

Mercury Reduction Plan Submittal

Air Quality Permit Program
Minn. R. 7007.0502, subp. 3

Doc Type: Regulated Party Response

Instructions:

- Complete this form to meet the Mercury Reduction Plan requirements for owners and operators subject to Minn. R. 7007.0502, subp. 3.
- Attach any additional explanatory information, for example, editable spreadsheets with calculations (on a CD), stack test reports, engineering or design reports, and any other information supporting your reduction plan.
- This reduction plan must be approved by the Minnesota Pollution Control Agency (MPCA) prior to submittal of a permit amendment application or development of an enforceable document. It is not a substitution for a permit amendment application.
- **Please submit form to:** Statewide Mercury TMDL Coordinator, Rebecca Place, Minnesota Pollution Control Agency, 520 Lafayette Road North, St. Paul, MN 55155.

Mercury Reduction Plan Submittal and Compliance Deadlines

Type of Source	Mercury Reduction Plan Submittal Deadline	Compliance Deadline
Existing mercury emission source The source does not qualify as an exemption under Minn. R. 7007.0502, subp. 3	June 30, 2015	
• Industrial Boilers		January 1, 2018
• Iron Melting		June 30, 2018
• Sources otherwise not identified		January 1, 2025
Ferrous mining/processing	December 30, 2018	January 1, 2025

Facility Information

1.a. Facility name: American Crystal Sugar - East Grand Forks 1.b. AQ facility ID number: 11900002

1.c. Main contact name for this reduction plan: Mr. Doug Emerson

1.d. Contact phone number: (218) 236-4777 1.e. Contact email address: demerson@crystalsugar.com

aq-ei2-05b

Mercury Reduction Plan

2. Description of mercury reduction action

Complete the following table for each emission unit that emits mercury. Use a separate row for each specific control, process, material or work practice that will be employed to achieve the applicable control efficiencies, reductions or allowable emissions. Provide a written summary below as needed for context or background. Minn. R. 7007.0502, subp. 5 (A)(1)(a) and (b).

This table has an example of information that the MPCA is seeking for industrial boilers. The table is designed to help address each element needed when composing enforceable emission limits, control efficiencies or other conditions to meet mercury reductions. To create a new row, place your cursor in the last column of the last row, hit tab.

Emission unit	Element to reduce mercury (Control device, work practice, etc.)	Reduction, control efficiency, emission limit, operating limit, or work practice* (indicate units, i.e., lb. hg/ton material, % control)	Describe element in detail (include manufacturer's data** as applicable)
<i>Example:</i> Apply control technology and fuel limits between two onsite boilers to meet total mercury reduction requirement of 70%, No changes proposed for lime kiln, but will track suppliers and fuels.: <i>[Examples can be deleted]</i>			
Boiler No. 1 – EU001	Powdered Activated Carbon (PAC) or Sorbent Enhancement Additive (SEA) Injection	Maintain combined boiler emissions less than 10 lb/yr.	Install PAC or SEA prior to ESP. Preliminary target carbon injection rate is 1.0 to 5.0 lb/mmacf. Supplier is to be determined. Compliance will be determined based on Method 29 or 30b and annual performance testing as required by 40 CFR 63, Subpart DDDDD. Sorbent injection rate maintained at level greater than or equal to performance test.
Boiler No. 2 – EU002	Powdered Activated Carbon (PAC) or Sorbent Enhancement Additive (SEA) Injection	Maintain combined boiler emissions less than 10 lb/yr.	Install carbon injection prior to ESP. Preliminary target carbon injection rate is 1.0 to 5.0 lb/mmacf. PAC supplier is to be determined. Compliance will be determined based on Method 29 30b and annual performance testing as required by 40 CFR 63, Subpart DDDDD. Sorbent injection rate maintained at level greater than or equal to performance test.
East Lime Kiln – EU008	Not Applicable – See Description	Emissions Less Than 3.0 lb/yr	Per Minn. R. 7007.0502, Subpart 6(D), individual processes that emit less than three pounds of mercury per year are not required to submit a mercury emissions reduction plan.
West Lime Kiln – EU009	Not Applicable – See Description	Emissions Less Than 3.0 lb/yr	Per Minn. R. 7007.0502, Subpart 6(D), individual processes that emit less than three pounds of mercury per year are not required to submit a mercury emissions reduction plan.

*The permit or enforceable document will include the proposed control efficiency, emission limits, or other requirements that achieve this rate.

**Attach manufacturer's information and other resources used to document the reduction

Written description:

Per Minn. R. 7007.0502, Subpart 2, the East Grand Forks facility is considered an existing mercury emission source with mercury emissions exceeding 3 pounds per year during the baseline calendar year of 2013. Each ICI coal-fired boiler is subject to Minn. R. 7011.7050, therefore, they must comply with Minn. R. 7007.0502, Subpart 6(C)(2) and are not fully exempt from the mercury emissions reduction plan requirements. An alternative plan is being proposed under Subpart 9 of the rule. Combined mercury emissions from the two ICI coal-fired boilers will be maintained at less than 10 lb/yr. The specific manufacturer is not available until the vendor procurement process is completed. However, based on common industry performance a target PAC/SEA injection rate of 1.0 to 5.0 lb/mmacf has been assumed. Final PAC/SEA injection rates will be based on equipment tuning after installation and commissioning.

The lime kilns are individual processes at a mercury emission source that each emit less than three pounds per year of mercury. Therefore, under Minn. R. 7007.0502, Subpart 6(D), a mercury reduction plan is not required for these sources.

3. Calculation data

Include all mercury emission calculations for the emission rates listed in item 2 in an editable spreadsheet on CD. Provide the PTE for mercury emissions, and an estimate of actual emissions the first full calendar year of operation.

3a. Emission Factors

Identify the emission factors and sources of the emission factors used to determine mercury emissions in item 3 in the table. Please include the rationale behind your decision. To create a new row, place *your cursor* in the last column of the last row, *hit tab*.

Emission unit	Emission factors for current mercury emissions rate, if applicable	Source of emission factor	Target emission rate	Source of emission factors for target emission rate
EU001	3.52E-06 lb/MMBtu	2014 Engineering test and operating parameters.	5 lb/yr (10 lb/yr combined)	Annual performance test at PAC/SEA injection rate combined with annual operational data.
EU002	2.84E-06 lb/MMBtu	2014 Engineering test and operating parameters.	5 lb/yr (10 lb/yr combined)	Annual performance test at PAC/SEA injection rate combined with annual operational data.
EU008, EU009	2.0E-05 lb/ton lime produced	EPA-454/R97-012	Not Applicable	Not Applicable

4. Monitoring and Recordkeeping Plan

4a. Proposed Monitoring and Record Keeping: For each reduction element (specific control equipment, emission limit, operating limit, material or work practice), describe monitoring to provide a reasonable assurance of continuous control of mercury emissions. If the plan includes control equipment, attach MPCA Air Quality Permit Forms GI-05A and CD-05. Minn. R. 7007.0502, subp. 5(A)(1)(d). *[Examples can be deleted]*

This table and following description has example material for a facility with two coal fired boilers. To create a new row, place your cursor in the last column of the last row, hit tab.

Emission Unit	Reduction element	Reduction, control efficiency or emission rate (include units)	operating parameters	Monitoring Method	Parameter range (include units, if applicable)	Monitoring frequency	Proposed recordkeeping	Discussion of why this monitoring is adequate
EU001	PAC/SEA Injection	Maintain sorbent injection rate at such level that is greater or equal to the level demonstrated during performance test to maintain emissions less than 10 lb/yr for combination of both boilers.	Pound per hour injection rate range	Periodic stack testing—Method 29 or 30B Monitor sorbent injection rate	Target is 1.0 to 5.0 lbs/mmacf based on unit tuning during performance test. Final value to be based on required control to achieve targeted reduction.	Periodic performance test for target emission rate as required by 40 CFR 63, Subpart DDDDD.	Recordkeeping as required by 40 CFR 63, Subpart DDDDD.	Equivalent monitoring as required by 40 CFR 63, Subpart DDDDD will assure compliance.
EU002	PAC/SEA Injection	Maintain sorbent injection rate at such level that is greater or equal to the level demonstrated during performance test to maintain emissions less than 10 lb/yr for combination of both boilers.	Pound per hour injection rate range	Periodic stack testing—Method 29 or 30B Monitor sorbent injection rate	Target is 1.0 to 5.0 lbs/mmacf based on unit tuning during performance test. Final value to be based on required control to achieve targeted reduction.	Periodic performance test for target emission rate as required by 40 CFR 63, Subpart DDDDD.	Recordkeeping as required by 40 CFR 63, Subpart DDDDD.	Equivalent monitoring as required by 40 CFR 63, Subpart DDDDD will assure compliance.

Additional Discussion:

During the acceptance tests for the sorbent injection systems and periodic Boiler MACT compliance tests, mercury emissions and associated sorbent mass feed rates will be determined. Because both coal-fired boilers are subject to sorbent injection requirements specified in 40 CFR 63, Subpart DDDDD, the monitoring, recordkeeping, and compliance requirements (i.e. test frequency, methodologies, PAC injection monitoring, and load monitoring) required by the federal rule are proposed for the Minnesota mercury reduction plan requirements to provide reasonable assurance of continuous control of mercury emissions.

4b. Optimization

For each control device used to achieve the overall mercury reduction of the plan, describe how you will operate the control system such that mercury reductions are maintained. Explain how an operator might adjust the control system at the facility. Describe system alarms or safeguards to ensure optimal operation of the mercury control system. Optimization also includes training of individuals responsible for operating the control system, the development and upkeep of operation and maintenance manuals. The MPCA is not requesting that such programs or manuals be included with this element, rather that they are summarized. Discuss potential variability of mercury emissions and how operations will be monitored to address variability. Minn. R. 7007.0502, subp. 5.A.(1)(c).

The operating limits and work practices as specified by 40 CFR 63, Subpart DDDDD will be followed. ESP optimization will be maintained through the use of a CPMS to continuously monitor PM emissions. The hourly average carbon injection rate will be determined based on data collected every 15 minutes during the most recent performance test. The actual carbon injection rate during operations will be based on boiler load by multiplying the activated carbon injection rate by the boiler load fraction. Continuous compliance will be assured by collecting the sorbent injection rate data using a monitoring system and reducing the data to 30-day rolling averages. The 30-day average sorbent injection rate will be maintained above the minimum required sorbent injection rate. The actual monitoring system make and model have not yet been determined and will be specified upon completion of the vendor procurement process. It is proposed that compliance with the federal requirements of 40 CFR 63, Subpart DDDDD will assure compliance with the Minnesota mercury reduction plan requirements.

4c. Evaluation of the use of Continuous Emissions Monitoring Systems (CEMS).

Evaluate the use of CEMS for mercury, both the sorbent tube method (U.S. Environmental Protection Agency [EPA] Method 30B) and an extractive "continuous" system. Describe if either method has been used at the mercury emissions source for parametric monitoring or for compliance determination. If CEMS is selected for monitoring of mercury emissions, please include in item 4a above. If it is not selected for monitoring of mercury emissions, please discuss the evaluation of the use of CEMS below:

The East Grand Forks facility will utilize Method 29 or 30B to determine mercury emissions and required carbon injection rates on an annual basis as required by 40 CFR 63, Subpart DDDDD.

5. Proposal of alternative reduction

If the owner or operator determines that the mercury reductions listed in Minn. R. 7007.0502, subp. 6 are not technically achievable by the identified compliance date; an alternative plan may be submitted under Minn. Stat. § 7007.0502, subp. 5A(2). If you are proposing an alternative plan to reduce mercury emissions, please complete the following.

- a) Provide a detailed explanation of why the mercury reductions are not technically achievable. Describe the reduction required by the rule and your alternative proposal. Include references and citations supporting the basis for the determination that the reductions are not technically feasible.

Not Applicable.

- b) Complete the information above for your alternative proposal.

Not Applicable.

- c) Provide an estimate of the annual mass of mercury emitted under the requirements of Minn. R. 7007.0502, subp. 6 and the proposed alternative plan.

Not Applicable.

6. Mechanism to make reduction plan enforceable.

The elements of the reduction plan will be included in your air emissions permit. If a permit amendment is needed in order to install or implement the control plan, please explain:

It is not anticipated that a increase of the current PM emission (rate) limit in the Title V Operating permit will be rquired. Therefore, no perimt application will be required. American Crystal Sugar will submit a notification of air pollution control equipment including all equipment details, as requied under Minn. R. 7007.1150, Subpart C.

7. Schedule

For each reduction element (specific control, process, material or work practice) described in Item 5 that will be employed as part of the mercury reduction plan, complete the following table. To create a new row, place your cursor in the last column of the last row, hit tab.

Emission unit	Reduction element	Anticipated date to start of element	Anticipated completion of element	Anticipated date for demonstrating reduction target	Date reduction needs to be met	Anticipated date of permit application submittal
EU001, EU002	Sorbent injection	Summer 2016	Fall 2016	Fall of 2017	January 1, 2018	Not Applicable

8. Additional information

Please provide additional information that will assist in reviewing your Mercury Reduction Plan.

Compliance with the federal rules under 40 CFR 63, Subpart DDDDD assures compliance with the Minnesota mercury reduction plan requirements. Specific equipment details will be provided when available during the vendor procurement process.

9. Submittal certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Permittee responsible official

Co-permittee responsible official (if applicable)

Print name: Mr. Thomas Astrup

Print name: _____

Title: Vice President of Operations Date _____

Title: _____ Date: _____

Signature: _____

Signature: _____

Phone: (218) 236-4402 Fax: (218) 236-4342

Phone: _____ Fax: _____