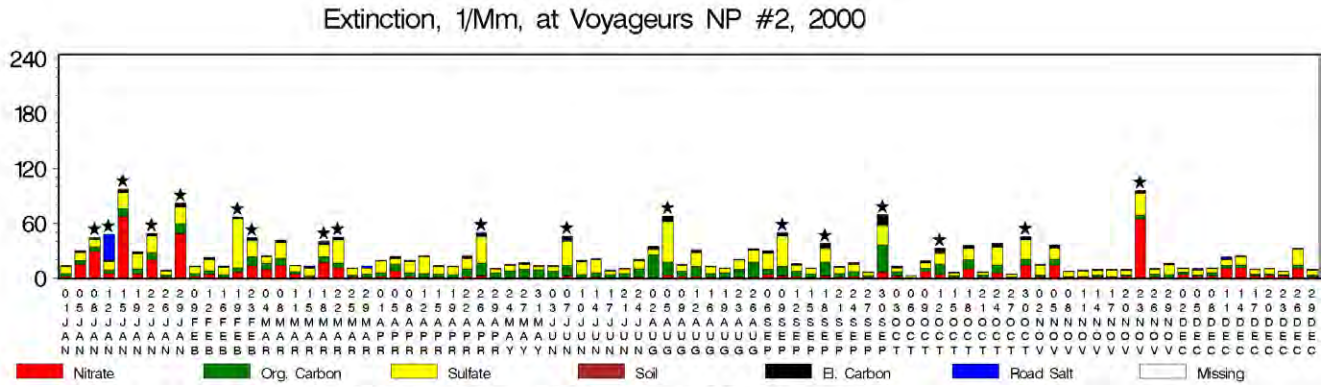
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Road Salt
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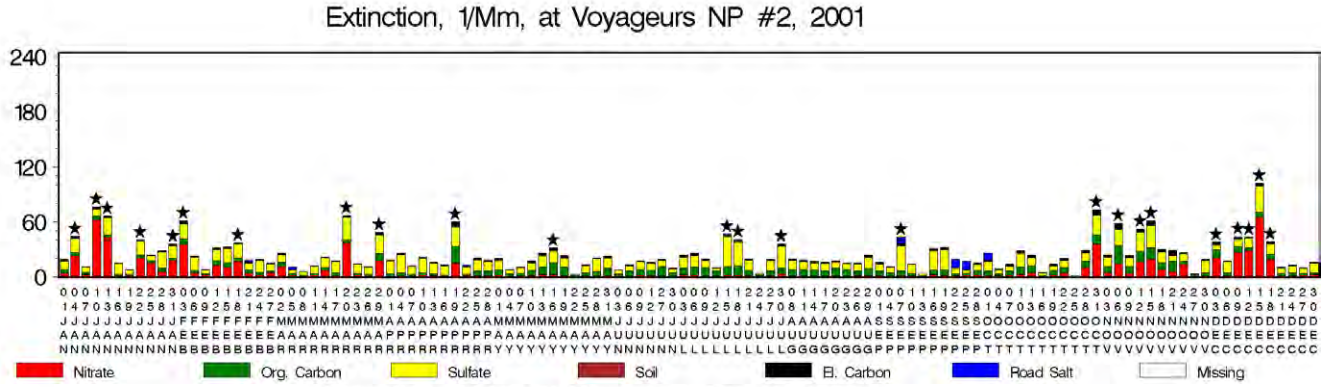
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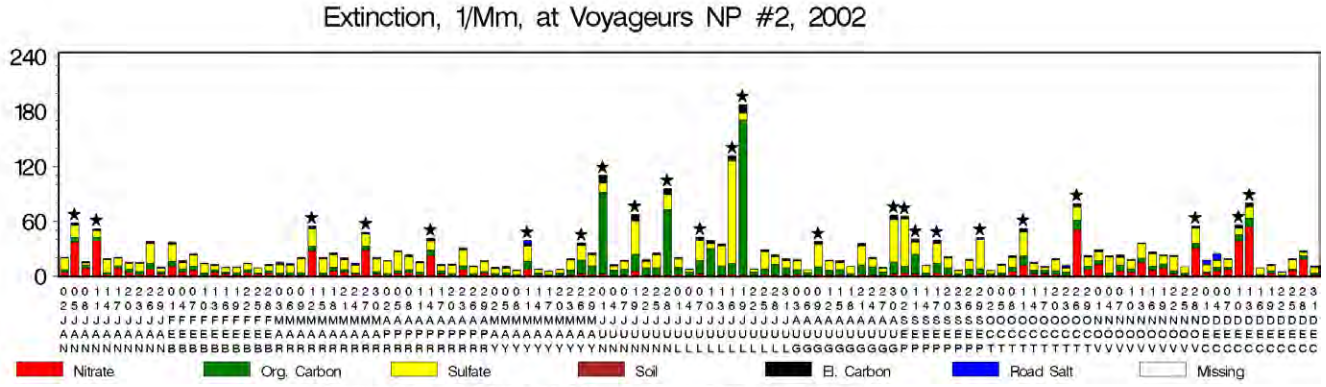
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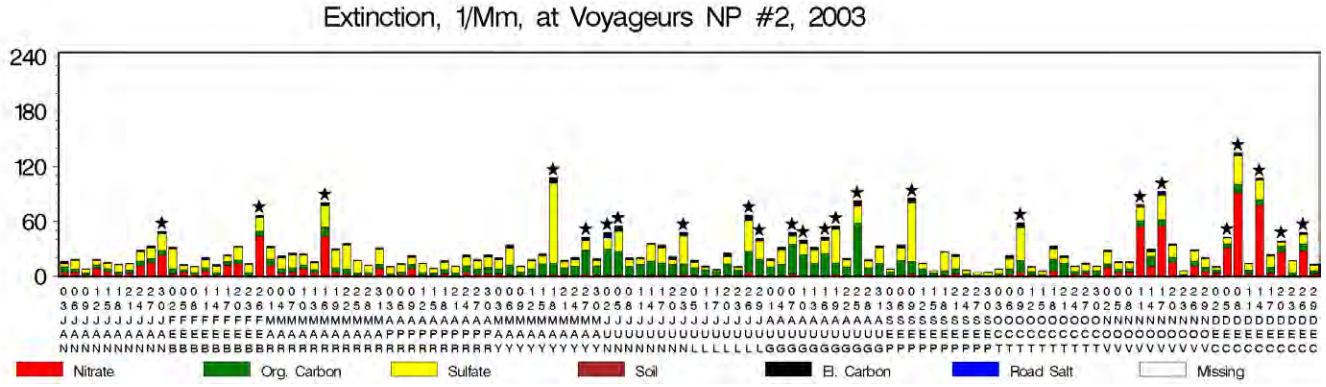
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Road Salt
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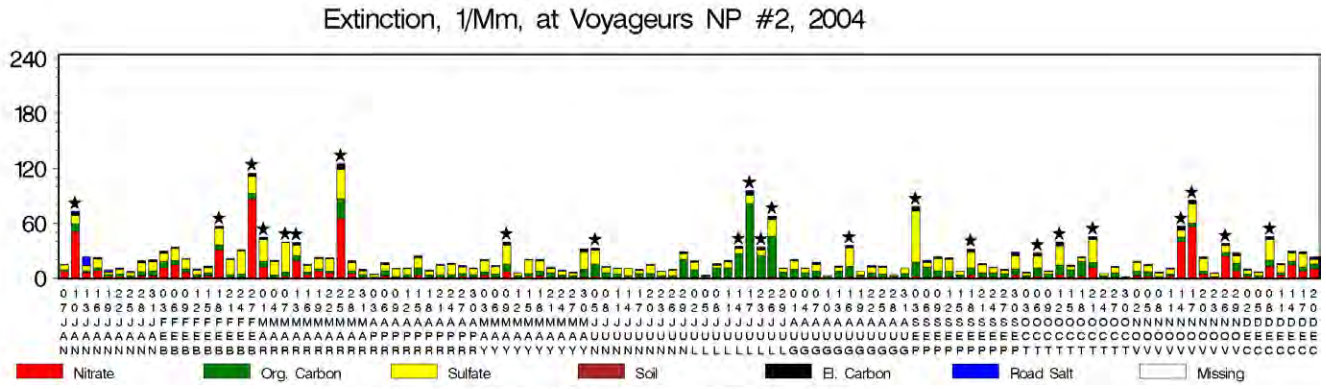
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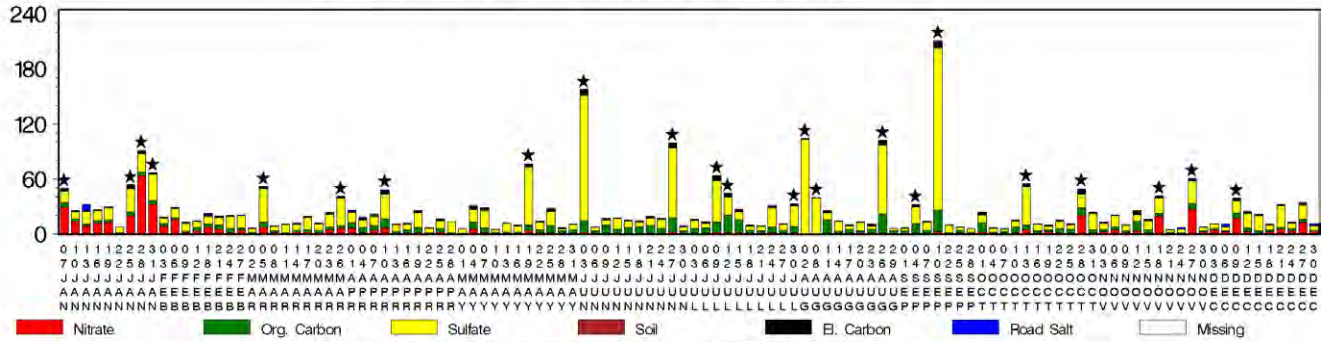
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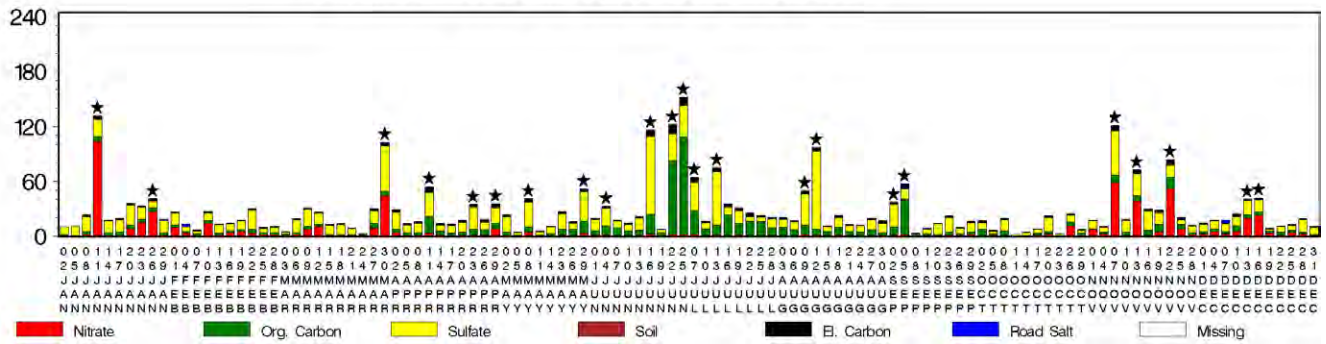
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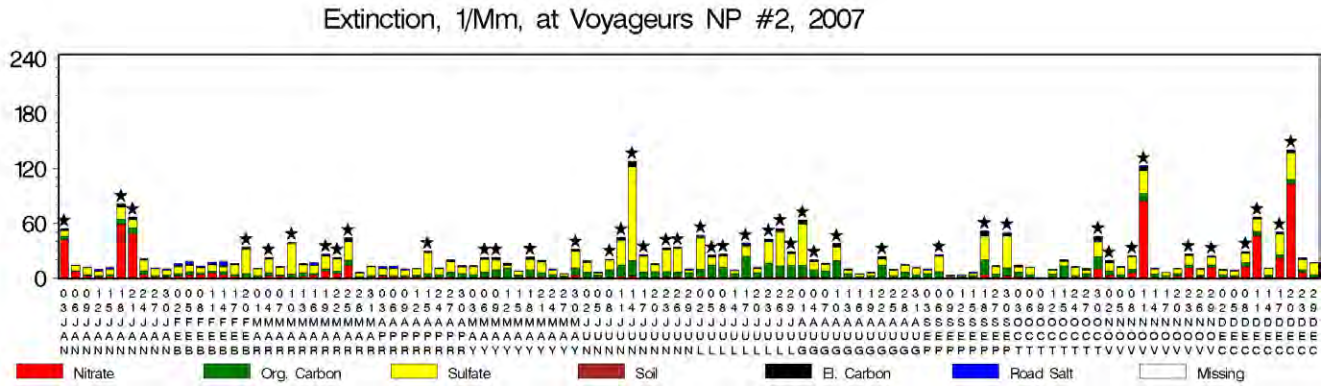
Extinction, 1/Mm, at Voyageurs NP #2, 2007
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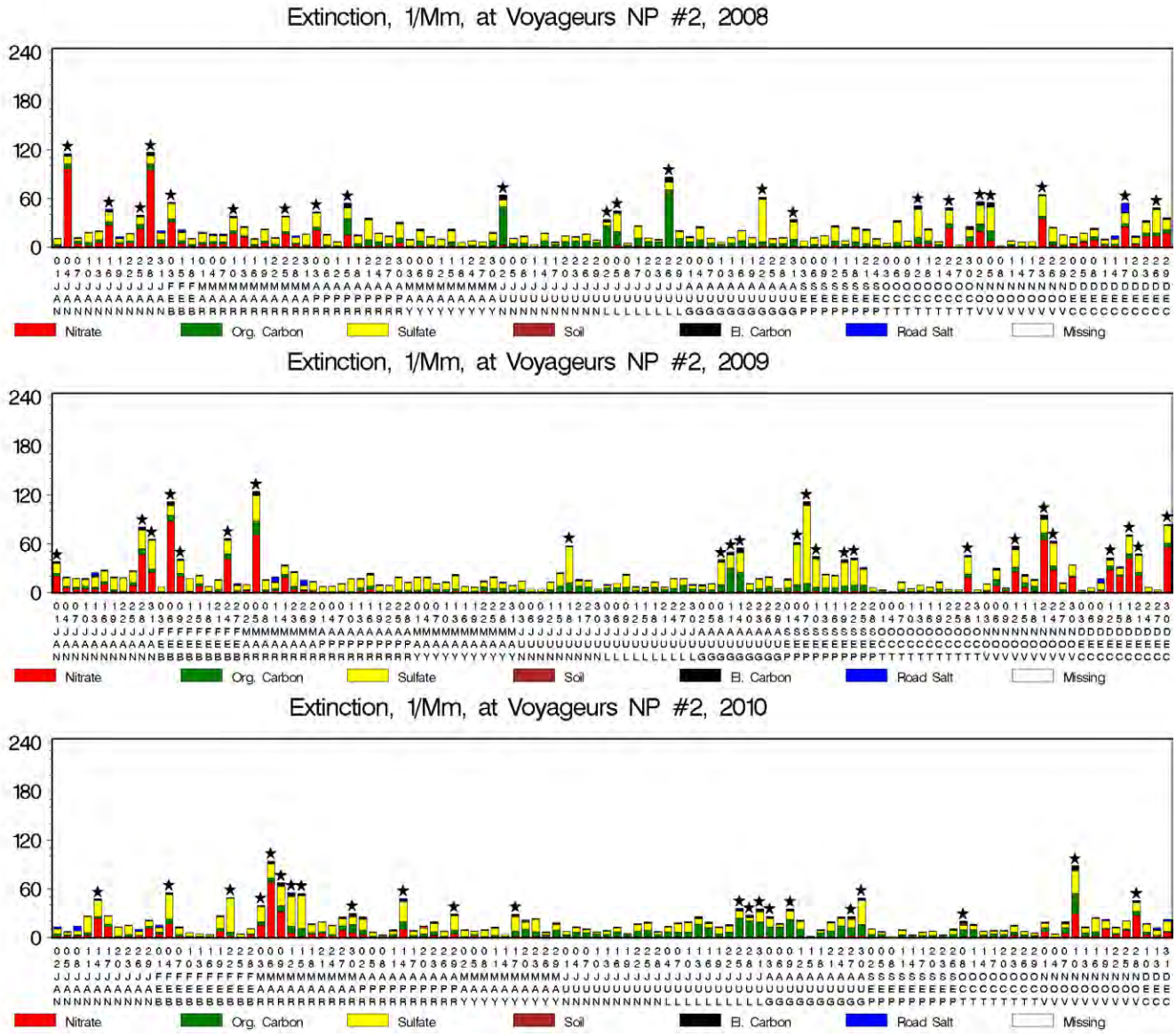
Extinction, 1/Mm, at Voyageurs NP #2, 2008
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Extinction, 1/Mm, at Voyageurs NP #2, 2009
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Extinction, 1/Mm, at Voyageurs NP #2, 2010
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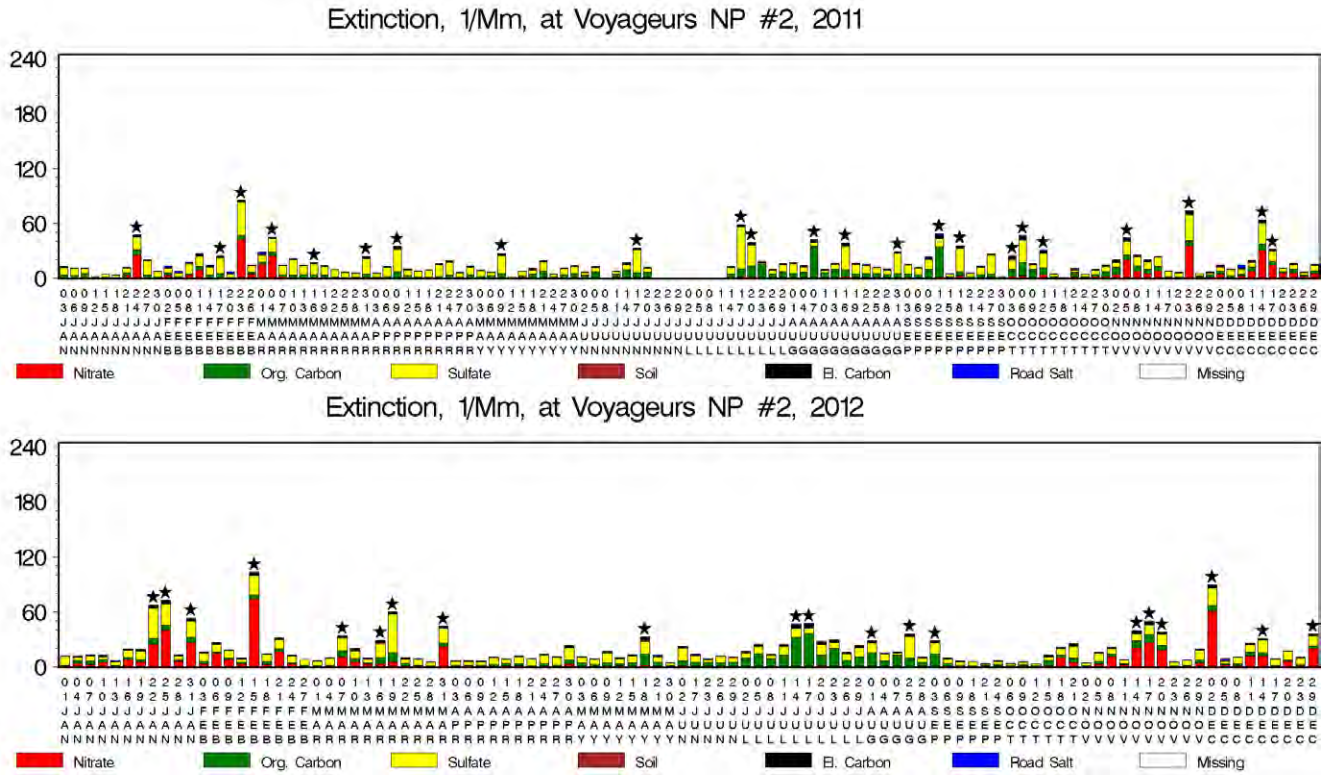
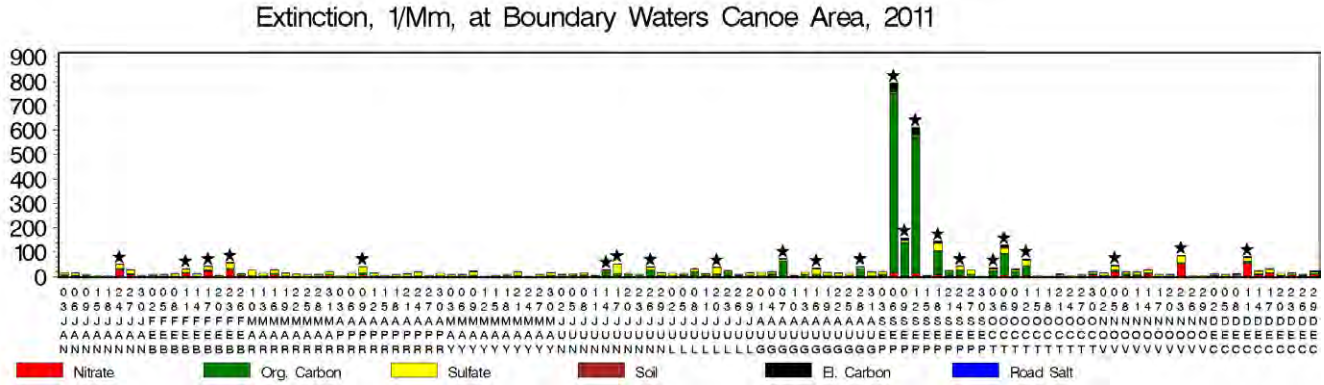


Analysis of Pagami Creek Wildfire Impacts on Boundary Waters

The U.S. Department of Interior, Forest Service has reported that the Pagami Creek wildfire, which burned 145 square miles of forest in Boundary Waters, began as a lightning strike. [1] While initially detected on August 18, 2011, it wasn't until August 26 that it began to spread. Fire crews were finally able to prevent expansion of the wildfire after September 13. Restrictions on recreational fires were lifted in the area on October 14. The figure below shows the impact on organic carbon collected at the Boundary Waters IMPROVE monitor while the wildfire was active. Days included in the 20% worst for the year are starred. Several of the 20% worst days for 2011 are due to high levels of organic carbon during this period.

Analysis of Pagami Creek Wildfire Impacts



[1] http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5346343.pdf

Appendix D

Emissions Tracking Information

Tables below present data shown in Figures 2D-1 and 2D-2 in the main progress report document.

Table 1 Disaggregated SO_2 Emissions Data - Minnesota

SO_2							
Year	Utilities	Taconite	Refineries	Other Point Sources	Nonpoint	Onroad	Nonroad
2002	105,000	9,020	4,110	12,400	17,500	3,010	9,070
2003	115,000	7,070	2,940	13,400	17,400	2,860	9,320
2004	108,000	8,890	1,610	14,300	17,400	2,710	9,580
2005	105,000	8,660	1,470	14,900	17,300	2,560	9,830
2006	94,400	9,660	1,540	12,700	13,000	1,930	7,260
2007	85,800	9,770	1,270	12,200	8,650	1,300	4,690
2008	76,000	9,430	1,100	12,700	4,320	667	2,120
2009	53,400	5,580	983	11,000	4,050	644	1,660
2010	44,400	6,600	905	10,700	3,780	622	1,200
2011	39,200	7,040	855	10,100	3,520	600	743
2012	27,500	6,410	838	8,350	-	-	-
2011-2002	(77,500)	(2,610)	(3,272)	(4,050)	(17,500)	(3,010)	(9,070)

Table 2 Disaggregated NO_X Emissions Data - Minnesota

NO_X							
Year	Utilities	Taconite	Refineries	Other Point Sources	Nonpoint	Onroad	Nonroad
2002	89,200	37,000	3,740	22,100	57,000	172,000	103,000
2003	93,700	29,100	3,650	22,200	49,400	161,000	104,000
2004	87,700	35,300	2,650	22,800	41,800	150,000	104,000
2005	87,500	34,000	2,720	23,000	34,200	138,000	105,000
2006	80,900	28,900	2,270	21,800	37,600	148,000	99,200
2007	78,700	30,300	1,980	22,300	41,000	158,000	93,600
2008	61,200	31,100	1,860	22,200	44,300	167,000	88,100
2009	41,100	14,900	1,810	20,000	36,800	151,000	85,600
2010	34,800	26,000	1,780	20,700	29,400	134,000	83,000
2011	33,000	26,400	1,790	18,200	21,900	117,000	80,400
2012	29,100	25,800	1,770	16,800	-	-	-
2011-2002	(60,100)	(11,200)	(1,970)	(5,300)	(57,000)	(172,000)	(103,000)

Appendix E

Air Markets Program (CAMD) Data for Neighboring States

State-level Emissions Reported to CAMD 2005 vs 2013

State	SO_2 Emissions		NO_X Emissions	
	2005	**2013**	**2005**	**2013**
Minnesota	101,000	24,000	84,000	25,000
Iowa	127,000	77,000	72,000	34,000
Illinois	327,000	136,000	134,000	56,000
Missouri	272,000	141,000	123,000	76,000
North Dakota	137,000	55,000	76,000	47,000
Wisconsin	176,000	62,000	68,000	26,000

Control Strategy Tables from LADCO States

LADCO States' Control Strategy Tables were located in Appendix D in the draft progress report (public noticed on July 28, 2014), but have been moved to Appendix E. Tables below are presented in the format provided by each State agency.

Ohio

Table 1 -OH Regional Haze Control Strategies

Control Strategy	Control Strategy/Rule Description	Date Enacted	Compliance Date	Emissions Limits	Emissions Reductions (if known– specify whether expected or actual)	Notes/Issues
All other sources						
BART for EGUs: OH	CAIR					BART = CAIR (40 CFR 51.308(e)(4))
BART for nonEGUs: OH P.H. Glatfelter	SO2 emission reductions from boilers B002 and B003: boilers will be limited to emitting 24,930 pounds per day	March 7, 2011 (federally enforceable permit issued final)	December 31, 2014	SO2 = 24,930 pounds per day	estimated reduction of 20,515 TPY of SO2	Specific controls were not mandated. P.H. Glatfelter can use any option for emission reductions (fuel, control, shutdown, etc.) provided they don't exceed the daily combined limit.
Long Term Regional Haze Strategy: Ohio	On the books controls	8/1/12 (effective date of EPA Final Approval)	2018	N/A	N/A	Ohio has no Class I areas. Current "on-the-books" controls address Ohio's impact on Class I areas and is therefore Ohio's long-term strategy.

Indiana

Table 2 -IN Regional Haze Control Strategies

Control Strategy	Control Strategy/Rule Description	Date Enacted	Compliance Date	Emissions Limits	Emissions Reductions (if known– specify whether expected or actual)	Notes/Issues
BART for EGUs	CAIR	11/01/06				Indiana accepted the U.S. EPA analysis that CAIR achieves greater progress than BART and may be used by States as a BART substitute (70 FR 39137). The Indiana Air Pollution Control Board, on November 1, 2006, adopted CAIR for the Indiana EGUs to participate in the cap and trade program. CAIR, therefore, satisfies the BART NO_x and SO_2 requirements for these sources. The PM impact on visibility on Class 1 areas was addressed for these sources. In December 2008, the DC Circuit Court remanded CAIR to U.S. EPA without vacatur because it found that "allowing CAIR to remain in effect until it is replaced by a rule consistent with our opinion would at least temporarily preserve the environmental values covered by CAIR." The CAIR requirements are currently in place and CAIR's regional control programs are operating while U.S. EPA develops replacement rules in response to the remand. Indiana identified several EGUs subject to BART. However, as provided by the federal rule, Indiana assumed NO_x and SO_2 BART requirements are met by the participation of these sources in the CAIR NO_x and SO_2 trading program.
BART for nonEGU source, Alcoa	BART controls and emission limits to control NO_x, SO_2, and PM emissions.	02/23/08	02/22/13	See Table 3 below.	Greater than 92% reduction in (actual) SO2 emissions after FGD's were installed on boilers 1-4 in 2008.	The Indiana Administrative Code at 326 IAC 26-2, Best Available Retrofit Technology, was final adopted on October 3, 2007 and became effective February 22, 2008.

Long Term Regional Haze Strategy: EGUs	The new MATS rule along with the revised SO_2 and $PM_{2.5}$ NAAQS will force EGU sources to convert to natural gas, install additional controls for SO2 and NO_x, if not already installed for compliance with the NOX SIP Call and CAIR, or shut down.	04/24/13, 06/02/10, and 12/14/12	2015, 2017, and 2020			Indiana does not have any Class 1 areas; however, emissions from Indiana were determined to impact Class 1 areas in other states. Indiana consulted with those states to develop reasonable progress goals. Strategy development considered the impacts of Indiana's emissions on Class 1 areas outside of Indiana. Each state must obtain its fair share of reductions necessary to reduce visibility impacts in neighboring states with Class 1 areas. On December 16, 2011, the EPA Administrator signed the final MATS and Utility NSPS rulemakings, and they were published in the Federal Register on February 16, 2012. Following publication of the rules, EPA received 20 petitions for reconsideration of the MATS and 4 for reconsideration of the Utility NSPS. On July 20, 2012, EPA sent a letter to petitioners stating that the Agency was granting reconsideration of certain new source issues. Then on March 28, 2013, emission limits for new power plants under the MATS were updated. The effective date of the rule is April 24, 2013. The primary SO2 NAAQS was strengthened on June 2, 2010, effective August 23, 2010. On Dec. 14, 2012, the EPA also strengthened the NAAQS for fine particles. The effective date of this rule is March 18, 2013.
Long Term Regional Haze Strategy: nonEGU source, Alcoa	Demonstrations of compliance with BART emission limits to control NO_x, SO_2, and PM emissions.	02/23/08	02/22/13			

Long Term Regional Haze Strategy: nonEGU sources	The new Boiler MACT rule along with the revised SO_2 and $PM_{2.5}$ NAAQS and other programs already on the books will force nonEGU sources to convert to natural gas, install additional controls for SO2 and NO_x or shut down.	3/21/11, 06/02/10, and 12/14/12	2017, and 2020			On March 21, 2011, the EPA promulgated national emission standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters. On that same day, the EPA also published a notice announcing its intent to reconsider certain provisions of the final rule. Following these actions, the Administrator received several petitions for reconsideration. After consideration of the petitions received on December 23, 2011, the EPA proposed revisions to certain provisions of the March 21, 2011 final rule and requested public comment on those provisions of the final rule. The EPA delayed the effective date of the 2011 rule in a May 18, 2011, notice, but that delay notice was vacated by the U.S. District Court for the District of Columbia on January 9, 2012. Therefore, the original effective date of the final rule stands as March 21, 2011 and the revised provisions of the final rule were effective as of April 1, 2013. The primary SO2 NAAQS was strengthened on June 2, 2010, effective August 23, 2010. On Dec. 14, 2012, the EPA strengthened the NAAQS for fine particles. The effective date of this rule is March 18, 2013.
All other sources						
Long Term Regional Haze Strategy: Other major sources,	Indiana's Permit Review Rules, 326 IAC 2-2, Prevention of Significant Deterioration (PSD) Requirements					

Table 2 - IN EGUs BART Determinations*

Facility Name	Emission Unit	PM BART Technology	PM BART Limit (lbs/MMBtu)	NOX BART Technology	NOX BART Limit (lbs/MMBtu)	SO2 BART Technology	SO2 BART Limit (lbs/MMBtu)

*No subject to BART determinations for EGUs were provided because Indiana accepted the U.S. EPA analysis that CAIR achieves greater progress than BART and may be used by States as a BART substitute (70 FR 39137).

Table 3 - IN nonEGU sources BART Determinations (SIP)

BART Controls and Limits

Facility	Unit	PM BART (filterable)	PM BART Limit	NOX BART	NOX BART Limit	SO2 BART	SO2 BART Limit
Alcoa	**Boiler 1 (Not a BART eligible unit)**		0.03 lb/MMBtu, 24-hour daily average		0.38 lb/MMBtu, 24-hour daily average		91% reduction, 24-hour daily average
	Boilers 2 and 3	ESP	0.03 lb/MMBtu, 24-hour daily average	low NO_x burners with staged overfire air	0.38 lb/MMBtu, 24-hour daily average	wet flue gas desulfurization system with 92% emissions reduction efficiency	90% reduction, 24-hour daily average
	Boiler 4	ESP	0.11 lb/MMBtu				
	Potlines 2-6		The sulfur content in each monthly baked anode composite shall not exceed 2.919%, provided that hourly SO_2 emissions from the potlines do not exceed 1,456 lbs/hr on a combined basis, and determined on a monthly basis				
	Fugitive Emissions	no add-on control		no add-on control		limit anode grade coke to 3% sulfur	
	Primary Emissions	gas treatment system followed by fabric filter		no add-on control		limit anode grade coke to 3% sulfur	
	Ingot Furnaces	no add-on control		no add-on control		no add-on control	

ALTERNATIVE BART Controls and Limits

Facility	Unit	PM BART (filterable)	PM BART Limit	NOX BART	NOX BART Limit	SO2 BART	SO2 BART Limit
Alcoa	**Boiler 1 (Not a BART eligible unit)**	ESP	0.03 lb/MMBtu, 24-hour daily average	low NO_x burners with staged overfire air	0.38 lb/MMBtu, 24-hour daily average	wet flue gas desulfurization system with 91% emissions reduction efficiency	91% reduction, 24-hour daily average
	Boilers 2 and 3	ESP	0.03 lb/MMBtu, 24-hour daily average	low NO_x burners with staged overfire air	0.38 lb/MMBtu, 24-hour daily average	wet flue gas desulfurization system with 90% emissions reduction efficiency	90% reduction, 24-hour daily
	Boiler 4	ESP	0.11 lb/MMBtu				
	Potlines 2-6		The sulfur content in each monthly baked anode composite shall not exceed 2.919%, provided that hourly SO_2 emissions from the potlines do not exceed 1,456 lbs/hr on a combined basis, and determined on a monthly basis				
	Fugitive Emissions	no add-on control		no add-on control		limit anode grade coke to 3.5% sulfur	
	Primary Emissions	gas treatment system followed by fabric filter		no add-on control		limit anode grade coke to 3.5% sulfur	
	Ingot Furnaces	no add-on control		no add-on control		no add-on control	

Table 4 – EPA nonEGU sources BART Determinations (FIP)*

BART LIMITS

Facility	Unit	PM BART (filterable)	PM BART Limit	NOX BART	NOX BART Limit	SO2 BART	SO2 BART Limit

*Indiana has an approved Regional Haze State Implementation Plan.

Table 5 – Additional Controls*

Control Strategy/ Facility	Control Strategy/Rule Description	Date Enacted	Compliance Date	Emissions Limits	Emissions Reductions (if known– specify whether expected or actual)	Notes/Issues

*Include significant controls used in SIPs for other pollutants, controls resulting from MATS, consent decrees, voluntary controls (specify, if voluntary, how emissions reductions will be assured).

Illinois

Table 3 -IL Regional Haze Control Strategies

Control Strategy	Control Strategy/Rule Description	Date Enacted	Compliance Date	Emissions Limits	Emissions Reductions (if known– specify whether expected or actual)	Notes/Issues
BART for EGUs	Alternative Plan employing Illinois Multi-pollutant Standards ("MPS") and Combined Pollutant Standards ("CPS") from Illinois Mercury Rule	1/3/2007	Ongoing	Emission Limits are on a fleet-wide average basis, by owner.	Totals of original estimates for emission reductions in 2019 were 113,895 tpy NOx and 260,619 tpy SO2. These have changed some in given years of the plan due to shutdowns that were not anticipated, and longer schedules for SO2 reduction schedules.	Illinois submitted a Regional Haze State Implementation Plan that included an alternative plan for EGUs that "better than BART." Illinois demonstrated that the emission reductions from the MPS and CPS for NOx and SO2 were much greater than what would have been achieved by applying BART-level control to the subject-to-BART units in Illinois. The MPS and CPS resulted in fleet wide average emission rate limits for the three largest operators of EGUs in Illinois. Additionally, EGUs not subject to the MPS and CPS agreed to significant reductions in NOx and SO2. The MPS and CPS have also resulted in the shutdown of several coal-fired units.
BART for Oil Refineries	Consent Decrees in force for all refineries in Illinois.	10/2005	12/31/2008	Emission limits vary by unit and process.	Totals of emission reductions from 2002 baseline were estimated at 2962 tpy NOx, and 33,945 tpy SO2.	Illinois' Regional Haze SIP also included emission reductions anticipated and achieved by federal consent decrees limiting emissions from the refineries in Illinois. Similar to the alternative plan for "better than BART" control of EGUs in the SIP, it was demonstrated that the reductions achieved by the consent decrees plant-wide for these refineries were significantly greater than reductions that would be achieved by apply BART-level control to only the subject-to-BART units at those refineries.
NOx RACT for	NOx RACT rules for	9/23/2009	1/1/2015	Limits vary by	Original estimates of	Despite the redesignation of the

industrial boilers, process heaters, cement kilns, lime kilns, glass melting furnaces, aluminum melting furnaces, and reheat, annealing, and galvanizing furnaces used at iron and steel plants.	various categories in the Chicago and Metro-East nonattainment areas			category and process	NOx reductions totaled 20666 tpy when fully implemented.	Metro-East nonattainment area to attainment, Illinois proceeded to adopt stringent NOx RACT rules for the Metro-East and Chicago areas. The compliance date for the new NOx RACT standards is January 1, 2015. Illinois EPA anticipates a downward trend in emissions in 2013 and 2014 from these sources as changes are made to them in order comply with the new standards by the compliance date. When the RACT standards are effective, in the calendar year 2015 and forward, Illinois EPA estimates that these new RACT standards will result in a 22% reduction in NOx emissions from affected sources in the Metro-East area, or a reduction of 2,678 tons of NOx annually. Illinois EPA also estimated a reduction of 9.1 tons of NOx per day during the ozone season in 2015.

Table 2 - IL EGU Resultant Emission Rates*

Facility Name	Emission Unit	NOX BART Technology	2002 NOX Rate (lbs/MMBtu)	2013 Projected NOx Rate (lbs/MMBtu)	SO2 BART Technology (lbs/MMBtu)	2002 SO2 Rate (lbs/MMBtu)	2013 Projected SO2 Rate (lbs/MMBtu)
Baldwin	1	Overfire Air Selective Catalytic Reduction	0.5473	0.0814	Dry Lime FGD	0.41259	0.07279
Baldwin	2	Overfire Air Selective Catalytic Reduction	0.4025	0.0778	Dry Lime FGD (Began Nov 03, 2012)	0.39225	0.07434
Baldwin	3	Low NOx Burner Technology w/ Separated OFA	0.1236	0.0883	Dry Lime FGD Dry Sorbent Injection	0.42805	0.07624
Coffeen	1	Overfire Air Selective Catalytic Reduction	0.5215	0.0796	Wet Limestone	1.54356	0.00444
Coffeen	2	Overfire Air Selective Catalytic Reduction	0.5162	0.0804	Wet Limestone	1.49151	0.00347
Crawford	7	SHUTDOWN	0.2233	0	SHUTDOWN	0.54051	0
Crawford	8	SHUTDOWN	0.2212	0	SHUTDOWN	0.51341	0
Dallman	31	Selective Catalytic Reduction	1.0688	0.1196	Wet Limestone	0.33240	0.18140
Dallman	32	Selective Catalytic Reduction	1.0756	0.1306	Wet Limestone	0.34882	0.19200
Dallman	33	Selective Catalytic Reduction	0.4408	0.0648	Wet Limestone	0.27591	0.09052
Dallman	4	Selective Catalytic Reduction		0.0457	Wet Limestone		0.06231
Duck Creek	1	Low NOx Burner Technology (Dry Bottom only) Selective Catalytic Reduction	0.4586	0.1036	Wet Limestone	0.97421	0.02346
E D Edwards	1	Low NOx Burner Technology (Dry Bottom only)	0.4056	0.2192		3.55291	0.53009
E D Edwards	2	Low NOx Burner Technology (Dry Bottom only)	0.4468	0.2156		1.70320	0.54484
E D Edwards	3	Low NOx Burner Technology (Dry Bottom only) Selective Catalytic Reduction Low NOx Burner Technology w/ Overfire Air	0.4402	0.0669		1.21251	0.52541
Fisk	19	SHUTDOWN	0.3373	0	SHUTDOWN	0.52461	0
Havana	1	SHUTDOWN	0.7655	0	SHUTDOWN	0.81768	0
Havana	2	SHUTDOWN	0.2196	0	SHUTDOWN	0.44851	0
Havana	3	SHUTDOWN	0.636	0	SHUTDOWN	0.79107	0
Havana	4	SHUTDOWN	0.6103	0	SHUTDOWN	0.77433	0
Havana	5	SHUTDOWN	0.3321	0	SHUTDOWN	0.58192	0

Havana	6	SHUTDOWN	0.7363	0	SHUTDOWN	0.72831	0
Havana	7	SHUTDOWN	0.4012	0	SHUTDOWN	0.71453	0
Havana	8	SHUTDOWN	0.4836	0	SHUTDOWN	0.72686	0
Havana	9	Overfire Air Selective Catalytic Reduction	0.282	0.0765	Dry Lime FGD (Began Nov 29, 2012)	0.89889	0.06262
Hennepin	1	Low NOx Burner Technology w/ Separated OFA	0.3269	0.1486		0.42710	0.49963
Hennepin	2	Low NOx Burner Technology w/ Separated OFA	0.3279	0.149		0.43148	0.50185
Hutsonville	5	SHUTDOWN	0.559	0	SHUTDOWN	4.53248	0
Hutsonville	6	SHUTDOWN	0.5173	0	SHUTDOWN	4.52608	0
Interstate	1	Water Injection	0.2295	0.0935		0.00060	0.00061
Joliet 29	71	Low NOx Burner Technology w/ Closed-coupled/Separated OFA Selective Non-catalytic Reduction	0.1183	0.0915		0.70184	0.39347
Joliet 29	72	Low NOx Burner Technology w/ Closed-coupled/Separated OFA Selective Non-catalytic Reduction	0.1203	0.0919		0.69854	0.39447
Joliet 29	81	Low NOx Burner Technology w/ Closed-coupled/Separated OFA Selective Non-catalytic Reduction	0.1418	0.1062		0.68014	0.40080
Joliet 29	82	Low NOx Burner Technology w/ Closed-coupled/Separated OFA Selective Non-catalytic Reduction	0.1438	0.1072		0.68295	0.40131
Joliet 9	5	Combustion Modification/Fuel Reburning Overfire Air Selective Non-catalytic Reduction	0.33	0.122		0.63463	0.39698
Joppa Steam	1	Low NOx Burner Technology w/ Closed-coupled OFA	0.1295	0.1231		0.50803	0.47378
Joppa Steam	2	Low NOx Burner Technology w/ Closed-coupled OFA	0.1291	0.1237		0.50922	0.47287
Joppa Steam	3	Low NOx Burner Technology w/ Closed-coupled OFA	0.134	0.1089		0.51269	0.48595
Joppa Steam	4	Low NOx Burner Technology w/ Closed-coupled OFA	0.135	0.1078		0.52054	0.48391
Joppa Steam	5	Low NOx Burner Technology w/ Closed-coupled OFA	0.1246	0.1135		0.52097	0.46516
Joppa Steam	6	Low NOx Burner Technology w/ Closed-	0.1245	0.1125		0.52065	0.46623

		coupled OFA					
Kincaid Station	1	Overfire Air Selective Catalytic Reduction	0.6242	0.3935		0.55111	0.42753
Kincaid Station	2	Overfire Air Selective Catalytic Reduction	0.6475	0.3303		0.54434	0.42805
Lakeside	7	SHUTDOWN	0.9136	0	SHUTDOWN	5.69752	0
Lakeside	8	SHUTDOWN	0.9251	0	SHUTDOWN	5.47121	0
Marion	123	Selective Non-catalytic Reduction	0	0.0952	Fluidized Bed Limestone Injection	0	0.37475
Marion	1	SHUTDOWN	0.7721	0	SHUTDOWN	4.89130	0
Marion	2	SHUTDOWN	0.5988	0	SHUTDOWN	4.39181	0
Marion	3	SHUTDOWN	1.028	0	SHUTDOWN	4.72124	0
Marion	4	Selective Catalytic Reduction	0.8338	0.2329	Wet Limestone	0.40596	0.57446
Meredosia	1	SHUTDOWN	0.5106	0	SHUTDOWN	5.01609	0
Meredosia	2	SHUTDOWN	0.4973	0	SHUTDOWN	5.02066	0
Meredosia	3	SHUTDOWN	0.5034	0	SHUTDOWN	5.04013	0
Meredosia	4	SHUTDOWN	0.5035	0	SHUTDOWN	5.00302	0
Meredosia	5	SHUTDOWN	0.4699	0	SHUTDOWN	2.33833	0
Meredosia	6	SHUTDOWN	0.1287	0	SHUTDOWN	0.44988	0
Newton	1	Low NOx Burner Technology w/ Closed-coupled/Separated OFA Other	0.1445	0.1113		0.44529	0.59054
Newton	2	Low NOx Burner Technology w/ Closed-coupled/Separated OFA Other	0.1123	0.107		0.45795	0.58824
Powerton	51	Overfire Air Selective Non-catalytic Reduction	0.7019	0.0988		0.42449	0.45821
Powerton	52	Overfire Air Selective Non-catalytic Reduction	0.7044	0.0977		0.42554	0.45480
Powerton	61	Overfire Air Selective Non-catalytic Reduction	0.648	0.0985		0.43340	0.45433
Powerton	62	Overfire Air Selective Non-catalytic Reduction	0.6502	0.1173		0.43220	0.45236
Vermilion	1	SHUTDOWN	0.3805	0	SHUTDOWN	2.74663	0
Vermilion	2	SHUTDOWN	0.3748	0	SHUTDOWN	2.73645	0
Waukegan	17	Low NOx Burner Technology w/ Closed-coupled/Separated OFA	0.6426	0	SHUTDOWN	0.43788	0
Waukegan	7	Low NOx Burner Technology w/ Closed-coupled/Separated OFA	0.1453	0.1126		0.46590	0.38986
Waukegan	8		0.1438	0.1169		0.49066	0.41599
Will County	1	SHUTDOWN	0.8321	0	SHUTDOWN	0.41896	0
Will County	2	SHUTDOWN	0.7849	0	SHUTDOWN	0.38993	0

Will County	3	Low NOx Burner Technology w/ Closed-coupled/Separated OFA Selective Non-catalytic Reduction	0.1798	0.085		0.46739	0.44600
Will County	4	Low NOx Burner Technology w/ Closed-coupled/Separated OFA Selective Non-catalytic Reduction (Began Feb 01, 2012)	0.1607	0.0929		0.46853	0.45350
Wood River	1	SHUTDOWN	0.2496	0	SHUTDOWN	0.00049	0
Wood River	2	SHUTDOWN	0.2032	0	SHUTDOWN	0.00068	0
Wood River	3	SHUTDOWN	0.3219	0	SHUTDOWN	0.00064	0
Wood River	4	Low NOx Burner Technology w/ Separated OFA	0.1837	0.1283		0.55246	0.48715
Wood River	5	Low NOx Burner Technology w/ Separated OFA	0.2168	0.1449		0.65025	0.47243

*Illinois did not perform individual BART determinations for EGUs. The above table shows 2002 emission rates vs. emission rates that have resulted from the Illinois EPA's alternative plan. Because the alternative rates are fleet-wide averages by company, these rates are not limits, but projected 2013 rates due to requirements of the plan.

Wisconsin

Table 4 – WI Regional Haze Control Strategies

Control Strategy	Control Strategy/Rule Description	Date Enacted	Compliance Date	Emissions Limits	Emissions Reductions (if known– specify whether expected or actual)	Notes/Issues
BART for EGUs	CAIR*	8/7/12 (EPA Final Approval)	Phase I/2009 Phase II/2015	State NOx and SO2 Emission Budgets set in CFR part 96.		**1)** WDNR determined in its Regional Haze SIP (dated 1/18/12) that CAIR = BART for subject-to-BART EGUs in WI. EPA approved this strategy effective 8/7/12. **2)** Each subject-to-BART EGU's existing controls/emission limits for PM were considered to be BART.
BART for non-EGUs	BART controls and emissions limits to control NO_X, SO_2, and PM emissions for 1 subject-to-BART non-EGU in WI	8/7/12	1/1/16	See Table 2.		WDNR determined that four facilities have sources that are potentially subject to BART. Based on visibility modeling WDNR determined that the Green Bay Georgia Pacific (GP) facility is the only source subject to BART.
Long Term Regional Haze Strategy	Future air regulatory programs and revised air quality standards					Several regulatory requirements are expected to significantly affect emissions from EGU and industrial boilers. These programs include PM2.5 RACT, attainment with the 1-hour SO2 NAAQS and NO2 NAAQS, and acid gas requirements under the ICI and EGU Boiler MACT rules. All of these programs have compliance time-frames consistent with the 2018 RPG date or a few years after.

* Many controls that have been implemented or planned to be implemented as a result of CAIR requirements are also included as part of Consent Decrees (C.D.'s) with U.S. EPA. Table 3 lists EGU C.D.'s that were enacted in recent years.

Table 2 – WI Non-EGU BART Determinations

Facility	Unit		NOX BART	NOX BART Limit*	SO2 BART	SO2 BART Limit*
Georgia-Pacific Green Bay	Stoker boiler	B26	Overfire Air/Flue Gas Recirculation/Selective Non-catalytic Reduction	110 tons per 30-day period on stack S10; 977 tons per 12-month period on stack S10	Dry FGD	268 tons per 30-day period on stack S10; 2,340 tons per 12-month period on stack S10
	Cyclone boiler	B27	Overfire Air/Regenerative Selective Catalytic Reduction			

*Flue gas from B26 and B27 are combined into a common flue duct with flue gas from 2 non-BART boilers, en route to stack S10.

Table 3 – Additional Controls

Control Strategy/ Facility	Control Strategy/Rule Description	Date Enacted	Compliance Date	Emissions Limits	Emissions Reductions (if known– specify whether expected or actual)*	Notes/Issues**
We - Valley - B1,B2,B3,B4	Repower from coal to natural gas	Unknown	2016 (target date for conversion completion)	Assumed SO2 at 0.006 Lb/mmBtu; Assumed NOx will remain at 0.22 Lb/mmBtu (2012 Em. Rate)	3,490 TPY SO2 expected	Voluntary to meet MATS, and pending approval from WI Public Service Commission
DPC - Alma - B4,B5	NOx: SNCR; SO2: DSI/DFGD	June 2012	July 2012	NOx: 0.35 Lb/mmBtu; SO2: 1.0 Lb/mmBtu	410 TPY SO2 expected	EPA Consent Decree (C.D.) requirements
DPC - Genoa - B1	NOx: SNCR; SO2: DFGD	June 2012	NOx: June 2016; SO2: Jan. 2013	NOx: 1,100 TPY; SO2: 0.09 Lb/mmBtu	1,930 TPY SO2 expected	C.D.
DPC - John P Madgett - B1	NOx: SCR; SO2: DFGD	June 2012	NOx: June 2016; SO2: Jan. 2015	NOx: 0.08 Lb/mmBtu; SO2: 0.09 Lb/mmBtu	1,960 TPY NOx expected; 3,290 TPY SO2 expected	C.D.
WPL - Columbia - B1	NOx: LNB/OFA; SO2: DFGD	Apr. 2013	NOx: July 2013; SO2: Jan. 2015	NOx: 0.15 Lb/mmBtu; SO2: 0.075 Lb/mmBtu	11,080 TPY SO2 expected	C.D.
WPL - Columbia - B2	NOx: SCR; SO2: DFGD		NOx: Jan. 2019; SO2: Jan. 2015	NOx: 0.07 Lb/mmBtu; SO2: 0.075 Lb/mmBtu	1,260 TPY NOx expected; 10,428 TPY SO2 expected	C.D.
WPL - Edgewater - B3	Retire	Apr. 2013	Jan. 2016	Retire	30 TPY NOx expected; 80 TPY SO2 expected	C.D.
WPL - Edgewater - B4	Retire or NG		Jan. 2019	TBD	4,550 TPY SO2 expected	C.D.
WPL - Edgewater - B5	NOx: SCR; SO2: DFGD		NOx: May 2013; SO2: Jan. 2017	NOx: 0.07 Lb/mmBtu; SO2: 0.075 Lb/mmBtu	680 TPY NOx expected; 5,820 TPY SO2 expected	C.D.
WPL - Nelson Dewey - B1,B2	Repower from coal to natural gas	Apr. 2013	Jan. 2016	Assumed SO2 at 0.006 Lb/mmBtu; Assumed NOx will decrease from 0.46 to 0.25 Lb/mmBtu	Unknown	C.D.
WPSC - Pulliam - B5,B6	Retire	Jan. 2013	June 2015	Retire	210 TPY NOx expected; 390 TPY SO2 expected	C.D.
WPSC - Pulliam - B7,B8	C.D. emission limit requirement		Jan. 2013	NOx: 0.25 Lb/mmBtu; SO2: 0.75 Lb/mmBtu	Unknown	C.D.
WPSC - Weston - B1	Retire	Jan. 2013	June 2015	Retire	100 TPY NOx expected; 250 TPY SO2 expected	C.D.
WPSC - Weston - B2	Retire	Jan. 2013	June 2015	Retire	410 TPY NOx expected; 880 TPY SO2 expected	C.D.
WPSC - Weston - B3	C.D. emission limit requirement	Jan. 2013	Jan. 2017	NOx: 0.1 Lb/mmBtu SO2: 0.08 Lb/mmBtu	640 TPY NOx expected; 4,120 TPY SO2 expected	C.D.
WPSC - Weston - B4	NOx: SCR; SO2: DFGD	Jan. 2013	Feb. 2013	NOx: 0.06 Lb/mmBtu; SO2: 0.08 Lb/mmBtu	410 TPY NOx expected	C.D.

* Emission reductions are relative to 2012 annual heat input and actual emissions.

** Voluntary emission reductions are expected to be assured by permit limitation.

Michigan

Table 5 -MI Regional Haze Control Strategies

Control Strategy	Control Strategy/Rule Description	Date Enacted	Compliance Date	Emissions Limits	Emissions Reductions (if known– specify whether expected or actual)	Notes/Issues
sources						
BART for EGUs	CAIR					CAIR = BART
BART for nonEGUs: New Page Paper St. Mary's Cement Tilden mine Lafarge Cement	 Status quo Status quo Test and set, resulting in permit limits for NOx Federal consent agreement requiring NOx and SO2 reductions	 Fall 2013 3-18-10	 Fall 2013 2014/2016	 Existing permit limits Existing permit limits NOx; 2270 lb. per hour NOx; 8,650 tons per year and 4.89 lb NOx per ton clinker. SO2; 13,100 tons per year and 3.68 lb SO2 per ton clinker.	 None None None To be determined	 FiPs issued by EPA requiring some revising of limits for New Page, SNCR for St. Marys, and low NOx burners for Tilden mine. The latter 2 companies are in litigation with EPA over the FIP. Approximate emission reductions from the consent agreement will be assessed in the near future.
Long Term Regional Haze Strategy:	On the books controls		2018	Not available	Not available	

Appendix F
Public Notice, Comment Response, and Comments Received

In the draft progress report public noticed on July 28, 2014, Appendix E was a placeholder appendix for the public notice, comment response, and comments received. The MPCA has moved these items to Appendix F in this final progress report.

Public Notice

The public notice for the State Implementation Plan (SIP) revision was published in the State Register on July 28, 2014 with the public comment period commencing on March July 28, 2014 and ending August 27, 2014. During the public comment period, a copy of the SIP revision was made available at the MPCA office located in St. Paul and on the MPCA's website. Text from the public notice is provided below, and the notice published in the State Register is included as Attachment 1 to this Appendix.

"Minnesota Pollution Control Agency

Environmental Analysis and Outcomes Division

Public Notice of Draft Five-Year Regional Haze Progress Report State Implementation Plan Revision

NOTICE IS HEREBY GIVEN that the Commissioner of the Minnesota Pollution Control Agency (MPCA) has determined that a State Implementation Plan (SIP) revision must be submitted to meet Minnesota's requirements under the federal Regional Haze Rule (40 Code of Federal Regulations § 51.300-51.309). The draft SIP revision is now available for public comment.

Background. Under the authority of section 169(a) of the Clean Air Act (CAA), the United States Environmental Protection Agency (EPA) on July 1, 1999 promulgated visibility goals for mandatory Class I Federal areas in the federal Regional Haze Rule. Section 169(a) of the CAA and the Regional Haze Rule required each state to adopt and submit a plan to EPA that addressed the state's contribution to visibility impairment at the mandatory Class I Federal areas. Minnesota submitted its Regional Haze SIP revision to EPA in December 2009, and submitted a supplement to the SIP in May 2012. The Regional Haze Rule further requires each state submit a five-year progress report on implementation of the Regional Haze SIP.

Purpose of the Progress Report. The purpose of this progress report is to fulfill Minnesota's responsibility under the CAA and Regional Haze Rule to assess whether the Regional Haze SIP is being implemented appropriately and whether reasonable visibility progress is being achieved consistent with the projected visibility improvement in the SIP. This progress report SIP revision does not modify Minnesota's Regional Haze SIP strategy, but rather, assesses its progress in the five years since its original submittal to EPA.

The MPCA will consider changing the contents of the proposed progress report based on comments received during the comment period. Following the end of the comment period, the Commissioner will decide whether to submit the proposed progress report SIP revision to the EPA unless, as provided by Minn. Stat. § 116.02, the MPCA Citizens' Board makes this decision.

MPCA contact person. The MPCA contact person is Melissa Andersen Kuskie. Written comments, requests, and petitions should be mailed to: Melissa Andersen Kuskie, Minnesota Pollution Control Agency, Environmental Analysis and Outcomes Division, 520 Lafayette Road North, Saint Paul, Minnesota 55155-4194; telephone: 651-757-2512 or toll free 1-800-657-3864; fax: 651-297-8324; and email: melissa.kuskie@state.mn.us. TTY users may call the MPCA at TTY 651-252-5332 or 1-800-657-3864.

Availability of SIP. A copy of the proposed progress report SIP revision is available on the MPCA's web site at http://www.pca.state.mn.us/index.php/public-notices/list.html. A copy is also available upon request by contacting Melissa Andersen Kuskie at 651-757-2512 or melissa.kuskie@state.mn.us, or can be mailed to any interested person upon the MPCA's receipt of a written request. Additional materials relating to the progress report SIP revision are available for inspection by appointment at the MPCA, 520 Lafayette Road North, Saint Paul, Minnesota 55155-4194, between the hours of 8:00 a.m. and 4:30 p.m., Monday through Friday. To examine these materials, or for more information, please contact Melissa Andersen Kuskie. All MPCA offices may be reached by calling 1-800-657-3864.

Public comment period and potential public meeting. Your comments must be in writing and received by Melissa Andersen Kuskie by 4:30 p.m. on Wednesday, August 27, 2014. Written comments may be submitted to her at the address, facsimile number, or e-mail address listed above.

As this progress report SIP revision does not include any substantive changes to the Minnesota's SIP, a public information meeting will only be held if one is requested by 4:30 p.m. on Wednesday, August 27, 2014. If such a meeting is requested, it will be held on Friday, August 29, 2014 at 10 a.m. at the MPCA Saint Paul Office, 520 Lafayette Road North, Saint Paul, Minnesota 55155-4194. To find out if a public information meeting will be held, please contact Melissa Andersen Kuskie at 651-757-2512 or melissa.kuskie@state.mn.us after Wednesday, August 27, 2014 at 4:30 p.m. The public information meeting, if one is requested, will provide information, receive public input, and answer questions about the proposed progress report SIP revision.

Request to have MPCA Citizens' Board make decision. You have the right to submit a petition to the MPCA Commissioner asking that the MPCA Citizens' Board make the decision on submitting the proposed progress report SIP revision to the EPA. Your petition must be in writing and must be received by the MPCA contact person listed above by 4:30 p.m. on Wednesday August 27, 2014. Whether the petition will be granted or denied is at the sole discretion of the MPCA Commissioner. The MPCA Citizens' Board will only make the decision on the proposed progress report SIP revision if the MPCA Commissioner grants your petition or if an MPCA Citizens' Board member makes a timely request to have the decision made by the MPCA Citizens' Board."

List of Comment Letters Received

1. U.S. Forest Service, letter received August 27, 2014
2. National Park Service, letter received August 22, 2014
3. Otter Tail Power Company, email received August 5, 2014
4. Rochester Public Utilities, email received August 27, 2014
5. Cliffs Natural Resources, email received August 27, 2014
6. Fond du Lac Band of Chippewa, email received July 17, 2014
7. National Parks Conservation Association, Earthjustice, Friends of the Boundary Waters Wilderness, Voyageurs National Park Association, and Minnesota Center for Environmental Advocacy, letter received August 27, 2014
8. U.S. Environmental Protection Agency, email received September 19, 2014

Responses to Comments on the Five-Year Regional Haze Progress Report SIP

The MPCA has summarized comments received on the draft five-year progress report and provided responses to comments below. Full comment letters and emails are attached to this Appendix.

1. U.S. Forest Service, letter received August 27, 2014

Comment 1A: "Overall, we found the progress review to be comprehensive in its coverage of the subject matter. We appreciated the efforts taken to include a level of technical analysis…which we have found lacking in submittals we have reviewed from other states."

Response 1A: The MPCA appreciates the input.

Comment 1B: Please clarify the phrase "evolution of controls" used in the Executive Summary, page ii. The SIP only requires the taconite facilities to model compliance with the NAAQS. This may not require them to investigate and/or install pollution controls.

Response 1B: The MPCA's 2012 Regional Haze SIP Supplement stated that "We believe efforts to demonstrate compliance with new federal standards will result in appropriate evolution of control technologies and other practices that reduce emissions and meet the overall objective of the Northeast Minnesota Plan." The MPCA continues to believe that while some facilities may be able to model compliance with the one-hour National Ambient Air Quality Standard (NAAQS) with existing operations, in general, the industry will need to modify operations and/or install controls to model compliance. However, to improve clarity, the MPCA has updated the language in the executive summary.

Comment 1C: We suggest changing language in the Executive Summary to reflect that the Northeast Minnesota Plan emission reduction goal cannot be met until 2018 – the year of compliance – and indicate that Minnesota is instead "in good position to meet" the goal.

Response 1C: The MPCA has modified language in the Executive Summary in response to the comment.

Comment 1D: We are concerned with the slow progress of the revised Long Term Strategy (NAAQS modeling by the taconite industry), which was originally expected to drive more stringent controls for the taconite facilities on a faster timeline than the pilot testing from the 2009 SIP. We also fear that the end result of the NAAQS modeling strategy could be modeled output files with no associated controls or emission reductions, even though the MPCA expects to see further emissions reductions from "controls not yet implemented, including BART and the taconite NAAQS compliance element of the Long Term Strategy."

Response 1D: The MPCA acknowledges the delay in implementation of the taconite facilities' NAAQS compliance element of the long term strategy, but remains committed to the continued implementation of the Administrative Order (AO)-required NAAQS modeling. The MPCA worked with the taconite facilities, Federal Land Managers (FLMs), and tribal governments in a stakeholder process throughout much of 2014 intended to refocus and refine the NAAQS modeling approach. The process improvements resulting from the stakeholder group will help to improve modeling once it begins.

The MPCA had expected to begin cumulative modeling in mid-2014, and to receive plans by late 2014/early 2015 from the taconite facilities (along with applications for permit amendments) ensuring NAAQS compliance. In mid-2014, after this five-year progress report had been put on public notice, the MPCA was informed that settlement talks between U.S. Environmental Protection Agency (EPA) and the taconite companies were proceeding, and resolution of the Best Available Retrofit Technology (BART) Federal Implementation plan (FIP) litigation was expected prior to January 2015. Because a settlement would likely include specific NO_X and SO_2 emissions limitations for each facility (that would differ from emissions rates previously received by the taconite companies as part of the AO modeling process), and because such limitations would be federally enforceable, the MPCA made the decision to temporarily pause modeling activities under the AO. If, as expected, the litigation is resolved by January 2015 and results in emissions limitations, these new emissions rates will be included in the cumulative modeling exercise conducted by the MPCA. If EPA and the taconite companies fail to reach a settlement that includes emissions limits, the MPCA would proceed with the AO using existing emissions information, and work to implement necessary controls ensuring NAAQS compliance as expeditiously as practicable.

The MPCA appreciates the commenter's concern regarding the pace of the revised long term strategy, but notes that the revised long term strategy did not consider a taconite BART FIP with limits different from those established by the State's BART process. This unforeseen development in Minnesota's Regional Haze program has, necessarily, resulted in some delays as we attempt to reconcile the State's SIP obligations with EPA's FIP developments which are largely outside the MPCA's control. The MPCA remains committed to its long term strategy, but will work to align that strategy with BART developments to ensure we achieve emissions reductions from the facilities as well as modeled compliance with the NAAQS in the most efficient manner possible. We continue to expect that AO-subject facilities will achieve necessary emissions reductions in support of the 2018 reasonable progress goals.

Comment 1E: The statement that "Minnesota did not rely on control strategies from other states in developing its Regional Haze SIP Reasonable Progress Goals," is confusing because the emission inventories developed as inputs to the models that calculated the Reasonable Progress Goals inherently contained each state's strategy within it."

Response 1E: The MPCA has modified language in the progress report in response to this comment. Minnesota did not rely on new, Regional Haze SIP-specific controls from other states in developing its Reasonable Progress Goals (RPGs). Minnesota, did, of course, project the emissions reductions associated with on-the-books controls for other states in developing its RPGs.

Comment 1F: Figure 2B-2 (Northeast Minnesota Plan Emissions) is illustrative of why we remain concerned about contributions to visibility impairment from the taconite industry. Most of the taconite industry has done little to address their impact to visibility, while the utility industry has reduced emissions so the region could meet its goals.

Response 1F: The MPCA believes all industries, taconite included, must work to support visibility progress in our Class I areas. While the BART strategy for the utility industry Cross-State Air Pollution Rule (CSAPR) was stayed for much of the time between SIP approval and this progress report, the utility industry had already begun implementing controls needed for compliance with CSAPR, long before CSAPR had been incorporated as part of Minnesota's Regional Haze SIP. EPA's BART FIP strategy for the

taconite industry, however, was developed more recently, and has been stayed by the court while litigation is resolved. The MPCA is confident that implementation of the BART FIP, along with the long term strategy, will yield emissions reductions that benefit visibility. Please also see response 1D.

Comment 1G: We believe that potential increases in NO_X and SO_2 emissions from oil and gas development in North Dakota must be considered. We just reviewed the progress report for North Dakota and are concerned that these emissions increases are poorly quantified and could potentially outstrip reductions made by the utilities in the state.

Response 1G: The MPCA cannot address adequacy of emissions quantifications by North Dakota in its draft five-year progress report, as such an assessment is outside the scope of this SIP revision.

It is difficult to directly compare North Dakota emissions projected in Minnesota's 2009 Regional Haze SIP with preliminary data provided by the North Dakota Department of Health or with North Dakota's draft progress report, as the base year emissions estimated differ significantly between the two states. However, North Dakota's data suggests that emissions reductions in both SO_2 and NO_X have occurred since the 2002 base year (exceeding modeled expectations for NO_X and falling short of, but on track to achieve by 2018, modeled expectations for SO_2), while Volatile Organic Compound/Chemical (VOC) emissions have increased – a concern identified in Minnesota's progress report. At this time, because VOC emissions are not a primary factor in the development of haze in Minnesota's Class I areas, we do not believe this increase in VOC emissions from North Dakota will interfere with the achievement of the reasonable progress goals in Minnesota's Class I areas. We will do a more in-depth analysis of emissions from North Dakota, and all contributing states, with the next Regional Haze SIP revision, and will work closely with states and FLMs in consultations as SIPs are developed.

2. National Park Service, letter received August 22, 2014

Comment 2A: In addition to the emissions summary for all electric generating units in Table 2B-1, please provide a table similar to Table 2A-1 that outlines unit generation capacity specific controls for SO_2 and NO_X, dates controls were installed or are anticipated, and any announced retirements. Please clarify if the facility controls under the MATS as defined in Table 2A-1 are in addition to actions taken under BART/CSAPR.

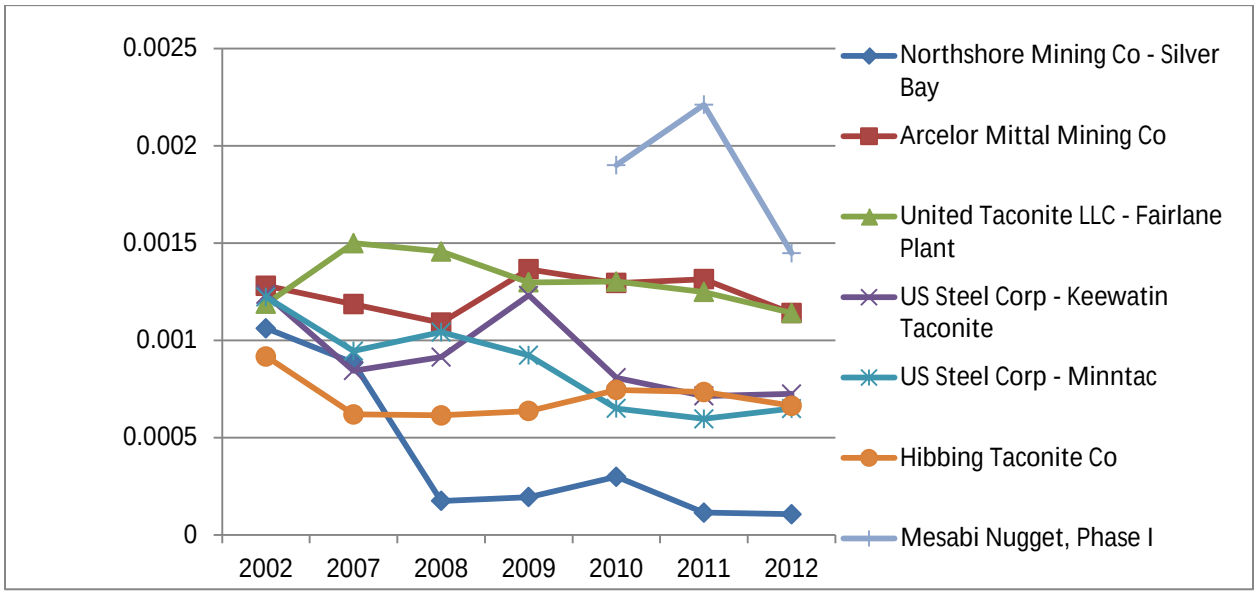
Response 2A: The MPCA added a table to Appendix B of the progress report, which provides some of the requested additional information for the BART-subject electric generating unit (EGUs). We have also provided CAMD-reported NO_X and SO_2 emissions data (where available) from 2009 and 2013 for these facilities, along with heat input, for informational purposes. Please note that the stay of CSAPR was lifted on October 23, 2014, and EPA's rule re-setting implementation deadlines was issued on November 21, 2014. Given that, it is not possible to assess specific actions taken under CSAPR for BART-subject facilities in this progress report. Additionally, CSAPR does not require the installation of specific controls. Facilities may comply with CSAPR provisions entirely within the framework of the rule's trading system – that is, a facility may comply with CSAPR without installing any controls or making any emissions reductions, if they are able to acquire sufficient allowances to cover emissions. CSAPR's improvement to visibility results from state and nation-wide emissions reductions, not necessarily facility-specific actions.

Comment 2B: Please clarify the source sectors included in the category "mining" in figure 2B-2, and clarify whether the increase in emissions from the category after 2009 is due to recovery after the 2009 recession or represents an increase over pre-recession activity. It is difficult to compare this mining category to the point source sectors in Figure 2D-1 and 2D-2. Please make the categories consistent across these figures or explain how to compare the categories.

Response 2B: The source sectors are somewhat comparable, but data for the figures was pulled in different ways, at different times. Data for figure 2B-2 were assembled by aggregating emissions for facilities identified in the Northeast Minnesota Plan, and it was last "pulled" for the covered facilities in 2013. Data for figures 2D-1 & 2D-2 were assembled by searching the emissions inventory by Standard Industrial Classification/Code (SIC) number groupings (mining includes SIC # 1000-1499) across the entire state, and was put together in 2014. For this reason, data for figures 2D-1 & 2D-2 include additional facilities and their emissions not factored into the Northeast Minnesota Plan assessment. We have updated the labels on figures 2D-1 & 2D-2, changing "taconite" to "mining" to make clear that the emissions values are not limited to the taconite industry.

Regarding a clarification of whether the increase in emissions after 2009 was due to the post-recession recovery or represents an increase over pre-recession activity, we are providing below a chart showing tons of combined SO_2 and NO_X per ton of pellets produced for the mining facilities tracked under the Northeast Minnesota Plan. The chart does not specifically identify whether there has been an increase over pre-recession activities, but does suggest that the level of emissions per unit of output has generally decreased since both the base year and the 2009 recession. This analysis is not a required part of Regional Haze Rule five-year progress report elements, and so has not been included in the report itself, but the MPCA believes the information may help to respond to your comment.

Figure 1 - Tons of Combined SO2/NOX per Ton of Pellets Produced for Northeast Minnesota Facilities



Comment 2C: Please include the 2011 daily IMPROVE monitoring data for Boundary Waters to support conclusions that the increase in organic carbon on the five-year average of the 20% worst visibility days is due to the 2011 Pagami Creek Wildfire.

Response 2C: As requested, the full measurements of organic carbon in Boundary Waters associated with the Pagami Creek fire are provided in Appendix C, along with some description of the fire event.

Comment 2D: We recommend further consultation with North Dakota Department of Health as they have drafted a five-year regional haze progress report. MPCA should recognize the significant increase in NO_X emissions from oil and gas production in North Dakota that is offsetting NO_X reductions from point sources and that could impact visibility in Minnesota's Class I areas.

Response 2D: Please see response 1G above. The MPCA will consult closely with North Dakota, and other states, as we develop our next Regional Haze SIPs. Such consultation at this time, given the MPCA's determination that its existing SIP is sufficient to meet 2018 reasonable progress goals, is outside the scope of this progress report.

3. Otter Tail Power Company, email received August 5, 2014

Comment 3A: Please correct Table 2A-2. The Hoot Lake Plant Units 2 and 3 are incorrectly listed as planning to install SO_2 scrubbers for MATS compliance. There are not any plans, nor have there ever been, to install scrubbers on those units. However, Units 2 and 3 are near the completion of a project to upgrade the electrostatic precipitators which will reduce particulate matter emissions for MATS compliance.

Response 3A: The MPCA has made the correction to the table on page 9 of the progress report.

4. Rochester Public Utilities, email received August 27, 2014

Comment 4A: Please revise language regarding the Rochester Public Utilities Silver Lake EGU. RPU plans to *decommission* the plant by December 31, 2015, not shut down, as currently indicated in the progress report. The definition of decommission is set by the Public Utility Board of the City of Rochester as "to cease coal burning and electric generation, while retaining the potential to generate steam for Mayo using natural gas until 2025." RPU ceased burning coal at the Silver Lake plant on November 14, 2013.

Response 4A: The MPCA has made the correction on page 9 of the progress report.

5. Cliffs Natural Resources, email received August 27, 2014

Comment 5A: The draft progress report does not contain any updated information evaluating Canadian emission sources, visibility impacts to Minnesota's Class I areas from those Canadian emission sources, or how deficiencies that were identified in the December 2009 SIP related to Canadian emission inventory data availability and modeling inconsistencies have been re-examined and addressed. Accordingly, Cliffs Natural Resources requests that MPCA supplement the final version of the five-year progress report with the following information:

- **updated emission data from Canadian sources relevant to Minnesota's Class I areas;**
- **an evaluation of how those Canadian emissions have changed over the most recent 5 year period; and**
- **a description of visibility impairment effects on Minnesota Class I areas from those Canadian emission sources.**

Response 5A: Chapter 2, Section E of the MPCA's five-year progress report assesses changes impeding visibility progress, focusing on states that contributed 5% or more to impaired visibility at Boundary Waters and Voyageurs as identified in the 2009 Regional Haze SIP. There are several reasons Minnesota does not focus on Canada as an area with emissions impeding visibility progress in the progress report.

- The 2009 Regional Haze SIP identified the entire country of Canada as contributing less than 5% to visibility impairment in Boundary Waters in the base and 2018 projection years; Canada was identified as contributing 5% to Voyageurs only in the projection year 2018. In contrast, the 2009 Regional Haze SIP shows that the United States contributes about 85% to visibility impairment in Boundary Waters and Voyageurs.
- The incremental probability of poor visibility at Boundary Waters, shown in Figure 2E-1 of the report, indicates that the United States remains the probable contributor to days in the Class I areas where visibility is most impaired, while Canada remains a probable contributor to days in the Class I areas where visibility is least impaired.
- Minnesota does not have updated Canadian emissions with any specificity with which to evaluate. Detailed Canadian emissions are not readily accessible outside of Canada without onerous confidentiality agreements. Most organizations rely on foreign emissions obtained and processed by the federal government[1]. The international emissions provided by EPA lack specificity, including data from individual point sources, making the commenter's requested analysis infeasible. EPA has Canadian emissions for the year 2006 in its currently available 2011 modeling platform. These emissions are not projected because, according to EPA, relevant information needed to do so is currently unavailable.
- EPA's guidance for states developing five-year progress reports[2], Section E states, "the EPA does not expect new emissions inventory collection or air quality modeling…" in the five-year progress reports.
- The Regional Haze rule requires a more comprehensive Regional Haze SIP update in 2018 and every ten years thereafter. However, while the MPCA hopes to have updated emissions from Canada for the next revision, we expect to continue to only have aggregated emissions.

[1] www.epa.gov/ttnchie1/emch/
[2] www.4cleanair.org/Documents/haze_5year_4-10-13.pdf

Comment 5B: Cliffs Natural Resources requests that the MPCA work with Ontario Ministry of Natural Resources to understand recent trends and management strategies for forest fires in Ontario and further document the significance of Ontario forest fires relative to visibility impairment in Minnesota's Class I areas in the final version of the five-year progress report.

Response 5B: As noted in response 5A, EPA does not expect states to conduct updated modeling for the five-year regional haze progress reports. Were the MPCA's five-year progress report to conclude that the current SIP is or may be inadequate to ensure reasonable progress due to emissions from sources in another country, it may be necessary to conduct further analyses to determine the cause of delayed visibility progress – including, possibly, Canadian wildfires. However, the MPCA expects to achieve the emissions reductions and visibility progress projected by its existing Regional Haze SIP and believes no substantive revision to its SIP is necessary at this time.

The MPCA will consider the commenter's request when it develops the 2018 Regional Haze SIP revision.

6. Fond du Lac Band of Chippewa, email received July 17, 2014

Comment 6A: The MPCA's five-year progress report does not account for how new emissions sources will impact the visibility progress that has already occurred.

Response 6A: The Clean Air Act's Prevention of Significant Deterioration (PSD) program regulates new and modified major stationary sources of air emissions. The PSD program was designed to preserve, protect and enhance the air quality in Class I areas, and does so by requiring new sources be built as cleanly as possible, with specific emissions controls. The program also requires air quality analyses to determine whether emissions from a particular proposed source would impact Class I areas, and prevents the approval of projects that would be expected to impact Class I areas without modifications to avoid such impacts. The MPCA works closely with FLMs to ensure that new projects will not negatively impact Class I areas.

7. National Parks Conservation Association, et al., letter received August 27, 2014

Comment 7A: The proposed progress report includes a list of measures the State relied upon, as required by 40 CFR Part 51.308(g)(1), but should distinguish between those that are required by Minnesota's Regional Haze SIP as enforceable measures and those that are not. Specifically address the Northeast Minnesota Plan's emission reduction goal and SO_2 NAAQS compliance with the 2010 one-hour standard.

Response 7A: The MPCA has updated language in the progress report to indicate that the Northeast Minnesota Plan's emission reduction target is non-binding and unenforceable. Regarding the 2010 SO_2 NAAQS, the MPCA identified the existence of the NAAQS under a section of the report titled "Additional measures/emission progress not included in SIP." Here, the report identifies requirements and/or controls that were specifically *not* included in Minnesota's Regional Haze SIP, merely to supplement the specific progress report requirements. While the requirements are expected to produce emissions reductions prior to the MPCA's 2018 reasonable progress goal, we do not rely upon any such reductions in the Regional Haze SIP. The measures listed in this section are, however (with the exception of "other states' controls") applicable federal requirements.

We also note that in its guidance to states in preparing five-year progress reports, EPA suggests that it may be "helpful" for the reports to include discussions of noteworthy changes in source activity, including, but not limited to regulations enacted after development of the regional haze SIP. The MPCA has chosen to include such discussions in its progress report.

Comment 7B: The proposed progress report does not provide an adequate summary of estimated reductions achieved through the identified control measures consistent with 40 CFR Part 51.308(g)(2). The purpose of the requirement is to provide a summary of emissions reductions achieved through implementation of the measures identified in the SIP.

Response 7B: In its guidance for states developing five-year progress reports, EPA states, "we do not expect states to quantify emission reductions for measures which have not yet been implemented or for which the compliance date has not yet been reached. These measures should be addressed in the "status of measures" discussion." The enforceable Regional Haze SIP-specific control measures identified in the "status of control strategies" section have compliance dates which have not been reached and/or have had their implementation delayed due to litigation (addressed in the "status of control strategies" section). For this reason, the MPCA cannot quantify emissions reductions for these specific controls. The MPCA did identify emissions progress as a part of its Northeast Minnesota Plan emissions reduction goal.

Comment 7C: The MPCA must make an accurate assessment of whether enforceable progress is off the "glide path" and if it is, the agency must explain why and must then make any necessary adjustments to the Regional Haze SIP to return Minnesota to the glide path to make reasonable progress on the 2064 deadlines.

Response 7C: The MPCA agrees that if Minnesota were unable to document adequate progress towards visibility goals (specifically, its EPA-approved reasonable progress goals for Boundary Waters and Voyageurs) that it should explain why and make adjustments to ensure necessary progress. However, both Class I areas in Minnesota are on track to achieve 2018 reasonable progress goals. At the time the draft report was made available for public notice and comment, monitoring data through 2012 was available. This data showed that visibility conditions in Voyageurs were better than the 2018 reasonable progress goal, and that conditions in Boundary Waters had improved, but were slightly above a "glide path" line to the 2018 reasonable progress goal. In the draft report, the MPCA provided data to support a determination that the delayed progress was due to a 2011 wildfire, and that absent the wildfire, Boundary Waters would show similar improvement to Voyageurs. Since the public comment period ended, monitoring data for 2013 has become available. The MPCA has amended its progress report to include this 2013 monitoring data, and finds that visibility in Boundary Waters has improved to the point that it is now "on track" to meet the 2018 reasonable progress goal. Further, the visibility data still includes the effects of the 2011 wildfire, which suggests that future monitoring data will show even greater progress once the 2011 data drops out of the five-year rolling average of visibility conditions.

In summary, because Minnesota expects to achieve and likely exceed the 2018 reasonable progress goals identified in its 2009 SIP, the MPCA believes that further substantive revisions to the Regional Haze SIP are unnecessary at this time.

Comment 7D: The progress report fails to show that control measures required in the SIP are the driving force for emissions reductions. It also fails to provide any assurance that these reductions will be permanent and enforceable going forward, or that the additional reductions necessary to meet the 2018 reasonable progress goals will be compelled.

Response 7D: The MPCA has fulfilled the requirements of the Regional Haze rule, 40 Part 51.308(g), and EPA's guidance to states for developing five-year progress reports. The Regional Haze rule (and EPA's guidance) directs states to provide a description of the status of implementation of measures included in the Regional Haze SIP and a summary of emissions reductions achieved in the state through the implementation of these measures. The rule then requires an assessment of visibility conditions and changes. States are neither required nor expected to demonstrate that the specific measures identified in the Regional Haze SIP are the sole cause of any visibility improvements. The MPCA has demonstrated that control measures identified in its Regional Haze SIP are or will be implemented in order to support reasonable progress goals, and has also demonstrated that emissions are at (as is the case with SO_2) or are expected by 2018 to be at (as is the case with NO_X) levels modeled in producing reasonable progress goals in Minnesota's Regional Haze SIP.

The existence of emissions reductions not directly linked to Minnesota's Regional Haze SIP controls (BART and the Northeast Minnesota Plan) cannot and should not be "discounted" as insufficient for the purpose of this five-year progress report. On-the-books controls modeled in Minnesota's 2009 Regional Haze SIP are federal rules/requirements that are currently in place and which contribute to improved emissions performance. Minnesota is not directly responsible for these emissions reductions, but our Class I areas benefit from them.

Further, Minnesota's EGUs have made considerable emissions reductions; however, these reductions to date cannot be specifically linked to CSAPR, as the rule was only recently reinstated by the courts and EPA. Many EGUs installed controls and/or modified operations in preparation for the Clean Air Interstate Rule (CAIR), which was ultimately stayed (permanently) for Minnesota. These controls and operational changes (and associated emissions reductions) can reasonably be assumed to be permanent and enforceable given the 2015 compliance date for CSAPR recently set by EPA.

Comment 7E: Because Minnesota's proposed reasonable progress goals set a rate of improvement that would not achieve natural visibility conditions by 2064, the MPCA must revisit its conclusion that the progress report is sufficient, and ground its assessment in a concrete and accurate evaluation of enforceable pollutant reductions to determine whether the state's regional haze plan will achieve the requisite level of progress.

Response 7E: Minnesota's five-year progress report demonstrates that Minnesota's Class I areas are on track to achieve the EPA-approved 2018 reasonable progress goals (i.e., monitoring results show the "requisite level of progress"). The MPCA acknowledges that its 2018 reasonable progress goals provide for less annual progress towards the ultimate visibility goals of natural conditions than does the Uniform Rate of Progress (a glide path set by essentially assuming a constant rate of progress between the base year and 2064). However, reasonable progress goals are based specifically on controls and emissions improvements that are considered reasonable, in accordance with EPA requirements and guidance. It cannot, and should not, be assumed that the ten-year reasonable progress goals will follow identical paths of annual progress. Over the course of what is essentially a 60-year planning process, it should be expected that reasonable progress goals will be more and less aggressive, depending on the state of air

pollution control technology and regulatory changes, as the State moves toward the final goal of natural visibility conditions by 2064 in Boundary Waters and Voyageurs. Minnesota will develop a new reasonable progress goal for its Class I areas for the year 2028 with the next substantive Regional Haze SIP revision.

Comment 7F: Where additional emissions reductions are readily achievable through measures not assumed in Minnesota's Regional Haze SIP, it is incumbent upon the State and EPA to revise the plan to ensure reasonable progress. The progress report is the venue determined by EPA to reset initial measures and goals as necessary, including revisions to BART requirements that fell short.

Response 7F: Please see response 7C. The MPCA believes its Five-Year Progress Report demonstrates that its current Regional Haze SIP is sufficient to achieve its EPA-approved 2018 reasonable progress goals. Minnesota believes that its Regional Haze SIP control measures will, once fully implemented, ensure reasonable progress. Therefore, further revision of the plan at this time is not necessary. If the commenter means to suggest that the MPCA should revisit BART determinations for applicable units, the MPCA believes that current BART strategies (upon implementation) are sufficient to support reasonable progress goals. Additionally, the reassessment of BART – to the extent that current BART controls are sufficient to support reasonable progress – is outside the scope of this SIP revision. The 2018 Regional Haze SIP revision will be the venue for large-scale regional haze program strategy modifications and developments.

Comment 7G: Graphs made available in the proposed progress report only show progress toward 2018 reasonable progress goals. To demonstrate progress toward natural conditions, it would be useful for the MPCA to include both the best and worst 20% days under natural conditions to be represented, as well as a comparison between existing progress and the Uniform Rate of Progress. We request that the final progress report include documentation of natural conditions and an assessment of time needed to achieve them.

Response 7G: The Regional Haze Rule clearly indicates that the purpose of the five-year progress review is to describe the level of progress made midway through the ten-year implementation cycle (i.e. 2008 – 2018) to meet the first reasonable progress goal established for 2018. The MPCA's assessment shows that Boundary Waters and Voyageurs are moving well toward the 2018 reasonable progress goal. In 2018, the MPCA expects to develop a more comprehensive Regional Haze SIP revision that will establish reasonable progress goals for the next ten-year cycle. As demonstrated in the graphs in the MPCA's progress report, actual progress will not strictly adhere to a uniform line of progress, but may remain relatively steady for a time until measures are implemented that reduce emissions, at which time obvious dips in visibility impairment levels are apparent. Assessing this in year to year increments allows for a determination of where things stand as emission reduction measures are implemented and for an opportunity to establish next steps based on what was achieved. As shown in the graphs, projecting even ten years out has uncertainty. Attempting to guess the level of visibility improvement beyond ten years would be just that, a guess. The MPCA will work to ensure its Regional Haze program achieves natural conditions by 2064, as required by EPA regulations.

Comment 7H: The proposed progress report indicates that ammonium nitrate contributions to Class I visibility impairment at Voyageurs and Boundary Waters have remained largely steady despite some decreases in Minnesota's NO_X emissions. The reasons for this are unclear. In order to reduce the ammonium nitrate contribution to visibility impairment at these Class I areas, understanding the causes of that contribution is critical. We request that the progress report include an explanation for this phenomenon or provide a pathway for identifying an explanation in time to incorporate that knowledge into the next round of regional haze planning.

Response 7H: EPA's guidance for five-year progress reports states, "the EPA does not expect new emissions inventory collection or air quality modeling" in the five-year regional haze progress reports. The Regional Haze rule requires a more comprehensive SIP update in 2018. Efforts are currently underway to establish a modeling platform, including new baseline and projected emissions, for the next regional haze SIP cycle. The current five-year progress report does indicate that NO_X emissions from mobile sources have not yet reached reduction goals for 2018. These are partially dependent on the implementation of federal mobile source controls. As the MPCA develops its next comprehensive Regional Haze SIP, we will assess NO_X emissions levels and ammonium nitrate contributions to visibility impairment, and determine necessary next steps.

Comment 7I: EPA requires an analysis "tracking the change over the past 5 years" in haze-causing pollutants. The regulation anticipates that the Agency will use the most recent data available "with estimates projected forward as necessary and appropriate" to address the applicable five-year period. Here, the applicable period is 2009-2013. But the proposed progress report provides data from 2002-2011/2012 and does not attempt to estimate last year's or existing emissions. We encourage the MPCA to include available emissions for 2013 (e.g. from all sources included in EPA's Air Markets Program Database), and also make "estimates projected forward as necessary" to provide a clearer picture of emissions changes in the last five years.

Response 7I: EPA's five-year progress report guidance provides considerable flexibility in determining relevant years of emissions used to "track the change over the past 5 years." The guidance clarifies that a change must "compare emissions at two points in time" over a five-year period. This will allow for at least "2 inventory years, 5 years apart". A full inventory of actual emissions is developed every three years. Emission inventories typically go through several iterations before a final inventory is published. The most recent final full emission inventory is for the year 2008. Version 1 of the year 2011 emission inventory is publicly available, but is expected to go through some revision before the final inventory is developed. Nonetheless, the MPCA included the full 2011 emissions inventory in the five-year progress report (indicating the draft status) in order to provide the most recent inventory information possible. In this case, the required change in emissions over the past five-year period is from 2008 to 2011. The MPCA went above and beyond this requirement by reporting emission changes from 2002 through 2011, interpolating emissions between full inventory years for non-point sources. The MPCA also provided point source emission changes that extend to 2012, as Minnesota derives point source emissions annually, which is the most current quality assured data available at the writing of the report. The MPCA does not generally project emissions into the future and "the EPA does not expect new emissions inventory collection or air quality modeling" in the five-year regional haze progress reports.

Comment 7J: MPCA appears to report actual emissions (from point sources). In order to understand whether the reported reductions are enforceable and permanent, the MPCA must also report permitted emissions levels.

Response 7J: The Regional Haze rule states under regional haze plan principles that "measuring reasonable progress should involve tracking the *actual* emissions achieved through implementation of (emission control) strategies."

Comment 7K: The MPCA should further disaggregate emissions and provide clearer information by source. The proposed progress report has grouped sources more broadly than in the example offered in EPA's guidance. Moreover, the way in which some of the data are presented makes it difficult to compare changes in emissions within any given group from year to year (a known difficulty with stacked column charts that could be ameliorated by category-specific charts and tabular data).

Response 7K: The MPCA has added tables to Appendix D containing the data underlying the emission progress charts for the two pollutants targeted as part of the reasonable progress strategy.

Comment 7L: The proposed progress report does not provide a clear picture of the impact of ammonia emissions on visibility, or progress as a result of changes in ammonia emissions. It would be helpful for the progress report to clarify the relationship between the ammonia emissions and the resulting impairment at affected Class I areas.

Response 7L: The Technical Support Document[3] for Minnesota's 2009 Regional Haze SIP thoroughly discusses the relationship between ammonia emissions and the resulting impairment at affected Class I areas. Because this information is already a part of Minnesota's Regional Haze SIP, re-stating in this five-year progress report SIP revision is unnecessary, particularly given the progress report is assessing implementation of existing regional haze strategies, which focus on SO_2 and NO_X, not ammonia. The MPCA intends to re-address the role of ammonia in visibility impairment for the next comprehensive SIP revision.

Comment 7M: We request that the progress report include more detailed information about NO_X and SO_2 emissions from the increased oil and gas development in North Dakota, and their impacts on visibility in Class I areas. We also encourage Minnesota to advocate for appropriate regulation of this emissions source.

Response 7M: Please see response 1G.

Comment 7N: The MPCA should provide a more detailed accounting of emissions from Illinois and Wisconsin to establish a full inventory of pollution affecting Minnesota's Class I areas. Minnesota should request this information from Illinois and Wisconsin and put together emissions trends from neighboring states should more comprehensive information prove unavailable.

[3] www.pca.state.mn.us/index.php/view-document.htmlgid=2184

Response 7N: The MPCA did not formally request detailed emissions data from Illinois and Wisconsin for its five-year progress report. However, the MPCA did discuss the progress report and its development with Lake Michigan Air Directors Consortium (LADCO), and provided the report to LADCO for review. Neither Illinois nor Wisconsin (or indeed, any LADCO state) indicated to Minnesota that any unforeseen emissions increases (or less-than-expected emissions reductions) had occurred or were expected to occur. Nevertheless, the MPCA has compiled information from EPA's Air Markets Program Database for neighboring states deemed as contributors to Minnesota's visibility impairment, and provided this information in Appendix E.

Comment 7O: The proposed progress report does not support its conclusion that Minnesota is on track to meet reasonable progress with sufficient evidence. The progress report fails to show that current plan elements are at the heart of any of the emission reductions it reports. Second and more importantly, it fails to provide any assurance that these emission reductions are, in fact, enforceable and permanent.

Response 7O: Please see response 7D. The MPCA believes its five-year progress report demonstrates that Minnesota's Regional Haze SIP is sufficient to ensure reasonable progress.

Comment 7P: The progress report represents an important opportunity for Minnesota to reassess its inappropriate reliance on CSAPR. If Minnesota wishes to use the CSAPR allocations for BART, Minnesota must still comply with the independent analysis requirements for demonstrating that assigned allocations are in fact "better than BART" for Minnesota. Even the extremely inadequate and non-compliant BART determinations in Minnesota's 2009 SIP submission show better protection and improvement for the Class I areas than the CSAPR allocations. We urge the MPCA to use this opportunity to amend its SIP to reject CSAPR. Failing this, at a minimum, Minnesota should augment its use of CSAPR with source-specific emission reductions from facilities that continue to impair Class I area visibility.

Response 7P: EPA has approved Minnesota's EGU BART strategy (CSAPR). The MPCA addressed comments concerning the use of CSAPR as a "better than BART" strategy for Minnesota's Regional Haze SIP when it finalized its 2012 Regional Haze SIP Supplement (please see http://www.pca.state.mn.us/index.php/view-document.html?gid=17236). EPA approved Minnesota's EGU BART strategy in 2012. At this time, circumstances that would warrant revisiting the EGU BART strategy (such as a vacatur or repeal of CSAPR or an expected failure to achieve reasonable progress) do not exist. While additional visibility progress and emissions reductions supporting such progress will certainly be required as we move toward the national goal of natural visibility conditions in Class I areas, Minnesota believes it has demonstrated that its current Regional Haze SIP is sufficient to support its 2018 reasonable progress goal. Additional source-specific controls are not required at this time. We will consider the commenters' input as we develop the next substantive Regional Haze SIP revision.

Comment 7Q: We urge Minnesota to commit to funding both Class I IMPROVE monitors in the event of a loss of federal funding, and additionally urge the state to support and advocate for continued federal funding for IMPROVE in whatever ways possible.

Response 7Q: At this time, there is no indication of any loss of federal funding for the IMPROVE network.

8. EPA Region V, email received September 19, 2014

The MPCA received comments from EPA after the August 27, 2014 close of the comment period, but has attempted to respond to and incorporate EPA's input. While comments received after the close of the public comment period are not required to be considered, because the MPCA has worked closely with EPA throughout the development of its regional haze program and because EPA has approval authority over Minnesota's SIP program, we have incorporated EPA's input where possible.

Comment 8A: Please provide additional information to support the MPCA's conclusion that Boundary Waters would meet reasonable progress goals but for the effects of the 2011 Pagami Creek wildfire.

Response 8A: The MPCA did not claim that Boundary Waters would meet reasonable progress goals but for the effects of the Pagami Creek wildfire, but rather stated that visibility improvement at Boundary Waters would look similar to that at Voyageurs. The MPCA has provided additional information on the Pagami Creek wildfire in Appendix C. However, following the close of the comment period for this SIP revision, 2013 monitoring data became available, and the MPCA has updated the five-year progress report to include this data. Revised five-year rolling averages of the 20% worst visibility days show that, even with the 2011 Pagami Creek wildfire, Boundary Waters is on track to meet the 2018 reasonable progress goal.

Comment 8B: EPA disagrees with Minnesota's characterization of EPA's action regarding Sherco and BART.

Response 8B: The MPCA appreciates EPA's perspective. The MPCA notes that in EPA's approval of Minnesota's Regional Haze SIP (77 FR 34806), it stated, "EPA is not acting on any source-specific BART determinations in this rule." While EPA made clear in its approval that deferral of action regarding BART for Sherco was focused on RAVI BART, it also explicitly failed to address Minnesota's source-specific regional haze BART determination for Sherco. EPA approved Minnesota's source-specific BART determination as a "SIP strengthening measure," but did not indicate a position on Minnesota's source-specific regional haze BART determination in and of itself. Minnesota appreciates that EPA found the EGU BART requirements to have been met for Minnesota, but notes that EPA made this finding on elements that differed from Minnesota's adopted Regional Haze SIP.

Comment 8C: The progress report states that "Minnesota's current EGU emissions of SO_2 and NO_X currently fall below the levels set by CSAPR emissions budgets." Strictly speaking, EPA's approval of the plan was predicated on emissions meeting the emission levels projected by IPM, which may be higher or lower than the emission budgets. That may be a more relevant comparison, at least in theory, depending on how easy those projections are to find.

Response 8C: Because CSAPR has not been in effect during the past few years, the MPCA does not document any emissions reductions as the result of the program. However, to provide a useful way for stakeholders to understand the magnitude of emissions progress that has occurred in the power sector over the past several years, we have included the comparison of emissions to CSAPR budgets, which will be the enforceable "limits" for Minnesota upon CSAPR's 2015 compliance deadline. This comparison

was not intended to justify the use of CSAPR for Minnesota's BART strategy, as CSAPR has already been approved as Minnesota's Regional Haze SIP EGU BART strategy. For the purpose of this progress report, the MPCA believes the comparison to Minnesota's CSAPR budgets is still the most relevant. The MPCA also notes that in its rule finalizing the "CSAPR is better than BART" alternative (http://www.epa.gov/visibility/pdfs/20120530finalrule.pdf), EPA stated that the IPM projections modeled were "based on the state budgets prescribed in the final [CSAPR]…"

Comment 8D: EPA believes the MPCA's statement that "no final decision on PM BART for the subject taconite facilities has been published," is incorrect, and that EPA implicitly made a final decision that no further limitations on PM were needed to address BART for PM from the subject taconite facilities.

Response 8D: The MPCA appreciates EPA's input, and requests EPA formally reconfirm this decision to the MPCA.

Comment 8E: EPA disagrees with the statement "Minnesota did not rely on control strategies from other states in developing its Regional Haze SIP Reasonable Progress Goals," as most of the expected progress Minnesota relied upon arose from power plant emission reductions in other states as well as Minnesota. I would suggest that acknowledging this contribution and perhaps providing a table listing, say, 2013 versus 2005 power plant emissions from say Minnesota, Iowa, Wisconsin, North Dakota, Missouri, and Illinois.

Response 8E: Please see response 1E. Additionally, Minnesota has provided CAMD emissions data in Appendix E for the states listed in EPA's comment.

Comment 8F: Please clarify language in Chapter 2, Section C regarding the calculation of baseline visibility conditions. A sentence currently states that the Regional Haze rule "defines baseline visibility conditions as the average of the most — or the 20% worst — visibility days…"

Response 8F: The MPCA has corrected the sentence in question, to say "defines baseline visibility conditions as the average of the most *impaired* – or the 20% worst…"

Comment 8G: EPA supports the MPCA's use of inverse megameters units of extinction in assessing component visibility. An additional reason for using inverse megameters is that it is a linear measure and thus is more suitable for linear comparison.

Response 8G: The MPCA appreciates EPA's support.

Comment 8H: The mobile emissions disconnect is distracting. Doing a complete inventory to replace the MOBILE-based inventory is more work than is warranted, but perhaps with a modest amount of work, the MPCA could calculate emission factor ratios and replace the MOBILE-based numbers with estimates based on these ratios so as to have more of an apples to apples comparison.

Response 8H: The MPCA appreciates EPA's input, but believes the primary result shown in the data, even with the MOBILE/MOVES "disconnect" (with MOVES showing higher emissions in 2008 than did

MOBILE for 2005), is that emissions still ultimately trend downward. The MPCA does not believe additional work to translate between the two inventories changes this result, and therefore has not pursued an emissions factor ratio translation for the progress report.

Comment Letters Received

Comment letters are provided as Attachment 2 to this Appendix.

Minnesota

State Register

(Published every Monday (Tuesday when Monday is a holiday.)

**Proposed, Adopted, Emergency, Expedited, Withdrawn, Vetoed Rules;
Executive Orders; Appointments; Commissioners' Orders; Revenue Notices;
Official Notices; State Grants & Loans; State Contracts;
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Monday 28 July 2014

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Minnesota State Register

Judicial Notice Shall Be Taken of Material Published in the *Minnesota State Register*

The *Minnesota State Register* is the official publication of the State of Minnesota's Executive Branch of government, published weekly to fulfill the legislative mandate set forth in *Minnesota Statutes*, Chapter 14, and *Minnesota Rules*, Chapter 1400. It contains:

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Printing Schedule and Submission Deadlines

Vol. 39 Issue Number	PUBLISH DATE (**BOLDFACE** shows altered publish date)	Deadline for: all Short Rules, Executive and Commissioner's Orders, Revenue and Official Notices, State Grants, Professional-Technical-Consulting Contracts, Non-State Bids and Public Contracts	Deadline for LONG, Complicated Rules (contact the editor to negotiate a deadline)
# 5	Monday 4 August	Noon Tuesday 29 July	Noon Thursday 24 July
# 6	Monday 11 August	Noon Tuesday 5 August	Noon Thursday 31 July
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Agency Contact Person. Written comments, questions, requests to receive a draft of the rules, and requests for more information on these possible rules should be directed to: Betsy Talbot at Minnesota Office of Higher Education at 1450 Energy Park Drive, Suite 350, St Paul, MN 55108-5227, **phone:** (651) 259-3965, **fax:** (651) 642-0675, and **e-mail:** ***betsy.talbot@state.mn.us***. TTY users may call the Agency at 1-800-627-3529.

Alternative Format. Upon request, this information can be made available in an alternative format, such as large print, braille, or audio. To make such a request, please contact the agency contact person at the address or telephone number listed above.

NOTE: Comments received in response to this notice will not necessarily be included in the formal rulemaking record submitted to the administrative law judge if and when a proceeding to adopt rules is started. The agency is required to submit to the judge only those written comments received in response to the rules after they are proposed. If you submitted comments during the development of the rules and you want to ensure that the Administrative Law Judge reviews the comments, you should resubmit the comments after the rules are formally proposed.

Dated: 18 July 2014

Larry Pogemiller, Commissioner
Office of Higher Education

Metropolitan Council

Notice of Request for Comments on the Disadvantaged Business Enterprise Program and Goal for Federal Fiscal Years 2014-2017

The Metropolitan Council's United States Department of Transportation (USDOT) Disadvantaged Business Enterprise Program (DBE) and goal request for federal fiscal years 2014 through 2017 has been submitted to the Federal Transportation Administration (FTA), pursuant to part 26 of the *Code of Federal Regulations*, Chapter 49.

The Metropolitan Council has approved an overall DBE goal of 15% for DOT-assisted contracts.

This goal and a description of how it was set is available for inspection during normal business hours at the Council offices for 45 days from the date of this notice. Comments, which are for information purposes only, may be sent to the Director, Office of Equal Opportunity, Metropolitan Council, 390 Robert Street North, St. Paul, MN 55101; or the U.S. Department of Transportation, 400 7th St., SW, Washington, DC 20590.

Minnesota Pollution Control Agency (MPCA)

Environmental Analysis and Outcomes Division

Public Notice of Draft Five-Year Regional Haze Progress Report State Implementation Plan Revision

NOTICE IS HEREBY GIVEN that the Commissioner of the Minnesota Pollution Control Agency (MPCA) has determined that a State Implementation Plan (SIP) revision must be submitted to meet Minnesota's requirements under the federal Regional Haze Rule (40 Code of Federal Regulations § 51.300-51.309). The draft SIP revision is now available for public comment.

Background. Under the authority of section 169(a) of the Clean Air Act (CAA), the United States Environmental Protection Agency (EPA) on July 1, 1999 promulgated visibility goals for mandatory Class I Federal areas in the federal Regional Haze Rule. Section 169(a) of the CAA and the Regional Haze Rule required each state to adopt and submit a plan to EPA that addressed the state's contribution to visibility impairment at the mandatory Class I Federal areas. Minnesota submitted its Regional Haze SIP revision to EPA in December 2009, and submitted a supplement to the SIP in May 2012. The Regional Haze Rule further requires each state submit a five-year progress report on implementation of the Regional Haze SIP.

Purpose of the Progress Report. The purpose of this progress report is to fulfill Minnesota's responsibility under the CAA and Regional Haze Rule to assess whether the Regional Haze SIP is being implemented appropriately and whether reasonable visibility progress is being achieved consistent with the projected visibility improvement in the SIP. This progress report SIP revision does not modify Minnesota's Regional Haze SIP strategy, but rather, assesses its progress in the five years since its original submittal to EPA.

The MPCA will consider changing the contents of the proposed progress report based on comments received during the comment period. Following the end of the comment period, the Commissioner will decide whether to submit the proposed progress report SIP revision to the EPA unless, as provided by *Minnesota Statutes* § 116.02, the MPCA Citizens' Board makes this decision.

MPCA contact person. The MPCA contact person is Melissa Andersen Kuskie. Written comments, requests, and petitions should be mailed to: Melissa Andersen Kuskie, Minnesota Pollution Control Agency, Environmental Analysis and Outcomes Division, 520 Lafayette Road North, Saint Paul, Minnesota 55155-4194; **telephone:** (651) 757-2512 or toll free 1-800-657-3864; **fax:** (651) 297-8324; and **e-mail:** ***melissa.kuskie@state.mn.us***. **TTY** users may call the MPCA at TTY (651) 252-5332 or 1-800-657-3864.

Availability of SIP. A copy of the proposed progress report SIP revision is available on the MPCA's web site at:
http://www.pca.state.mn.us/index.php/public-notices/list.html.

A copy is also available upon request by contacting Melissa Andersen Kuskie at (651) 757-2512 or ***melissa.kuskie@state.mn.us***, or can be mailed to any interested person upon the MPCA's receipt of a written request. Additional materials relating to the progress report SIP revision are available for inspection by appointment at the MPCA, 520 Lafayette Road North, Saint Paul, Minnesota 55155-4194, between the hours of 8:00 a.m. and 4:30 p.m., Monday through Friday. To examine these materials, or for more information, please contact Melissa Andersen Kuskie. All MPCA offices may be reached by calling 1-800-657-3864.

Public comment period and potential public meeting. Your comments must be in writing and received by Melissa Andersen Kuskie by 4:30 p.m. on Wednesday, August 27, 2014. Written comments may be submitted to her at the address, facsimile number, or e-mail address listed above.

As this progress report SIP revision does not include any substantive changes to the Minnesota's SIP, a public information meeting will only be held if one is requested by 4:30 p.m. on Wednesday, August 27, 2014. If such a meeting is requested, it will be held on Friday, August 29, 2014 at 10 a.m. at the MPCA Saint Paul Office, 520 Lafayette Road North, Saint Paul, Minnesota 55155-4194. To find out if a public information meeting will be held, please contact Melissa Andersen Kuskie at (651) 757-2512 or ***melissa.kuskie@state.mn.us*** after Wednesday, August 27, 2014 at 4:30 p.m. The public information meeting, if one is requested, will provide information, receive public input, and answer questions about the proposed progress report SIP revision.

Request to have MPCA Citizens' Board make decision. You have the right to submit a petition to the MPCA Commissioner asking that the MPCA Citizens' Board make the decision on submitting the proposed progress report SIP revision to the EPA. Your petition must be in writing and must be received by the MPCA contact person listed above by 4:30 p.m. on Wednesday August 27, 2014. Whether the petition will be granted or denied is at the sole discretion of the MPCA Commissioner. The MPCA Citizens' Board will only make the decision on the proposed progress report SIP revision if the MPCA Commissioner grants your petition or if an MPCA Citizens' Board member makes a timely request to have the decision made by the MPCA Citizens' Board.

United States Department of Agriculture **Forest Service** **Superior National Forest**

8901 Grand Ave. Place
Duluth, MN 55808-1122
Phone: (218) 626-4300
Fax: (218) 626-4398

File Code: 2580
Date: August 27, 2014

Melissa Andersen Kuskie
Environmental Analysis and Outcomes Division
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

Dear Ms. Andersen-Kuskie:

On July 28, 2014, you placed a draft five-year progress report regarding your regional haze state implementation plan on public notice. Thank you for the opportunity to review an early version of this document. Please find our comments attached. We look forward to your response per 40 CFR 51.308(i)(3).

As you know, my role as the Federal Land Manager for the Boundary Waters Canoe Area Wilderness (BWCAW) is to review and provide comments as outlined in the Clean Air Act (Act). The Act directs me to exercise an "affirmative responsibility" to protect the air quality related values (including visibility) of the BWCAW.

Overall we are very pleased with the progress the State has made in reducing air emissions since the start of the implementation of the regional haze program. In particular I'd like to highlight the reduction in sulfur. Besides visibility impairment, sulfur also causes acid rain and enhanced mercury uptake by fish. The effect of the reduction in air emissions of sulfur can be seen in proportional reductions measured not only in visibility data, but also in precipitation and lake chemistry data collected on the Superior National Forest. These trends all lead to a healthier forest ecosystem.

In the five-year report, you highlighted that the majority of progress made in reducing visibility-impairing emissions in Minnesota so far has been due to existing federal regulations and steps taken by the utilities to anticipate their implementation, as interpreted by the courts. Since the vast majority of the taconite industry in the United States is located in Minnesota, the Minnesota Regional Haze Plan bears the responsibility of addressing most of the emissions from the industry. We are concerned with the pace of emission reductions from the taconite industry seen to date and hope they will move forward in reducing their contribution to visibility impairment.

We appreciate the opportunity to continue working closely with the State toward the Act's goal of improved visibility conditions in mandatory Class I wilderness areas and National Parks.

Sincerely,

/s/ Brenda Halter
BRENDA HALTER
Forest Supervisor

Enclosure

cc: Don Shepherd
Meredith Bond
John Summerhays

US Forest Service Technical Comments on the Regional Haze State Implementation Plan Periodic Progress Report for Minnesota

Thank you for the opportunity to review the State of Minnesota (MN) Regional Haze State Implementation Plan (SIP) Periodic Progress Report as required under Section 308(i) of the Regional Haze Rule. The US Forest Service (FS) has reviewed the report and offers the following comments. These comments relate to impacts at the Boundary Waters Canoe Area Wilderness (BWCAW) Class I area.

Overall, we found the progress review to be comprehensive in its coverage of the subject matter. We appreciated the efforts taken to include a level of technical analysis (e.g. analysis of 2005 high sulfate levels and state-by-state emission comparisons to those assumed in the modeling) which we have found lacking in submittals we have reviewed from other states.

Our itemized technical comments follow.

Executive Summary, page ii - "Controls identified in Minnesota's Regional Haze SIP have either been implemented, or are expected to be implemented by 2018 (including CSAPR and the evolution of controls at taconite facilities)."

The phrase "evolution of controls" is vague. The SIP only requires the taconite facilities to model compliance with the national ambient air quality standards. This may not require them to investigate and/or install pollution controls. Please clarify.

Executive Summary, page ii – "Though some of the Regional Haze SIP strategies have not yet produced quantifiable emissions reductions, to date, Minnesota has met the emissions reduction goal from the Northeast Minnesota Plan portion of the Long Term Strategy."

The emission reduction goal cannot be met yet because the compliance date is 2018. What happens between now and then is unknown. We suggest changing to "Currently Minnesota is in good position to meet…"

Page 8, Northeast Minnesota Plan - Taconite NAAQS compliance - The 2012 SIP revision changed the 2009 SIP's pilot testing requirement to a national ambient air quality standard modeling exercise. Interestingly the controls that were determined to be reasonable from the original pilot testing were to be incorporated into the regional haze SIP with this 5-year progress report. Emission controls were to begin installation in 2015. We note that when the change was made in 2012 to replace the pilot testing the sole stated purpose was to "drive more stringent controls for taconite facilities, and on a faster timeline."

This clearly has not been the case. In relation to the timing – the compliance date of June 30, 2017 is over 2 years from the previous one of 2015. We are also very concerned that the end result of this modeling exercise may just be model output files and no emission reductions. Such an outcome would be a failing of the other stated purpose for the 2012 change. We have communicated our concerns regarding how the modeling is implemented, and still believe a facility may be able to refine the model inputs, refine the resulting permit conditions and/or simply raise their stacks to avoid the installation of controls. The progress report assumes emission reductions from this effort – see page 29 "MPCA also expects to see further emissions reductions in both SO2 and NOX from controls not yet implemented, including BART and the taconite NAAQS compliance element of the Long Term Strategy."

Page 10, "Other states' controls. Minnesota did not rely on control strategies from other states in developing its Regional Haze SIP Reasonable Progress Goals. "

This statement is confusing because the emission inventories developed as inputs to the models that calculated the Reasonable Progress Goals (RPGs) inherently contained each state's strategy within it. In fact, later in the progress review the most current estimate of each state's emissions is compared to what was assumed in the model that set the RPGs.

Page 12, Figure 2B-2 – this figure is particularly illustrative of the reason why we remain concerned about contributions to visibility impairment from the taconite industry. Other than the strides made with low-NOx burners at Minntac, the rest of the industry has done little to address their impact to visibility. In contrast, the utility industry has reduced its emissions so that the region could meet its goals.

Page 28 – The discussion regarding the oil and gas development in North Dakota focuses only on potential increases in VOCs. We also believe that potential increases in NOx and SO_2 need to be considered. We just reviewed the progress report for North Dakota and are concerned that the emissions increases associated with the development of oil and gas are poorly quantified and could potentially outstrip the reductions made by the utilities in the state.

Sanders, Vonda (MPCA)

From: Wickman, Trent R -FS <twickman@fs.fed.us>
Sent: Tuesday, June 24, 2014 2:06 PM
To: Kuskie, Melissa (MPCA)
Cc: David Pohlman (David_Pohlman@nps.gov); Don Shepherd (Don_Shepherd@nps.gov)
Subject: RE: Draft Five-Year Regional Haze Progress Report State Implementation Plan

Hi Melissa

Thanks for the preview of the five year progress report. I anticipate we will be submitting formal comments later but I wanted to get to you my initial impressions after my first run through of the document to meet you deadlines.

First off I wanted to say great effort. It contains a lot of insightful analyses, e.g. the 2005 SO2 episode. I also especially appreciated the unit-by-unit analysis of BART for MN and the neighboring states.

I would clarify the following on page ii, by adding the underlined words

Emissions Reductions from Regional Haze SIP Strategies
Though some of the Regional Haze SIP strategies have not yet produced quantifiable emissions reductions, <u>to date</u> Minnesota has met the emissions reduction goal from the Northeast Minnesota Plan portion of the Long Term Strategy.

Since it is not yet 2018, we don't know what the emissions will be then and if we will meet the goal. I agree it looks good but we should wait until we get there to say we met or did not meet the goal

To clarify the statement on page 8 – the plan was to incorporate the determination of reasonable controls in this 5-yr plan and then to begin to install controls in 2015. The way it reads now would lead people to believe that the determination was to be included in the 2018 plan.

A second component of the 2009 SIP's "Northeast Minnesota Plan" SIP therefore required facilities to investigate control technologies and pollution prevention practices for their indurating furnaces through pilot tests and report to MPCA on the feasibility and cost-effectiveness of said technologies and practices, with those controls determined reasonable being incorporated **into this 5-year update and their installation beginning in 2015 in support of** Minnesota's Long Term Strategy ~~in support of the~~ **and the** 2018 Reasonable Progress Goal.

Thanks

Trent

From: Kuskie, Melissa (MPCA) [mailto:Melissa.Kuskie@state.mn.us]
Sent: Friday, June 20, 2014 3:33 PM
To: Wickman, Trent R -FS; david_pohlman@nps.gov; Don Shepherd (don_shepherd@nps.gov) (don_shepherd@nps.gov); 'tgeshick@boisforte-nsn.gov'; 'joywiecks@fdlrez.com'; 'alexanderjackson@fdlrez.com'; 'soberb@boreal.org'; 'air@lldrm.org'; 'sydney.harper@lldrm.org'; 'charlie.lippert@millelacsband.com'; 'jmalinski@redlakenation.org'; 'monicahm@whiteearth.com'; 'hwestra@piic.org'; 'gmiller@piic.org'; 'jesse.anderson@lowersioux.com'; 'scottw@uppersiouxcommunity-nsn.gov'; 'mike.whitt@shakopeedakota.org'; dvogt@1854treatyauthority.org; 'amsoltis@glifwc.org'; 'gfrazer@mnchippewatribe.org'; 'greg.blackdeer@ho-chunk.com'; 'melonee.montano@redcliff-nsn.gov'; 'mcgerman@venture.comm.net'; 'katies@stcroixtribalcenter.com'
Cc: Fenske, MaryJean (MPCA); Kohlasch, Frank (MPCA); Lotthammer, Shannon (MPCA); Thornton, J. David (MPCA)
Subject: Draft Five-Year Regional Haze Progress Report State Implementation Plan

Good afternoon,

Attached is Minnesota's draft Five-Year Regional Haze Progress Report State Implementation Plan (SIP). The draft SIP will continue to undergo formal internal agency review, until the public notice period (anticipated to begin in late July and close in late August), and so may change somewhat in the next few weeks. In particular, we are trying to determine whether it is feasible to incorporate data from the 2011 National Emissions Inventory, which were not "SIP-ready" at the time this document was drafted. If and when substantive changes to the SIP occur, I will be sure to let you know.

If we receive any immediate comments from your preliminary review that are feasible to incorporate/address prior to the public notice of the draft SIP, we will make every attempt to do so, but minimally, will ensure that your input is considered and addressed as we finalize the SIP for EPA submittal. As mentioned above, we anticipate releasing the draft SIP for public notice and comment in late July, and closing the comment period in late August. I'll send a follow up email once we put the SIP on public notice and let you know the official date the comment period will close.

Also, please note there are some "placeholder" elements in the document (the final chapter, some of the appendices) that will eventually be written as we move through the SIP administrative process.

Please don't hesitate to contact me with any questions or concerns as you read through everything. Please pass this email on to any additional FLM and/or Tribal contacts who may be interested in reviewing.

Thanks very much,
Melissa

Melissa Andersen Kuskie
Air Policy Planner
Minnesota Pollution Control Agency
(651) 757-2512
melissa.kuskie@state.mn.us

Sanders, Vonda (MPCA)

From: Wickman, Trent R -FS <twickman@fs.fed.us>
Sent: Wednesday, June 25, 2014 9:12 AM
To: Kuskie, Melissa (MPCA)
Cc: David Pohlman (David_Pohlman@nps.gov); Don Shepherd (Don_Shepherd@nps.gov)
Subject: RE: Draft Five-Year Regional Haze Progress Report State Implementation Plan

You are right. I read all the appendices so it wouldn't matter to me.

I think you should address 2005 to some degree in the report because anyone who glances at the speciated data will see that peak in SO4 and wonder what the heck happened and if it can happen again. Scott Copeland and other IMPROVE folks have also looked at this event. It was quite the regional phenomenon.

2008 vs 2011 – I agree the big changes will be the mobile emissions and the main affected pollutant will be NOx. You already address current emissions of MN EGUs and other point sources in the report. I don't have a strong opinion either way.

Thanks again

From: Kuskie, Melissa (MPCA) [mailto:melissa.kuskie@state.mn.us]
Sent: Wednesday, June 25, 2014 7:37 AM
To: Wickman, Trent R -FS
Cc: David Pohlman (David_Pohlman@nps.gov); Don Shepherd (Don_Shepherd@nps.gov)
Subject: RE: Draft Five-Year Regional Haze Progress Report State Implementation Plan

Hi Trent,

Thanks for the initial thoughts – good catches – I'll make the changes now.

Quick question – regarding the 2005 SO2 episode. I've gotten internal feedback that that section might be more appropriate as an appendix (just include a summary in the main body that an analysis was done and the general findings of it, with the technical support in the appendix). My initial thoughts were "I bet the FLMs, and maybe EPA would like it in the main body…but then, those are also the folks that know to read the appendices…" Do you have any strong feelings on where that section is located?

Also, just as an FYI, we've decided to incorporate the 2011 NEI data into the report. Initially, Margaret had thought it was best to go with the 2008 numbers since all we have ready of the 2011 is version 1, and especially with mobile emissions, the numbers can change a fair amount between versions (since the primary chunk of our NOx emissions are mobile sources). We decided, though, that we'd rather just caveat the 2011 numbers in the report – say they are v1 of the NEI, would be expected to change, but we wanted to include anyway to get a preliminary feel for where we're at now (2008 numbers will stay in the report as well, though). We're going to work to get it in before the public notice date…I expect to have the data in next week and will send out an updated version for you guys to look at then.

Thanks!

Melissa

From: Wickman, Trent R -FS [mailto:twickman@fs.fed.us]
Sent: Tuesday, June 24, 2014 2:06 PM

To: Kuskie, Melissa (MPCA)
Cc: David Pohlman (David_Pohlman@nps.gov); Don Shepherd (Don_Shepherd@nps.gov)
Subject: RE: Draft Five-Year Regional Haze Progress Report State Implementation Plan

Hi Melissa

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I would clarify the following on page ii, by adding the underlined words

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A second component of the 2009 SIP's "Northeast Minnesota Plan" SIP therefore required facilities to investigate control technologies and pollution prevention practices for their indurating furnaces through pilot tests and report to MPCA on the feasibility and cost-effectiveness of said technologies and practices, with those controls determined reasonable being incorporated **into this 5-year update and their installation beginning in 2015 in support of** Minnesota's Long Term Strategy ~~in support of the~~ **and the** 2018 Reasonable Progress Goal.

Thanks

Trent

From: Kuskie, Melissa (MPCA) [mailto:Melissa.Kuskie@state.mn.us]
Sent: Friday, June 20, 2014 3:33 PM
To: Wickman, Trent R -FS; david_pohlman@nps.gov; Don Shepherd (don_shepherd@nps.gov) (don_shepherd@nps.gov); 'tgeshick@boisforte-nsn.gov'; 'joywiecks@fdlrez.com'; 'alexanderjackson@fdlrez.com'; 'soberb@boreal.org'; 'air@lldrm.org'; 'sydney.harper@lldrm.org'; 'charlie.lippert@millelacsband.com'; 'jmalinski@redlakenation.org'; 'monicahm@whiteearth.com'; 'hwestra@piic.org'; 'gmiller@piic.org'; 'jesse.anderson@lowersioux.com'; 'scottw@uppersiouxcommunity-nsn.gov'; 'mike.whitt@shakopeedakota.org'; dvogt@1854treatyauthority.org; 'amsoltis@glifwc.org'; 'gfrazer@mnchippewatribe.org'; 'greg.blackdeer@ho-chunk.com'; 'melonee.montano@redcliff-nsn.gov'; 'mcgerman@venture.comm.net'; 'katies@stcroixtribalcenter.com'
Cc: Fenske, MaryJean (MPCA); Kohlasch, Frank (MPCA); Lotthammer, Shannon (MPCA); Thornton, J. David (MPCA)
Subject: Draft Five-Year Regional Haze Progress Report State Implementation Plan

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whether it is feasible to incorporate data from the 2011 National Emissions Inventory, which were not "SIP-ready" at the time this document was drafted. If and when substantive changes to the SIP occur, I will be sure to let you know.

If we receive any immediate comments from your preliminary review that are feasible to incorporate/address prior to the public notice of the draft SIP, we will make every attempt to do so, but minimally, will ensure that your input is considered and addressed as we finalize the SIP for EPA submittal. As mentioned above, we anticipate releasing the draft SIP for public notice and comment in late July, and closing the comment period in late August. I'll send a follow up email once we put the SIP on public notice and let you know the official date the comment period will close.

Also, please note there are some "placeholder" elements in the document (the final chapter, some of the appendices) that will eventually be written as we move through the SIP administrative process.

Please don't hesitate to contact me with any questions or concerns as you read through everything. Please pass this email on to any additional FLM and/or Tribal contacts who may be interested in reviewing.

Thanks very much,
Melissa

Melissa Andersen Kuskie
Air Policy Planner
Minnesota Pollution Control Agency
(651) 757-2512
melissa.kuskie@state.mn.us

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)

August 22, 2014

Melissa Andersen Kuskie
Air Policy Planner
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

Dear Ms. Kuskie:

Thank you for the opportunity to review and comment on Minnesota's draft Five-Year Regional Haze Progress Report. We believe that Minnesota Pollution Control Agency (MPCA) has met the requirements for the periodic progress report as outlined in 40 CFR 41.508 (g) and (h). MPCA has demonstrated that ammonium sulfate, ammonium nitrate, and organic carbon are the major pollutant contributing to visibility impairment at Voyageurs National Park and Boundary Waters Wilderness Area (WA). MPCA has also demonstrated substantive reductions in sulfur dioxide (SO_2) and nitrogen oxides (NO_x) emissions from point sources in Minnesota than contribute to visibility impairment.

We suggest a few additional technical discussions to strengthen MPCA's demonstration:

- In addition to the emissions summary for all electric generating units (EGU) in Table 2B-1, please provide a table similar to Table 2A-1 that outlines unit generation capacity, specific controls for SO_2 and NO_x, dates controls were installed or are anticipated, and any announced retirements. The discussion of Best Available Retrofit Technology (BART), the Clean Air Interstate Rule (CAIR), and the Cross State Air Pollution Rule (CSAPR) covered regulatory status, but did not include specific actions taken at Minnesota EGU. Please clarify if the facility controls under the Mercury Air Toxic Standard (MATS) as defined in Table 2A-1 are in addition to actions taken under BART/CSAPR.
- In Figure 2B-2 illustrating emissions under the Northeast Minnesota long term strategy please clarify the source sectors included in the category "mining". Please clarify if the

increase in emissions from the mining category after 2009 is due to recovery after the 2009 recession or represents an increase over pre-recession activity. It is difficult to compare this mining category to the point source sectors illustrated in Figure 2D-1 and 2D-2. It would be helpful to make the point source categories consistent across these Figures, or to explain how to compare the categories.

- Please include the 2011 daily IMPROVE monitoring data for Boundary Waters WA to support the conclusion on page 17 that the increase in organic carbon on the five-year average of the 20% worst visibility days is due to the 2011 Pagami Creek Wildfire. The figure shown on page 6 of Appendix C truncates the organic carbon mass; the attached figure includes the full measurements for that event. This demonstration is important to support MPCA's conclusion on page 13 that visibility improvement at Boundary Waters would be better than the uniform rate of progress if it were not for this fire event.
- We recommend further consultation with North Dakota Department of Health as they have drafted a five year regional haze progress report. MPCA cites the significant expansion of oil production in ND that could increase VOC emissions. MPCA should also recognize the significant increase in NO_x emissions from oil and gas production in ND that is offsetting NO_x reductions from point sources in ND and could impact visibility at Class I areas in MN.

We appreciate the opportunity to work closely with MPCA to improve visibility in our Class I national park and wilderness areas. If you have questions, please contact me at patricia_f_brewer@nps.gov or 303-969-2153.

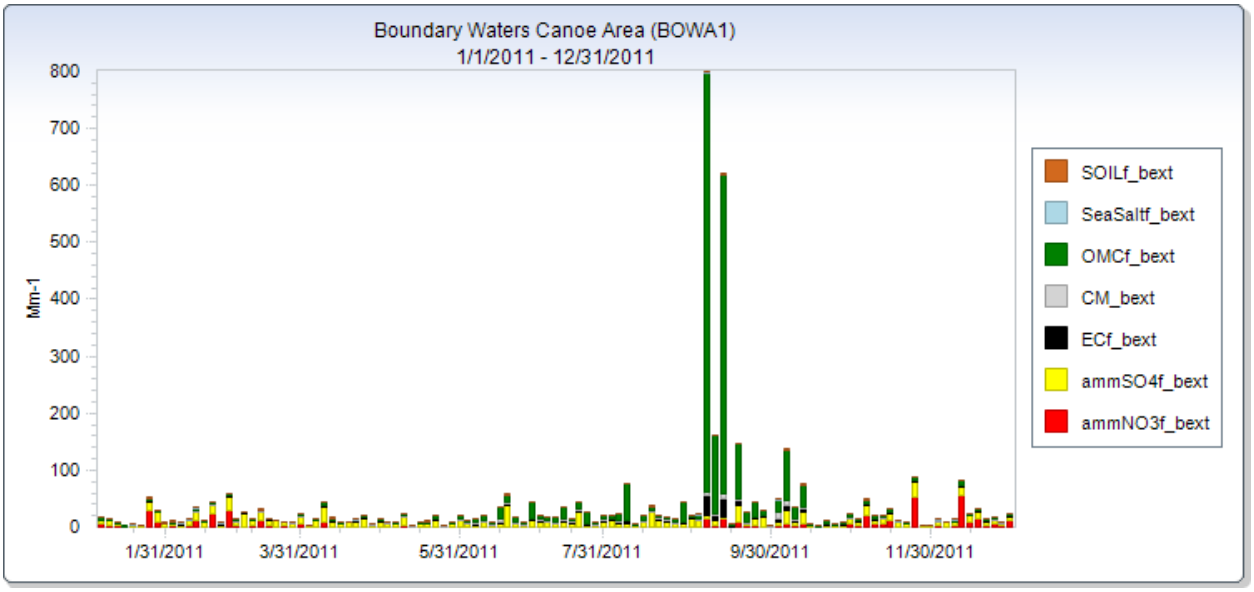
Sincerely,

Pat Brewer

Pat Brewer

Enclosure

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


Boundary Waters Canoe Area (BOWA1)
1/1/2011 - 12/31/2011
Mm-1
800
700
600
500
400
300
200
100
0
1/31/2011
3/31/2011
5/31/2011
7/31/2011
9/30/2011
11/30/2011
SOILf_bext
SeaSaltf_bext
OMCf_bext
CM_bext
ECf_bext
ammSO4f_bext
ammNO3f_bext

Sanders, Vonda (MPCA)

From: mthoma@otpco.com
Sent: Tuesday, August 05, 2014 2:45 PM
To: Kuskie, Melissa (MPCA)
Subject: Otter Tail Power Comment on Draft Regional Haze Progress Report
Attachments: Hoot Lake ESP Upgrade Applicability Determination.pdf

Melissa,

This comment is regarding the Draft Five-Year Regional Haze Progress Report State Implementation Plan Revision. In Table 2A-2 on page 9, Otter Tail Power Company's Hoot Lake Plant Units 2 and 3 are incorrectly listed as planning to install SO2 scrubbers for MATS compliance. There are not any plans, nor have there ever been, to install scrubbers on those units. However, Units 2 and 3 are near the completion of a project to upgrade the electrostatic precipitators which will reduce particulate matter emissions for MATS compliance. This project was announced in 2013; attached is the applicability determination review of the project by the MPCA dated June 11, 2013.

Thank you in advance for correcting this error.

Regards,

Mark Thoma

Mark Thoma
Manager, Environmental Services
Otter Tail Power Company
215 S. Cascade, P.O. Box 496
Fergus Falls, MN 56538-0496
Direct: 218.739.8526 Fax: 218-739-8629
Mobile: 218.205.4381 Email: mthoma@otpco.com

Minnesota Pollution Control Agency

520 Lafayette Road North | St. Paul, Minnesota 55155-4194 | 651-296-6300

800-657-3864 | 651-282-5332 TTY | www.pca.state.mn.us | Equal Opportunity Employer

June 11, 2013

Mr. Mark Thoma
Manager, Environmental Services
Otter Tail Power Company - Hoot Lake Plant
215 South Cascade Street
P.O. Box 496
Fergus Falls, MN 56538

RE: May 22, 2013, Applicability Determination Request for Otter Tail Power Company - Hoot Lake Plant

Dear Mr. Thoma:

The Minnesota Pollution Control Agency (MPCA) has received and reviewed the Otter Tail Power Company - Hoot Lake Plant (Hoot Lake Plant) Applicability Determination Request dated May 22, 2013. The Applicability Determination requested the MPCA to determine; if the project to improve the performance of Hoot Lake Plant's electrostatic precipitators is considered a replacement of control equipment, if a permit amendment is required, and if so, what type. The following discussion will support the MPCA's determination that the change does not qualify as a replacement and therefore requires no permit amendment.

Background

Hoot Lake Plant consists of two boilers, Boilers 2 and 3, and fuel and ash handling equipment. The primary fuel for the boilers is coal. Particulate matter (PM) emissions from Boilers 2 (EU 002) and 3 (EU 003) are controlled by electrostatic precipitators (ESPs). The ESPs, CE 001 and CE 002, are the subject of this applicability determination. The proposed changes to CE 001/002 would be performed to meet the Mercury and Air Toxics Standards (MATS) rule requiring existing electric utility steam generating units (EUSGUs) to achieve a filterable PM emission rate of 0.030lb/MMBtu, on a 30-day rolling average basis, no later than April 16, 2015.

To meet the emission limitation, Hoot Lake Plant plans on removing the existing internal components and installing new internal components consisting of grounded collection plates, rigid discharge electrodes, collecting plate rappers, discharge electrode rappers, and high frequency power supplies. The foundation, structural steel, fly ash removal system, casing, thermal insulation, outside siding, perforated plates, expansion joints, roof, walkways and platforms, control system, and the electrical feed all remain unaffected by the project. According to Hoot Lake Plant, the only emissions impact associated with this project will be a decrease in particulate matter emissions.

Discussion

Based on the information submitted by Hoot Lake Plant on May 22, 2013, the MPCA agrees with Hoot Lake Plant's conclusion that the described project to improve the performance of Hoot Lake Plant's ESPs does not constitute replacing the control equipment with a new control device.

As this project is not considered installation of a new control device, there is not an emissions increase associated with the change. Because there is not an emissions increase, the project does not meet the definition of a modification (as defined by Minn. R. 7007.0100, subp. 14). Under Minn. R. 7007.1150(B), if a change at a facility does not constitute a modification, no permit amendment is required unless the change is described under part Minn. R. 7007.1500, subp. 1. If a change does not constitute a modification, a notification may still be required under 7007.1150(C).

The described project does not meet the description of any changes specified to require a major amendment under Minn. R. 7007.1500, subp.1 and therefore is not required to submit an amendment to proceed with the change. The change would not meet the criteria of Minn. R. 7007.1150(C) so a notification would not be required under that rule. Additionally, since the change is not a modification by definition, it is not an insignificant modification and would not be required to submit a notification as required by Minn. R. 7007.1250, subp. 4.

Determination Summary
Hoot Lake Plant is required by Minn. R. 7007.1200, subp. 4 to keep records, as described, of all calculations required under Minn. R. 7007.1200 for the change. For expiring permits, these records shall be kept for a period of five years from the date the change was made or until permit reissuance, whichever is longer. The records shall be kept at the stationary source for the current calendar year of operation and may be kept at the stationary source or office of the stationary source for all other years. The records may be maintained in either electronic or paper format. Hoot Lake Plant would not be required to obtain an amendment to move forward with this project but must keep records of calculations as described in Minn. R. 7007.1200.

Any changes to this information or discrepancies between the information provided in the applicability determination request and actual facility operation may impact this decision.

If you have any questions regarding this determination, please contact Hassan Bouchareb at 651-757-2653 or by e-mail at Hassan.Bouchareb@state.mn.us.

Sincerely,

Carolina Espejel-Schutt, P.E.
Supervisor, Air Quality Permits Unit 1
St. Paul Office
Industrial Division

CES/HB:rm

cc: Hassan Bouchareb, MPCA
Rachel Studanski, MPCA
AQ File No. 116C

Sanders, Vonda (MPCA)

From: Craig Diekvoss <CDiekvoss@RPU.ORG>
Sent: Wednesday, August 27, 2014 4:26 PM
To: Kuskie, Melissa (MPCA)
Subject: Draft Five-Year Regional Haze Progress Report State Implementation Plan Revision

Ms. Kuskie:

I have the following comment on the Draft Five-Year Regional Haze Progress Report State Implementation Plan Revision:

On page 9, under the Mercury Air Toxic Standard Rule (MATS) paragraph, it states "Additionally, though not specifically related to the MATS rule, the Rochester Public Utilities, Silver Lake EGU, a 100 MW facility in Olmstead County, Minnesota, plans to shut down by 2015". This statement needs correction as the plan is to decommission the Silver Lake plant by December 31, 2015 or sooner, with the definition of decommissioning set by the Public Utility Board of the City of Rochester, Minnesota on August 7, 2012 as "to cease coal burning and electric generation, while retaining the potential to generate steam for Mayo using natural gas until 2025." The Rochester Public Utilities ceased burning coal at the Silver Lake Plant on November 14, 2013.

Thank You

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Rochester Public Utilities
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Sanders, Vonda (MPCA)

From: Aagenes, Jason D <Jason.Aagenes@CliffsNR.com>
Sent: Wednesday, August 27, 2014 4:32 PM
To: Kuskie, Melissa (MPCA)
Cc: Long, Michael E; Cartella, David T
Subject: FW: MPCA Draft Five-Year Regional Haze Progress Report

Importance: High

Ms. Kuskie:
Cliffs Natural Resources would like to submit the following comments for MPCA to consider while finalizing its Five-Year Regional Haze Progress Report as part of the State Implementation Plan (SIP) revision.

MPCA's December 2009 Regional Haze SIP examines the contribution of Canadian emissions on visibility impairment in Minnesota's Class I airsheds. On page 107 of the December 2009 SIP (Chapter 10. Reasonable Progress Goals and Long Term Strategy, Reasonable Progress Goals, Factors Impacting RPG), MPCA states,

> *" There is some indication, particularly from the modeling performed by CENRAP, that Minnesota's two Class I areas may have significant visibility impacts resulting from Canadian emissions. However, estimates of this international impact vary due to difficulties quantifying Canadian emissions and discrepancies between models. (For more information, see Chapter 8 and the TSD.) The MPCA requests that EPA work with Canada in order that future SIP revisions for regional haze will be able to include more accurate emission estimates and modeling in order to better quantify any international impact on visibility. Where necessary, EPA should then work with Canada and support reductions in haze-causing emissions."*

The Draft Five-Year Regional Haze Progress Report does not contain any updated information evaluating Canadian emission sources, visibility impacts to Minnesota's Class I areas from those Canadian emission sources, or how deficiencies that were identified in the December 2009 SIP related to Canadian emission inventory data availability and modelling inconsistencies have been re-examined and addressed.

Accordingly, Cliffs Natural Resources requests that MPCA supplements the final version of the Five-Year Regional Haze Progress Report with the following information:

- updated emission data from Canadian sources relevant to Minnesota's Class I areas,
- evaluation of how those Canadian emissions have changed over the most recent 5 year period, and
- description of visibility impairment effects on Minnesota Class I areas from those Canadian emission sources.

Suggested Canadian emission sources that may warrant examinations include, but are not necessarily limited to, the following: Resolute paper mills in Thunder Bay and Fort Frances; Domtar paper mill in Dryden; Burla paper mill in Terrace Bay; Atikokan power generating station; and Thunder Bay power generating station.

Cliffs Natural Resources also requests that MPCA work with Ontario Ministry of Natural Resources to understand recent trends and management strategies for forest fires in Ontario and further document the significance of Ontario forest fires relative to visibility impairment in Minnesota's Class I areas in the final version of the Five-Year Regional Haze Progress Report.

Please feel free to email me or contact me at the numbers below if you have any questions on Cliffs Natural Resources' submittal.

Best Regards,

CLIFFS

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Sanders, Vonda (MPCA)

From: Joy Wiecks <JoyWiecks@FDLREZ.COM>
Sent: Thursday, July 17, 2014 3:24 PM
To: Kuskie, Melissa (MPCA)
Cc: Alexander Jackson
Subject: RH SIP 5 year review

Hi Melissa,

I've read thru the MPCA's 5 year review of the RH SIP and don't really have much to add. I guess my only comment would be that the SIP doesn't account for how new sources will impact the progress that has already been made, but I understand that would be hard to predict. So that is the only thing I can think of. It appeared to be a well-written document that addresses the main elements. Thanks for all your hard work!

-Joy

August 27, 2014

Ms. Melissa Andersen Kuskie
Minnesota Pollution Control Agency
520 Lafayette Road North,
Saint Paul, Minnesota 55155-4194

Via email to melissa.kuskie@state.mn.us

Re: Comments on the Proposed Minnesota Five-Year Regional Haze Progress Report State Implementation Plan, December 2014

Dear Ms. Kuskie:

We write on behalf of Earthjustice, Friends of the Boundary Waters Wilderness, Minnesota Center for Environmental Advocacy, National Parks Conservation Association, Voyageurs National Park Association, and their thousands of members in Minnesota with comments regarding the Minnesota Pollution Control Agency's ("MPCA" or "Agency") Proposed Minnesota Five-Year Regional Haze Progress Report ("Progress Report"). The Progress Report represents an important opportunity for the State to take stock of whether the haze state implementation plan ("SIP") is on track to meet the reasonable progress goals at Class I areas in Minnesota and other states.

We appreciate the Agency's efforts to provide a picture of the progress Minnesotans are making toward reducing emissions of haze-causing pollutants and the benefits those emissions reductions can have on the State's iconic Class I areas. We believe, however that several improvements would help the final Progress Report provide a clearer picture for policymakers and the public. Specifically, we submit that the draft report should be revised as set forth in detail in the paragraphs below.

I. BACKGROUND

A. Class I Areas In and Near Minnesota

Minnesota is home to two of the nation's most pristine and most visited Class I federal areas, the Boundary Waters Canoe Area Wilderness and Voyageurs National Park. Minnesota air pollution also affects places beyond the state's borders, including Isle Royale National Park, which is important historically, scientifically, and as an iconic wild landscape. The parks are important economic resources for the region as well: Voyageurs National Park received over a quarter million visits in 2013 with an estimated revenue of $18 million, and Isle Royale—despite being a remote island in Lake Superior—received upwards of 16,000 visitors in 2013 with an estimated $4 million in revenue to the surrounding economies of Upper Michigan and Minnesota.[1]

[1] Headwaters Economics, "*National Park's Economic Impacts*," available at http://headwaterseconomics.org/interactive/national-park-service-units.

B. The Clean Air Act's Regional Haze Program

1. Development of a Regional Haze SIP.

Congress had the foresight to set aside national parks so as to preserve some of the nation's most spectacular scenery. *See, e.g.*, John Copeland Nagle, The Scenic Protections of the Clean Air Act, 87 N.D. L. Rev. 571, 576 (2011). With the nation's rapid industrialization, however, these remarkable scenic views have become increasingly marred by air pollution. *See id.* at 573. Today, air pollution is "perhaps the greatest threat to national parks," and pollution all too often degrades visibility in these scenic areas. *Id.*

To reduce this threat to the national parks and other treasured public lands, Congress amended the Clean Air Act in 1977 to set a "national goal" of preventing and rectifying all visibility impairment caused by human activities in national parks, wilderness areas, and other "Class I" federal areas. 42 U.S.C. § 7491(a)(1). Congress again amended the Clean Air Act in 1990 to further spur reductions of regional haze after it concluded that the U.S. Environmental Protection Agency ("EPA") and the states had not made adequate progress toward reducing haze. *Id.* § 7492. The Act delegates implementation of the regional haze program to EPA. The Agency set a goal of achieving natural visibility conditions at every Class I area by 2064, and the Agency directed states to make incremental, reasonable progress toward that goal. 40 C.F.R. § 51.308(d)(1)(i)(B), (d)(1)(ii).

To achieve natural visibility conditions by 2064, the goal set forth in the Clean Air Act's implementing regulations, 40 C.F.R. §51.308(d)(1)(i)(B), the states are directed to create regional haze SIPs, which are then submitted to EPA for its review and approval. *See* 42 U.S.C. §§ 7410(a), 7491(b)(2). EPA evaluates the SIP and either approves or disapproves it in whole or in part. *Id.* § 7410(k)(3). If EPA's evaluation reveals that a SIP does not comply with the Clean Air Act, then EPA must promulgate a FIP that remedies the shortcomings. *Id.* § 7410(c)(1).

Each state's regional haze SIP must include emissions limits on sources of air pollution within the state as necessary to protect visibility at all impacted Class I areas, both inside and outside the state. *See* 42 U.S.C. § 7491(a)(4), 7491(b)(2). The 2064 natural visibility goal is to be achieved, in part, by installing BART controls at certain fossil fuel-fired power plants and other sources. *Id.* § 7491(b)(2)(A); 40 C.F.R. § 51.308(e). BART is required at eligible sources[2] that are reasonably anticipated to cause or contribute to visibility impairment at national parks, wilderness areas, wildlife refuges and other "Class I areas" where air quality should be pristine. *Id.* § 7491(b)(2)(A). BART is an essential component of the regional haze program as it compels emissions reductions from older, disproportionately polluting sources that often have escaped control under other Clean Air Act programs. *See id.*

[2] A source is BART-eligible if it is a stationary source within one of 26 enumerated categories, was not in operation before August 7, 1962, but was in existence on August 7, 1977, and has the potential to emit 250 tons per year or more of any pollutant. 42 U.S.C. § 7491(b)(2)(A), (g)(7).

In addition to requiring BART, each state's regional haze SIP must also set goals, expressed in deciviews[3] for each Class I area located within the state that will ensure reasonable progress toward achieving natural visibility conditions by 2064 (the "reasonable progress goals"). *See* 42 U.S.C. § 7491(b)(2); 40 C.F.R. § 51.308(d)(1). The reasonable progress goals must provide for improvement in visibility on the most impaired days and ensure no degradation in visibility on the least impaired days over the period of the implementation plan. 40 C.F.R. § 51.308(d)(1). These goals are set after considering the anticipated visibility reductions over the planning period of the SIP from anticipated BART controls and other federal or state programs, as well as controls imposed on non-BART sources under the regional haze SIP to help achieve reasonable progress. *See, e.g.,* 76 Fed. Reg. at 58,623.

States set the level of additional reasonable progress controls based on "the costs of compliance, the time necessary for compliance, the energy and non-air quality environmental impacts of compliance, and the remaining useful life of any potentially affected source . . . ." 40 C.F.R. § 51.308(d)(1)(i)(A); 42 U.S.C. § 7491(g)(1). With the emissions reductions anticipated from these cumulative controls in mind, the state establishes the reasonable progress goals for the period of the SIP – through 2018 in this case.

2. The Role of Five-Year Progress Reports

Every five years, states must evaluate the progress they are making in implementing the control measures included in their haze SIPs and whether they are on track to meet the visibility goals for Class I areas. 40 C.F.R. § 51.308(g). As part of these five-year progress reports, each state must assess whether its existing implementation plan is adequate to achieve its established goals for visibility improvement and emissions reductions. 40 C.F.R. § 51.308(h). To determine the adequacy of the haze plan, each state must include in its progress report the following elements:

> (1) A description of the status of implementation of all measures included in the implementation plan for achieving reasonable progress goals for mandatory Class I Federal areas both within and outside the State;
>
> (2) A summary of the emissions reductions achieved throughout the State through implementation of the measures described in paragraph (d)(10)(i)(A) of this section;
> (3) For each mandatory Class I Federal area within the State, an assessment of the following: the current visibility conditions for the most impaired and least impaired days; the difference between current visibility conditions for the most impaired and least impaired days and baseline visibility conditions; the change in visibility impairment for the most impaired and least impaired days over the past 5 years;
> (4) An analysis tracking the change over the past 5 years in emissions of pollutants contributing to visibility impairment from all sources and activities within the State. Emissions changes should be identified by type of source or activity. The analysis must be based on the most recent updated emissions inventory, with estimates projected forward as necessary and appropriate, to account for emissions changes during the applicable 5-year period;

[3] EPA uses the deciview as the principal metric for measuring visibility impairment. The deciview scale "expresses uniform changes in haziness in terms of common increments across the entire range of visibility conditions, from pristine to extremely hazy conditions." 64 Fed. Reg. 35,714, 35,727 (July 1, 1999).

(5) An assessment of any significant changes in anthropogenic emissions within or outside the State that have occurred over the past 5 years that have limited or impeded progress in reducing pollutant emissions and improving visibility;
(6) An assessment of whether the current implementation plan elements and strategies are sufficient to enable the State, or other States with mandatory Federal Class I areas affected by emissions from the State, to meet all established reasonable progress goals; and
(7) A review of the State's visibility monitoring strategy and any modifications to the strategy as necessary.

40 C.F.R. § 51.308(g)(1)-(7). If, after considering the above elements, a state determines that its SIP is or may be inadequate to ensure reasonable progress, it must provide notification to the EPA, develop additional strategies to address the implementation plan deficiencies, collaborate with other States whose emissions may be impeding its progress, and revise the plan no later than one year from the date that the progress report was due. *Id.* § 51.308(h)(3)-(4).

II. MINNESOTA'S REGIONAL HAZE PROGRESS REPORT SHOULD BE REVISED IN ORDER TO MEET THE REGIONAL HAZE PROGRAM'S PROGRESS REPORT REQUIREMENTS.

A. The Proposed Progress Report Includes a List of Measures the State Relied Upon, as Required by 40 C.F.R. §51.308(g)(1), But Should Distinguish Between Those That are Required By Minnesota's SIP as Enforceable Measures and Those That Are Not.

While the Progress Report provides an accurate list of measures contained in the SIP that the State is relying on for achieving its reasonable progress goals, it is not clear to what degree many of these measures are enforceable requirements as opposed to voluntary or 'best plans'. It is therefore also unclear whether the measures provide any certainty that the emission reductions projected from such measures will be achieved.

EPA's guidance instructs the state to "identify the *control measures* in the state's regional haze SIP that apply to sources within the state that the state relied on to meet the requirements of the regional haze program."[4] *Control* measures are generally regulatory requirements, i.e. measures with a level of certainty and enforceability ensuring that they will actually occur. The final report should distinguish between those measures that are actually required and enforceable by MPCA versus measures that are not. For example, the Progress Report discusses the Northeast Minnesota Plan – Emissions Reduction Goal, which was developed in the 2009 SIP, but that goal is not itself *a control measure* and therefore is not particularly reliable; it is a target rather than a requirement. Also by way of example, the Report discusses SO2 NAAQS compliance based on the 2010 1-hour NAAQS standard (PR, pp. 9-10), yet there are several power plants directly adjacent to Minnesota's Class I areas whose Title V permits are expired, but for which the Agency has not yet issued new permits with more stringent SO2 limits. The Agency must be clear and up front about these significant gaps and the attendant negative effects on reliability for

[4] General Principles for the 5-Year Regional Haze Progress Reports for the Initial Regional Haze State Implementation Plans (Intended to Assist States and EPA Regional Offices in Development and Review of the Progress Reports), EPA, April 2013, p. 5 (emphasis added).

measuring progress on haze. Statements of good intention, voluntary options, and incomplete work by the Agency cannot and should not be counted as "progress" on meeting 2064 regional haze deadlines. At a minimum, voluntary measures must be set apart from actual, enforceable emission reduction requirements.

B. The Proposed Progress Report Does Not Provide an Adequate Summary of Estimated Reductions Achieved Through the Identified Measures Consistent with 40 C.F.R. §51.308(g)(2).

The Progress Report must provide a "summary of the emissions reductions achieved throughout the State through implementation of the measures described in [the first section]." 40 C.F.R. § 51.308(g)(2). MPCA's Report takes a pass at providing such a summary, and instead states that "it is difficult to describe specific emissions reductions associated with each strategy" because of varying compliance deadlines and the fact that some of the strategies have not been implemented. PR, p. 10. The Report then provides general figures on reported emission reductions over time without attempting to link any of those reductions to the actual control measures identified in the state's Regional Haze SIP.

This section of the proposed Progress Report does not meet the letter or the spirit of the regulation. The point is to provide a "summary of emissions reductions achieved . . . *through implementation* of the measures" identified in the SIP. The Agency and the public need to know and understand whether those measures are achieving reasonable progress toward eliminating visibility impairment. If they are not, the SIP must be amended. Simply stating that statewide emissions of haze-causing pollutants have decreased without providing evidence about how and *why* the emissions have decreased is of little value in assessing the current SIP or planning for the next round of SIP revisions. We don't know, for example, to what degree recent emissions reductions were simply the result of the recession and will be reversed as the economy turns around. Or, alternatively, how much is due to the changing economics of fossil fuels and renewables. The purpose of the progress report is lost if MPCA fails to do the required work and make a genuine, good faith examination of haze pollutant status and changes and the actual sources of those changes. MPCA must make an accurate assessment of whether enforceable progress is off the "glide path," and if it is, the agency must explain why and must then make any necessary adjustments to the haze SIP to return Minnesota to the glide path to make reasonable progress on the 2064 deadlines.

We acknowledge that the data appear to support the State's conclusions that emission reductions have been achieved relative to the 2002 base year, and agree that is encouraging. However, the Progress Report fails to show that control measures required in the SIP are the driving force for those reductions. It also fails to provide any assurance that these reductions will be permanent and enforceable going forward, or that the additional reductions necessary to meet the 2018 reasonable progress goals will be compelled.

The Agency's failure to make these distinctions and do the required analysis is particularly troubling given that the Agency made clear in the original SIP proposal that it was *not* actually going to meet the requirement to eliminate human-made haze pollution in Class I areas by 2064. Instead, Minnesota has proposed a reasonable progress goal that would attain natural visibility

conditions in Boundary Waters in 2093 and in Voyageurs National Park in 2177. 2009 SIP at 107. Given that MPCA currently thinks it will meet the 2018 goals but is way off the path for the actual 2064 goals, MPCA needs to revisit its conclusion and ground its SIP assessment in a concrete and accurate evaluation of enforceable pollutant reductions to determine whether the state's regional haze plan will achieve the requisite level of progress.

Requirements of the Progress Report are spelled out within the Regional Haze Rule and more recently in EPA guidance. As the report establishes the building blocks for forthcoming rounds of regional haze SIP revisions, it is imperative that an accurate and full accounting of reductions attributable to the haze program as well as to other programs that will have the co-benefit of reducing visibility impairing pollution be achieved within the Progress Report. Where Minnesota is simply relying on potential reductions to achieve improved Class I visibility, and where additional reductions are readily achievable through measures not assumed in the 2012 Minnesota Regional Haze Plan, it is incumbent upon the state and EPA to revise the plan to ensure reasonable progress. The progress report is the venue determined by EPA to reset initial measures and goals as necessary, including revisions to BART requirements that fell short. This will help Minnesota meet its overall obligations and will do so in a way that is certain and enforceable.

C. <u>The Proposed Progress Report Fails to Provide Information Sufficient to Determine Whether 40 CFR §51.308(g)(3) is Met</u>

Progress reports should include summaries of the monitored visibility at relevant Class I areas. 40 C.F.R. §51.308(g)(3). This information is mainly useful, however, in the context of the end goal of the regional haze program: natural conditions. The proposed Progress Report fails to include values for natural conditions. Although values for natural conditions have been articulated elsewhere (e.g. the 2009 SIP), it is difficult for the public to meaningfully assess progress without those values for comparison. Graphs made available in the proposed Progress Report only show progress towards the 2018 RPGs (p. 14-16). To demonstrate progress towards natural conditions, it would be useful for both the best and worst 20% days under natural conditions to be represented, as well as a comparison between existing progress and the Uniform Rate of Progress (the rate of progress necessary to meet the 2064 goal). Because the Progress Report does not include the values for natural conditions at all, assessing progress towards the overall goal, rather than just the 2018 goal, is difficult and fails to provide the larger picture necessary for a meaningful periodic review. We request that the final Progress Report submitted to EPA include documentation of natural conditions as described above, including an assessment of time needed to achieve them.

This section of the Progress Report also indicates that ammonium nitrate contributions to Class I visibility impairment at Voyageurs and Boundary Waters have remained largely steady despite some decreases in Minnesota's NOx emissions (p. 17-18, 22-23). The reasons for this are unclear, and could have to do with changing out-of-state NOx emissions, insufficient in-state NOx reductions, insufficient in-state NOx reductions in proximity to the Class I areas, inaccurate emissions accounting, complex atmospheric reactions, or other causes. In order to reduce the ammonium nitrate contribution to visibility impairment at these Class I areas, understanding the causes of that contribution is critical. We request that the Progress Report include an explanation

for this phenomenon or provide a pathway for identifying an explanation in time to incorporate that knowledge into the next round of regional haze planning.

D. The Proposed Progress Report Fails to Proved the Complete Information Required By 40 C.F.R. §51.308(g)(4).

EPA's regulation plainly requires an analysis "tracking the change over the past 5 years" in haze-causing pollutants. The regulation anticipates that the Agency will use the most recent data available "with estimates projected forward as necessary and appropriate" to address the applicable 5-year period. Here, the applicable period is 2009 – 2013. But the Agency's Progress Report provides data from 2002 – 2011/12 and does not attempt to estimate last year's or existing emissions. We understand that EPA's Guidance provides some flexibility on this issue, but, given the questions raised about the source and permanence of many of the emission reductions reported, we encourage the MPCA to include available emissions for 2013 (e.g. from all sources included in EPA's Air Markets Program Database), and also make "estimates projected forward as necessary" to provide a clearer picture of changes in the last 5 years.

MPCA's discussion again demonstrates the non-enforceability of existing emissions reductions. It references, for example, several events resulting in decreased emissions that are not permanent (lower coal use at Sherco in 2010; power boiler shutdown at Sherco for calendar year 2012; demand-related decrease in taconite emissions in 2009 and subsequent rebound). PR, p. 20. This problem extends to the way in which data are presented as well. For example, MPCA appears to report *actual* emissions (from point sources). But how do the actual emissions compare to permitted emissions? In order to understand whether the reported reductions are enforceable and permanent, the Agency must also report permitted emission levels.

The Agency could also significantly improve its discussion by further disaggregating the emissions and providing clearer information by source. The regulation calls for "an analysis tracking . . . emissions . . . from all sources and activities within the state." The Progress Report has grouped sources more broadly than in the example offered in EPA's Guidance.[5] Moreover, the way in which some of the data are presented, for example Figure 2D-2, p. 22, makes it difficult to compare the changes in emissions within any given group from year to year (this is a known difficulty with stacked column charts and could be ameliorated by category-specific charts and tabular data).

The Progress Report does not provide a clear picture of the impact of ammonia emissions on visibility, or progress as a result of changes in ammonia emissions. As a visibility impairing pollutant, the Regional Haze Rule mandates it be regulated to the extent that its emissions contribute to visibility impairment. In addition to the emissions estimates on p. 23-24, the Progress Report notes,

> Minnesota ammonia emissions are increasing, though not as significantly as originally projected. This is a positive development, because less available ammonia equates to less formation of ammonium sulfate and ammonium nitrate, the main causes of visibility impairment in Boundary Waters and Voyageurs.

[5] Guidance, pp. 14 -15.

p. 26. This implies that the supply of ammonia is the limiting factor in the development of ammonium sulfate and ammonium nitrate. If this is the case, the increased ammonia emissions are clearly a negative development, not a positive one, even if the lower rate of increase means this development is less bad than originally projected. It would be helpful for the Progress Report to clarify the relationship between the ammonia emissions and the resulting impairment at affected Class I areas.

E. The Proposed Progress Report Does Not Fully Discuss Anthropogenic Changes Impeding Progress as Required By §51.308(g)(5)

Progress reports should include a discussion of anthropogenic changes impeding visibility progress at the state's Class I areas. Here, the Progress Report notes the increased oil and gas development in North Dakota, but only in the context of VOC emissions. The NOx and SO2 emissions from this substantial development must also be considered. The map below illustrates recent development of the oil and gas sector in North Dakota, and clearly demonstrates why estimates from 2008, as discussed in the Progress Report, are entirely inadequate to estimate emissions from North Dakota. Emissions from these activities are contributing to haze problems at nearby Class I areas,[6] likely play an increasing role in air quality in Minnesota as well, are expected to continue to increase significantly, and are not well regulated. We request that the Progress Report include more detailed information about these emissions and their impacts, and encourage the state to advocate for appropriate regulation of this emissions source.

[6] "Bakken boom linked to haze at Theodore Roosevelt park", Phil Taylor, E&E reporter. Published: Thursday, November 7, 2013. Available at http://www.eenews.net/stories/1059990151. See also "Assessing the Emissions from the Oil and Gas Development in the Bakken Formation and Their Impact on Air Quality in National Parks," available at http://www.eenews.net/assets/2013/11/06/document_gw_01.pdf.

Beyond contributions of visibility impairing NOx and VOCs from North Dakota, a more detailed accounting of emissions from Illinois and Wisconsin would be useful to establish a full inventory of pollution affecting the region's Class I areas. While increases in anthropogenic emissions may not be anticipated at this time, without a full and accurate accounting of emission as of this date, future inventories have no baseline from which calculate increases. At a minimum, Minnesota should request this information from Illinois and Wisconsin, and put together emissions trends from neighboring states should more comprehensive information prove unavailable (e.g. compiling at least trends from EPA's Air Markets Program Database, which captures a large portion of stationary source emissions).

F. The Proposed Progress Report Does Not Support Its Conclusion That the State is On Track To Meet Reasonable Progress With Sufficient Evidence.

The Progress Report concludes that "in light of emissions and visibility trends, Class I areas adversely affected by emissions from Minnesota are on track to meet 2018 RPGs." We do not disagree that the emissions data presented show emission reductions below or near those modeled to meet the 2018 goal, or that the visibility conditions are at or near the 2018 RPGs. But two necessary elements prevent the public, the Agency, or EPA from concluding that "the current implementation plan elements and strategies are sufficient to enable the State . . . to meet all established reasonable progress goals" as required by the regulation. 40 C.F.R § 51.308(g)(6). First, the Progress Report fails to show that "current implementation plan elements" are at the heart of any of the emission reductions it reports. Second, and more importantly, it fails to provide any assurance that these emission reductions are, in fact, enforceable and permanent. Given that the point of the progress report is to judge the SIP and needed changes, the statement regarding 2018 goals lacks sound foundation that it will in fact turn out to be true and fails to fulfill the *purpose and intent* of the reporting requirement.

III. THE PROGRESS REPORT REPRESENTS AN IMPORTANT OPPORTUNITY FOR MINNESOTA TO REASSESS ITS INAPPROPRIATE RELIANCE ON CSPAR.

Minnesota chose to rely on allowances set out in the Cross State Air Pollutant Rule ("CSAPR") to substitute for its obligations to determine and impose source-specific BART in the Minnesota haze SIP. As set forth in detail in comments to the MPCA and EPA in February of 2012 and in comments from the Federal Land Managers throughout the course of the SIP development, if Minnesota wishes to use the CSAPR allocations for BART, Minnesota must still comply with the independent analysis requirements for demonstrating that assigned allocations are in fact "better than BART" for Minnesota. 40 C.F.R. § 51.308(e)(2)-(3). Minnesota has not engaged in that process and therefore cannot claim that it "independently" proposes the CSAPR allocations as a BART alternative. Further, given what has been demonstrated in numerous comments to the agency from the Conservation Organizations and the Federal Land Managers, Minnesota (and for that matter EPA) cannot so demonstrate: even the extremely inadequate and non-compliant BART determinations in Minnesota's 2009 SIP submission show better protection and improvement for the Class I areas than the CSAPR allocations. See e.g. Letter from Timothy A.

Dabney, Acting Forest Supervisor, Superior National Forest, to David Thornton, Assistant Commissioner, attached to February 2012 comments and referenced in the Conservation Organizations' Technical Document. We rely here on our comments to MPCA dated February 2012 and our comments to EPA (copied to MPCA) dated February 24, 2012.

The Progress Report is the opportunity for MPCA to see and understand that its failure to impose BART controls on Minnesota coal-fired power plants and taconite facilities will result in Minnesota's failure to adequately address air pollution in Minnesota and regional parks and wildernesses in accordance with the requirements of the Clean Air Act. We urge MPCA to use this opportunity to amend its SIP to reject CSAPR. Failing this, at a minimum, Minnesota should augment its use of CSAPR with source specific emission reductions from facilities that continue to impair Class I area visibility.

IV. SUPPORT FOR IMPROVE MONITORING NETWORK

We would also like to express our strong support for the maintenance of the IMPROVE network of monitors. In line with statements from other states, the Progress Report notes, IMPROVE monitoring sites "are a key component of the EPA's national fine particle monitoring and are critical to tracking progress related to the Regional Haze Regulations." p. 30. We support continued funding for this network. The Progress Report notes Minnesota's willingness to "attempt to provide support for the operation of at least one of its two Class I IMPROVE sites" should federal funding fail. p. 31. We urge Minnesota to commit to funding both Class I IMPROVE monitors in that event, and additionally urge the state to support and advocate for continued federal funding for IMPROVE in whatever ways possible.

Thank you for the opportunity to submit comments on Minnesota's draft Five-Year Regional Haze Progress Report.

Sincerely,

Janette Brimmer
Attorney
Earthjustice

Stephanie Kodish
Director & Counsel, Clean Air Program
National Parks Conservation Association

Paul Danicic
Executive Director
Friends of the Boundary Waters Wilderness

Christina Hausman
Executive Director
Voyageurs National Park Association

Kevin Reuther
Legal Director
Minnesota Center for Environmental Advocacy

Comments

In the summary, you state that "excluding the effects of the 2011 Pagami Creek Wildfire, would be expected to [meet progress goals] for Boundary Waters." However, the chart suggests otherwise, presumably because it does not exclude the effects of the Pagami Creek Wildfire. Can you show us more here why you conclude that the area meets goals but for that wildfire?

p. 5 – You state that "EPA approved Minnesota's EGU BART strategy, with the exception of the limits for Sherco." I suppose that's literally true, though I wouldn't put it that way. It's also a little misleading to say that EPA deferred action on BART for Sherco, since we only deferred action on whether the state plan satisfied BART for RAVI purposes. We did conclude that the plan satisfied regional haze planning requirements for BART for EGUs. CSAPR provided sufficient reductions to satisfy BART requirements for EGUs (for SO2 and NOx) in the state, the plan's combination of CSAPR plus limits on Sherco did even better at satisfying BART, and so we found the EGU BART requirements met, albeit not exactly in the way Minnesota envisioned.

You state that "Minnesota's current EGU emissions of SO_2 and NO_X currently fall below the levels set by CSAPR emissions budgets." Strictly speaking, our approval of the plan was predicated on emissions meeting the emission levels projected by IPM, which may be higher or lower than the emission budgets. I'm not sure how easy those projections are to find, but at least in theory, that would be a more relevant comparison. A similar comment applies on page 10.

p. 6 - You state that "but no final decision on PM BART for the subject taconite facilities has been published." I haven't fully researched this, but my hunch is that we said that our FIP fills in the gap that the state submittal left, meaning that we implicitly made a final decision that no further limitations on PM were needed to address BART for PM.

p. 10 – You state that "Minnesota did not rely on control strategies from other states' in developing its Regional Haze SIP Reasonable Progress Goals." However, I would say that most of the expected progress that Minnesota relied upon arose from power plant emission reductions in other states as well as Minnesota. I don't have a request for any specific way of addressing this, but I would suggest acknowledging this contribution and perhaps providing a table listing say 2013 versus 2005 power plant emissions of SO2 and NOx from say Minnesota, Iowa, Wisconsin, North Dakota, Missouri, and Illinois. (These data can readily be retrieved from the CAMD web site.) Perhaps you were referring to beyond "on-the-books" measures, i.e. that you weren't relying on any "beyond the books" measures in other states. But even if you clarify your point, I think it's worth observing the power plant emission reductions (attributable to an "on-the-books" measure, i.e. CAIR/CSAPR) that we know to be highly significant.

p. 13 – "Most?" Do you mean "20% best?"

p.17 – Another good reason to use Mm-1 for this is that Mm-1 is a linear measure and thus is more suitable for linear comparison.

p.22 – I don't want to create a lot of work, but the mobile emissions disconnect is distracting, and I wonder if there are easy things to do to fix it. I'm sure that MOVES can give you emission factors for any year you want. I assume that doing a complete inventory to replace the MOBILE-based inventory is more work than is warranted. But I'm wondering if, with a modest amount of work, you could compute emission factor ratios, e.g. that emissions per mile in 2010 is 85% of emissions per mile in 2005, and

replace the MOBILE-based numbers with estimates based on these ratios so as to have more of an apples to apples comparison.

p. 28 – You state, "continued improvements in SO_2 and NO_X emissions may have occurred." However, it is not necessary to be so indeterminate. I would suggest using statewide total emission data from CAMD's website to support a more definitive statement.

Sanders, Vonda (MPCA)

From: Summerhays, John <Summerhays.John@epa.gov>
Sent: Friday, September 19, 2014 4:40 PM
To: Kuskie, Melissa (MPCA)
Cc: Fenske, MaryJean (MPCA); Aburano, Douglas
Subject: RE: Minnesota Five-year Regional Haze Progress Report SIP Revision
Attachments: Five Year Report Comments.docx

Attached are comments on your draft 5-year report submittal. In general, this is a good report; my comments pertain to particular sections for which I have particular suggestions. Let me know if you have any questions.

From: Kuskie, Melissa (MPCA) [mailto:Melissa.Kuskie@state.mn.us]
Sent: Wednesday, July 23, 2014 10:06 AM
To: Summerhays, John
Subject: Minnesota Five-year Regional Haze Progress Report SIP Revision

Good morning, John,

As mentioned on this morning's call, here's our 5 year review. It will be public noticed on Monday, July 28, with the comment period closing Wednesday, August 27. If requested, a public meeting will be held on Friday, August 29.

I'm providing you a pdf as well as the Microsoft word version, in case you wanted to use track changes to make suggestions/edits. Please feel free to give me a call/send an email with any questions.

Thanks,
Melissa

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