

**From:** [O'Brien, Thomas W](#)  
**To:** [EGLE-ROP](#)  
**Cc:** [O'Brien, Thomas W](#); [Ketzenberger, Brent A](#)  
**Subject:** B4885 ROP Renewal Application  
**Date:** Tuesday, December 14, 2021 3:43:07 PM  
**Attachments:** [B4885 Tilden Mine ROP Renewal Application 12\\_14\\_2021.pdf](#)  
[B4885 ROP Renewal Mark-up Copy.docx](#)  
[2020\\_12\\_16 Tilden Mine PTI 76-20.pdf](#)  
[B4885 Tilden DRYERS\\_FGDUSTCOLLECTORS\\_CAM Plan.pdf](#)  
[B4885 Tilden EUKILNS\\_CAM Plan.pdf](#)  
[B4885 Tilden MACT\\_SSM Plan.pdf](#)  
[Tilden MACT OM Plan.pdf](#)  
[B4885 Tilden MACT SS Monitoring Plan.pdf](#)  
[B4885 Tilden Fugitive Dust Control Plan.pdf](#)  
[B4885 Tilden Rule 801 NOx Control Plan 2002\\_03.pdf](#)  
[B4885 Tilden PFMS Quality Assurance Manual.pdf](#)  
[B4885 Tilden NOx SO2 CEMS Monitoring Plan.pdf](#)  
[B4885 Tilden NOx SO2 CEMS OA-OC Plan.pdf](#)  
[B4885 Tilden Mine ROP Renewal Application Cover Letter 12\\_14\\_2021.pdf](#)

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Tilden Mining Company L.C. B4885 ROP Renewal Application and required documents attached



**Thomas O'Brien, CHMM**

Environmental Engineer

P 906.475.3306 M 906.458.0360 [thomas.obrien@clevelandcliffs.com](mailto:thomas.obrien@clevelandcliffs.com)

**CLEVELAND-CLIFFS INC.**

MICHIGAN OPERATIONS

Tilden Mining Company L.C.

Managed by the Cleveland-Cliffs Iron Company

PO Box 2000, Ishpeming, MI 49849-0901

P 906.475.3400 F 906.475.3536 [clevelandcliffs.com](http://clevelandcliffs.com)

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TILDEN MINING COMPANY L.C.  
Managed by The Cleveland-Cliffs Iron Company  
PO Box 2000, Ishpeming, MI 49849-0901  
P 906.475.3600 F 906.475.3777 clevelandcliffs.com

Mr. Edward Lancaster  
EGLE-AQD-UPDO  
1504 W. Washington St.  
Marquette, MI 49855

December 14, 2021

SUBJECT: Tilden Mine Renewable Operating Permit, Renewal Application  
ROP Permit Number: MI-ROP-B4885-2017b

Dear Mr. Lancaster:

The Tilden Mining Company L.C. is submitting to the Department of Environment, Great Lakes, and Energy, the Renewable Operating Permit (ROP) Renewal Application Form and required supporting materials.

- Michigan Department of Environment, Great Lakes, and Energy (EGLE) Renewable Operating Permit Renewal Application Form
- Current ROP MI-ROP-B4885-2017b Mark-up Copy
- Compliance Assurance Monitoring Plan EUOREDRIYER1, EUOREDRIYER2, FGDUSTCOLLECTORS
- Compliance Assurance Monitoring Plan EUKILN1, EUKILN2
- MACT Startup, Shutdown, and Malfunction Plan
- MACT Operation and Maintenance Plan
- MACT Site-Specific Monitoring Plan for Continuous Parametric Monitoring Systems
- MACT Fugitive Dust Control Plan
- Wet Scrubber and ESP Monitoring and Response Plan (PTI 76-20)
- Rule 801 NOx Control Plan
- Predictive Emissions Monitoring System Quality Assurance Manual
- Continuous Emissions Monitoring Systems Monitoring Plan EUKILN1
- Continuous Emissions Monitoring Systems Quality Assurance Quality Control Plan EUKILN1
- PTI 76-20

Please contact me if you have any further questions regarding this report.

Sincerely,

Ryan Korpela  
General Manager  
Cleveland Cliffs Michigan Operations  
Tilden Mining Company L.C



## RENEWABLE OPERATING PERMIT RENEWAL APPLICATION FORM

*This information is required by Article II, Chapter 1, Part 55 (Air Pollution Control) of P.A. 451 of 1994, as amended, and the Federal Clean Air Act of 1990. Failure to obtain a permit required by Part 55 may result in penalties and/or imprisonment. Refer to instructions for additional information to complete the Renewable Operating Permit Renewal Application Form.*

### GENERAL INSTRUCTIONS

This application form should be submitted as part of an administratively complete application package for renewal of a Renewable Operating Permit (ROP). This application form consists of nine parts. Parts A – H must be completed for all applications and must also be completed for each section of a sectioned ROP. Answer all questions in all parts of the form unless directed otherwise. Detailed instructions for this application form can be found at <http://michigan.gov/air> (select the Permits Tab, "Renewable Operating Permits (ROP)/Title V", then "ROP Forms & Templates").

### PART A: GENERAL INFORMATION

Enter information about the source, owner, contact person and the responsible official.

#### SOURCE INFORMATION

SRN B4885	SIC Code 1011	NAICS Code 212210	Existing ROP Number MI-ROP-B4885-2017b	Section Number (if applicable) NA
Source Name Tilden Mining Company L.C.				
Street Address 1 Tilden Mine Road				
City Ishpeming		State MI	ZIP Code 49849	County Marquette
Section/Town/Range (if address not available)				
Source Description The Tilden Mine is an open pit iron ore mining, concentrating, and pelletizing facility producing iron ore pellets for steel making in blast furnaces. The Tilden Mine employees 827 people with an annual rated capacity of 8.0 million long tons of pellets.				
<input type="checkbox"/> Check here if any of the above information is different than what appears in the existing ROP. Identify any changes on the marked-up copy of your existing ROP.				

#### OWNER INFORMATION

Owner Name Tilden Mining Company L.C.				Section Number (if applicable) NA	
Mailing address ( <input type="checkbox"/> check if same as source address) PO Box 2000					
City Ishpeming		State MI	ZIP Code 49849	County Marquette	Country USA

Check here if any information in this ROP renewal application is confidential. Confidential information should be identified on an Additional Information (AI-001) Form.

**PART A: GENERAL INFORMATION (continued)**

At least one contact and responsible official must be identified. Additional contacts and responsible officials may be included if necessary.

**CONTACT INFORMATION**

Contact 1 Name Brent Ketzenberger		Title Area Manager Environmental		
Company Name & Mailing address ( <input type="checkbox"/> check if same as source address) Tilden Mining Company L.C., PO Box 2000				
City Ishpeming	State MI	ZIP Code 49849	County Marquette	Country USA
Phone number (906) 475-3792		E-mail address brent.ketzenberger@clevelandcliffs.com		

Contact 2 Name (optional) Thomas O'Brien		Title Environmental Engineer		
Company Name & Mailing address ( <input type="checkbox"/> check if same as source address) Tilden Mining Company L.C., PO Box 2000				
City Ishpeming	State MI	ZIP Code 49849	County Marquette	Country USA
Phone number (906) 475-3306		E-mail address thomas.obrien@clevelandcliffs.com		

**RESPONSIBLE OFFICIAL INFORMATION**

Responsible Official 1 Name Ryan Korpela		Title General Manager		
Company Name & Mailing address ( <input type="checkbox"/> check if same as source address) Tilden Mining Company L.C., PO Box 2000				
City Ishpeming	State MI	ZIP Code 49849	County Marquette	Country USA
Phone number (906) 475-3520		E-mail address ryan.korpela@clevelandcliffs.com		

Responsible Official 2 Name (optional)		Title		
Company Name & Mailing address ( <input type="checkbox"/> check if same as source address)				
City	State	ZIP Code	County	Country
Phone number		E-mail address		

<input type="checkbox"/> Check here if an AI-001 Form is attached to provide more information for Part A. Enter AI-001 Form ID:
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**PART B: APPLICATION SUBMITTAL and CERTIFICATION by Responsible Official**

Identify the items that are included as part of your administratively complete application in the checklist below. For your application to be complete, it must include information necessary to evaluate the source and to determine all applicable requirements. Answer the compliance statements as they pertain to all the applicable requirements to which the source is subject. The source's Responsible Official must sign and date this form.

**Listing of ROP Application Contents. Check the box for the items included with your application.**

<input checked="" type="checkbox"/> Completed ROP Renewal Application Form (and any AI-001 Forms) (required)	<input type="checkbox"/> Compliance Plan/Schedule of Compliance
<input checked="" type="checkbox"/> Mark-up copy of existing ROP using official version from the AQD website (required)	<input type="checkbox"/> Stack information
<input checked="" type="checkbox"/> Copies of all Permit(s) to Install (PTIs) that have not been incorporated into existing ROP (required)	<input type="checkbox"/> Acid Rain Permit Initial/Renewal Application
<input type="checkbox"/> Criteria Pollutant/Hazardous Air Pollutant (HAP) Potential to Emit Calculations	<input type="checkbox"/> Cross-State Air Pollution Rule (CSAPR) Information
<input type="checkbox"/> MAERS Forms (to report emissions not previously submitted)	<input type="checkbox"/> Confidential Information
<input type="checkbox"/> Copies of all Consent Order/Consent Judgments that have not been incorporated into existing ROP	<input checked="" type="checkbox"/> Paper copy of all documentation provided (required)
<input checked="" type="checkbox"/> Compliance Assurance Monitoring (CAM) Plan	<input checked="" type="checkbox"/> Electronic documents provided (optional)
<input checked="" type="checkbox"/> Other Plans (e.g., Malfunction Abatement, Fugitive Dust, Operation and Maintenance, etc.)	<input type="checkbox"/> Other, explain:

**Compliance Statement**

This source is in compliance with **all** of its applicable requirements, including those contained in the existing ROP, Permits to Install that have not yet been incorporated into that ROP, and other applicable requirements not currently contained in the existing ROP.  Yes  No

This source will continue to be in compliance with all of its applicable requirements, including those contained in the existing ROP, Permits to Install that have not yet been incorporated into that ROP, and other applicable requirements not currently contained in the existing ROP.  Yes  No

This source will meet in a timely manner applicable requirements that become effective during the permit term.  Yes  No

The method(s) used to determine compliance for each applicable requirement is/are the method(s) specified in the existing ROP, Permits to Install that have not yet been incorporated into that ROP, and all other applicable requirements not currently contained in the existing ROP.

If any of the above are checked No, identify the emission unit(s) or flexible group(s) affected and the specific condition number(s) or applicable requirement for which the source is or will be out of compliance at the time of issuance of the ROP renewal on an AI-001 Form. Provide a compliance plan and schedule of compliance on an AI-001 Form.

**Name and Title of the Responsible Official (Print or Type)**

Ryan Korpela, General Manager

***As a Responsible Official, I certify that, based on information and belief formed after reasonable inquiry, the statements and information in this application are true, accurate, and complete.***


  
Signature of Responsible Official

 12-14-21  
Date

**PART C: SOURCE REQUIREMENT INFORMATION**

Answer the questions below for specific requirements or programs to which the source may be subject.

C1.	Actual emissions and associated data from <b>all</b> emission units with applicable requirements (including those identified in the existing ROP, Permits to Install and other equipment that have not yet been incorporated into the ROP) are required to be reported in MAERS. Are there any emissions and associated data that have <u>not</u> been reported in MAERS for the most recent emissions reporting year? If <u>Yes</u> , identify the emission unit(s) that was/were not reported in MAERS on an AI-001 Form. Applicable MAERS form(s) for unreported emission units must be included with this application.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
C2.	Is this source subject to the federal regulations on ozone-depleting substances? (40 CFR Part 82)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
C3.	Is this source subject to the federal Chemical Accident Prevention Provisions? (Section 112(r) of the Clean Air Act Amendments, 40 CFR Part 68) If <u>Yes</u> , a Risk Management Plan (RMP) and periodic updates must be submitted to the USEPA. Has an updated RMP been submitted to the USEPA? NA	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No
C4.	Has this stationary source <b>added or modified</b> equipment since the last ROP renewal that changes the potential to emit (PTE) for criteria pollutant (CO, NO <sub>x</sub> , PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , VOC, lead) emissions? If <u>Yes</u> , include potential emission calculations (or the PTI and/or ROP revision application numbers, or other references for the PTE demonstration) for the added or modified equipment on an AI-001 Form. If <u>No</u> , criteria pollutant potential emission calculations do not need to be included.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
C5.	Has this stationary source <b>added or modified</b> equipment since the last ROP renewal that changes the PTE for hazardous air pollutants (HAPs) regulated by Section 112 of the federal Clean Air Act? If <u>Yes</u> , include potential emission calculations (or the PTI and/or ROP revision application numbers or other references for the PTE demonstration) for the added or modified equipment on an AI-001 Form. Fugitive emissions <u>must</u> be included in HAP emission calculations. If <u>No</u> , HAP potential emission calculations do not need to be included.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
C6.	Are any emission units subject to the Cross-State Air Pollution Rule (CSAPR)? If <u>Yes</u> , identify the specific emission unit(s) subject to CSAPR on an AI-001 Form.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
C7.	Are any emission units subject to the federal Acid Rain Program? If <u>Yes</u> , identify the specific emission unit(s) subject to the federal Acid Rain Program on an AI-001 Form. Is an Acid Rain Permit Renewal Application included with this application?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No
C8.	Are any emission units identified in the existing ROP subject to compliance assurance monitoring (CAM)? If <u>Yes</u> , identify the specific emission unit(s) subject to CAM on an AI-001 Form. If a CAM plan has not been previously submitted to EGLE, one must be included with the ROP renewal application on an AI-001 Form. If the CAM Plan has been updated, include an updated copy. Is a CAM plan included with this application? If a CAM Plan is included, check the type of proposed monitoring included in the Plan: 1. Monitoring proposed by the source based on performance of the control device, or 2. Presumptively Acceptable Monitoring, if eligible	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> <input type="checkbox"/>
C9.	Does the source have any plans such as a malfunction abatement plan, fugitive dust plan, operation/maintenance plan, or any other monitoring plan that is referenced in an existing ROP, Permit to Install requirement, or any other applicable requirement? If <u>Yes</u> , then a copy must be submitted as part of the ROP renewal application.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
C10.	Are there any specific requirements that the source proposes to be identified in the ROP as non-applicable? If <u>Yes</u> , then a description of the requirement and justification must be submitted as part of the ROP renewal application on an AI-001 Form.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<input checked="" type="checkbox"/>	Check here if an AI-001 Form is attached to provide more information for Part C. Enter AI-001 Form ID: <b>AI- 001</b>	

**PART D: PERMIT TO INSTALL (PTI) EXEMPT EMISSION UNIT INFORMATION**

Review all emission units at the source and answer the question below.

D1. Does the source have any emission units that do not appear in the existing ROP but are required to be listed in the ROP application under R 336.1212(4) (Rule 212(4)) of the Michigan Air Pollution Control Rules? If Yes, identify the emission units in the table below.

 Yes  No

If No, go to Part E.

*Note: Emission units that are subject to process specific emission limitations or standards, even if identified in Rule 212, must be captured in either Part G or H of this application form. Identical emission units may be grouped (e.g. PTI exempt Storage Tanks).*

Emission Unit ID	Emission Unit Description	Rule 212(4) Citation [e.g. Rule 212(4)(c)]	Rule 201 Exemption Rule Citation [e.g. Rule 282(2)(b)(i)]
EUNGHEATERS	All natural gas fired space heaters, 23 natural gas fired heaters		282(bi)
EUPROPANEHEATERS	LP fired heaters		282(bi)
EUHTR.GAS.D2RN	North Rupp Heater T2 Dryer		282(bi)
EUHTR.GAS.D2RS	South Rupp Heater T2 Dryer		282(bi)
EUEMERGENCYGENS	Diesel fired emergency generators		285(g)
EUGEN.BOOST.PH	Propane generator tailings line booster pumphouse		285(g)
EUFUELOILTANK	1,500,000 Gallon Fuel Oil Tank		284(d)
EUPITBOILER	Pit service building boiler 6.84 million BTU/hour, fired with #2 fuel oil		282(bii)
EUPROPANETANKS	LP storage tanks, 14 tanks, 1000 Gallons each		284(b)
EUGASOLINEDISP	Gasoline dispensing facility, equipped with Rule 703 submerged fill tube		284(gi)
EUDIESELTKS	Diesel fuel storage tanks		284(d)

Comments:

Check here if an AI-001 Form is attached to provide more information for Part D. Enter AI-001 Form ID: **AI-**

**PART E: EXISTING ROP INFORMATION**

Review all emission units and applicable requirements (including any source wide requirements) in the existing ROP and answer the questions below as they pertain to all emission units and all applicable requirements in the existing ROP.

<p>E1. Does the source propose to make any additions, changes or deletions to terms, conditions and underlying applicable requirements as they appear in the existing ROP? If <u>Yes</u>, identify changes and additions on Part F, Part G and/or Part H.</p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>E2. For each emission unit(s) identified in the existing ROP, <u>all</u> stacks with applicable requirements are to be reported in MAERS. Are there any stacks with applicable requirements for emission unit(s) identified in the existing ROP that were <u>not</u> reported in the most recent MAERS reporting year? If <u>Yes</u>, identify the stack(s) that was/were not reported on applicable MAERS form(s).</p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>
<p>E3. Have any emission units identified in the existing ROP been modified or reconstructed that required a PTI? If <u>Yes</u>, complete Part F with the appropriate information.</p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>
<p>E4. Have any emission units identified in the existing ROP been dismantled? If <u>Yes</u>, identify the emission unit(s) and the dismantle date in the comment area below or on an AI-001 Form.</p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>
<p>Comments:</p>	
<p><input type="checkbox"/> Check here if an AI-001 Form is attached to provide more information for Part E. Enter AI-001 Form ID: <b>AI-</b></p>	



**PART F: PERMIT TO INSTALL (PTI) INFORMATION**

Review all emission units and applicable requirements at the source and answer the following questions as they pertain to all emission units with PTIs. Any PTI(s) identified below must be attached to the application.

F1. Has the source obtained any PTIs where the applicable requirements from the PTI have not been incorporated into the existing ROP? If Yes, complete the following table.  Yes  No  
 If No, go to Part G.

Permit to Install Number	Emission Units/Flexible Group ID(s)	Description (Include Process Equipment, Control Devices and Monitoring Devices)	Date Emission Unit was Installed/ Modified/ Reconstructed
76-20	FGTACONITEMACT	The permittee shall operate FGTACONITEMACT consistent with the Operation and Maintenance Plan (O&M Plan) Wet Scrubber and ESP Monitoring and Response Plan, for operation of the wet scrubbers and electrostatic precipitators (ESPs) in compliance with the Taconite MACT (40 CFR Part 63 Subpart RRRRR), Updates and revisions to the O&M plan shall not require permit amendments. (R 336.1331, R 336.1910, R 336.1911, EPA Consent Decree, Civil Action No. 2:19-cv-095, Act 451 324.5503(b))	05/09/2019

F2. Do any of the PTIs listed above change, add, or delete terms/conditions to **established emission units** in the existing ROP? If Yes, identify the emission unit(s) or flexible group(s) affected in the comments area below or on an AI-001 Form and identify all changes, additions, and deletions in a mark-up of the existing ROP.  Yes  No

F3. Do any of the PTIs listed above identify **new emission units** that need to be incorporated into the ROP? If Yes, submit the PTIs as part of the ROP renewal application on an AI-001 Form, and include the new emission unit(s) or flexible group(s) in the mark-up of the existing ROP.  Yes  No

F4. Are there any stacks with applicable requirements for emission unit(s) identified in the PTIs listed above that were not reported in MAERS for the most recent emissions reporting year? If Yes, identify the stack(s) that were not reported on the applicable MAERS form(s).  Yes  No

F5. Are there any proposed administrative changes to any of the emission unit names, descriptions or control devices in the PTIs listed above for any emission units not already incorporated into the ROP? If Yes, describe the changes on an AI-001 Form.  Yes  No

Comments:  
 F1: F2: PTI 76-20 Included:  
 FGTACONITEMACT:  
 III. PROCESS/OPERATIONAL RESTRICTION(S)  
 6. The permittee shall operate FGTACONITEMACT consistent with the Operation and Maintenance Plan (O&M Plan) Wet Scrubber and ESP Monitoring and Response Plan, for operation of the wet scrubbers and electrostatic precipitators (ESPs) in compliance with the Taconite MACT (40 CFR Part 63 Subpart RRRRR), Updates and revisions to the O&M plan shall not require permit amendments. (R 336.1331, R 336.1910, R 336.1911, EPA Consent Decree, Civil Action No. 2:19-cv-095, Act 451 324.5503(b))

Check here if an AI-001 Form is attached to provide more information for Part F. Enter AI-001 Form ID: **AI-**

**PART G: EMISSION UNITS MEETING THE CRITERIA OF RULES 281(2)(h), 285(2)(r)(iv), 287(2)(c), OR 290**

Review all emission units and applicable requirements at the source and answer the following questions.

G1. Does the source have any new and/or existing emission units which do not already appear in the existing ROP and which meet the criteria of Rules 281(2)(h), 285(2)(r)(iv), 287(2)(c), or 290.

If Yes, identify the emission units in the table below. If No, go to Part H.

Yes  No

*Note: If several emission units were installed under the same rule above, provide a description of each and an installation/modification/reconstruction date for each.*

<b>Origin of Applicable Requirements</b>	<b>Emission Unit Description – Provide Emission Unit ID and a description of Process Equipment, Control Devices and Monitoring Devices</b>	<b>Date Emission Unit was Installed/ Modified/ Reconstructed</b>
<input type="checkbox"/> Rule 281(2)(h) or 285(2)(r)(iv) cleaning operation		
<input type="checkbox"/> Rule 287(2)(c) surface coating line		
<input type="checkbox"/> Rule 290 process with limited emissions		

Comments:

Check here if an AI-001 Form is attached to provide more information for Part G. Enter AI-001 Form ID: **AI-**

**PART H: REQUIREMENTS FOR ADDITION OR CHANGE**

Complete this part of the application form for all proposed additions, changes or deletions to the existing ROP. This includes state or federal regulations that the source is subject to and that must be incorporated into the ROP or other proposed changes to the existing ROP. **Do not include additions or changes that have already been identified in Parts F or G of this application form.** If additional space is needed copy and complete an additional Part H.

Complete a separate Part H for each emission unit with proposed additions and/or changes.

H1. Are there changes that need to be incorporated into the ROP that have not been identified in Parts F and G? If <u>Yes</u> , answer the questions below.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
H2. Are there any proposed administrative changes to any of the existing emission unit names, descriptions or control devices in the ROP? If <u>Yes</u> , describe the changes in questions H8 – H16 below and in the affected Emission Unit Table(s) in the mark-up of the ROP.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
H3. Does the source propose to add a new emission unit or flexible group to the ROP not previously identified in Parts F or G? If <u>Yes</u> , identify and describe the emission unit name, process description, control device(s), monitoring device(s) and applicable requirements in questions H8 – H16 below and in a new Emission Unit Table in the mark-up of the ROP. See instructions on how to incorporate a new emission unit/flexible group into the ROP.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
H4. Does the source propose to add new state or federal regulations to the existing ROP? If <u>Yes</u> , on an AI-001 Form, identify each emission unit/flexible group that the new regulation applies to and identify <u>each</u> state or federal regulation that should be added. Also, describe the new requirements in questions H8 – H16 below and add the specific requirements to existing emission units/flexible groups in the mark-up of the ROP, create a new Emission Unit/Flexible Group Table, or add an AQD template table for the specific state or federal requirement.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
H5. Has a Consent Order/Consent Judgment (CO/CJ) been issued where the requirements were not incorporated into the existing ROP? If <u>Yes</u> , list the CO/CJ number(s) below and add or change the conditions and underlying applicable requirements in the appropriate Emission Unit/Flexible Group Tables in the mark-up of the ROP.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
H6. Does the source propose to add, change and/or delete <b>source-wide</b> requirements? If <u>Yes</u> , identify the addition/change/deletion in a mark-up of the corresponding section of the ROP and provide a justification below.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
H7. Are you proposing to <b>streamline</b> any requirements? If <u>Yes</u> , identify the streamlined and subsumed requirements and the EU ID, and provide a justification for streamlining the applicable requirement below.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

**PART H: REQUIREMENTS FOR ADDITION OR CHANGE – (continued)**

H8. Does the source propose to add, change and/or delete **emission limit** requirements? If Yes, identify the addition/change/deletion in a mark-up of the corresponding section of the ROP and provide a justification below.  Yes  No

Eliminate Used Oil fuel and associated emission limits, monitoring and recordkeeping from emissions units EUKILN1, EUKILN2, EUBOILER1, and EUBOILER3. Eliminate the associated 1.5 Million Gallon Used Oil Tank.

H9. Does the source propose to add, change and/or delete **material limit** requirements? If Yes, identify the addition/change/deletion in a mark-up of the corresponding section of the ROP and provide a justification below.  Yes  No

Eliminate Used Oil fuel and associated emission limits, monitoring and recordkeeping from emissions units EUKILN1, EUKILN2, EUBOILER1, and EUBOILER3. Eliminate the associated 1.5 Million Gallon Used Oil Tank.

H10. Does the source propose to add, change and/or delete **process/operational restriction** requirements? If Yes, identify the addition/change/deletion in a mark-up of the corresponding section of the ROP and provide a justification below.  Yes  No

Eliminate Used Oil fuel and associated emission limits, monitoring and recordkeeping from emissions units EUKILN1, EUKILN2, EUBOILER1, and EUBOILER3. Eliminate the associated 1.5 Million Gallon Used Oil Tank. EUOREDRIYER1 and EUOREDRIYER2 will continue to be supplied used oil from the existing 15,000 Gallon Tank.

H11. Does the source propose to add, change and/or delete **design/equipment parameter** requirements? If Yes, identify the addition/change/deletion in a mark-up of the corresponding section of the ROP and provide a justification below.  Yes  No

H12. Does the source propose to add, change and/or delete **testing/sampling** requirements? If Yes, identify the addition/change/deletion in a mark-up of the corresponding section of the ROP and provide a justification below.  Yes  No

H13. Does the source propose to add, change and/or delete **monitoring/recordkeeping** requirements? If Yes, identify the addition/change/deletion in a mark-up of the corresponding section of the ROP and provide a justification below.  Yes  No

Eliminate Used Oil fuel and associated emission limits, monitoring and recordkeeping from emissions units EUKILN1, EUKILN2, EUBOILER1, and EUBOILER3. Eliminate the associated 1.5 Million Gallon Used Oil Tank.

H14. Does the source propose to add, change and/or delete **reporting** requirements? If Yes, identify the addition/change/deletion in a mark-up of the corresponding section of the ROP and provide a justification below.  Yes  No

**PART H: REQUIREMENTS FOR ADDITION OR CHANGE – (continued)**

H15. Does the source propose to add, change and/or delete **stack/vent restrictions**? If Yes, identify the addition/change/deletion in a mark-up of the corresponding section of the ROP and provide a justification below.  Yes  No

H16. Does the source propose to add, change and/or delete any **other** requirements? If Yes, identify the addition/change/deletion in a mark-up of the corresponding section of the ROP and provide a justification below.  Yes  No

H17. Does the source propose to add terms and conditions for an alternative operating scenario or intra-facility trading of emissions? If Yes, identify the proposed conditions in a mark-up of the corresponding section of the ROP and provide a justification below.  Yes  No

Check here if an AI-001 Form is attached to provide more information for Part H. Enter AI-001 Form ID: **AI-**



## RENEWABLE OPERATING PERMIT APPLICATION AI-001: ADDITIONAL INFORMATION

This information is required by Article II, Chapter 1, part 55 (Air Pollution Control) of P.A. 451 of 1994, as amended, and the Federal Clean Air Act of 1990. Failure to obtain a permit required by Part 55 may result in penalties and/or imprisonment. Please type or print clearly. Refer to instructions for additional information to complete this form.

SRN: B4885

Section Number (if applicable):

1. Additional Information ID  
**AI- 001**

### Additional Information

2. Is This Information Confidential?  Yes  No

**C8:** Emission units identified in the existing ROP subject to compliance assurance monitoring (CAM)

FGDUSTCOLLECTORS: EU-CONV14-15-16  
 EU-CONV15.8-15.9; EU-CONV15.9-16.1  
 EU-CONV16.1-17.1; EU-CONV17.1-17.2  
 EU-CONV19 & 19A-17; EU-CONV13-17.1  
 EU-CONV15-15.1; EU-CONVEYOR1  
 EU-CONVEYOR12A-13; EU-CONVEYOR12B-13  
 EU-CONVEYOR4A-4A1; EU-CONVEYOR4B-4C  
 EU-CONVEYOR4C-4D  
 EU-FEEDMIXER1; EU-FEEDMIXER2  
 EU-PRIMARYCRUSHER; EU-SCREENSRECLAIM  
 EU-COOLER1 ; EU-COOLER2  
 EU-TRANSFERTOWER1; EU-TRANSFERTOWER2  
 EU-UNIT1LHF; EU-UNIT2LHF; EU-PROD CONV2

EUOREDRIYER1  
 EUOREDRIYER2  
 EUKILN1  
 EUKILN2

Updated CAM plans provided with ROP renewal application.

ROP Application Contents: Included Plans:

Compliance Assurance Monitoring Plan EUOREDRIYER1, EUOREDRIYER2, FGDUSTCOLLECTORS  
 Compliance Assurance Monitoring Plan EUKILN1, EUKILN2  
 MACT Startup, Shutdown, and Malfunction Plan  
 MACT Operation and Maintenance Plan  
 MACT Site-Specific Monitoring Plan for Continuous Parametric Monitoring Systems  
 MACT Fugitive Dust Control Plan  
 Wet Scrubber and ESP Monitoring and Response Plan (PTI 76-20)  
 Rule 801 NOx Control Plan  
 Predictive Emissions Monitoring System Quality Assurance Manual  
 Continuous Emissions Monitoring Systems Monitoring Plan EUKILN1  
 Continuous Emissions Monitoring Systems Quality Assurance Quality Control Plan EUKILN1

**MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY  
AIR QUALITY DIVISION**

EFFECTIVE DATE: July 10, 2017  
REVISION DATES: August 14, 2018, April 9, 2020

ISSUED TO

**Tilden Mining Company L.C.**

State Registration Number (SRN): B4885

LOCATED AT

1 Tilden Mine Road, Ishpeming, Marquette County, Michigan 49849

**RENEWABLE OPERATING PERMIT**

Permit Number: MI-ROP-B4885-2017b

Expiration Date: July 10, 2022

Administratively Complete ROP Renewal Application Due Between  
January 10, 2021 and January 10, 2022

This Renewable Operating Permit (ROP) is issued in accordance with and subject to Section 5506(3) of Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451). Pursuant to Michigan Air Pollution Control Rule 210(1), this ROP constitutes the permittee's authority to operate the stationary source identified above in accordance with the general conditions, special conditions and attachments contained herein. Operation of the stationary source and all emission units listed in the permit are subject to all applicable future or amended rules and regulations pursuant to Act 451 and the federal Clean Air Act.

**SOURCE-WIDE PERMIT TO INSTALL**

Permit Number: MI-PTI-B4885-2017b

This Permit to Install (PTI) is issued in accordance with and subject to Section 5505(5) of Act 451. Pursuant to Michigan Air Pollution Control Rule 214a, the terms and conditions herein, identified by the underlying applicable requirement citation of Rule 201(1)(a), constitute a federally enforceable PTI. The PTI terms and conditions do not expire and remain in effect unless the criteria of Rule 201(6) are met. Operation of all emission units identified in the PTI is subject to all applicable future or amended rules and regulations pursuant to Act 451 and the federal Clean Air Act.

Michigan Department of Environment, Great Lakes, and Energy

\_\_\_\_\_  
Ed Lancaster, Marquette District Supervisor

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## AUTHORITY AND ENFORCEABILITY

For the purpose of this permit, the **permittee** is defined as any person who owns or operates an emission unit at a stationary source for which this permit has been issued. The **department** is defined in Rule 104(d) as the Director of the Michigan Department of Environment, Great Lakes, and Energy (EGLE) or his or her designee.

The permittee shall comply with all specific details in the permit terms and conditions and the cited underlying applicable requirements. All terms and conditions in this ROP are both federally enforceable and state enforceable unless otherwise footnoted. Certain terms and conditions are applicable to most stationary sources for which an ROP has been issued. These general conditions are included in Part A of this ROP. Other terms and conditions may apply to a specific emission unit, several emission units which are represented as a flexible group, or the entire stationary source which is represented as a Source-Wide group. Special conditions are identified in Parts B, C, D and/or the appendices.

In accordance with Rule 213(2)(a), all underlying applicable requirements are identified for each ROP term or condition. All terms and conditions that are included in a PTI, are streamlined, subsumed and/or are state-only enforceable will be noted as such.

In accordance with Section 5507 of Act 451, the permittee has included in the ROP application a compliance certification, a schedule of compliance, and a compliance plan. For applicable requirements with which the source is in compliance, the source will continue to comply with these requirements. For applicable requirements with which the source is not in compliance, the source will comply with the detailed schedule of compliance requirements that are incorporated as an appendix in this ROP. Furthermore, for any applicable requirements effective after the date of issuance of this ROP, the stationary source will meet the requirements on a timely basis, unless the underlying applicable requirement requires a more detailed schedule of compliance.

Issuance of this permit does not obviate the necessity of obtaining such permits or approvals from other units of government as required by law.

## A. GENERAL CONDITIONS

### Permit Enforceability

- All conditions in this permit are both federally enforceable and state enforceable unless otherwise noted. **(R 336.1213(5))**
- Those conditions that are hereby incorporated in a state-only enforceable Source-Wide PTI pursuant to Rule 201(2)(d) are designated by footnote one. **(R 336.1213(5)(a), R 336.1214a(5))**
- Those conditions that are hereby incorporated in a federally enforceable Source-Wide PTI pursuant to Rule 201(2)(c) are designated by footnote two. **(R 336.1213(5)(b), R 336.1214a(3))**

### General Provisions

1. The permittee shall comply with all conditions of this ROP. Any ROP noncompliance constitutes a violation of Act 451, and is grounds for enforcement action, for ROP revocation or revision, or for denial of the renewal of the ROP. All terms and conditions of this ROP that are designated as federally enforceable are enforceable by the Administrator of the United States Environmental Protection Agency (USEPA) and by citizens under the provisions of the federal Clean Air Act (CAA). Any terms and conditions based on applicable requirements which are designated as "state-only" are not enforceable by the USEPA or citizens pursuant to the CAA. **(R 336.1213(1)(a))**
2. It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this ROP. **(R 336.1213(1)(b))**
3. This ROP may be modified, revised, or revoked for cause. The filing of a request by the permittee for a permit modification, revision, or termination, or a notification of planned changes or anticipated noncompliance does not stay any ROP term or condition. This does not supersede or affect the ability of the permittee to make changes, at the permittee's own risk, pursuant to Rule 215 and Rule 216. **(R 336.1213(1)(c))**
4. The permittee shall allow the department, or an authorized representative of the department, upon presentation of credentials and other documents as may be required by law and upon stating the authority for and purpose of the investigation, to perform any of the following activities **(R 336.1213(1)(d))**:
  - a. Enter, at reasonable times, a stationary source or other premises where emissions-related activity is conducted or where records must be kept under the conditions of the ROP.
  - b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of the ROP.
  - c. Inspect, at reasonable times, any of the following:
    - i. Any stationary source.
    - ii. Any emission unit.
    - iii. Any equipment, including monitoring and air pollution control equipment.
    - iv. Any work practices or operations regulated or required under the ROP.
  - d. As authorized by Section 5526 of Act 451, sample or monitor at reasonable times substances or parameters for the purpose of assuring compliance with the ROP or applicable requirements.
5. The permittee shall furnish to the department, within a reasonable time, any information the department may request, in writing, to determine whether cause exists for modifying, revising, or revoking the ROP or to determine compliance with this ROP. Upon request, the permittee shall also furnish to the department copies of any records that are required to be kept as a term or condition of this ROP. For information which is claimed by the permittee to be confidential, consistent with the requirements of the 1976 PA 442, MCL 40 CFR15.231 et seq., and known as the Freedom of Information Act, the person may also be required to furnish the records directly to the USEPA together with a claim of confidentiality. **(R 336.1213(1)(e))**

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6. A challenge by any person, the Administrator of the USEPA, or the department to a particular condition or a part of this ROP shall not set aside, delay, stay, or in any way affect the applicability or enforceability of any other condition or part of this ROP. **(R 336.1213(1)(f))**
7. The permittee shall pay fees consistent with the fee schedule and requirements pursuant to Section 5522 of Act 451. **(R 336.1213(1)(g))**
8. This ROP does not convey any property rights or any exclusive privilege. **(R 336.1213(1)(h))**

### Equipment & Design

9. Any collected air contaminants shall be removed as necessary to maintain the equipment at the required operating efficiency. The collection and disposal of air contaminants shall be performed in a manner so as to minimize the introduction of contaminants to the outer air. Transport of collected air contaminants in Priority I and II areas requires the use of material handling methods specified in Rule 370(2).<sup>2</sup> **(R 336.1370)**
10. Any air cleaning device shall be installed, maintained, and operated in a satisfactory manner and in accordance with the Michigan Air Pollution Control rules and existing law. **(R 336.1910)**

### Emission Limits

11. Unless otherwise specified in this ROP, the permittee shall comply with Rule 301, which states, in part, "Except as provided in subrules 2, 3, and 4 of this rule, a person shall not cause or permit to be discharged into the outer air from a process or process equipment a visible emission of a density greater than the most stringent of the following:"<sup>2</sup> **(R 336.1301(1))**
  - a. A 6-minute average of 20 % opacity, except for one 6-minute average per hour of not more than 27 % opacity.
  - b. A limit specified by an applicable federal new source performance standard.

The grading of visible emissions shall be determined in accordance with Rule 303.
12. The permittee shall not cause or permit the emission of an air contaminant or water vapor in quantities that cause, alone or in reaction with other air contaminants, either of the following:
  - a. Injurious effects to human health or safety, animal life, plant life of significant economic value, or property.<sup>1</sup> **(R 336.1901(a))**
  - b. Unreasonable interference with the comfortable enjoyment of life and property.<sup>1</sup> **(R 336.1901(b))**

### Testing/Sampling

13. The department may require the owner or operator of any source of an air contaminant to conduct acceptable performance tests, at the owner's or operator's expense, in accordance with Rule 1001 and Rule 1003, under any of the conditions listed in Rule 1001(1).<sup>2</sup> **(R 336.2001)**
14. Any required performance testing shall be conducted in accordance with Rule 1001(2), Rule 1001(3) and Rule 1003. **(R 336.2001(2), R 336.2001(3), R 336.2003(1))**
15. Any required test results shall be submitted to the Air Quality Division (AQD) in the format prescribed by the applicable reference test method within 60 days following the last date of the test. **(R 336.2001(5))**

### Monitoring/Recordkeeping

16. Records of any periodic emission or parametric monitoring required in this ROP shall include the following information specified in Rule 213(3)(b)(i), where appropriate. **(R 336.1213(3)(b))**
  - a. The date, location, time, and method of sampling or measurements.
  - b. The dates the analyses of the samples were performed.
  - c. The company or entity that performed the analyses of the samples.
  - d. The analytical techniques or methods used.
  - e. The results of the analyses.
  - f. The related process operating conditions or parameters that existed at the time of sampling or measurement.
17. All required monitoring data, support information and all reports, including reports of all instances of deviation from permit requirements, shall be kept and furnished to the department upon request for a period of not less than 5 years from the date of the monitoring sample, measurement, report or application. Support information includes all calibration and maintenance records and all original strip-chart recordings, or other original data records, for continuous monitoring instrumentation and copies of all reports required by the ROP. **(R 336.1213(1)(e), R 336.1213(3)(b)(ii))**

### Certification & Reporting

18. Except for the alternate certification schedule provided in Rule 213(3)(c)(iii)(B), any document required to be submitted to the department as a term or condition of this ROP shall contain an original certification by a Responsible Official which states that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete. **(R 336.1213(3)(c))**
19. A Responsible Official shall certify to the appropriate AQD District Office and to the USEPA that the stationary source is and has been in compliance with all terms and conditions contained in the ROP except for deviations that have been or are being reported to the appropriate AQD District Office pursuant to Rule 213(3)(c). This certification shall include all the information specified in Rule 213(4)(c)(i) through (v) and shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the certification are true, accurate, and complete. The USEPA address is: USEPA, Air Compliance Data - Michigan, Air and Radiation Division, 77 West Jackson Boulevard, Chicago, Illinois 60604. **(R 336.1213(4)(c))**
20. The certification of compliance shall be submitted annually for the term of this ROP as detailed in the special conditions, or more frequently if specified in an applicable requirement or in this ROP. **(R 336.1213(4)(c))**
21. The permittee shall promptly report any deviations from ROP requirements and certify the reports. The prompt reporting of deviations from ROP requirements is defined in Rule 213(3)(c)(ii) as follows, unless otherwise described in this ROP. **(R 336.1213(3)(c))**
  - a. For deviations that exceed the emissions allowed under the ROP, prompt reporting means reporting consistent with the requirements of Rule 912 as detailed in Condition 25. All reports submitted pursuant to this paragraph shall be promptly certified as specified in Rule 213(3)(c)(iii).
  - b. For deviations which exceed the emissions allowed under the ROP and which are not reported pursuant to Rule 912 due to the duration of the deviation, prompt reporting means the reporting of all deviations in the semiannual reports required by Rule 213(3)(c)(i). The report shall describe reasons for each deviation and the actions taken to minimize or correct each deviation.
  - c. For deviations that do not exceed the emissions allowed under the ROP, prompt reporting means the reporting of all deviations in the semiannual reports required by Rule 213(3)(c)(i). The report shall describe the reasons for each deviation and the actions taken to minimize or correct each deviation.

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22. For reports required pursuant to Rule 213(3)(c)(ii), prompt certification of the reports is described in Rule 213(3)(c)(iii) as either of the following **(R 336.1213(3)(c))**:
- Submitting a certification by a Responsible Official with each report which states that, based on information and belief formed after reasonable inquiry, the statements and information in the report are true, accurate, and complete.
  - Submitting, within 30 days following the end of a calendar month during which one or more prompt reports of deviations from the emissions allowed under the ROP were submitted to the department pursuant to Rule 213(3)(c)(ii), a certification by a Responsible Official which states that, "based on information and belief formed after reasonable inquiry, the statements and information contained in each of the reports submitted during the previous month were true, accurate, and complete". The certification shall include a listing of the reports that are being certified. Any report submitted pursuant to Rule 213(3)(c)(ii) that will be certified on a monthly basis pursuant to this paragraph shall include a statement that certification of the report will be provided within 30 days following the end of the calendar month.
23. Semiannually for the term of the ROP as detailed in the special conditions, or more frequently if specified, the permittee shall submit certified reports of any required monitoring to the appropriate AQD District Office. All instances of deviations from ROP requirements during the reporting period shall be clearly identified in the reports. **(R 336.1213(3)(c)(i))**
24. On an annual basis, the permittee shall report the actual emissions, or the information necessary to determine the actual emissions, of each regulated air pollutant as defined in Rule 212(6) for each emission unit utilizing the emissions inventory forms provided by the department. **(R 336.1212(6))**
25. The permittee shall provide notice of an abnormal condition, start-up, shutdown, or malfunction that results in emissions of a hazardous or toxic air pollutant which continue for more than one hour in excess of any applicable standard or limitation, or emissions of any air contaminant continuing for more than two hours in excess of an applicable standard or limitation, as required in Rule 912, to the appropriate AQD District Office. The notice shall be provided not later than two business days after the start-up, shutdown, or discovery of the abnormal conditions or malfunction. Notice shall be by any reasonable means, including electronic, telephonic, or oral communication. Written reports, if required under Rule 912, must be submitted to the appropriate AQD District Supervisor within 10 days after the start-up or shutdown occurred, within 10 days after the abnormal conditions or malfunction has been corrected, or within 30 days of discovery of the abnormal conditions or malfunction, whichever is first. The written reports shall include all of the information required in Rule 912(5) and shall be certified by a Responsible Official in a manner consistent with the CAA.<sup>2</sup> **(R 336.1912)**

## Permit Shield

26. Compliance with the conditions of the ROP shall be considered compliance with any applicable requirements as of the date of ROP issuance, if either of the following provisions is satisfied. **(R 336.1213(6)(a)(i), R 336.1213(6)(a)(ii))**
- The applicable requirements are included and are specifically identified in the ROP.
  - The permit includes a determination or concise summary of the determination by the department that other specifically identified requirements are not applicable to the stationary source.
- Any requirements identified in Part E of this ROP have been identified as non-applicable to this ROP and are included in the permit shield.
27. Nothing in this ROP shall alter or affect any of the following:
- The provisions of Section 303 of the CAA, emergency orders, including the authority of the USEPA under Section 303 of the CAA. **(R 336.1213(6)(b)(i))**
  - The liability of the owner or operator of this source for any violation of applicable requirements prior to or at the time of this ROP issuance. **(R 336.1213(6)(b)(ii))**
  - The applicable requirements of the acid rain program, consistent with Section 408(a) of the CAA. **(R 336.1213(6)(b)(iii))**

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- d. The ability of the USEPA to obtain information from a source pursuant to Section 114 of the CAA. **(R 336.1213(6)(b)(iv))**
28. The permit shield shall not apply to provisions incorporated into this ROP through procedures for any of the following:
- a. Operational flexibility changes made pursuant to Rule 215. **(R 336.1215(5))**
  - b. Administrative Amendments made pursuant to Rule 216(1)(a)(i)-(iv). **(R 336.1216(1)(b)(iii))**
  - c. Administrative Amendments made pursuant to Rule 216(1)(a)(v) until the amendment has been approved by the department. **(R 336.1216(1)(c)(iii))**
  - d. Minor Permit Modifications made pursuant to Rule 216(2). **(R 336.1216(2)(f))**
  - e. State-Only Modifications made pursuant to Rule 216(4) until the changes have been approved by the department. **(R 336.1216(4)(e))**
29. Expiration of this ROP results in the loss of the permit shield. If a timely and administratively complete application for renewal is submitted not more than 18 months, but not less than 6 months, before the expiration date of the ROP, but the department fails to take final action before the end of the ROP term, the existing ROP does not expire until the renewal is issued or denied, and the permit shield shall extend beyond the original ROP term until the department takes final action. **(R 336.1217(1)(c), R 336.1217(1)(a))**

#### Revisions

- 30. For changes to any process or process equipment covered by this ROP that do not require a revision of the ROP pursuant to Rule 216, the permittee must comply with Rule 215. **(R 336.1215, R 336.1216)**
- 31. A change in ownership or operational control of a stationary source covered by this ROP shall be made pursuant to Rule 216(1). **(R 336.1219(2))**
- 32. For revisions to this ROP, an administratively complete application shall be considered timely if it is received by the department in accordance with the time frames specified in Rule 216. **(R 336.1210(10))**
- 33. Pursuant to Rule 216(1)(b)(iii), Rule 216(2)(d) and Rule 216(4)(d), after a change has been made, and until the department takes final action, the permittee shall comply with both the applicable requirements governing the change and the ROP terms and conditions proposed in the application for the modification. During this time period, the permittee may choose to not comply with the existing ROP terms and conditions that the application seeks to change. However, if the permittee fails to comply with the ROP terms and conditions proposed in the application during this time period, the terms and conditions in the ROP are enforceable. **(R 336.1216(1)(c)(iii), R 336.1216(2)(d), R 336.1216(4)(d))**

#### Reopenings

- 34. A ROP shall be reopened by the department prior to the expiration date and revised by the department under any of the following circumstances:
  - a. If additional requirements become applicable to this stationary source with three or more years remaining in the term of the ROP, but not if the effective date of the new applicable requirement is later than the ROP expiration date. **(R 336.1217(2)(a)(i))**
  - b. If additional requirements pursuant to Title IV of the CAA become applicable to this stationary source. **(R 336.1217(2)(a)(ii))**
  - c. If the department determines that the ROP contains a material mistake, information required by any applicable requirement was omitted, or inaccurate statements were made in establishing emission limits or the terms or conditions of the ROP. **(R 336.1217(2)(a)(iii))**
  - d. If the department determines that the ROP must be revised to ensure compliance with the applicable requirements. **(R 336.1217(2)(a)(iv))**

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## Renewals

35. For renewal of this ROP, an administratively complete application shall be considered timely if it is received by the department not more than 18 months, but not less than 6 months, before the expiration date of the ROP. **(R 336.1210(8))**

## Stratospheric Ozone Protection

36. If the permittee is subject to Title 40 of the Code of Federal Regulations (CFR), Part 82 and services, maintains, or repairs appliances except for motor vehicle air conditioners (MVAC), or disposes of appliances containing refrigerant, including MVAC and small appliances, or if the permittee is a refrigerant reclaimer, appliance owner or a manufacturer of appliances or recycling and recovery equipment, the permittee shall comply with all applicable standards for recycling and emissions reduction pursuant to 40 CFR Part 82, Subpart F.
37. If the permittee is subject to 40 CFR Part 82, and performs a service on motor (fleet) vehicles when this service involves refrigerant in the MVAC, the permittee is subject to all the applicable requirements as specified in 40 CFR Part 82, Subpart B, Servicing of Motor Vehicle Air Conditioners. The term "motor vehicle" as used in Subpart B does not include a vehicle in which final assembly of the vehicle has not been completed by the original equipment manufacturer. The term MVAC as used in Subpart B does not include the air-tight sealed refrigeration system used for refrigerated cargo or an air conditioning system on passenger buses using Hydrochlorofluorocarbon-22 refrigerant.

## Risk Management Plan

38. If subject to Section 112(r) of the CAA and 40 CFR Part 68, the permittee shall register and submit to the USEPA the required data related to the risk management plan for reducing the probability of accidental releases of any regulated substances listed pursuant to Section 112(r)(3) of the CAA as amended in 40 CFR Part 68.130. The list of substances, threshold quantities, and accident prevention regulations promulgated under 40 CFR Part 68, do not limit in any way the general duty provisions under Section 112(r)(1).
39. If subject to Section 112(r) of the CAA and 40 CFR Part 68, the permittee shall comply with the requirements of 40 CFR Part 68, no later than the latest of the following dates as provided in 40 CFR 68.10(a):
- June 21, 1999,
  - Three years after the date on which a regulated substance is first listed under 40 CFR 68.130, or
  - The date on which a regulated substance is first present above a threshold quantity in a process.
40. If subject to Section 112(r) of the CAA and 40 CFR Part 68, the permittee shall submit any additional relevant information requested by any regulatory agency necessary to ensure compliance with the requirements of 40 CFR Part 68.
41. If subject to Section 112(r) of the CAA and 40 CFR Part 68, the permittee shall annually certify compliance with all applicable requirements of Section 112(r) as detailed in Rule 213(4)(c). **(40 CFR Part 68)**

## Emission Trading

42. Emission averaging and emission reduction credit trading are allowed pursuant to any applicable interstate or regional emission trading program that has been approved by the Administrator of the USEPA as a part of Michigan's State Implementation Plan. Such activities must comply with Rule 215 and Rule 216. **(R 336.1213(12))**

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#### Permit To Install (PTI)

43. The process or process equipment included in this permit shall not be reconstructed, relocated, or modified unless a PTI authorizing such action is issued by the department, except to the extent such action is exempt from the PTI requirements by any applicable rule.<sup>2</sup> **(R 336.1201(1))**
44. The department may, after notice and opportunity for a hearing, revoke PTI terms or conditions if evidence indicates the process or process equipment is not performing in accordance with the terms and conditions of the PTI or is violating the department's rules or the CAA.<sup>2</sup> **(R 336.1201(8), Section 5510 of Act 451)**
45. The terms and conditions of a PTI shall apply to any person or legal entity that now or hereafter owns or operates the process or process equipment at the location authorized by the PTI. If a new owner or operator submits a written request to the department pursuant to Rule 219 and the department approves the request, this PTI will be amended to reflect the change of ownership or operational control. The request must include all of the information required by Subrules (1)(a), (b) and (c) of Rule 219. The written request shall be sent to the appropriate AQD District Supervisor, EGLE.<sup>2</sup> **(R 336.1219)**
46. If the installation, reconstruction, relocation, or modification of the equipment for which PTI terms and conditions have been approved has not commenced within 18 months of the original PTI issuance date, or has been interrupted for 18 months, the applicable terms and conditions from that PTI, as incorporated into the ROP, shall become void unless otherwise authorized by the department. Furthermore, the person to whom that PTI was issued, or the designated authorized agent, shall notify the department via the Supervisor, Permit Section, EGLE, AQD, P. O. Box 30260, Lansing, Michigan 48909, if it is decided not to pursue the installation, reconstruction, relocation, or modification of the equipment allowed by the terms and conditions from that PTI.<sup>2</sup> **(R 336.1201(4))**

#### **Footnotes:**

<sup>1</sup>This condition is state-only enforceable and was established pursuant to Rule 201(1)(b).

<sup>2</sup>This condition is federally enforceable and was established pursuant to Rule 201(1)(a).



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## **B. SOURCE-WIDE CONDITIONS**

Part B outlines the Source-Wide Terms and Conditions that apply to this stationary source. The permittee is subject to these special conditions for the stationary source in addition to the general conditions in Part A and any other terms and conditions contained in this ROP.

The permittee shall comply with all specific details in the special conditions and the underlying applicable requirements cited. If a specific condition type does not apply to this source, NA (not applicable) has been used in the table. If there are no Source-Wide Conditions, this section will be left blank.

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### C. EMISSION UNIT CONDITIONS

Part C outlines terms and conditions that are specific to individual emission units listed in the Emission Unit Summary Table. The permittee is subject to the special conditions for each emission unit in addition to the General Conditions in Part A and any other terms and conditions contained in this ROP.

The permittee shall comply with all specific details in the special conditions and the underlying applicable requirements cited. If a specific condition type does not apply, NA (not applicable) has been used in the table. If there are no conditions specific to individual emission units, this section will be left blank.

#### EMISSION UNIT SUMMARY TABLE

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

Emission Unit ID	Emission Unit Description (Including Process Equipment & Control Device(s))	Installation Date/ Modification Date	Flexible Group ID
EU-CONV14-15-16	Transfer points from Conveyor 14 to 15 to 16, concentrator building, with wet scrubber	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-CONV15.8-15.9	Transfer point from Conveyor 15.8 to 15.9, pellet plant, with wet scrubber. <b>(PTI No. 731-80)</b>	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-CONV15.9-16.1	Transfer point from Conveyor 15.9 to 16.1, pellet plant, with wet scrubber. <b>(PTI No. 347-76)</b>	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-CONV16.1-17.1	Transfer point from Conveyor 16.1 to 17.1, concentrator building, with wet scrubber	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-CONV17.1-17.2	Transfer point from Conveyor 17.1 to 17.2, pellet plant, with wet scrubber. <b>(PTI No. 485-80)</b>	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-CONV19 & 19A-17	Transfer points from Conveyors 19 & 19A to 17 and screen, concentrator building, with wet scrubber	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-CONV13-17.1	Transfer point from Conveyor 13 to 17.1, concentrator building, with wet scrubber	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-CONV15-15.1	Transfer point from Conveyor 15 to 15.1, concentrator building, with wet scrubber	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-CONVEYOR1	Ore handling, transfer point from Conveyor 1 to 2, with wet scrubber	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-CONVEYOR12A-13	Transfer point from Conveyor 12A to 13, concentrator building, with wet scrubber	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-CONVEYOR12B-13	Transfer point from Conveyor 12B to 13, concentrator building, with wet scrubber. <b>(PTI No. 485-80)</b>	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-CONVEYOR4A-4A1	Transfer point from Conveyor 4A to 4A1, secondary crusher, with wet scrubber. <b>(PTI No. 279-86)</b>	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-CONVEYOR4B-4C	Transfer points from Conveyors 4B & 4B1 to 4C, at secondary crusher, with wet scrubber	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-CONVEYOR4C-4D	Transfer points from Conveyors 4C to 4D, secondary crusher, with wet scrubber. <b>(PTI No. 278-86)</b>	1975	FGDUSTCOLLECTORS FGTACONITEMACT

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Emission Unit ID	Emission Unit Description (Including Process Equipment & Control Device(s))	Installation Date/ Modification Date	Flexible Group ID
EU-FEEDMIXER1	Bentonite feeders and blender mixers for Tilden 1 (lines 1 to 7), pellet plant, with wet scrubber. <b>(PTI No. 354-75)</b>	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-FEEDMIXER2	Bentonite feeders and blender mixers for Tilden 2, (lines 8 to 14), pellet plant, with wet scrubber. <b>(PTI No. 354-75)</b>	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-PRIMARYCRUSHER	Primary Ore Crusher, with wet scrubber. <b>(PTI No. 275-72)</b>	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-SCREENSRECLAIM	Transfer points from Conveyor 19 to 19A to 19B & screen, concentrator building with wet scrubber	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-COOLER1	Tilden 1 Cooler Discharge Hopper and Finished Product Conveyors with wet scrubber. <b>(PTI No. 354-75)</b>	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-COOLER2	Tilden 2 Cooler Discharge Hopper and Finished Product Conveyor with wet scrubber. <b>(PTI No. 354-75)</b>	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-TRANSFERTOWER1	Tilden 1 Pellet Loadout with wet scrubber. <b>(PTI No. 616-82)</b>	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-TRANSFERTOWER2	Tilden 2 Pellet Loadout with wet scrubber <b>(PTI No. 616-82)</b>	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-UNIT1LHF	Tilden 1 Low Head Feeder with wet scrubber	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-UNIT2LHF	Tilden 2 Low Head Feeder with wet scrubber	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-PRODCONV2	Transfer points for finished product conveyors 31.4, 31.5, 31.6, and 31.7 with wet scrubber	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EUOREDRIYER1	Ore Concentrate Dryer 1 is rated at 400 tons per hour throughput and 70 million BTU per hour heat input. This dryer is fired with natural gas and used oil. The used oil is supplied only from the <del>1.5 million</del> <b>15,000</b> gallon storage tank which may contain used oil and virgin fuel oil. All oil burned from this tank is considered used oil. Concentrate Dryer 1 is controlled with a cyclone precleaner and a wet scrubber. <b>(PTI Nos. 511-87C and 148-12A)</b>	1974 1996	FGTACONITEMACT

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Emission Unit ID	Emission Unit Description (Including Process Equipment & Control Device(s))	Installation Date/ Modification Date	Flexible Group ID
EUOREDRYER2	Ore Concentrate Dryer 2 is rated at 800 tons per hour throughput and 125 million BTU per hour heat input. This dryer is fired with natural gas and used oil. The used oil is supplied only from the <del>1.5 million dryer 15,000</del> gallon storage tank which may contain used oil and virgin fuel oil. All oil burned from this tank is considered used oil. Concentrate Dryer 2 is controlled with two cyclone precleaners and two wet scrubbers. <b>(PTI No. 511-87C)</b>	1978 1996	FGTACONITEMACT
EUKILN1	Unit 1 Grate Kiln Indurating Furnace dries and preheats pellets on a traveling grate and then heats the pellets in a rotary kiln for final induration. Unit 1 main burners are rated at 590 million BTU per hour heat input. The Tilden facility produces hematite pellets and magnetite pellets. Unit 1 is fired with coal, <del>or</del> natural gas, <del>or used oil supplied from the 1.5 million gallon storage tank which may contain used oil and virgin fuel oil. All oil burned from this tank is considered used oil.</del> The unit is controlled with dry electrostatic precipitators. <b>(PTI Nos. 511-87C, 70-02 and 148-12A)</b>	1974 1996 2002	FGTACONITEMACT
EUKILN2	Unit 2 Grate Kiln Indurating Furnace dries and preheats pellets on a traveling grate and then heats the pellets in a rotary kiln for final induration. Unit 2 main burners are rated at 590 million BTU per hour heat input. The Tilden facility produces hematite pellets and magnetite pellets. Unit 2 is fired with coal, <del>or</del> natural gas, <del>or used oil supplied from the 1.5 million gallon storage tank which may contain used oil and virgin fuel oil. All oil burned from this tank is considered used oil.</del> The unit is controlled with dry electrostatic precipitators. <b>(PTI Nos. 511-87C, and 70-02)</b>	1978 1996 2002	FGTACONITEMACT
EUBOILER1	Boiler 1 is rated at 225 million BTU per hour heat input capacity and fired with natural gas <del>and used oil supplied from the 1.5 million gallon storage tank, which may contain used oil and virgin fuel oil. All oil burned from this tank is considered used oil.</del> <b>(PTI No. 202-16)</b>	1974 1996	NA
EUBOILER3	Boiler 3 is rated at 240 million BTU per hour heat input capacity and is fired with natural gas <del>and used oil supplied from the 1.5 million gallon storage tank which may contain used oil and virgin fuel oil. All oil burned from this tank is considered used oil.</del> <b>(PTI No. 511-87C)</b>	1978 1996	NA

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Emission Unit ID	Emission Unit Description (Including Process Equipment & Control Device(s))	Installation Date/ Modification Date	Flexible Group ID
EU-BOILER4	Boiler 4 is rated at 300 million BTU per hour (mmBTU/hr) heat input capacity and is fired with natural gas only. The boiler will be equipped with a low NOx burner.	May 2018	FGNESHAP5D
EU-BOILER6 EU-BOILER7	Kewaunee Boilers 6 and 7 are located at the Pit Service Building. Each boiler is rated at 19.46 million BTU per hour. The boilers are capable of burning natural gas, No. 2 fuel oil and/or used oil fuel. These emission units were originally permitted to Empire Mine Partnership. <b>(Permits to Install Nos. 436-97, 219-04)</b>	1980 1997	FGBOILERS6-7

**EUOREDRYER1  
 EMISSION UNIT CONDITIONS**

**DESCRIPTION**

Ore Concentrate Dryer #1 (EUOREDRYER1) is rated at 400 tons per hour throughput and 70 million BTU per hour heat input. EUOREDRYER1 is fired with natural gas and used oil. The used oil is supplied from the ~~dryer~~ ~~15.000~~ ~~4.5 million~~ gallon storage tank, which may contain used oil and virgin fuel oil. All oil burned from this tank is considered used oil. EUOREDRYER1 is controlled with a cyclone pre-cleaner and a wet scrubber. (PTI Nos. 511-87C and 148-12A)

Flexible Group ID: FGTAACONITE MACT

**POLLUTION CONTROL EQUIPMENT**

Cyclone pre-cleaner and a wet scrubber

**I. EMISSION LIMIT(S)**

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
1. Arsenic	0.0009 tpy <sup>1</sup>	12-month rolling time period/when firing used oil	EUOREDRYER1	SC VI.3 Appendix 7	R 336.1224
2. Cadmium	0.0009 tpy <sup>1</sup>	12-month rolling time period/when firing used oil	EUOREDRYER1	SC VI.3 Appendix 7	R 336.1224
3. Chromium (total)	0.0009 tpy <sup>1</sup>	12-month rolling time period/when firing used oil	EUOREDRYER1	Appendix 7	R 336.1224
4. Lead	0.00265 tpy <sup>2</sup>	12-month rolling time period/when firing used oil	EUOREDRYER1	SC VI.3 Appendix 7	40 CFR 52.21(d)
5. PM	0.10 lb./1000 lbs. of exhaust gases, calculated on a dry gas basis <sup>2</sup>	Test Protocol*	EUOREDRYER1	SC V.1.	R 336.1331

\* Test protocol shall specify averaging time.

**II. MATERIAL LIMIT(S)**

- The fuel sulfur content limit of no greater than 1.50% sulfur content by weight shall apply to fuel combusted in EUOREDRYER1. (40 CFR 52.1183(k)(2))
- The halogen content of the used oil burned in EUOREDRYER1 shall not exceed 1000 parts per million, by weight.<sup>1</sup> (R 336.1224)

**III. PROCESS/OPERATIONAL RESTRICTION(S)**

- The oil burned in EUOREDRYER1 shall be supplied only from the ~~4.5 million~~ ~~15,000~~ gallon used oil tank.<sup>2</sup> (R 336.1201(3))

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#### **IV. DESIGN/EQUIPMENT PARAMETER(S)**

1. The permittee shall equip each wet scrubber with at least one of the following:<sup>2</sup> **(R 336.1910)**
  - a. Operable water pressure gauge
  - b. Operable water flow meter
  - c. Viewport with pivoted cover or quick-release hatch
  - d. Scrubber drain with readily visible sump to verify scrubber water flow

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

Records shall be maintained on file for a period of five years. **(R 336.1213(3)(b)(ii))**

1. The permittee shall demonstrate compliance with the particulate matter emission limit in Special Condition (SC) I.5 for EUOREDRIYER1 by testing at owner's expense, in accordance with the requirements in 40 CFR 63.9621(c). Testing will be conducted at least once during the five-year permit term and once every five years thereafter.<sup>2</sup> **(R 336.1213(3), R 336.2001(3) and (4), 40 CFR 63.9621(c), 63.9630(d) and 63.9634(c)(2))**

#### **VI. MONITORING/RECORDKEEPING**

Records shall be maintained on file for a period of five years. **(R 336.1213(3)(b)(ii))**

1. The permittee shall keep a record of the gallons of used oil burned in EUOREDRIYER1 for each calendar month. The permittee shall submit these records with the semiannual reports.<sup>2</sup> **(R 336.1201(3))**
2. The permittee shall sample and perform analyses and keep monthly records of the density, total halogen content, sulfur content, arsenic content, cadmium content, chromium (total) content, and lead content of the used oil burned in EUOREDRIYER1, as detailed in Appendix 4. The permittee shall submit these records with the semiannual reports.<sup>2</sup> **(40 CFR 52.21(d))**
3. The permittee shall calculate the rolling 12-calendar month period emissions for arsenic, cadmium, chromium (total), and lead from EUOREDRIYER1 using the formula and procedure specified in Appendix 7. The permittee shall submit these calculations with the semiannual reports.<sup>2</sup> **(40 CFR 52.21(d))**
4. The permittee shall continuously measure pressure drop and scrubber liquid flow rate, using a Continuous Parameter Monitoring System (CPMS), and record every 15 minutes for a 24-hour average as an indicator of proper operation of the scrubber. **(40 CFR 64.6(c)(1)(i and ii))**
5. Upon detecting an excursion or exceedance, the owner or operator shall restore operation of EUOREDRIYER1 and its control equipment to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions. The response shall include minimizing the period of any startup, shutdown or malfunction and taking any necessary corrective actions to restore normal operation and prevent the likely recurrence of the cause of an excursion or exceedance (other than those caused by excused startup or shutdown conditions). **(40 CFR 64.7(d))**
6. Except for, as applicable, monitoring malfunctions, associated repairs, and required quality assurance or control activities (including, as applicable, calibration checks and required zero and span adjustments), the owner or operator shall conduct all monitoring in continuous operation (or shall collect data at all required intervals) at all times that the pollutant-specific emissions unit is operating. Data recorded during monitoring malfunctions, associated repairs, and required quality assurance or control activities shall not be used for purposes of this part, including data averages and calculations or fulfilling a minimum data availability requirement, if applicable. The owner or operator shall use all the data collected during all other periods in assessing the operation of the control device and associated control system. A monitoring malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring to provide valid data. Monitoring failures that are caused in part by poor maintenance or careless operation are not malfunctions. **(40 CFR 64.6(c)(3), 64.7(c))**
7. The permittee shall properly maintain the monitoring system, including keeping necessary parts for routine repair of the monitoring equipment. **(40 CFR 64.7(b))**

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8. The permittee shall maintain records of monitoring data, monitor performance data, corrective actions taken, any written quality improvement plan and any activities undertaken to implement a quality improvement plan, and other information such as data used to document the adequacy of monitoring, or records of monitoring maintenance or corrective actions. **(40 CFR 64.9(b)(1))**

See Appendices 4 and 7

## VII. REPORTING

1. Prompt reporting of deviations pursuant to General Conditions 21 and 22 of Part A. **(R 336.1213(3)(c)(ii))**
2. Semiannual reporting of monitoring and deviations pursuant to General Condition 23 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. **(R 336.1213(3)(c)(i))**
3. Annual certification of compliance pursuant to General Conditions 19 and 20 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for the previous calendar year. **(R 336.1213(4)(c))**
4. Each semiannual report of monitoring and deviations shall include summary information on the number, duration and cause of excursions and/or exceedances and the corrective actions taken. If there were no excursions and/or exceedances in the reporting period, then this report shall include a statement that there were no excursions and/or exceedances. **(40 CFR 64.9(a)(2)(i))**
5. Each semiannual report of monitoring and deviations shall include summary information on monitor downtime. If there were no periods of monitor downtime in the reporting period, then this report shall include a statement that there were no periods of monitor downtime. **(40 CFR 64.9(a)(2)(ii))**
6. The permittee shall submit two complete test protocols to the AQD, one to the Technical Programs Unit Supervisor and one to the District Supervisor for approval at least 30 days prior to the anticipated test date. The protocol shall describe the test method(s) and the maximum routine operating conditions, including targets for key operational parameters associated with air pollution control equipment to be monitored and recorded during testing.<sup>2</sup> **(R 336.12001(3))**
7. The permittee shall notify the AQD Technical Programs Unit Supervisor and the District Supervisor no less than 7 days prior to the anticipated test date.<sup>2</sup> **(R 336.2001(4))**
8. The permittee shall submit two complete test reports of the test results to the AQD, one to the Technical Programs Unit Supervisor and one to the District Supervisor, within 60 days following the last date of the test.<sup>2</sup> **(R 336.2001(5))**

See Appendix 8

## VIII. STACK/VENT RESTRICTION(S)

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

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SVP0082951	75.6 <sup>1</sup>	119.1 <sup>1</sup>	R 336.1224

## IX. OTHER REQUIREMENT(S)



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1. The permittee shall comply with the applicable requirements of 40 CFR Part 52 APPROVAL AND PROMULGATION OF IMPLEMENTATION PLANS, Subpart X—Michigan, Section 52.1183 Visibility Protection. **(40 CFR 52.1183(k))**

**Footnotes:**

<sup>1</sup>This condition is state only enforceable and was established pursuant to Rule 201(1)(b).

<sup>2</sup>This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

**EUOREDRIYER2  
 EMISSION UNIT CONDITIONS**

**DESCRIPTION**

Ore Concentrate Dryer #2 (EUOREDRIYER2) is rated at 800 tons per hour throughput and 125 million BTU per hour heat input. The dryer is fired with natural gas and used oil supplied from the ~~dryer 15,000 4.5 million~~ gallon storage tank, ~~which may contain used oil and virgin fuel oil. All oil burned from this tank is considered used oil.~~ EUOREDRIYER2 is controlled with two cyclone pre-cleaners and two wet scrubbers. **(PTI No. 511-87C)**

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**Flexible Group ID:** FGTAACONITE MACT

**POLLUTION CONTROL EQUIPMENT**

Two cyclone pre-cleaners and two wet scrubbers.

**I. EMISSION LIMIT(S)**

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
1. Arsenic	0.0016 tpy <sup>1</sup>	12-month rolling time period/when firing used oil	EUOREDRIYER2	SC VI.3 Appendix 7	<b>R 336.1224</b>
2. Cadmium	0.0016 tpy <sup>1</sup>	12-month rolling time period/when firing used oil	EUOREDRIYER2	SC VI.3 Appendix 7	<b>R 336.1224</b>
3. Chromium (total)	0.0016 tpy <sup>1</sup>	12-month rolling time period/when firing used oil	EUOREDRIYER2	SC VI.3 Appendix 7	<b>R 336.1224</b>
4. Lead	0.0048 tpy <sup>2</sup>	12-month rolling time period/when firing used oil	EUOREDRIYER2	SC VI.3 Appendix 7	<b>40 CFR 52.21(d)</b>
5. PM	0.10 lb. per 1000 lbs. of exhaust gases, calculated on a dry gas basis. <sup>2</sup>	Test Protocol	EUOREDRIYER2	SC V.1.	<b>R 336.1331</b>

\* Test protocol shall specify averaging time.

**II. MATERIAL LIMIT(S)**

- The used oil burned in EUOREDRIYER2 shall not exceed a sulfur content of 1.5% by weight, calculated on the basis of 18,000 BTU per pound.<sup>2</sup> **(R 336.1402)**
- The halogen content of the used oil burned in EUOREDRIYER2 shall not exceed 1000 parts per million, by weight.<sup>1</sup> **(R 336.1224)**

**III. PROCESS/OPERATIONAL RESTRICTION(S)**

- The oil burned in EUOREDRIYER2 shall be supplied only from the ~~dryer 15,000 4.5 million~~ gallon used oil tank.<sup>2</sup> **(R 336.1201(3))**

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#### **IV. DESIGN/EQUIPMENT PARAMETER(S)**

1. The permittee shall equip each wet scrubber with at least one of the following:<sup>2</sup> **(R 336.1910)**
  - a. Operable water pressure gauge
  - b. Operable water flow meter
  - c. Viewport with pivoted cover or quick-release hatch
  - d. Scrubber drain with readily visible sump to verify scrubber water flow

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

Records shall be maintained on file for a period of five years. **(R 336.1213(3)(b)(ii))**

1. The permittee shall demonstrate compliance with the particulate matter emission limit in SC 1.5 for EUOREDRIYER2 by testing at owner's expense, in accordance with the requirements in 40 CFR 63.9621(c). Testing will be conducted at least once during the five-year permit term and once every five years thereafter.<sup>2</sup> **(R 336.1213(3), R 336.2001(3) and (4), 40 CFR 63.9621(c), 63.9630(d) and 63.9634(c)(2))**

#### **VI. MONITORING/RECORDKEEPING**

Records shall be maintained on file for a period of five years. **(R 336.1213(3)(b)(ii))**

1. The permittee shall keep a record of the gallons of used oil burned in EUOREDRIYER2 for each calendar month. The permittee shall submit these records with the semiannual reports.<sup>2</sup> **(R 336.1201(3))**
2. The permittee shall sample and perform analyses and keep monthly records of the density, total halogen content, sulfur content, arsenic content, cadmium content, chromium (total) content, and lead content of the used oil burned in EUOREDRIYER2, as detailed in Appendix 4. The permittee shall submit these records with the semiannual reports.<sup>1</sup> **(R 336.1224)**
3. The permittee shall calculate the rolling 12-calendar month period emissions for arsenic, cadmium, chromium (total), and lead from EUOREDRIYER2 using the formula and procedure specified in Appendix 7. The permittee shall submit these calculations with the semiannual reports.<sup>1</sup> **(R 336.1224)**
4. The permittee shall continuously measure pressure drop and scrubber liquid flow rate, using a Continuous Parameter Monitoring System (CPMS), and record every 15 minutes for a 24-hour average as an indicator of proper operation of the scrubber. **(40 CFR 64.6(c)(1)(i and ii))**
5. Upon detecting an excursion or exceedance, the owner or operator shall restore operation of EUOREDRIYER2 and its control equipment to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions. The response shall include minimizing the period of any startup, shutdown or malfunction and taking any necessary corrective actions to restore normal operation and prevent the likely recurrence of the cause of an excursion or exceedance (other than those caused by excused startup or shutdown conditions). **(40 CFR 64.7(d))**
6. Except for, as applicable, monitoring malfunctions, associated repairs, and required quality assurance or control activities (including, as applicable, calibration checks and required zero and span adjustments), the owner or operator shall conduct all monitoring in continuous operation (or shall collect data at all required intervals) at all times that the pollutant-specific emissions unit is operating. Data recorded during monitoring malfunctions, associated repairs, and required quality assurance or control activities shall not be used for purposes of this part, including data averages and calculations or fulfilling a minimum data availability requirement, if applicable. The owner or operator shall use all the data collected during all other periods in assessing the operation of the control device and associated control system. A monitoring malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring to provide valid data. Monitoring failures that are caused in part by poor maintenance or careless operation are not malfunctions. **(40 CFR 64.6(c)(3), 64.7(c))**
7. The permittee shall properly maintain the monitoring system, including keeping necessary parts for routine repair of the monitoring equipment. **(40 CFR 64.7(b))**

- The permittee shall maintain records of monitoring data, monitor performance data, corrective actions taken, any written quality improvement plan and any activities undertaken to implement a quality improvement plan, and other information such as data used to document the adequacy of monitoring, or records of monitoring maintenance or corrective actions. **(40 CFR 64.9(b)(1))**

See Appendices 4 and 7

**VII. REPORTING**

- Prompt reporting of deviations pursuant to General Conditions 21 and 22 of Part A. **(R 336.1213(3)(c)(ii))**
- Semiannual reporting of monitoring and deviations pursuant to General Condition 23 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. **(R 336.1213(3)(c)(i))**
- Annual certification of compliance pursuant to General Conditions 19 and 20 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for the previous calendar year. **(R 336.1213(4)(c))**
- Each semiannual report of monitoring and deviations shall include summary information on the number, duration and cause of excursions and/or exceedances and the corrective actions taken. If there were no excursions and/or exceedances in the reporting period, then this report shall include a statement that there were no excursions and/or exceedances. **(40 CFR 64.9(a)(2)(i))**
- Each semiannual report of monitoring and deviations shall include summary information on monitor downtime. If there were no periods of monitor downtime in the reporting period, then this report shall include a statement that there were no periods of monitor downtime. **(40 CFR 64.9(a)(2)(ii))**
- The permittee shall submit two complete test protocols to the AQD, one to the Technical Programs Unit Supervisor and one to the District Supervisor for approval at least 30 days prior to the anticipated test date. The protocol shall describe the test method(s) and the maximum routine operating conditions, including targets for key operational parameters associated with air pollution control equipment to be monitored and recorded during testing.<sup>2</sup> **(R 336.12001(3))**
- The permittee shall notify the AQD Technical Programs Unit Supervisor and the District Supervisor no less than 7 days prior to the anticipated test date.<sup>2</sup> **(R 336.2001(4))**
- The permittee shall submit two complete test reports of the test results to the AQD, one to the Technical Programs Unit Supervisor and one to the District Supervisor, within 60 days following the last date of the test.<sup>2</sup> **(R 336.2001(5))**

See Appendix 8

**VIII. STACK/VENT RESTRICTION(S)**

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

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SVP0082851	75.6 <sup>1</sup>	119.1 <sup>1</sup>	<b>R 336.1224</b>
2. SVP0082861	75.6 <sup>1</sup>	119.1 <sup>1</sup>	<b>R 336.1224</b>

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**IX. OTHER REQUIREMENT(S)**

NA

**Footnotes:**

<sup>1</sup>This condition is state only enforceable and was established pursuant to Rule 201(1)(b).

<sup>2</sup>This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

**EUKILN1  
 EMISSION UNIT CONDITIONS**

**DESCRIPTION**

Unit 1 Grate Kiln Indurating Furnace (EUKILN1) dries and preheats pellets on a traveling grate and then heats the pellets in a rotary kiln for final induration. EUKILN1 main burners are rated at 590 million BTU per hour heat input. The Tilden facility produces hematite pellets and magnetite pellets. EUKILN1 is fired with coal, ~~or natural gas, or used oil supplied from the 1.5 million gallon storage tank which may contain used oil and virgin fuel oil. All oil burned from this tank is considered used oil.~~ The unit is controlled with dry electrostatic precipitators. (PTI Nos. 511-87C, 70-02 and 148-12A)

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Flexible Group ID: FGTA CONITEMACT

**POLLUTION CONTROL EQUIPMENT**

Dry Electrostatic precipitators

**I. EMISSION LIMIT(S)**

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
<del>1. Arsenic</del>	<del>0.0058 tpy<sup>4</sup></del>	<del>12-month rolling time period/when firing used oil</del>	<del>EUKILN1</del>	<del>SC VI.4</del>	<del>R 336.1224</del>
<del>2. Cadmium</del>	<del>0.0058 tpy<sup>4</sup></del>	<del>12-month rolling time period/when firing used oil</del>	<del>EUKILN1</del>	<del>SC VI.4</del>	<del>R 336.1224</del>
<del>3. Chromium (total)</del>	<del>0.0058 tpy<sup>4</sup></del>	<del>12-month rolling time period/when firing used oil</del>	<del>EUKILN1</del>	<del>SC VI.4</del>	<del>R 336.1224</del>
<del>4. Lead</del>	<del>0.017 tpy<sup>2</sup></del>	<del>12-month rolling time period/when firing used oil</del>	<del>EUKILN1</del>	<del>SC VI.4</del>	<del>40 CFR 52.21(d)</del>
5. PM	0.065 lb./1000 lbs. of exhaust gases <sup>2</sup>	Test Protocol*	EUKILN1	SC V.1	R 336.1331
6. PM	200 pph <sup>2</sup>	Test Protocol*	EUKILN1	SC V.1	R 336.1331
7. SO <sub>2</sub>	28,800 lbs/day <sup>2</sup>	Calendar Day	EUKILN1	SC VI.1, VI.2 VI.5	R 336.1402 R 336.1971
8. SO <sub>2</sub>	500 pph <sup>3</sup>	30-day rolling average	EUKILN1	SC VI.9	40 CFR 52.1183(k)(3)
9. NO <sub>x</sub>	2.8 lbs/MMBtu <sup>3</sup>	720-hour rolling average/when burning natural gas	EUKILN1	SC VI.6	40 CFR 52.1183(k)(1)(i)
10. NO <sub>x</sub>	1.5 lbs/MMBtu <sup>3</sup>	720-hour rolling average/when burning coal or a mixture of coal and natural gas	EUKILN1	SC VI.6	40 CFR 52.1183(k)(1)(i)

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\* Test protocol shall specify averaging time

**II. MATERIAL LIMIT(S)**

~~1. The halogen content of the used oil burned in EUKILN1 shall not exceed 1000 parts per million, by weight.<sup>1</sup> (R 336.1224)~~

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2. The sulfur content of the coal burned in EUKILN1 shall not exceed 0.60% by weight, based on a monthly block average. (40 CFR 52.1183(k)(3))

### III. PROCESS/OPERATIONAL RESTRICTION(S)

1. The permittee shall not operate EUKILN1 unless the electrostatic precipitators are operating properly.<sup>2</sup> (R 336.1910)

~~2. The oil burned in EUKILN1 shall be supplied only from the 1.5 million gallon used oil tank.<sup>2</sup> (R 336.1201(3))~~

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### IV. DESIGN/EQUIPMENT PARAMETER(S)

1. The permittee shall install, calibrate, maintain and operate in a satisfactory manner, a continuous emissions monitoring system (CEMS) to monitor and record the NO<sub>x</sub> emissions and flow from EUKILN1 on a continuous basis.<sup>2</sup> (R 336.1971 and 40 CFR 52.1183(k)(1)(ii))

2. The permittee shall install, calibrate, maintain and operate in a satisfactory manner, a CEMS to monitor and record the SO<sub>2</sub> emissions and flow from EUKILN1 on a continuous basis. (40 CFR 52.1183(k)(3))

### V. TESTING/SAMPLING

Records shall be maintained on file for a period of five years. (R 336.1213(3)(b)(ii))

1. The permittee shall demonstrate compliance with the particulate matter emission limit specified in SCs I.5 and 6 for EUKILN1 by testing at owner's expense, in accordance with the requirements in 40 CFR 63.9621(a). Testing will be conducted at least twice during the five-year permit term and twice every five year term thereafter.<sup>2</sup> (R 336.1213(3), R 336.2001(3) and (4), 40 CFR 63.9621(c), 63.9630(b) and 63.9634(c)(2))

### VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of five years. (R 336.1213(3)(b)(ii))

1. The permittee shall obtain and keep records of the sulfur content of the coal burned in EUKILN1, as detailed in Appendix 4. The permittee shall submit these records with the semiannual reports.<sup>2</sup> (R 336.1201(3))

~~2. The permittee shall keep a record of the gallons of used oil burned in EUKILN1 for each calendar month. The permittee shall submit these records with the semiannual reports.<sup>2</sup> (R 336.1201(3))~~

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~~3. The permittee shall sample and perform analyses and keep monthly records of the density, total halogen content, sulfur content, arsenic content, cadmium content, chromium (total) content, and lead content of the used oil burned in EUKILN1, as detailed in Appendix 4. The permittee shall submit these records with the semiannual reports.<sup>4</sup> (R 336.1224)~~

~~4. The permittee shall calculate the 12-month rolling time period emissions for arsenic, cadmium, chromium (total), and lead from EUKILN1 using the formula and procedure specified in Appendix 7. The permittee shall submit these calculations with the semiannual reports.<sup>4</sup> (R 336.1224)~~

5. The permittee shall calculate the daily SO<sub>2</sub> emissions from EUKILN1, to determine compliance with SC 1.7, and shall submit these calculations with the semiannual reports.<sup>2</sup> (R 336.1971, 40 CFR 52.1183(k)(2))

6. The permittee shall continuously monitor and record, in a satisfactory manner, the NO<sub>x</sub> emissions and flow from EUKILN1. The permittee shall operate the CEMS to meet the timelines, requirements and reporting detailed in Appendix 3 and shall use the CEMS data for determining compliance with SC 9 and 10.<sup>2</sup> (40 CFR 52.1183(k)(1)(ii))

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7. The permittee shall utilize COM-recorded opacity as an indicator of the proper operation of the electrostatic precipitator. The indicator range of opacity defining proper function of the ESP is (opacity). Six-minute average values shall be based on 36 or more equally spaced instantaneous opacity measurements per six-minute period. The COM shall be calibrated in accordance with 40 CFR Part 60, Subpart A. **(40 CFR 64.6(c)(1)(i and ii))**
8. The permittee shall continuously monitor and record, in a satisfactory manner, the SO<sub>2</sub> emissions from EUKILN1. The permittee shall operate the CEMS data for determining compliance with SC I.8. **(40 CFR 52.1183(k)(3))**

See Appendices 3, 4 and 7

## VII. REPORTING

1. Prompt reporting of deviations pursuant to General Conditions 21 and 22 of Part A. **(R 336.1213(3)(c)(ii))**
2. Semiannual reporting of monitoring and deviations pursuant to General Condition 23 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. **(R 336.1213(3)(c)(i))**
3. Annual certification of compliance pursuant to General Conditions 19 and 20 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for the previous calendar year. **(R 336.1213(4)(c))**
4. Within 60 days after the end of each Ozone Control Period (May 1 through September 30 of each year), the permittee shall submit a summary report for EUKILN1 in an acceptable format including all of the information specified in Rule 801(12).<sup>1</sup> **(R 336.1801(12))**
5. Each semiannual report of monitoring and deviations shall include summary information on the number, duration and cause of excursions and/or exceedances and the corrective actions taken. If there were no excursions and/or exceedances in the reporting period, then this report shall include a statement that there were no excursions and/or exceedances. **(40 CFR 64.9(a)(2)(i))**
6. Each semiannual report of monitoring and deviations shall include summary information on monitor downtime. If there were no periods of monitor downtime in the reporting period, then this report shall include a statement that there were no periods of monitor downtime. **(40 CFR 64.9(a)(2)(ii))**
7. The permittee shall submit two complete test protocols to the AQD, one to the Technical Programs Unit Supervisor and one to the District Supervisor for approval at least 30 days prior to the anticipated test date. The protocol shall describe the test method(s) and the maximum routine operating conditions, including targets for key operational parameters associated with air pollution control equipment to be monitored and recorded during testing.<sup>2</sup> **(R 336.12001(3))**
8. The permittee shall notify the AQD Technical Programs Unit Supervisor and the District Supervisor no less than 7 days prior to the anticipated test date.<sup>2</sup> **(R 336.2001(4))**
9. The permittee shall submit two complete test reports of the test results to the AQD, one to the Technical Programs Unit Supervisor and one to the District Supervisor, within 60 days following the last date of the test.<sup>2</sup> **(R 336.2001(5))**

See Appendix 8

## VIII. STACK/VENT RESTRICTION(S)

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



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Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SVP0051981 (North Stack)	160.8 <sup>1</sup>	160 <sup>1</sup>	R 336.1224
2. SVP0051711 (South Stack)	232.8 <sup>1</sup>	240 <sup>1</sup>	R 336.1224

**IX. OTHER REQUIREMENT(S)**

1. During the Ozone Control Period (May 1 through September 30 of each year), the permittee shall operate EUKILN1 in conformance with the control program for NO<sub>x</sub> required by Rule 801(4)(g), as approved by the Air Quality Division.<sup>1</sup> **(R 336.1801)**
2. The permittee shall comply with the applicable requirements of 40 CFR Part 52, APPROVAL AND PROMULGATION OF IMPLEMENTATION PLANS, Subpart X—Michigan, Section 52.1183 Visibility Protection.<sup>3</sup> **(40 CFR 52.1183(k))**

**Footnotes:**

<sup>1</sup> This condition is state only enforceable and was established pursuant to Rule 201(1)(b).

<sup>2</sup> This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

<sup>3</sup> These conditions will become enforceable according to the timeline pursuant to 40 CFR 52.1183(k)

**EUKILN2  
 EMISSION UNIT CONDITIONS**

**DESCRIPTION**

Unit 2 Grate Kiln Indurating Furnace (EUKILN2) dries and preheats pellets on a traveling grate and then heats the pellets in a rotary kiln for final induration. EUKILN2 main burners are rated at 590 million BTU per hour heat input. The Tilden facility produces hematite pellets and magnetite pellets. EUKILN2 is fired with coal, ~~or natural gas, or used oil supplied from the 1.5 million gallon storage tank which may contain used oil and virgin fuel oil. All oil burned from this tank is considered used oil.~~ The unit is controlled with dry electrostatic precipitators. (PTI Nos. 511-87C, and 70-02)

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**POLLUTION CONTROL EQUIPMENT**

Dry Electrostatic precipitators.

**I. EMISSION LIMIT(S)**

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
<del>1. Arsenic</del>	<del>0.0058 tpy<sup>4</sup></del>	<del>12-month rolling time period when firing used oil</del>	<del>EUKILN2</del>	<del>SC VI.4 Appendix 7</del>	<del>R 336.1224</del>
<del>2. Cadmium</del>	<del>0.0058 tpy<sup>4</sup></del>	<del>12-month rolling time period when firing used oil</del>	<del>EUKILN2</del>	<del>SC VI.4 Appendix 7</del>	<del>R 336.1224</del>
<del>3. Chromium (total)</del>	<del>0.0058 tpy<sup>4</sup></del>	<del>12-month rolling time period when firing used oil</del>	<del>EUKILN2</del>	<del>SC VI.4 Appendix 7</del>	<del>R 336.1224</del>
<del>4. Lead</del>	<del>0.017 tpy<sup>2</sup></del>	<del>12-month rolling time period when firing used oil</del>	<del>EUKILN2</del>	<del>SC VI.4 Appendix 7</del>	<del>40 CFR 52.21(d)</del>
5. PM	0.065 lb. / 1000 lbs. of exhaust gases <sup>2</sup>	Test Protocol	EUKILN2	SC V.1	R 336.1331
6. PM	200 pph <sup>2</sup>	Test Protocol	EUKILN2	SC V.1	R 336.1331
7. SO <sub>2</sub>	28,800 lbs. per day <sup>2</sup>	Calendar Day	EUKILN2	SC VI.1 SC VI.2 SC VI.5	R 336.1402

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\* Test protocol shall specify averaging time

**II. MATERIAL LIMIT(S)**

~~1. The halogen content of the used oil burned in EUKILN2 shall not exceed 1000 parts per million, by weight.<sup>1</sup> (R 336.1224)~~

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**III. PROCESS/OPERATIONAL RESTRICTION(S)**

1. The permittee shall not operate EUKILN2 unless the electrostatic precipitators are operating properly.<sup>2</sup> (R 336.1910)

~~2. The oil burned in EUKILN2 shall be supplied only from the 1.5 million gallon used oil tank.<sup>2</sup> (R 336.1201(3))~~

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#### **IV. DESIGN/EQUIPMENT PARAMETER(S)**

NA

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

Records shall be maintained on file for a period of five years. **(R 336.1213(3)(b)(ii))**

1. The permittee shall demonstrate compliance with the particulate matter emission limit specified in SC I.5 and 6 for EUKILN2 by testing at owner's expense, in accordance with the requirements in 40 CFR 63.9621(a). Testing will be conducted at least twice during the five-year permit term and twice every five year term thereafter. <sup>2</sup> **(R 336.1213(3), R 336.2001(3) and (4), 40 CFR 63.9621(c), 63.9630(b) and 63.9634(c)(2))**

#### **VI. MONITORING/RECORDKEEPING**

Records shall be maintained on file for a period of five years. **(R 336.1213(3)(b)(ii))**

1. The permittee shall obtain and keep records of the sulfur content of the coal burned in EUKILN2, as detailed in Appendix 4. The permittee shall submit these records with the semiannual reports<sup>2</sup>. **(R 336.1201(3))**
- ~~2. The permittee shall keep a record of the gallons of used oil burned in EUKILN2 for each calendar month. The permittee shall submit these records with the semiannual reports.<sup>2</sup> **(R 336.1201(3))**~~
- ~~3. The permittee shall sample and perform analyses and keep monthly records of the density, total halogen content, sulfur content, arsenic content, cadmium content, chromium (total) content, and lead content of the used oil burned in EUKILN2, as detailed in Appendix 4. The permittee shall submit these records with the semiannual reports<sup>4</sup>. **(R 336.1224)**~~
- ~~4. The permittee shall calculate the rolling 12-calendar month period emissions for arsenic, cadmium, chromium (total), and lead from EUKILN2 using the formula and procedure specified in Appendix 7. The permittee shall submit these calculations with the semiannual reports.<sup>4</sup> **(R 336.1224)**~~
5. The permittee shall calculate the daily sulfur dioxide emissions from EUKILN2, and shall submit these calculations with the semiannual reports. <sup>2</sup> **(R 336.1201(3))**
6. The permittee shall utilize COM-recorded opacity as an indicator of the proper operation of the electrostatic precipitator. The indicator range of opacity defining proper function of the ESP is (opacity). Six-minute average values shall be based on 36 or more equally spaced instantaneous opacity measurements per six-minute period. The COM shall be calibrated in accordance with 40 CFR Part 60, Subpart A. **(40 CFR 64.6(c)(1)(i and ii))**

See Appendices 4 and 7

#### **VII. REPORTING**

1. Prompt reporting of deviations pursuant to General Conditions 21 and 22 of Part A. **(R 336.1213(3)(c)(ii))**
2. Semiannual reporting of monitoring and deviations pursuant to General Condition 23 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. **(R 336.1213(3)(c)(i))**
3. Annual certification of compliance pursuant to General Conditions 19 and 20 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for the previous calendar year. **(R 336.1213(4)(c))**
4. Within 60 days after the end of each Ozone Control Period (May 1 through September 30 of each year), the permittee shall submit a summary report for EU KILN2 in an acceptable format including all of the information specified in Rule 801(12).<sup>1</sup> **(R 336.1801(12))**

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5. Each semiannual report of monitoring and deviations shall include summary information on the number, duration and cause of excursions and/or exceedances and the corrective actions taken. If there were no excursions and/or exceedances in the reporting period, then this report shall include a statement that there were no excursions and/or exceedances. **(40 CFR 64.9(a)(2)(i))**
6. Each semiannual report of monitoring and deviations shall include summary information on monitor downtime. If there were no periods of monitor downtime in the reporting period, then this report shall include a statement that there were no periods of monitor downtime. **(40 CFR 64.9(a)(2)(ii))**
7. The permittee shall submit two complete test protocols to the AQD, one to the Technical Programs Unit Supervisor and one to the District Supervisor for approval at least 30 days prior to the anticipated test date. The protocol shall describe the test method(s) and the maximum routine operating conditions, including targets for key operational parameters associated with air pollution control equipment to be monitored and recorded during testing.<sup>2</sup> **(R 336.12001(3))**
8. The permittee shall notify the AQD Technical Programs Unit Supervisor and the District Supervisor no less than 7 days prior to the anticipated test date.<sup>2</sup> **(R 336.2001(4))**
9. The permittee shall submit two complete test reports of the test results to the AQD, one to the Technical Programs Unit Supervisor and one to the District Supervisor, within 60 days following the last date of the test.<sup>2</sup> **(R 336.2001(5))**

See Appendix 8

#### **VIII. STACK/VENT RESTRICTION(S)**

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

<b>Stack &amp; Vent ID</b>	<b>Maximum Exhaust Dimensions (inches)</b>	<b>Minimum Height Above Ground (feet)</b>	<b>Underlying Applicable Requirements</b>
1. SVP0052431 (North Stack)	160.8 <sup>1</sup>	240 <sup>1</sup>	<b>R 336.1224</b>
2. SVP0052131 (South Stack)	232.8 <sup>1</sup>	240 <sup>1</sup>	<b>R 336.1224</b>

#### **IX. OTHER REQUIREMENT(S)**

1. During the Ozone Control Period (May 1 through September 30 of each year), the permittee shall operate EU KILN2 in conformance with the control program for Oxides of Nitrogen required by Rule 801(4)(g), as approved by the AQD.<sup>1</sup> **(R 336.1801)**

#### **Footnotes:**

<sup>1</sup>This condition is state only enforceable and was established pursuant to Rule 201(1)(b).

<sup>2</sup>This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

**EUBOILER1  
 EMISSION UNIT CONDITIONS**

**DESCRIPTION**

EUBOILER1 is rated at 225 million BTU per hour heat input capacity and fired with natural gas ~~and used oil supplied from the 1.5 million gallon storage tank, which may contain used oil and virgin fuel oil. All oil burned from this tank is considered used oil.~~

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Flexible Group ID: NA

**POLLUTION CONTROL EQUIPMENT**

NA

**I. EMISSION LIMIT(S)**

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
<del>1. Arsenic</del>	<del>0.12 tpy<sup>1</sup></del>	<del>12-month rolling time period when firing used oil</del>	<del>EUBOILER1</del>	<del>SC VI.3</del>	<del>R 336.1224</del>
<del>2. Cadmium</del>	<del>0.12 tpy<sup>1</sup></del>	<del>12-month rolling time period when firing used oil</del>	<del>EUBOILER1</del>	<del>SC VI.3</del>	<del>R 336.1224</del>
<del>3. Chromium (total)</del>	<del>0.12 tpy<sup>1</sup></del>	<del>12-month rolling time period when firing used oil</del>	<del>EUBOILER1</del>	<del>SC VI.3</del>	<del>R 336.1224</del>
<del>4. Lead</del>	<del>0.37 tpy<sup>2</sup></del>	<del>12-month rolling time period when firing used oil</del>	<del>EUBOILER1</del>	<del>SC VI.3</del>	<del>40 CFR 52.21(d)</del>

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**II. MATERIAL LIMIT(S)**

- ~~The fuel sulfur content limit of no greater than 1.20% sulfur content by weight shall apply to fuel combusted in EUBOILER1. (40 CFR 52.1183(k)(2))~~
- ~~The halogen content of the used oil burned in EUBOILER1 shall not exceed 1000 parts per million, by weight.<sup>1</sup> (R 336.1224)~~

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**III. PROCESS/OPERATIONAL RESTRICTION(S)**

- ~~The oil burned in EUBOILER1 shall be supplied only from the 1.5 million gallon used oil tank.<sup>2</sup> (R 336.1201(3))~~
- The permittee must operate and maintain EUBOILER1 in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator that may include but is not limited to, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.<sup>2</sup> (40 CFR 63.7500(a)(3))
- The permittee may obtain approval from the Administrator to use an alternative to the work practice standards.<sup>2</sup> (40 CFR 63.7500(b))
- The permittee shall complete a tune-up of EUBOILER1 every five (5) years (61 months) for boiler/process heaters utilizing an oxygen trim system and greater than 10 million Btu per hour.<sup>2</sup> (40 CFR 63.7540(a)(10), 63.7515(d))

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**IV. DESIGN/EQUIPMENT PARAMETER(S)**

NA

#### V. TESTING/SAMPLING

Records shall be maintained on file for a period of five years. **(R 336.1213(3)(b)(ii))**

NA

#### VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of five years. **(R 336.1213(3)(b)(ii))**

- ~~1. The permittee shall keep a record of the gallons of used oil burned in EUBOILER1 for each calendar month. The permittee shall submit these records with the semiannual reports.<sup>2</sup> **(R 336.1201(3))**~~
- ~~2. The permittee shall sample and perform analyses and keep monthly records of the density, total halogen content, sulfur content, arsenic content, cadmium content, chromium (total) content, and lead content of the used oil burned in EUBOILER1, as detailed in Appendix 4. The permittee shall submit these records with the semiannual reports.<sup>2</sup> **(R 336.1201(3))**~~
- ~~3. The permittee shall calculate the 12-month rolling time period emissions for arsenic, cadmium, chromium (total), and lead from EUBOILER1 using the formula and procedure specified in Appendix 7. The permittee shall submit these calculations with the semiannual reports.<sup>2</sup> **(R 336.1201(3))**~~
4. The permittee must keep a copy of each notification and report submittal to comply with 40 CFR Part 63, Subpart DDDDD, including all documentation supporting any Initial Notification or Notification of Compliance Status or semiannual compliance report that the permittee submitted, according to the requirements in 40 CFR 63.10(b)(2)(xiv).<sup>2</sup> **(40 CFR 63.7555(a)(1))**
5. The permittee must keep each record on site, or they must be accessible from on-site (for example, through a computer network), for at least two (2) years after the date of each occurrence, measurement, maintenance, corrective action, report, or record. The permittee can keep the records off site for the remaining three (3) years.<sup>2</sup> **(40 CFR 63.7560(a), (b), and (c))**

See Appendices 4 and 7

#### VII. REPORTING

1. Prompt reporting of deviations pursuant to General Conditions 21 and 22 of Part A. **(R 336.1213(3)(c)(ii))**
2. Semiannual reporting of monitoring and deviations pursuant to General Condition 23 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. **(R 336.1213(3)(c)(i))**
3. Annual certification of compliance pursuant to General Conditions 19 and 20 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for the previous calendar year. **(R 336.1213(4)(c))**
4. The permittee shall submit boiler tune-up reports to the AQD upon request.<sup>2</sup> **(40 CFR 63.7540(a)(10))**
5. The permittee must submit boiler tune-up compliance reports. Compliance reports must be postmarked or submitted by March 15<sup>th</sup> of the year following the tune-up and must cover the period starting from January 1 and ending December 31. Compliance reports must be submitted using the Compliance and Emission Data Reporting Interface (CEDRI) which is accessed through the EPA's Central Data Exchange (CDX) (<https://cdx.epa.gov>). If the reporting form is not available in CEDRI at the time the compliance report is due, a hardcopy of the compliance report shall be submitted to the state and EPA Region 5. At the discretion of the Administrator, the permittee must submit these reports in the format specified by the Administrator.<sup>2</sup> **(40 CFR 63.7550(b), 63.10(a)(5), and 63.7550(h)(3))**

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See Appendix 8

**VIII. STACK/VENT RESTRICTION(S)**

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

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SVBLR.STK.T1	90 <sup>1</sup>	130 <sup>1</sup>	<b>R 336.1224</b>

**IX. OTHER REQUIREMENT(S)**

1. The permittee shall comply with the applicable requirements of 40 CFR Part 63, Subpart DDDDD - National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters.<sup>2</sup> **(40 CFR Part 63, Subpart DDDDD)**
2. The permittee shall comply with the applicable requirements of 40 CFR Part 52 APPROVAL AND PROMULGATION OF IMPLEMENTATION PLANS, Subpart X—Michigan, Section 52.1183 Visibility Protection.<sup>2</sup> **(40 CFR 52.1183(k))**

**Footnotes:**

<sup>1</sup>This condition is state only enforceable and was established pursuant to Rule 201(1)(b).

<sup>2</sup>This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

**EUBOILER3  
 EMISSION UNIT CONDITIONS**

**DESCRIPTION**

**EUBOILER3** - Boiler #3 is rated at 240 million BTU per hour heat input capacity and is fired with natural gas ~~and used oil supplied from the 1.5 million gallon storage tank.~~ (PTI No. 511-87C)

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Flexible Group ID: NA

**POLLUTION CONTROL EQUIPMENT**

NA

**I. EMISSION LIMIT(S)**

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
<del>1. Arsenic</del>	<del>0.06 tpy<sup>1</sup></del>	<del>12-month rolling time period/ when firing used oil<sup>1</sup></del>	<del>EUBOILER3</del>	<del>SC VI.3 Appendix 7</del>	<del>R 336.1224</del>
<del>2. Cadmium</del>	<del>0.06 tpy<sup>1</sup></del>	<del>12-month rolling time period/ when firing used oil<sup>1</sup></del>	<del>EUBOILER3</del>	<del>SC VI.3 Appendix 7</del>	<del>R 336.1224</del>
<del>3. Chromium (total)</del>	<del>0.06 tpy<sup>1</sup></del>	<del>12-month rolling time period/ when firing used oil<sup>1</sup></del>	<del>EUBOILER3</del>	<del>SC VI.3 Appendix 7</del>	<del>R 336.1224</del>
<del>4. Lead</del>	<del>0.18 tpy<sup>2</sup></del>	<del>12-month rolling time period/ when firing used oil<sup>1</sup></del>	<del>EUBOILER3</del>	<del>SC VI.3 Appendix 7</del>	<del>40 CFR 52.21(d)</del>

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**II. MATERIAL LIMIT(S)**

~~1. The used oil burned in Boiler #3 shall not exceed a sulfur content of 1.2 percent by weight.<sup>2</sup> (R 336.1402)~~

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~~2. The halogen content of the used oil burned in Boiler #3 shall not exceed 1000 parts per million, by weight.<sup>1</sup> (R 336.1224)~~

**III. PROCESS/OPERATIONAL RESTRICTION(S)**

~~1. The oil burned in Boiler #3 shall be supplied only from the 1.5 million gallon used oil tank.<sup>2</sup> (R 336.1201(3))~~

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2. The permittee must operate and maintain EUBOILER3 in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator that may include but is not limited to, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source. (40 CFR 63.7500(a)(3))

3. The permittee may obtain approval from the Administrator to use an alternative to the work practice standards. (40 CFR 63.7500(b))

4. The permittee shall complete a tune-up of EUBOILER3 every five (5) years (61 months) for boiler/process heaters utilizing an oxygen trim system and greater than 10 million Btu per hour. (40 CFR 63.7540(a)(10), 63.7515(d))



#### IV. DESIGN/EQUIPMENT PARAMETER(S)

NA

#### V. TESTING/SAMPLING

Records shall be maintained on file for a period of five years. (R 336.1213(3)(b)(ii))

NA

#### VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of five years. (R 336.1213(3)(b)(ii))

- ~~1. The permittee shall keep a record of the gallons of used oil burned in Boiler #3 for each calendar month. The permittee shall submit these records with the semiannual reports.<sup>2</sup> (R 336.1201(3))~~
- ~~2. The permittee shall sample and perform analyses and keep monthly records of the density, total halogen content, sulfur content, arsenic content, cadmium content, chromium (total) content, and lead content of the used oil burned in Boiler #3, as detailed in Appendix 4. The permittee shall submit these records with the semiannual reports.<sup>2</sup> (R 336.1201(3))~~
- ~~3. The permittee shall calculate the rolling 12-calendar month period emissions for arsenic, cadmium, chromium (total), and lead from Boiler #3 using the formula and procedure specified in Appendix 7. The permittee shall submit these calculations with the semiannual reports.<sup>2</sup> (R 336.1201(3))~~
4. The permittee must keep a copy of each notification and report submittal to comply with 40 CFR Part 63, Subpart DDDDD, including all documentation supporting any Initial Notification or Notification of Compliance Status or semiannual compliance report that the permittee submitted, according to the requirements in 40 CFR 63.10(b)(2)(xiv). (40 CFR 63.7555(a)(1))
5. The permittee must keep each record on site, or they must be accessible from on-site (for example, through a computer network), for at least two (2) years after the date of each occurrence, measurement, maintenance, corrective action, report, or record. The permittee can keep the records off site for the remaining three (3) years. (40 CFR 63.7560(a), (b), and (c))

See Appendices 4 and 7

#### VII. REPORTING

1. Prompt reporting of deviations pursuant to General Conditions 21 and 22 of Part A. (R 336.1213(3)(c)(ii))
2. Semiannual reporting of monitoring and deviations pursuant to General Condition 23 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. (R 336.1213(3)(c)(i))
3. Annual certification of compliance pursuant to General Conditions 19 and 20 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for the previous calendar year. (R 336.1213(4)(c))
4. The permittee shall submit boiler tune-up reports to the AQD upon request. (40 CFR 63.7540(a)(10))
5. The permittee must submit boiler tune-up compliance reports. Compliance reports must be postmarked or submitted by March 15<sup>th</sup> of the year following the tune-up and must cover the period starting from January 1 and ending December 31. Compliance reports must be submitted using the Compliance and Emission Data Reporting Interface (CEDRI) which is accessed through the EPA's Central Data Exchange (CDX) (<https://cdx.epa.gov>). If the reporting form is not available in CEDRI at the time the compliance report is due, a hardcopy of the compliance report shall be submitted to the state and EPA Region 5. At the discretion of the

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Administrator, the permittee must submit these reports in the format specified by the Administrator. (40 CFR 63.7550(b), 63.10(a)(5), and 63.7550(h)(3))

See Appendix 8

**VIII. STACK/VENT RESTRICTION(S)**

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

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SVBLR.STK.T2	168 <sup>1</sup>	241 <sup>1</sup>	R 336.1224

**IX. OTHER REQUIREMENT(S)**

1. The permittee shall comply with the applicable requirements of 40 CFR Part 63, Subpart DDDDD - National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters. (40 CFR Part 63, Subpart DDDDD)

**Footnotes:**

<sup>1</sup>This condition is state only enforceable and was established pursuant to Rule 201(1)(b).  
<sup>2</sup>This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

**EU-BOILER4  
 EMISSION UNIT CONDITIONS**

**DESCRIPTION**

Boiler 4 is rated at 300 million BTU per hour (mmbTU/hr) heat input capacity and is fired with natural gas only. The boiler will be equipped with a low NOx burner.

**Flexible Group ID:** FGNESHAP5D

**POLLUTION CONTROL EQUIPMENT**

Low NOx burner to control NOx emissions.

**I. EMISSION LIMIT(S)**

Pollutant	Limit	Time Period / Operating Scenario	Equipment	Testing / Monitoring Method	Underlying Applicable Requirements
1. NOx	0.0350 lb/MMBTU <sup>2</sup>	Continuous	EU-BOILER4	SC V.1 SC VI.2	<b>R 336.2803 R 336.2804</b>
2. NOx	0.20 lb/MMBTU <sup>a,2</sup> or 86 ng/J <sup>a,2</sup>	24-hour average basis for the initial performance test and on a 3-hour average basis for subsequent performance tests.	EU-BOILER4	SC V.1 SC VI.3	<b>40 CFR 60.44b(a),(h),(j)</b>
3. CO	0.0840 lb/MMBTU <sup>2</sup>	Hourly	EU-BOILER4	SC V.2 SC VI.5	<b>R 336.2804</b>
4. SO <sub>2</sub>	0.20 lb/MMBTU <sup>2</sup>	Hourly	EU-BOILER4	SC VI.7	<b>40 CFR 60.42b(k)(1)</b>

<sup>a</sup>High heat release rate.

**II. MATERIAL LIMIT(S)**

1. The permittee shall burn only pipeline quality natural gas in EU-BOILER4.<sup>2</sup> (**R 336.1205(1)(a) & (3), R 336.1224, R 336.1225, R 336.1702(a), R 336.2803, R 336.2804**)
2. The pipeline quality natural gas shall not have a total sulfur content in excess of 0.2 grains of sulfur per 100 standard cubic feet.<sup>2</sup> (**R 336.1205(1)(a) & (3)**)
3. The natural gas fuel usage for EU-BOILER4 shall not exceed 1,275 million cubic feet per 12-month rolling time period. The limit is based on a heat input value of 1,000 BTU per cubic foot of natural gas.<sup>2</sup> (**R 336.1205(1)(a) & (3)**)

**III. PROCESS/OPERATIONAL RESTRICTION(S)**

1. The permittee shall operate and maintain EU-BOILER4, including associated air pollution control equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions and comply with Table 3 of 40 CFR Part 63, Subpart DDDDD.<sup>2</sup> (**R 336.1910, R 336.1911, R 336.2803, R 336.2804**)

**IV. DESIGN/EQUIPMENT PARAMETER(S)**

1. The maximum design heat input capacity for each unit in EU-BOILER4 shall not exceed a maximum of 300 MMBTU per hour on a fuel heat input basis.<sup>2</sup> (**R 336.1205(1)(a) & (3), R 336.1225, R 336.2803, R 336.2804**)

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2. The permittee shall not operate any unit in EU-BOILER4 unless the low NO<sub>x</sub> burners are installed, maintained, and operated in a satisfactory manner. Satisfactory manner includes operating and maintaining the air pollution control equipment in accordance with SC III.1.<sup>2</sup> **(R 336.1205(1)(a) & (3), R 336.1910, R 336.2803, R 336.2804)**
3. The permittee shall install, calibrate, maintain and operate, in a satisfactory manner, a device to monitor and record the natural gas flow rate for EU-BOILER4 on a continuous basis.<sup>2</sup> **(R 336.1205(1)(a) & (3))**
4. The continuous NO<sub>x</sub> emissions, and CO<sub>2</sub> or O<sub>2</sub> concentration monitoring systems are to be operated and data recorded during all periods of operation including periods of start-up, shutdown, malfunction or emergency conditions, except for continuous monitor system breakdowns, repairs, calibration checks, and zero span adjustments.<sup>2</sup> **(40 CFR 60.48b(b))**
5. The procedures under 40 CFR 60.13 and Performance Specification 2 of Appendix B to 40 CFR, Part 60 shall be followed for installation, initial evaluation, and operation of the NO<sub>x</sub> CEMS or PEMS.<sup>2</sup> **(R 336.2150(1)(b), 40 CFR 60.48b(b))**
6. The procedures under 40 CFR 60.13 and Performance Specification 3 of Appendix B to 40 CFR, Part 60 shall be followed for installation, initial evaluation, and operation of the O<sub>2</sub> or CO<sub>2</sub> CEMS or PEMS.<sup>2</sup> **(R 336.2150(1)(d) and (e), 40 CFR 60.48b(b))**
7. The procedures under 40 CFR 60.13 and Performance Specification 6 of Appendix B to 40 CFR, Part 60 shall be followed for installation, initial evaluation, and operation of the flow rate CEMS or PEMS. As an alternative to Performance Specification 6, the permittee may use the procedures set forth in 40 CFR, Part 75, Appendix B.<sup>2</sup> **(R 336.2150)**
8. The span value for the NO<sub>x</sub> CEMS or PEMS, for natural gas fuel, shall be 500 ppm.<sup>2</sup> **(40 CFR 60.48b(e)(2))**

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

Records shall be maintained on file for a period of five years. **(R 336.1213(3)(b)(ii))**

1. The permittee shall perform the Quality Assurance Procedures of the CEMS or PEMS set forth in Appendix F, Procedure 1 of 40 CFR, Part 60. As an alternative, the permittee may perform the Quality Assurance Procedures for CEMS set forth in Appendix B of 40 CFR, Part 75.<sup>2</sup> **(40 CFR Part 60, Appendix F)**
2. Within 180 days after commencement of initial start up the permittee shall verify CO emission rates from EU-BOILER4 by testing at the owner's expense, in accordance with the Department requirements. Testing shall be performed using an approved EPA Method listed in 40 CFR Part 60, Appendix A. An alternate method, or a modification to the approved EPA Method, may be specified in an AQD-approved Test Protocol. No less than 60 days prior to testing, the permittee shall submit a complete test plan to the AQD Technical Programs Unit and District Office. The AQD must approve the final plan prior to testing, including any modifications to the method in the test protocol that are proposed after initial submittal. The permittee must submit a complete report of the test results to the AQD Technical Programs Unit and District Office within 60 days following the last date of the test.<sup>2</sup> **(R 336.1213(3), R 336.2001, R 336.2003, R 336.2004)**
3. The permittee shall verify the CO emission rates from EU-BOILER4, at a minimum, every five years from the date of the last test. **(R 336.1213(3), R 336.2001, R 336.2003, R 336.2004)**

See Appendix 5

#### **VI. MONITORING/RECORDKEEPING**

Records shall be maintained on file for a period of five years. **(R 336.1213(3)(b)(ii))**

1. The permittee shall complete all required calculations in a format acceptable to the AQD District Supervisor by the last day of the calendar month, for the previous calendar month, unless otherwise specified in any monitoring/recordkeeping special condition.<sup>2</sup> **(R 336.1205(1)(a) & (3), R 336.2803, R 336.2804)**

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2. The permittee shall monitor and record the NOx and O<sub>2</sub> (or CO<sub>2</sub>) emissions from EU-BOILER4 on a continuous basis in a manner and with instrumentation acceptable to the AQD. Emission data shall be obtained for at least 18 hours in at least 22 out of 30 successive boiler operating days.<sup>2</sup> **(40 CFR 60.48b(b),(f))**
3. The permittee shall use CEMS or PEMS data to calculate and record the NOx emission rates from EU-BOILER4 in pounds per MMBtu heat input based on a 30-day rolling average. The NOx emissions shall be determined by calculating the arithmetic average of all hourly emission rates for NOx for the 30 successive boiler operating days.<sup>2</sup> **(R 336.2810, 40 CFR 60.48b(d))**
4. The permittee shall use CEMS or PEMS data to calculate and record the NOx emission rate from EU-BOILER4 in tons per year based on a 12-month rolling time period. The NOx emissions shall be determined by calculating the arithmetic average of all hourly emission rates for NOx for the averaging periods specified in Special Conditions I.1, I.2, and I.3.<sup>2</sup> **(R 336.1205(3))**
5. The Permittee shall calculate and record the CO emissions, in a satisfactory manner from EU-BOILER4, in tons per year based on a 12-month rolling time period. The CO emissions shall be determined by using the most recent stack test data.<sup>2</sup> **(R 336.1205(3))**
6. The permittee shall monitor and record, in a satisfactory manner, the natural gas usage for EU-BOILER4 on a monthly and 12 month rolling time period basis. The permittee shall keep all records on file and make them available to the Air Quality Division, upon request.<sup>2</sup> **(R 336.1205(1)(a) & (3))**
7. The permittee shall keep records of fuel certification (fuel receipts such as a current, valid purchase contract, tariff sheet, or transportation contract) from the fuel supplier that certify that the gaseous fuel for EU-BOILER4 meets the definition of natural gas as defined in 40 CFR 60.41b.<sup>2</sup> **(R 336.1205(3), 40 CFR 60.45b(j), 40 CFR 60.49b(r))**
8. The permittee shall maintain records for EU-BOILER4 of all information necessary for all notifications and reports as specified in these special conditions as well as that information necessary to demonstrate compliance with the emission limits of this permit. This information shall include, but shall not be limited to the following:
  - a. Compliance tests and any testing required under the special conditions of this permit;
  - b. Monitoring data;
  - c. Verification of heat input capacity required to show compliance with SC IV.1;
  - d. Fuel certification;
  - e. All calculations or documents necessary to show compliance with the limits contained in this permit.

The permittee shall keep all records on file and make them available to the Department upon request.<sup>2</sup> **(R 336.1205(1)(a) & (b), R 336.2803, R 336.2804, 40 CFR Part 60, Subparts A & Db)**

## **VII. REPORTING**

1. Prompt reporting of deviations pursuant to General Conditions 21 and 22 of Part A. **(R 336.1213(3)(c)(ii))**
2. Semiannual reporting of monitoring and deviations pursuant to General Condition 23 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. **(R 336.1213(3)(c)(i))**
3. Annual certification of compliance pursuant to General Conditions 19 and 20 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for the previous calendar year. **(R 336.1213(4)(c))**
4. Within 30 days after completion of the installation, construction, reconstruction, relocation, or modification authorized by Permit to Install 202-16, the permittee or the authorized agent pursuant to Rule 204, shall notify the AQD District Supervisor, in writing, of the completion of the activity. Completion of the installation, construction, reconstruction, relocation, or modification is considered to occur not later than commencement of trial operation of each unit in EU-BOILER4.<sup>2</sup> **(R 336.1216(1)(a)(v), R 336.1201(7)(a))**

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5. The permittee shall submit the quality assurance procedures for the CEMS or PEMS set forth in Appendix F, Procedure 1 of 40 CFR Part 60 to the AQD District Supervisor within the quarterly EER for the quarter in which the annual audit is completed.<sup>2</sup> **(R 336.2170, 40 CFR 60.7)**
6. Quarterly Excess Emission Report (EERs) of NO<sub>x</sub>, shall be submitted, in a format acceptable to the AQD District Supervisor, within 30 days following the end of the quarter that the data was collected. The EER shall include the following:<sup>2</sup> **(R 336.2170, 40 CFR 60.49b(g), 40 CFR 60.48b(p), 40 CFR 60.7)**
  - a. Calendar date;
  - b. The number of hours of operation;
  - c. A record of the hourly steam load;
  - d. Average hourly NO<sub>x</sub> emission rates (expressed as NO<sub>2</sub>) (ng/J or lb/MMBTU heat input) measured or predicted;
  - e. The 30-day average NO<sub>x</sub> emission rates calculated at the end of each steam generating unit operating day from the measured or predicted hourly nitrogen oxide emission rates for the preceding 30 steam generating unit operating days;
  - f. Identification of the steam generating unit operating days when the calculated 30-day average NO<sub>x</sub> emission rates are in excess of the NO<sub>x</sub> emissions standards with the reasons for such excess emissions as well as a description of corrective actions taken;
  - g. Identification of the steam generating unit operating days for which pollutant data have not been obtained, including reasons for not obtaining sufficient data and a description of corrective actions taken;
  - h. Identification of the times when emission data have been excluded from the calculation of average emission rates and the reasons for excluding data;
  - i. Identification of "F" factor used for calculations, method of determination, and type of fuel combusted;
  - j. Identification of the times when the pollutant concentration exceeded full span of the CEMS or PEMS;
  - k. Description of any modifications to CEMS or PEMS which could affect the ability of the CEMS or PEMS to comply with Performance Specifications 2 or 3; and
  - l. Results of daily CEMS or PEMS drift tests and quarterly accuracy assessments as required under Appendix F, Procedure 1 of 40 CFR Part 60.
7. The permittee shall submit any performance test reports, including RATA reports, to the AQD Technical Programs Unit and District Office, in a format approved by the AQD. **(R 336.1213(3)(c), R 336.2001(5))**

See Appendix 8

**VIII. STACK/VENT RESTRICTION(S)**

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

Stack & Vent ID	Maximum Exhaust Diameter/Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SVBLR.STK.T1 (EUBOILER4 will share stack with EUBOILER1)	90 <sup>2</sup>	130 <sup>2</sup>	R 336.1224 R 336.1225 R 336.2803 R 336.2804

**IX. OTHER REQUIREMENT(S)**

1. The permittee shall comply with all provisions of the federal Standards of Performance for New Stationary Sources as specified in 40 CFR Part 60, Subparts A and Db, as they apply to EU-BOILER4.<sup>2</sup> **(40 CFR Part 60, Subparts A & Db)**
2. The permittee shall comply with all provisions of the National Emission Standards for Hazardous Air Pollutants as specified in 40 CFR Part 63, Subparts A and DDDDD, as they apply to EU-BOILER4.<sup>2</sup> **(40 CFR Part 63, Subparts A & DDDDD)**

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3. The permittee shall decommission EUBOILER2 before operating EUBOILER4.<sup>2</sup> **(R 336.2803, R 336.2804)**
4. The permittee shall comply with the applicable requirements of 40 CFR Part 52 APPROVAL AND PROMULGATION OF IMPLEMENTATION PLANS, Subpart X—Michigan, Section 52.1183 Visibility Protection.<sup>2</sup> **(40 CFR 52.1183(k))**

**Footnotes:**

<sup>1</sup>This condition is state only enforceable and was established pursuant to Rule 201(1)(b).

<sup>2</sup>This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

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### D. FLEXIBLE GROUP CONDITIONS

Part D outlines the terms and conditions that apply to more than one emission unit. The permittee is subject to the special conditions for each flexible group in addition to the General Conditions in Part A and any other terms and conditions contained in this ROP.

The permittee shall comply with all specific details in the special conditions and the underlying applicable requirements cited. If a specific condition type does not apply, NA (not applicable) has been used in the table. If there are no special conditions that apply to more than one emission unit, this section will be left blank.

#### FLEXIBLE GROUP SUMMARY TABLE

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

Flexible Group ID	Flexible Group Description	Associated Emission Unit IDs
FGDUSTCOLLECTORS	Various ore, concentrate, and finished pellet handling processes throughout the facility, including primary and secondary ore crushing, conveyor transfer points, bentonite feeders and mixer blenders, pellet cooler discharge hoppers, low head feeders, transfer towers, etc. The various emission units are controlled with wet scrubbers.	EU-CONV14-15-16 EU-CONV15.8-15.9 EU-CONV15.9-16.1 EU-CONV16.1-17.1 EU-CONV17.1-17.2 EU-CONV19 & 19A-17 EU-CONV13-17.1 EU-CONV15-15.1 EU-CONVEYOR1 EU-CONVEYOR12A-13 EU-CONVEYOR12B-13 EU-CONVEYOR4A-4A1 EU-CONVEYOR4B-4C EU-CONVEYOR4C-4D EU-FEEDMIXER1 EU-FEEDMIXER2 EU-PRIMARYCRUSHER EU-SCREENSRECLAIM EU-COOLER1 EU-COOLER2 EU-TRANSFERTOWER1 EU-TRANSFERTOWER2 EU-UNIT1LHF EU-UNIT2LHF EU-PROD CONV2
FGBOILERS	One or more propane or natural gas-fired boilers, each with a maximum rated heat input of 100 million Btu per hour, and each controlled by a low-NOx burner. <b>(PTI No. 147-13)</b>	NA
FGTACONITEMACT	The affected source is an existing taconite iron ore processing plant, that is (or is part of) a major source of hazardous air pollutant (HAP) emissions. An existing affected source is a source that commenced construction or reconstruction before December 18, 2002. The regulations cover emissions from ore crushing and handling emission units, ore dryer stacks, indurating furnace stacks, finished pellet handling emission units, and fugitive dust emissions.	EUOREDRYER1 EUOREDRYER2 EUKILN1 EUKILN2 FGDUSTCOLLECTORS



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Flexible Group ID	Flexible Group Description	Associated Emission Unit IDs
FGBOILERS6-7	Kewaunee Boilers 6 and 7 are located at the Pit Service Building. Each boiler is rated at 19.46 million BTU per hour. The boilers are capable of burning natural gas, No. 2 fuel oil and/or used oil fuel. These emission units were originally permitted to Empire Mine Partnership. <b>(Permits to Install Nos. 436-97, 219-04)</b>	EUBOILER6 EUBOILER7
FGNESHAP5D	Gas 1 Fuel Subcategory requirements for new Boilers/Process Heaters at major sources of Hazardous Air Pollutants per 40 CFR Part 63, Subpart DDDDD. These new boilers or process heaters must comply with this subpart upon startup.	EU-BOILER4

**FGDUSTCOLLECTORS  
 FLEXIBLE GROUP CONDITIONS**

**DESCRIPTION**

Various ore, concentrate, and finished pellet handling processes throughout the facility, including primary and secondary ore crushing, conveyor transfer points, bentonite feeders and mixer blenders, pellet cooler discharge hoppers, low head feeders, transfer towers, etc. The various emission units are controlled with wet scrubbers.

**Emission Units:** EU-CONV14-15-16, EU-CONV15.8-15.9, EU-CONV15.9-16.1, EU-CONV16.1-17.1, EU-CONV17.1-17.2, EU-CONV19&19A-17, EU-CONV13-17.1, EU-CONV15-15.1, EU-CONVEYOR1, EU-CONVEYOR12A-13, EU-CONVEYOR12B-13, EU-CONVEYOR4A-4A1, EU-CONVEYOR4B-4C, EU-CONVEYOR4C-4D, EU-FEEDMIXER1, EU-FEEDMIXER2, EU-PRIMARYCRUSHER, EU-SCREENSRECLAIM, EU-COOLER1, EU-COOLER2, EU-TRANSFERTOWER1, EU-TRANSFERTOWER2, EU-UNIT1LHF, EU-UNIT2LHF, EU-PROD CONV2

**Related Flexible Group ID:** FG TACONITEMACT

**POLLUTION CONTROL EQUIPMENT**

Wet Scrubbers

**I. EMISSION LIMIT(S)**

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
1. PM	0.10 lb./1000 lbs. of exhaust gases, calculated on a dry gas basis <sup>2</sup>	Test Protocol	FGDUSTCOLLECTORS	See FG TACONITEMACT SC V.1	R 336.1331

\* Test protocol shall specify averaging time

**II. MATERIAL LIMIT(S)**

NA

**III. PROCESS/OPERATIONAL RESTRICTION(S)**

NA

**IV. DESIGN/EQUIPMENT PARAMETER(S)**

1. The permittee shall equip each wet scrubber with at least one of the following:<sup>2</sup> (R 336.1910)
  - a. Operable water pressure gauge
  - b. Operable water flow meter
  - c. Viewport with pivoted cover or quick-release hatch
  - d. Scrubber drain with readily visible sump to verify scrubber water flow

**V. TESTING/SAMPLING**

Records shall be maintained on file for a period of five years. (R 336.1213(3)(b)(ii))

See FG TACONITEMACT.

See Appendix 5

#### **VI. MONITORING/RECORDKEEPING**

Records shall be maintained on file for a period of five years. **(R 336.1213(3)(b)(ii))**

1. The permittee shall continuously measure pressure drop and scrubber liquid flow rate, using a Continuous Parameter Monitoring System (CPMS), and record every 15 minutes for a 24-hour average as an indicator of proper operation of the scrubber. **(40 CFR 64.6(c)(1)(i and ii))**
2. Upon detecting an excursion or exceedance, the owner or operator shall restore operation of DUSTCOLLECTORS and its control equipment to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions. The response shall include minimizing the period of any startup, shutdown or malfunction and taking any necessary corrective actions to restore normal operation and prevent the likely recurrence of the cause of an excursion or exceedance (other than those caused by excused startup or shutdown conditions). **(40 CFR 64.7(d))**
3. Except for, as applicable, monitoring malfunctions, associated repairs, and required quality assurance or control activities (including, as applicable, calibration checks and required zero and span adjustments), the owner or operator shall conduct all monitoring in continuous operation (or shall collect data at all required intervals) at all times that the pollutant-specific emissions unit is operating. Data recorded during monitoring malfunctions, associated repairs, and required quality assurance or control activities shall not be used for purposes of this part, including data averages and calculations or fulfilling a minimum data availability requirement, if applicable. The owner or operator shall use all the data collected during all other periods in assessing the operation of the control device and associated control system. A monitoring malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring to provide valid data. Monitoring failures that are caused in part by poor maintenance or careless operation are not malfunctions. **(40 CFR 64.6(c)(3), 64.7(c))**
4. The permittee shall properly maintain the monitoring system, including keeping necessary parts for routine repair of the monitoring equipment. **(40 CFR 64.7(b))**
5. The permittee shall maintain records of monitoring data, monitor performance data, corrective actions taken, any written quality improvement plan and any activities undertaken to implement a quality improvement plan, and other information such as data used to document the adequacy of monitoring, or records of monitoring maintenance or corrective actions. **(40 CFR 64.9(b)(1))**

#### **VII. REPORTING**

1. Prompt reporting of deviations pursuant to General Conditions 21 and 22 of Part A. **(R 336.1213(3)(c)(ii))**
2. Semiannual reporting of monitoring and deviations pursuant to General Condition 23 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. **(R 336.1213(3)(c)(i))**
3. Annual certification of compliance pursuant to General Conditions 19 and 20 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for the previous calendar year. **(R 336.1213(4)(c))**
4. Each semiannual report of monitoring and deviations shall include summary information on the number, duration and cause of excursions and/or exceedances and the corrective actions taken. If there were no excursions and/or exceedances in the reporting period, then this report shall include a statement that there were no excursions and/or exceedances. **(40 CFR 64.9(a)(2)(i))**
5. Each semiannual report of monitoring and deviations shall include summary information on monitor downtime. If there were no periods of monitor downtime in the reporting period, then this report shall include a statement that there were no periods of monitor downtime. **(40 CFR 64.9(a)(2)(ii))**

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6. The permittee shall submit two complete test protocols to the AQD, one to the Technical Programs Unit Supervisor and one to the District Supervisor for approval at least 30 days prior to the anticipated test date. The protocol shall describe the test method(s) and the maximum routine operating conditions, including targets for key operational parameters associated with air pollution control equipment to be monitored and recorded during testing.<sup>2</sup> (R 336.12001(3))
7. The permittee shall notify the AQD Technical Programs Unit Supervisor and the District Supervisor no less than 7 days prior to the anticipated test date.<sup>2</sup> (R 336.2001(4))
8. The permittee shall submit two complete test reports of the test results to the AQD, one to the Technical Programs Unit Supervisor and one to the District Supervisor, within 60 days following the last date of the test.<sup>2</sup> (R 336.2001(5))

See Appendix 8

#### VIII. STACK/VENT RESTRICTION(S)

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

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
2 - 145 sly impinjet scrubbers (731-80)	26 <sup>1</sup>	85 <sup>1</sup>	R 336.1901
140 sly impinjet scrubber (485-80)	20 <sup>1</sup>	45 <sup>1</sup>	R 336.1901
150 sly impinjet scrubber (485-80)	25 <sup>1</sup>	35 <sup>1</sup>	R 336.1901
160 sly impinjet scrubber (485-80)	30 <sup>1</sup>	35 <sup>1</sup>	R 336.1901

#### IX. OTHER REQUIREMENT(S)

NA

#### Footnotes:

<sup>1</sup>This condition is state only enforceable and was established pursuant to Rule 201(1)(b).

<sup>2</sup>This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

**FGBOILERS  
FLEXIBLE GROUP CONDITIONS**

**DESCRIPTION**

One or more propane or natural gas-fired boilers, each with a maximum rated heat input of 100 million Btu per hour, and each controlled by a low-NOx burner. (PTI No. 147-13)

Emission Unit: NA

**POLLUTION CONTROL EQUIPMENT**

Low-NOx burner

**I. EMISSION LIMIT(S)**

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
1. NOx	0.05 lb/MMBtu <sup>2</sup>	Test Protocol	FGBOILERS	SC V.1	R 336.1205(1)(a)

\* Test protocol shall specify averaging time

**II. MATERIAL LIMIT(S)**

1. The permittee shall burn only propane or natural gas in FGBOILERS.<sup>2</sup> (R 336.1205(1)(a))
2. The fuel use for FGBOILERS covered by this general permit shall not exceed 1400 million standard cubic feet per 12-month rolling time period as determined at the end of each calendar month.<sup>1</sup> (R 336.1224, R 336.1225, R 336.1205(1)(a))

**III. PROCESS/OPERATIONAL RESTRICTION(S)**

1. The permittee shall operate FGBOILERS in accordance with manufacturer's recommendations for safe and proper operation to minimize emissions during periods of startup, shutdown and malfunction.<sup>2</sup> (R 336.1912)

**IV. DESIGN/EQUIPMENT PARAMETER(S)**

NA

**V. TESTING/SAMPLING**

Records shall be maintained on file for a period of five years. (R 336.1213(3)(b)(ii))

1. Verification of the NOx emission limit (0.05 pound of NOx emitted per million Btu of heat input), by testing at owner's expense, in accordance with Department requirements may be required. No less than 60 days prior to testing, a complete test plan shall be submitted to the AQD. The final plan must be approved by the AQD prior to testing. Verification of the emission factor includes the submittal of a complete report of the test results to the AQD within 60 days following the last date of the test.<sup>2</sup> (R 336.1205(1)(a), R 336.2001, R 336.2003, R 336.2004)

See Appendix 5

## **VI. MONITORING/RECORDKEEPING**

Records shall be maintained on file for a period of five years. **(R 336.1213(3)(b)(ii))**

1. The permittee shall install, calibrate, maintain and operate in a satisfactory manner a device to monitor and record the fuel use for FGBOILERS on a daily basis.<sup>2</sup> **(R 336.1205(1)(a))**
2. The permittee shall keep, in a satisfactory manner, daily, monthly and 12-month rolling time period fuel use records for FGBOILERS. The records must indicate the total amount of fuel used in FGBOILERS. All records shall be kept on file for a period of at least five years and made available to the Department upon request.<sup>2</sup> **(R 336.1205(1)(a), 40 CFR 60.48c (g))**
3. The permittee shall keep on file, a demonstration that the low-NOx burner is designed to emit no more than 0.05 pound of NOx per million Btu of heat input (i.e., manufacturer's guarantee, test data, etc.).<sup>2</sup> **(R 336.1205(1)(a))**
4. The permittee shall keep, in a satisfactory manner, records of the date, duration, and description of any malfunction of the control equipment, any maintenance performed and any testing results for FGBOILERS. All records shall be kept on file for a period of at least five years and made available to the Department upon request.<sup>2</sup> **(R 336.1702(a), R 336.1910)**

## **VII. REPORTING**

1. Prompt reporting of deviations pursuant to General Conditions 21 and 22 of Part A. **(R 336.1213(3)(c)(ii))**
2. Semiannual reporting of monitoring and deviations pursuant to General Condition 23 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. **(R 336.1213(3)(c)(i))**
3. Annual certification of compliance pursuant to General Conditions 19 and 20 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for the previous calendar year. **(R 336.1213(4)(c))**
4. The permittee shall submit the following notifications to the AQD District Supervisor in accordance with 40 CFR 60.48c. **(40 CFR Part 60, Subparts A & Dc)**
  - a. A notification of the date when construction was commenced, submitted no later than 30 calendar days after such date.
  - b. A notification of the actual date of startup of the source, submitted within 30 calendar days after such date.
5. The permittee shall submit two complete test protocols to the AQD, one to the Technical Programs Unit Supervisor and one to the District Supervisor for approval at least 30 days prior to the anticipated test date. The protocol shall describe the test method(s) and the maximum routine operating conditions, including targets for key operational parameters associated with air pollution control equipment to be monitored and recorded during testing.<sup>2</sup> **(R 336.12001(3))**
6. The permittee shall notify the AQD Technical Programs Unit Supervisor and the District Supervisor no less than 7 days prior to the anticipated test date.<sup>2</sup> **(R 336.2001(4))**
7. The permittee shall submit two complete test reports of the test results to the AQD, one to the Technical Programs Unit Supervisor and one to the District Supervisor, within 60 days following the last date of the test.<sup>2</sup> **(R 336.2001(5))**

See Appendix 8

## **VIII. STACK/VENT RESTRICTION(S)**

1. The exhaust gases from FGBOILERS shall be discharged unobstructed vertically upwards to the ambient air from stack(s) with an exit point not less than one and one half times the building height (from ground level to point of discharge).<sup>2</sup> **(R 336.1225, 40 CFR 52.21 (c) & (d))**

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**IX. OTHER REQUIREMENT(S)**

1. The permittee shall not replace or modify FGBOILERS, or any portion of FGBOILERS, including control equipment, unless all of the following conditions are met:<sup>2</sup> **(R 336.1201a(1))**
  - a. The permittee shall update the general permit by submitting a new Process Information Form (EQP5783) to the Permit Section and the District Supervisor; identifying the existing and new equipment a minimum of 10 days before the equipment is replaced or modified.
  - b. The permittee shall continue to meet all General PTI applicability criteria after the replacement or modification is complete.
  - c. The permittee shall keep records of the date and description of the replacement or modification.

**Footnotes:**

<sup>1</sup>This condition is state only enforceable and was established pursuant to Rule 201(1)(b).

<sup>2</sup>This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

**FGTACONITEMACT  
 FLEXIBLE GROUP CONDITIONS**

**DESCRIPTION**

The affected source is an existing taconite iron ore processing plant, that is (or is part of) a major source of hazardous air pollutant (HAP) emissions. An existing affected source is a source that commenced construction or reconstruction before December 18, 2002. The regulations cover emissions from ore crushing and handling emission units, ore dryer stacks, indurating furnace stacks, finished pellet handling emission units, and fugitive dust emissions.

**Emission Units:** EUOREDRIYER1, EUOREDRIYER2, EUKILN1, EUKILN2, and FGDUSTCOLLECTORS

**POLLUTION CONTROL EQUIPMENT**

Cyclone pre-cleaners, wet scrubbers and dry electrostatic precipitators

**I. EMISSION LIMIT(S)**

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
1. PM	0.008 gr/dscf	Test Protocol/Flow weighted mean concentration	All affected source Ore Crushing and Handling Emission Units: EU-CONV14-15-16 EU-CONV15.8-15.9 EU-CONV15.9-16.1 EU-CONV16.1-17.1 EU-CONV17.1-17.2 EU-CONV19 & 19A-17 EU-CONV13-17.1 EU-CONV15-15.1 EU-CONVEYOR1 EU-CONVEYOR12A-13 EU-CONVEYOR12B-13 EU-CONVEYOR4A-4A1 EU-CONVEYOR4B-4C EU-CONVEYOR4C-4D EU-FEEDMIXER1 EU-FEEDMIXER2 EU-PRIMARYCRUSHER EU-SCREENSRECLAIM	SC V.1	<b>40 CFR 63.9590(a), 63.9621(a),(b), 40 CFR Part 63, Subpart RRRRR, Table 1(1)</b>
2. PM	0.008 gr/dscf	Test Protocol/Flow weighted mean concentration	All affected Finished Pellet Handling emission units: EU-COOLER1 EU-COOLER2 EU-TRANSFERTOWER1 EU-TRANSFERTOWER2 EU-UNIT1LHF EU-UNIT2LHF EU-PROD CONV2	SC V.2	<b>40 CFR 63.9590(a) 40 CFR Part 63, Subpart RRRRR, Table 1(5)</b>



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Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
3. PM	0.052 gr/dscf	Test Protocol	Each individual ore dryer: EUOREDRIYER1 EUOREDRIYER2	SC V.3	<b>40 CFR 63.9590(a), 63.9621(a),(c), 40 CFR Part 63, Subpart RRRRR, Table 1(6)</b>
4. PM	0.01 gr/dscf	Test Protocol/When processing <b>magnetite</b>	Each individual indurating furnace: EUKILN1 EUKILN2	SC V.4	<b>40 CFR 63.9590(a), 63.9621(a), (c), 40 CFR Part 63, Subpart RRRRR, Table 1(3)</b>
5. PM	0.03 gr/dscf	Test Protocol/When processing <b>hematite</b>	Each individual indurating furnace: EUKILN1 EUKILN2	SC V.5	<b>40 CFR 63.9590(a), 63.9621(a),(c), 40 CFR Part 63, Subpart RRRRR, Table 1(4)</b>

\* Test protocol shall specify averaging time

**II. MATERIAL LIMIT(S)**

NA

**III. PROCESS/OPERATIONAL RESTRICTION(S)**

1. Except as provided in paragraph (2) of this section, for each wet scrubber applied to meet any particulate matter emission limit in Section I, the permittee must maintain the daily average pressure drop and daily average scrubber water flow rate at or above the minimum levels established during an initial or subsequent performance test. If the daily average pressure drop or water flow rate is below the established operating limits, the permittee must follow the corrective action procedures specified in Condition 4 of this Section. **(40 CFR 63.9590(b)(1), 40 CFR 63.9622(a), 40 CFR 63.9622(f), 40 CFR 63.9634(e), and 40 CFR 63.9636)**
2. For each dynamic wet scrubber applied to meet any particulate matter emission limit in Section I, the permittee must maintain the daily average scrubber water flow rate and either the daily average fan amperage (a surrogate for fan speed as revolutions per minute) or the daily average pressure drop at or above the minimum levels established during an initial or subsequent performance test. If the daily average pressure drop or water flow rate is below the established operating limits, the permittee must follow the corrective action procedures specified in Condition 4 of this Section. **(40 CFR 63.9590(b)(2), 40 CFR 63.9622(a), 40 CFR 63.9622(f) 63.9634(f) and 63.9636)**
3. For each dry electrostatic precipitator applied to meet any particulate matter emission limit in Section I, the permittee must maintain either (1) the 6-minute average opacity of emissions exiting the control device stack; or (2) the daily average secondary voltage and daily average secondary current for each field, at or below the levels established during an initial or subsequent performance test. If demonstrating compliance using opacity, if the daily average opacity is above the operating limits established for the corresponding emission unit, the permittee must follow the corrective action procedures specified in Condition 4 of this section. If demonstrating compliance using daily average secondary voltage and secondary current, if the daily average is below the operating limit established for the corresponding emission unit, the permittee must follow the corrective action procedures specified in Condition 5 of this section. **(40 CFR 63.9590(b)(3), 63.6922(c), 63.6922(f), 63.9634(g) and 63.9636)**

4. If the daily average operating parameter value for an emission unit or group of similar emission units does not meet the corresponding established operating limit, the permittee must follow the procedures in paragraphs (a) through (d) of this section.
- a. You must initiate and complete initial corrective action within 10 calendar days and demonstrate that the initial corrective action was successful. During any period of corrective action, you must continue to monitor and record all required operating parameters for equipment that remains in operation. After 10 calendar days, measure and record the daily average operating parameter value for the emission unit or group of similar emission units on which corrective action was taken. After the initial corrective action, if the daily average operating parameter value for the emission unit or group of similar emission units meets the operating limit established for the corresponding unit or group, then the corrective action was successful and the emission unit or group of similar emission units is in compliance with the established operating limits. **(40 CFR 63.9634(j)(1))**
  - b. If the initial corrective action required in paragraph (a) of this section was not successful, then you must complete additional corrective action within 10 calendar days and demonstrate that the subsequent corrective action was successful. During any period of corrective action, you must continue to monitor and record all required operating parameters for equipment that remains in operation. After the second set of 10 calendar days allowed to implement corrective action, you must again measure and record the daily average operating parameter value for the emission unit or group of similar emission units. If the daily average operating parameter value for the emission unit or group of similar emission units meets the operating limit established for the corresponding unit or group, then the corrective action was successful and the emission unit or group of similar emission units is in compliance with the established operating limits. **(40 CFR 63.9634(j)(2))**
  - c. (3) If the second attempt at corrective action required in paragraph (b) of this section was not successful, then you must repeat the procedures of paragraph (j)(2) of this section until the corrective action is successful. If the third attempt at corrective action is unsuccessful, you must conduct another performance test in accordance with the procedures in 40 CFR 63.9622(f) and report to the Administrator as a deviation the third unsuccessful attempt at corrective action. **(40 CFR 63.9634(j)(3))**
  - d. (4) After the third unsuccessful attempt at corrective action, you must submit to the Administrator the written report required in paragraph (c) of this section within 5 calendar days after the third unsuccessful attempt at corrective action. This report must notify the Administrator that a deviation has occurred and document the types of corrective measures taken to address the problem that resulted in the deviation of established operating parameters and the resulting operating limits. **(40 CFR 63.9634(j)(4))**

5. As required by 40 CFR 63.6(e)(1)(i), the permittee must always operate and maintain the affected source, including air pollution control and monitoring equipment, in a manner consistent with good air pollution control practices for minimizing emissions at least to the levels required by Section I. **(40 CFR 63.9600(a))**

6. The permittee shall operate FGTACTIONEMACT consistent with the Operation and Maintenance Plan (O&M Plan); Wet Scrubber and ESP Monitoring and Response Plan, for operation of the wet scrubbers and electrostatic precipitators (ESPs) in compliance with the Taconite MACT (40 CFR Part 63 Subpart RRRRR), Updates and revisions to the O&M plan shall not require permit amendments. (R 336.1331, R 336.1910, R 336.1911, EPA Consent Decree, Civil Action No. 2:19-cv-095, Act 451 324.5503(b))

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**IV. DESIGN/EQUIPMENT PARAMETER(S)**

NA

**V. TESTING/SAMPLING**

Records shall be maintained on file for a period of five years. **(R 336.1213(3)(b)(ii))**

1. The permittee shall demonstrate compliance with the particulate matter emission limit specified in SC I.1 for the Ore Crushing and Handling emission units (EU-CONV14-15-16, EU-CONV15.8-15.9, EU-CONV15.9-16.1, EU-CONV16.1-17.1, EU-CONV17.1-17.2, EU-CONV19 &19A-17,EU-CONV13-17.1, EU-CONV15-15.1, EU-CONVEYOR1, EU-CONVEYOR12A-13, EU-CONVEYOR12B-13, EU-CONVEYOR4A-4A1, EU-CONVEYOR4B-4C, EU-CONVEYOR4C-4D, EU-FEEDMIXER1, EU-FEEDMIXER2, EU-PRIMARYCRUSHER,

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EU-SCREENSRECLAIM) by testing at owner's expense, in accordance the requirements in 40 CFR 63.9621(b). The permittee may elect to test a representative unit in accordance with 40 CFR 63.9260(e – g) in lieu of testing each and every Ore Crushing and Handling emission unit. Testing will be conducted at least once during the five-year permit term and once every five years thereafter.<sup>2</sup> **(R 336.1213(3), R 336.2001(3) and (4), 40 CFR 63.9621(b), 40 CFR 63.9630(a) and 40 CFR 63.9640)**

2. The permittee shall demonstrate compliance with the particulate matter emission limit in SC I.2 for the Finished Pellet Handling emission units (EU-COOLER1, EU-COOLER2, EU-TRANSFERTOWER1, EU-TRANSFERTOWER2, EU-UNIT1LHF, EU-UNIT2LHF, EU-PRODCONV2) by testing at owner's expense, in accordance with the requirements in 40 CFR 63.9621(b). The permittee may elect to test a representative unit in accordance with 40 CFR 63.9620(e)-(g) in lieu of testing each and every Finished Pellet Handling emission unit. Testing will be conducted at least once during the five-year permit term and once every five years thereafter. **(40 CFR 63.9620(e), 40 CFR 63.9621(b), 40 CFR 63.9630(c), 40 CFR 63.9640)**
3. The permittee shall demonstrate compliance with the particulate matter emission limit in SC I.3 for EUOREDRIYER1 and EUOREDRIYER2 by testing at owner's expense, in accordance with the requirements in 40 CFR 63.9621(c). Testing will be conducted at least once during the five-year permit term and once every five years thereafter. **(40 CFR 63.9621(c), 40 CFR 63.9630(d), 40 CFR 63.9640)**
4. The permittee shall demonstrate compliance with the particulate matter emission limit, when processing magnetite, specified in SC I.4 for EUKILN1 and EUKILN2 by testing at owner's expense, in accordance with the requirements in 40 CFR 63.9621(a). Testing will be conducted at least twice during the five-year permit term and twice every five year term thereafter. If magnetite is not processed during the five year permit term, testing will not be required. **(40 CFR 63.9621(a), 40 CFR 63.9630(a), 40 CFR 63.9630 (b), 40 CFR 63.9640)**
5. The permittee shall demonstrate compliance with the particulate matter emission limit, when processing hematite, specified in SC I.5 for EUKILN1 and EUKILN2 by testing at owner's expense, in accordance with the requirements in 40 CFR 63.9621(a). Testing will be conducted at least twice during the five-year permit term and twice every five year term thereafter. **(40 CFR 63.9621(a), 40 CFR 63.9630(a), 40 CFR 63.9630 (b), 40 CFR 63.9640)**

## **VI. MONITORING/RECORDKEEPING**

Records shall be maintained on file for a period of five years. **(R 336.1213(3)(b)(ii))**

1. Except as provided in paragraph (2) of this section, for each wet scrubber subject to the operating limits for pressure drop and scrubber water flow rate in 40 CFR 63.9590(b)(1), the permittee must install, operate, and maintain a CPMS according to the requirements in 40 CFR 63.9632(b) through (e) and monitor the daily average pressure drop and daily average scrubber water flow rate according to the requirements in 40 CFR 63.9633. The permittee shall record all information needed to document conformance with these requirements. **(40 CFR 63.9631(b), 63.9632(b)-(e), 63.9633, and 63.9634(e)(2),(3))**
2. For each dynamic wet scrubber subject to the scrubber water flow rate and either the fan amperage or pressure drop operating limits in 40 CFR 63.9590(b)(2), the permittee must install, operate, and maintain a CPMS according to the requirements in 40 CFR 63.9632(b) through (e) and monitor the daily average scrubber water flow rate and either the daily average fan amperage or the daily average pressure drop according to the requirements in 40 CFR 63.9633. The permittee shall record all information needed to document conformance with these requirements. **(40 CFR 63.9631(c), 63.9632(b)-(e), 63.9633, and 63.9634(f)(2)-(3))**
3. For each dry electrostatic precipitator subject to the operating limits in 40 CFR 63.9590(b)(3), the permittee must follow the monitoring requirements in paragraph (a) or (b). **(40 CFR 63.9631(d))**
  - a. If the operating limit the permittee chooses to monitor is the 6-minute average opacity of emissions in accordance with 40 CFR 63.9590(b)(3)(i), the permittee must install, operate, and maintain a COMS according to the requirements in 40 CFR 63.9632(f) and monitor the 6-minute average opacity of emissions exiting each control device stack according to the requirements in 40 CFR 63.9633.
  - b. If the operating limit the permittee chooses to monitor is average secondary voltage and average secondary current for each dry electrostatic precipitator field in accordance with 40 CFR 63.9590(b)(3)(ii), the permittee must install, operate, and maintain a CPMS according to the requirements in 40 CFR 63.9632(b) through (e)

and monitor the daily average secondary voltage and daily average secondary current according to the requirements in 40 CFR 63.9633.

The permittee shall record all information needed to document conformance with these requirements. **(40 CFR 63.9631(b), 40 CFR 63.9632(b)-(e), 63.9633, 63.9634(g)(2))**

4. The permittee must keep the following records:
  - a. A copy of each notification and report that you submitted to comply with this subpart, including all documentation supporting any initial notification or notification of compliance status that you submitted, according to the requirements in 40 CFR 63.10(b)(2)(xiv).
  - b. The records in 40 CFR 63.6(e)(3)(iii) through (v) related to startup, shutdown, and malfunction.
  - c. Records of performance tests and performance evaluations as required in 40 CFR 63.10(b)(2)(viii). **(40 CFR 63.9642(a))**
5. For each COMS, the permittee must keep the following records:
  - a. Records described in 40 CFR 63.10(b)(2)(vi) through (xi).
  - b. Monitoring data for COMS during a performance evaluation as required in 40 CFR 63.6(h)(7)(i) and (ii).
  - c. Previous (that is, superseded) versions of the performance evaluation plan as required in 40 CFR 63.8(d)(3).
  - d. Records of the date and time that each deviation started and stopped and whether the deviation occurred during a period of startup, shutdown, or malfunction or during another period. **(40 CFR 63.9642(b))**
6. The permittee must keep the records required in 40 CFR 63.9634 through 63.9636 to show continuous compliance with each emission limitation, work practice standard, and operation and maintenance requirement that applies to you. **(40 CFR 63.9642(c))**
7. Your records must be in a form suitable and readily available for expeditious review, according to 40 CFR 63.10(b)(1). **(40 CFR 63.9643(a))**
8. As specified in 40 CFR 63.10(b)(1), you must keep each record for 5 years following the date of each occurrence, measurement, maintenance, corrective action, report, or record. **(40 CFR 63.9643(b))**
9. You must keep each record on site for at least 2 years after the date of each occurrence, measurement, maintenance, corrective action, report, or record according to 40 CFR 63.10(b)(1). You can keep the records offsite for the remaining 3 years. **(40 CFR 63.9643(c))**
10. If the permittee uses any air pollution control device other than a baghouse, wet scrubber, dry electrostatic precipitator, or wet electrostatic precipitator, the permittee must submit a site-specific monitoring plan that includes the information in paragraphs (a) through (d). The monitoring plan is subject to approval by the Administrator. The permittee must maintain a current copy of the monitoring plan onsite, and it must be available for inspection upon request, and kept for the life of the affected source or until the affected source is no longer subject to the requirements of this subpart. **(40 CFR 63.9631(f) and 63.9634(i))**
  - a. A description of the device.
  - b. Test results collected in accordance with 40 CFR 63.9621 verifying the performance of the device for reducing emissions of particulate matter to the atmosphere to the levels required by this subpart.
  - c. A copy of the operation and maintenance plan required in 40 CFR 63.9600(b).
  - d. Appropriate operating parameters that will be monitored to maintain continuous compliance with the applicable emission limitation(s).
11. For each CPMS required in 40 CFR 63.9631, the permittee must develop and make available for inspection upon request by the permitting authority a site-specific monitoring plan that addresses the requirements in paragraphs (a) through (g) of this section. **(40 CFR 63.9632(b))**
  - a. Installation of the CPMS sampling probe or other interface at a measurement location relative to each affected emission unit such that the measurement is representative of control of the exhaust emissions (e.g., on or downstream of the last control device).
  - b. Performance and equipment specifications for the sample interface, the parametric signal analyzer, and the data collection and reduction system.
  - c. Performance evaluation procedures and acceptance criteria (e.g., calibrations).

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- d. Ongoing operation and maintenance procedures in accordance with the general requirements of 40 CFR 63.8(c)(1), (3), (4)(ii), (7), and (8).
  - e. Ongoing data quality assurance procedures in accordance with the general requirements of 40 CFR 63.8(d).
  - f. Ongoing recordkeeping and reporting procedures in accordance with the general requirements of 40 CFR 63.10(c), (e)(1), and (e)(2)(i).
  - g. Corrective action procedures that you will follow in the event an air pollution control device, except for a baghouse, exceeds an established operating limit as required in 40 CFR 63.9600(b)(3).
12. Unless otherwise specified, each CPMS must meet the requirements in paragraphs (a) and (b).  
**(40 CFR 63.9632(c))**
- a. Each CPMS must complete a minimum of one cycle of operation for each successive 15-minute period and must have valid data for at least 95 percent of every daily averaging period.
  - b. Each CPMS must determine and record the daily average of all recorded readings.
13. The permittee must conduct a performance evaluation of each CPMS in accordance with the site-specific monitoring plan. **(40 CFR 63.9632(d))**
14. The permittee must operate and maintain the CPMS in continuous operation according to the site-specific monitoring plan. **(40 CFR 63.9632(e))**
15. For each dry electrostatic precipitator subject to the opacity operating limit in 40 CFR 63.9590(b)(3)(i), the permittee must install, operate, and maintain each COMS according to the requirements in paragraphs (a) through (d) of this section. **(40 CFR 63.9632(f))**
- a. The permittee must install each COMS and conduct a performance evaluation of each COMS according to 40 CFR 63.8 and Performance Specification 1 in appendix B to 40 CFR Part 60.
  - b. The permittee must develop and implement a quality control program for operating and maintaining each COMS according to 40 CFR 63.8. At a minimum, the quality control program must include a daily calibration drift assessment, quarterly performance audit, and annual zero alignment of each COMS.
  - c. The permittee must operate and maintain each COMS according to 40 CFR 63.8(e) and the quality control program. The permittee must also identify periods the COMS is out of control, including any periods that the COMS fails to pass a daily calibration drift assessment, quarterly performance audit, or annual zero alignment audit.
  - d. The permittee must determine and record the 6-minute average opacity for periods during which the COMS is not out of control.
16. Except for monitoring malfunctions, associated repairs, and required quality assurance or control activities (including as applicable, calibration checks and required zero and span adjustments), the permittee must monitor continuously (or collect data at all required intervals) at all times an affected source is operating.  
**(40 CFR 63.9633(a))**
17. The permittee may not use data recorded during monitoring malfunctions, associated repairs, and required quality assurance or control activities in data averages and calculations used to report emission or operating levels, or to fulfill a minimum data availability requirement. The permittee must use all the data collected during all other periods in assessing compliance. **(40 CFR 63.9633(b))**
18. A monitoring malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring system to provide valid data. Monitoring failures that are caused in part by poor maintenance or careless operation are not considered malfunctions. **(40 CFR 63.9633(c))**

## **VII. REPORTING**

1. Prompt reporting of deviations pursuant to General Conditions 21 and 22 of Part A. **(R 336.1213(3)(c)(ii))**
2. Semiannual reporting of monitoring and deviations pursuant to General Condition 23 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. **(R 336.1213(3)(c)(i))**

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3. Annual certification of compliance pursuant to General Conditions 19 and 20 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for the previous calendar year. **(R 336.1213(4)(c))**
4. The permittee must report each instance in which you did not meet an emission limitation in 40 CFR Part 63, Subpart RRRRR, including during periods of startup, shutdown or malfunction, and each instance in which you did not meet a work practice standard in 40 CFR 63.9591 or an operation and maintenance requirement in 40 CFR 63.9600. Deviations occurring during a period of startup, shutdown, or malfunction are not violations if you demonstrate to the Department's satisfaction that you were operating in accordance with 40 CFR 63.6(e)(1). Deviations shall be reporting semiannually. **(40 CFR 63.9637, 40 CFR 63.9641(a), 40 CFR 63.9641(b), 40 CFR 63.9641(d), 40 CFR 63.9650, 40 CFR 63.6(e), 40 CFR 63.10(d)(5)(i))**
5. If the permittee had a startup, shutdown, or malfunction during the semiannual reporting period that was not consistent with your Malfunction Abatement Plan, you must submit an immediate Malfunction Abatement report according to the requirements in 40 CFR 63.10(d)(5)(ii). **(40 CFR 63.9641(c))**
6. If the permittee had three unsuccessful attempts of applying corrective action as described in 40 CFR 63.9634(j), then you must submit an immediate corrective action report. Within 5 calendar days after the third unsuccessful attempt at corrective action, you must submit to the District Supervisor a written report in accordance with 40 CFR 63.9634(j)(3) and (4). This report must notify that a deviation has occurred and document the types of corrective measures taken to address the problem that resulted in the deviation of established operating parameters and the resulting operating limits. **(40 CFR 63.9641(e))**
7. The permittee shall submit two complete test protocols to the AQD, one to the Technical Programs Unit Supervisor and one to the District Supervisor for approval at least 60 days prior to the anticipated test date. The protocol shall describe the test method(s) and the maximum routine operating conditions, including targets for key operational parameters associated with air pollution control equipment to be monitored and recorded during testing.<sup>2</sup> **(R 336.12001(3))**
8. The permittee shall notify the AQD Technical Programs Unit Supervisor and the District Supervisor no less than 7 days prior to the anticipated test date.<sup>2</sup> **(R 336.2001(4))**
9. The permittee shall submit two complete test reports of the test results to the AQD, one to the Technical Programs Unit Supervisor and one to the District Supervisor, within 60 days following the last date of the test.<sup>2</sup> **(R 336.2001(5))**

See Appendix 8

#### VIII. STACK/VENT RESTRICTION(S)

NA

#### IX. OTHER REQUIREMENT(S)

1. The permittee shall comply with all applicable requirements of the National Emission Standards for Hazardous Air Pollutants: Taconite Iron Ore Processing as specified in 40 CFR Part 63, Subparts A and RRRRR. **(40 CFR Part 63, Subparts A and RRRRR)**
2. The permittee must prepare, and at all times operate according to, a fugitive dust emissions control plan that describes in detail the measures that will be put in place to control fugitive dust emissions from the locations listed in paragraphs (a) through (f) below. **(40 CFR 63.9591(a)(1-6), (b) and 63.9635)**
  - a. Stockpiles (includes, but is not limited to, stockpiles of uncrushed ore, crushed ore, or finished pellets);
  - b. Material transfer points;
  - c. Plant roadways;
  - d. Tailings basin;
  - e. Pellet loading areas; and
  - f. Yard areas.

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3. The permittee must maintain a current copy of the fugitive dust emissions control plan onsite for the life of the affected source or until the source is no longer subject to the requirements of 40 CFR Part 63, Subpart RRRRR. The permittee must make the plan available for inspection upon request. **(40 CFR 63.9591(d))**
4. As required by 40 CFR 63.6(e)(1)(i), the permittee must always operate and maintain the affected source, including air pollution control and monitoring equipment, in a manner consistent with good air pollution control practices for minimizing emissions at least to the levels required by Section I. **(40 CFR 63.9600(a))**
5. The permittee must prepare, and at all times operate according to, a written operation and maintenance plan for each control device applied to meet any particulate matter emission limit in Section I and to meet the requirement of each indurating furnace subject to good combustion practices (GCP). The plan must explain why the chosen practices (i.e., quantified objectives) are effective in performing corrective actions or GCP in minimizing the formation of formaldehyde (and other products of incomplete combustion). The permittee must maintain a current copy of the operation and maintenance plan onsite, and make it available for inspection upon request. Each operation and maintenance plan must address the elements in paragraphs (a) through (c). **(40 CFR 63.9600(b) and 63.9636)**
  - a. Preventative maintenance for each control device, including a preventative maintenance schedule that is consistent with the manufacturer's instructions for routine and long-term maintenance. **(40 CFR 63.9600(b)(1))**
  - b. Corrective action procedures for continuous parameter monitoring systems (CPMS) for all air pollution control devices except for baghouses. In the event the permittee exceeds an established operating limit for an air pollution control device except for a baghouse, the permittee must initiate corrective action to determine the cause of the operating limit exceedance and complete the corrective action within 10 calendar days. The corrective action procedures the permittee takes must be consistent with the installation, operation, and maintenance procedures listed in your site-specific CPMS monitoring plan in accordance with 40 CFR 63.9632(b). **(40 CFR 63.9600(b)(3) and 63.9634(j))**
  - c. The permittee must identify and implement a set of site-specific Good Combustion Practices (GCP) for each type of indurating furnace at the plant. These GCP should correspond to the permittee's standard operating procedures for maintaining the proper and efficient combustion within each indurating furnace. Good combustion practices include, but are not limited to, the elements listed in paragraphs (i) through (v). **(40 CFR 63.9600(b)(4))**
    - i. Proper operating conditions for each indurating furnace (e.g., minimum combustion temperature, maximum carbon monoxide concentration in the furnace exhaust gases, burner alignment, or proper fuel-air distribution/mixing).
    - ii. Routine inspection and preventative maintenance and corresponding schedules of each indurating furnace.
    - iii. Performance analyses of each indurating furnace.
    - iv. Keeping applicable operator logs.
    - v. Keeping applicable records to document compliance with each element.
6. The permittee must develop a written startup, shutdown, and malfunction plan according to the provisions in 40 CFR 63.6(e)(3). **(40 CFR 63.9610(c), ) 63.9650, 63.6(e)(3)**

**Footnotes:**

<sup>1</sup>This condition is state only enforceable and was established pursuant to Rule 201(1)(b).

<sup>2</sup>This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

**FGBOILERS6-7  
FLEXIBLE GROUP CONDITIONS**

**DESCRIPTION**

Kewaunee Boilers 6 and 7 (FGBOILERS6-7) are located at the Pit Service Building. Each boiler is rated at 19.46 million BTU per hour. The boilers are capable of burning natural gas, No. 2 fuel oil and/or used oil fuel. **(Permits to Install Nos. 436-97, 219-04)**

**Emission Unit:** EUBOILER6, EUBOILER7

**POLLUTION CONTROL EQUIPMENT**

NA

**I. EMISSION LIMIT(S)**

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
NA	NA	NA	NA	NA	NA

**II. MATERIAL LIMIT(S)**

1. The permittee shall burn only natural gas, No. 2 fuel oil, or used oil fuel in FGBOILERS6-7.<sup>2</sup> **(R 336.1301)**
2. The permittee shall not burn any used oil fuel in FGBOILERS6-7 except that generated from equipment operated by the permittee on the permittee's property.<sup>2</sup> **(R 336.1201(3))**
3. The used oil fuel burned in FGBOILERS6-7 shall not exceed sulfur content of 0.5 percent by weight, calculated on the basis of 150,000 BTU per gallon.<sup>2</sup> **(R 336.1201(3))**
4. The number 2 fuel oil burned in FGBOILERS6-7 shall not exceed sulfur content of 0.40 percent by weight, calculated on the basis of 18,000 BTU per pound.<sup>2</sup> **(R 336.1201(3))**

**III. PROCESS/OPERATIONAL RESTRICTION(S)**

1. The permittee shall not burn more than 200,000 gallons of used oil fuel per 12-month rolling time period. A monthly record of the amount of used oil fuel burned per 12-month rolling time period shall be kept on file for at least five years, and made available to the AQD upon request.<sup>1</sup> **(R 336.1225)**
2. The permittee must operate and maintain FGBOILERS6-7 in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator that may include but is not limited to, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source. **(40 CFR 63.7500(a)(3))**
3. The permittee may obtain approval from the Administrator to use an alternative to the work practice standards. **(40 CFR 63.7500(b))**
4. The permittee shall complete a tune-up of FGBOILERS6-7 every five (5) years (61 months) for boiler/process heaters utilizing an oxygen trim system and greater than 10 million Btu per hour. **(40 CFR 63.7540(a)(10), 63.7515(d))**



#### **IV. DESIGN/EQUIPMENT PARAMETER(S)**

NA

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

Records shall be maintained on file for a period of five years. **(R 336.1213(3)(b)(ii))**

NA

#### **VI. MONITORING/RECORDKEEPING**

Records shall be maintained on file for a period of five years. **(R 336.1213(3)(b)(ii))**

1. For each shipment of fuel oil received, the permittee shall obtain from the fuel oil supplier a laboratory analysis of the sulfur and BTU content. The determination of sulfur content shall be carried out in accordance with one of the following procedures: ASTM Method D129-64 or ASTM Method 1552-83 or ASTM Method 2622-87 or ASTM Method 1266-87 or an alternative method approved by the AQD District Supervisor. For each fuel oil shipment received, the permittee shall also record the date received, source of fuel oil and supplier, and gallons received. These records shall be retained by the permittee for a minimum of five years, and made available to the AQD upon request.<sup>2</sup> **(R 336.1201(3))**
2. At least once per calendar year, the permittee shall have an analysis performed of the used oil fuel sulfur and BTU content. The determination of sulfur content shall be carried out in accordance with one of the following procedures: ASTM Method D129-64 or ASTM Method 1552-83 or ASTM Method 2622-87 or ASTM Method 1266-87 or an alternative method approved by the AQD District Supervisor. These records shall be retained by the permittee for a minimum of five years, and made available to the AQD upon request.<sup>2</sup> **(R 336.1201(3))**
3. The permittee must keep a copy of each notification and report submittal to comply with 40 CFR Part 63, Subpart DDDDD, including all documentation supporting any Initial Notification or Notification of Compliance Status or semiannual compliance report that the permittee submitted, according to the requirements in 40 CFR 63.10(b)(2)(xiv). **(40 CFR 63.7555(a)(1))**
4. The permittee must keep each record on site, or they must be accessible from on-site (for example, through a computer network), for at least two (2) years after the date of each occurrence, measurement, maintenance, corrective action, report, or record. The permittee can keep the records off site for the remaining three (3) years. **(40 CFR 63.7560(a), (b), and (c))**

#### **VII. REPORTING**

1. Prompt reporting of deviations pursuant to General Conditions 21 and 22 of Part A. **(R 336.1213(3)(c)(ii))**
2. Semiannual reporting of monitoring and deviations pursuant to General Condition 23 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. **(R 336.1213(3)(c)(i))**
3. Annual certification of compliance pursuant to General Conditions 19 and 20 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for the previous calendar year. **(R 336.1213(4)(c))**
4. The permittee shall submit boiler tune-up reports to the AQD upon request. **(40 CFR 63.7540(a)(10))**
5. The permittee must submit boiler tune-up compliance reports. Compliance reports must be postmarked or submitted by March 15<sup>th</sup> of the year following the tune-up and must cover the period starting from January 1 and ending December 31. Compliance reports must be submitted using the Compliance and Emission Data Reporting Interface (CEDRI) which is accessed through the EPA's Central Data Exchange (CDX) (<https://cdx.epa.gov>). If the reporting form is not available in CEDRI at the time the compliance report is due, a

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hardcopy of the compliance report shall be submitted to the state and EPA Region 5. At the discretion of the Administrator, the permittee must submit these reports in the format specified by the Administrator. **(40 CFR 63.7550(b), 63.10(a)(5), and 63.7550(h)(3))**

See Appendix 8

**VIII. STACK/VENT RESTRICTION(S)**

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

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SVBOILER6-7	34 inches <sup>1</sup>	38 feet <sup>1</sup>	R 336.1225

**IX. OTHER REQUIREMENT(S)**

1. The permittee shall comply with all provisions of the federal Standards of Performance for New Stationary Sources as specified in 40 CFR Part 60, Subparts A and Dc, as they apply to FGBOILERS6-7.<sup>2</sup> **(40 CFR Part 60, Subparts A & Dc)**
2. The permittee shall comply with the applicable requirements of 40 CFR Part 63, Subpart DDDDD - National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters.<sup>2</sup> **(40 CFR Part 63, Subpart DDDDD)**

**Footnotes:**

<sup>1</sup>This condition is state only enforceable and was established pursuant to Rule 201(1)(b).

<sup>2</sup>This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

**FGNESHAP5D  
FLEXIBLE GROUP CONDITIONS**

**DESCRIPTION**

Gas 1 Fuel Subcategory requirements for new Boilers/Process Heaters at major sources of Hazardous Air Pollutants per 40 CFR Part 63, Subpart DDDDD. These new boilers or process heaters must comply with this subpart upon startup.

**Emission Unit:** EU-BOILER4

**POLLUTION CONTROL EQUIPMENT**

NA

**I. EMISSION LIMIT(S)**

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
NA	NA	NA	NA	NA	NA

**II. MATERIAL LIMIT(S)**

1. The permittee shall only burn fuels as allowed in the Unit designed to burn gas 1 subcategory definition in 40 CFR 63.7575.<sup>2</sup> **(40 CFR 63.7499(l))**

**III. PROCESS/OPERATIONAL RESTRICTION(S)**

1. The permittee must meet the requirements in paragraphs (a)(1) and (3) of 40 CFR 63.7500, as listed below, except as provided in paragraphs (b) and (e) of 40 CFR 63.7500, stated in SC III.2 and SC III.3. The permittee must meet these requirements at all times the affected unit is operating, except as provided in paragraph (f) of 40 CFR 63.7500, stated in SC III.4.<sup>2</sup> **(40 CFR 63.7500(a))**
  - a. The permittee must meet each work practice standard in Table 3 of 40 CFR Part 63, Subpart DDDDD that applies to the boiler. **(40 CFR 63.7500(a)(1))**
  - b. At all times, the permittee must operate and maintain any affected source (as defined in 40 CFR 63.7490, stated in SC IX.1), including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator that may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source. **(40 CFR 63.7500(a)(3))**
2. As provided in 40 CFR 63.6(g), EPA may approve use of an alternative to the work practice standards.<sup>2</sup> **(40 CFR 63.7500(b))**
3. The permittee must perform compliance tune-ups for FGNESHAP5D meeting the requirements in SC IX.5 according to the following frequency:<sup>2</sup> **(40 CFR 63.7500(e), 40 CFR 64.7515(d))**
  - a. For any unit of FGNESHAP5D greater than 10 MMBtu per hour must complete a tune-up no later than one year (13 months) after the initial startup of the unit. Subsequent tune-ups shall be conducted no more than one year (13 months) after the previous tune-up.
4. The permittee must demonstrate initial compliance with the applicable work practice standards in Table 3 to 40 CFR Part 63, Subpart DDDDD within the annual, biennial, or 5-year schedule as specified in 40 CFR 63.7515(d), stated in SC III.5, following the initial compliance date specified in 40 CFR 63.7495(a), stated

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in SC IX.3. Thereafter, you are required to complete the annual, biennial, or 5-year tune-up as specified in 40 CFR 63.7515(d), stated in SC III.5.<sup>2</sup> **(40 CFR 63.7510(g))**

5. If the permittee is required to meet an applicable tune-up work practice standard, the permittee must:<sup>2</sup> **(40 CFR 63.7515(d))**
  - a. Conduct the first annual tune-up no later than 13-months after the initial startup of the new or reconstructed boiler or process heater, the first biennial tune-up no later than 25-months after the initial startup of the new or reconstructed boiler or process heater, or the first 5-year tune-up no later than 61-months after the initial startup of the new or reconstructed boiler or process heater.
  - b. Conduct an annual performance tune-up according to 40 CFR 63.7540(a)(10), stated in SC IX.5.a; biennial performance tune-up according to 40 CFR 63.7540(a)(11), stated in SC IX.5.b; or 5-year performance tune-up according to 40 CFR 63.7540(a)(12), stated in SC IX.5.c. Each annual tune-up specified in 40 CFR 63.7540(a)(10) must be no more than 13-months after the previous tune-up. Each biennial tune-up specified in 40 CFR 63.7540(a)(11) must be conducted no more than 25-months after the previous tune-up. Each 5-year tune-up specified in 40 CFR 63.7540(a)(12) must be conducted no more than 61-months after the previous tune-up.

#### **IV. DESIGN/EQUIPMENT PARAMETER(S)**

1. The boiler shall have a heat input capacity of greater than or equal to 10 MMBtu per hour.<sup>2</sup> **(40 CFR Part 63, Subpart DDDDD, Table 2)**

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

Records shall be maintained on file for a period of five years. **(R 336.1213(3)(b)(ii))**

NA

#### **VI. MONITORING/RECORDKEEPING**

Records shall be maintained on file for a period of five years. **(R 336.1213(3)(b)(ii))**

1. The permittee's records must be in a form suitable and readily available for expeditious review, according to 40 CFR 63.10(b)(1).<sup>2</sup> **(40 CFR 63.7560(a))**
2. As specified in 40 CFR 63.10(b)(1), the permittee must keep each record for 5-years following the date of each occurrence, measurement, maintenance, corrective action, report, or record.<sup>2</sup> **(40 CFR 63.7560(b))**
3. The permittee must keep each record on site, or they must be accessible from on-site (for example, through a computer network), for at least 2-years after the date of each occurrence, measurement, maintenance, corrective action, report, or record, according to 40 CFR 63.10(b)(1). The permittee can keep the records off site for the remaining 3-years.<sup>2</sup> **(40 CFR 63.7560(c))**

#### **VII. REPORTING**

1. Prompt reporting of deviations pursuant to General Conditions 21 and 22 of Part A. **(R 336.1213(3)(c)(ii))**
2. Semiannual reporting of monitoring and deviations pursuant to General Condition 23 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. **(R 336.1213(3)(c)(i))**
3. Annual certification of compliance pursuant to General Conditions 19 and 20 of Part A. The report shall be postmarked or received by the appropriate AQD District Office by March 15 for the previous calendar year. **(R 336.1213(4)(c))**
4. The permittee must meet the notification requirements in 40 CFR 63.7545 according to the schedule in 40 CFR 63.7545, both stated in SC VII.2 through SC VII.10, and in Subpart A of 40 CFR Part 63.<sup>2</sup> **(40 CFR 63.7495(d))**

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5. The permittee must submit to the Administrator all of the notifications in 40 CFR 63.7(b) and (c), 40 CFR 63.8(e), (f)(4) and (6), and 40 CFR 63.9(b) through (h) that apply to the permittee by the dates specified.<sup>2</sup> **(40 CFR 63.7545(a))**
6. As specified in 40 CFR 63.9(b)(4) and (5), if the permittee starts up the new or reconstructed affected source on or after January 31, 2013, the permittee must submit an Initial Notification not later than 15-days after the actual date of startup of the affected source.<sup>2</sup> **(40 CFR 63.7545(c))**
7. The permittee must submit each report in Table 9 of 40 CFR Part 63, Subpart DDDDD that applies.<sup>2</sup> **(40 CFR 63.7550(a))**
8. Unless the EPA Administrator has approved a different schedule for submission of reports under 40 CFR 63.10(a), the permittee must submit each report, according to paragraph (h) of 40 CFR 63.7550, stated in SC VII.10, by the date in Table 9 of 40 CFR Part 63, Subpart DDDDD and according to the requirements in paragraphs (b)(1) through (4) of 40 CFR 63.7550, as listed below. For units that are subject only to a requirement to conduct an annual tune-up according to 40 CFR 63.7540(a)(10), stated in SC IX.11.a, biennial tune-up according to 40 CFR 63.7540(a)(11), stated in SC IX.11.b, or 5-year tune-up according to 40 CFR 63.7540(a)(12), stated in SC IX.11.c, and not subject to emission limits or operating limits, the permittee may submit only an annual, biennial, or 5-year compliance report, as applicable as specified in paragraphs (b)(1) through (4) of 40 CFR 63.7550, as listed below, instead of a semi-annual compliance report.<sup>2</sup> **(40 CFR 63.7550(b))**
  - a. The first semi-annual compliance report must cover the period beginning on the compliance date that is specified for each boiler or process heater in 40 CFR 63.7495, stated in SC IX.3, and ending on December 31 after the compliance date that is specified for the source in 40 CFR 63.7495, stated in SC IX.3. When submitting an annual, biennial, or 5-year compliance report, the first compliance report must cover the period beginning on the compliance date specified for each boiler or process heater in 40 CFR 63.7495 and ending on December 31 within 1, 2, or 5-years, as applicable, after the compliance date that is specified in 40 CFR 63.7495. **(40 CFR 63.7550(b)(1))**
  - b. The first semi-annual compliance report must be postmarked or submitted no later than September 15 or March 15, whichever date is the first date following the end of the first calendar half after the compliance date that is specified for each boiler or process heater in 40 CFR 63.7495, stated in SC IX.3. The first annual, biennial, or 5-year compliance report must be postmarked or submitted no later than March 15. **(40 CFR 63.7550(b)(2), 40 CFR 63.7550(b)(5))**
  - c. Each subsequent semi-annual compliance report must cover the semiannual reporting period from January 1 through June 30 or the semiannual reporting period from July 1 through December 31. Annual, biennial, and 5-year compliance reports must cover the applicable 1, 2, or 5-year period from January 1 to December 31. **(40 CFR 63.7550(b)(3))**
  - d. Each subsequent semi-annual compliance report must be postmarked or submitted no later than September 15 or March 15, whichever date is the first date following the end of the semiannual reporting period. Annual biennial, and 5-year compliance reports must be postmarked or submitted no later than March 15. **(40 CFR 63.7550(b)(4), 40 CFR 63.7550(b)(5))**
9. A compliance report must contain the following information depending on how the permittee chooses to comply with the limits set in this rule.<sup>2</sup> **(40 CFR 63.7550(c))**
  - a. If the facility is subject to the requirements of a tune up the permittee must submit a compliance report with the information in paragraphs (c)(5)(i) through (iii), (xiv), and (xvii) of 40 CFR 63.7550. **(40 CFR 63.7550(c)(1))**
  - b. 40 CFR 63.7550(c)(5) is as follows:
    - i. Company and Facility name and address. **(40 CFR 63.7550(c)(5)(i))**
    - ii. Process unit information, emissions limitations, and operating parameter limitations. **(40 CFR 63.7550(c)(5)(ii))**
    - iii. Date of report and beginning and ending dates of the reporting period. **(40 CFR 63.7550(c)(5)(iii))**
    - iv. Include the date of the most recent tune-up for each unit subject to only the requirement to conduct an annual tune-up according to 40 CFR 63.7540(a)(10), stated in SC IX.5.a, biennial tune-up according to 40 CFR 63.7540(a)(11), stated in SC IX.5.b, or 5-year tune-up according to 40 CFR 63.7540(a)(12), stated in SC IX.5.c. Include the date of the most recent burner inspection if it was not done annually,

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biennially, or on a 5-year period and was delayed until the next scheduled or unscheduled unit shutdown. **(40 CFR 63.7550(c)(5)(xiv))**

- v. Statement by a responsible official with that official's name, title, and signature, certifying the truth, accuracy, and completeness of the content of the report. **(40 CFR 63.7550(c)(5)(xvii))**

10. The permittee must submit the reports according to the procedures specified in paragraph (h)(3) of 40 CFR 63.7550, as listed below.<sup>2</sup> **(40 CFR 63.7550(h))**

- a. The permittee must submit all reports required by Table 9 of 40 CFR Part 63, Subpart DDDDD electronically to the EPA via the Compliance and Emissions Data Reporting Interface (CEDRI). (CEDRI can be accessed through the EPA's CDX.) The permittee must use the appropriate electronic report in CEDRI for 40 CFR Part 63, Subpart DDDDD. Instead of using the electronic report in CEDRI for 40 CFR Part 63, Subpart DDDDD, the permittee may submit an alternate electronic file consistent with the XML schema listed on the CEDRI Web site (<http://www.epa.gov/ttn/chief/cedri/index.html>), once the XML schema is available. If the reporting form specific to 40 CFR Part 63, Subpart DDDDD is not available in CEDRI at the time that the report is due, the permittee must submit the report to the Administrator at the appropriate address listed in 40 CFR 63.13. The permittee must begin submitting reports via CEDRI no later than 90-days after the form becomes available in CEDRI. **(40 CFR 63.7550(h)(3))**

See Appendix 8

### VIII. STACK/VENT RESTRICTION(S)

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

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
NA	NA	NA	NA

### IX. OTHER REQUIREMENT(S)

1. 40 CFR Part 63, Subpart DDDDD applies to new or reconstructed affected sources as described in paragraph (a)(2) of 40 CFR 63.7490, as listed below.<sup>2</sup> **(40 CFR 63.7490(a))**
  - a. The affected source of 40 CFR Part 63, Subpart DDDDD is each new or reconstructed industrial, commercial, or institutional boiler or process heater, as defined in 40 CFR 63.7575, located at a major source. **(40 CFR 63.7490(a)(2))**
2. A boiler or process heater is:<sup>2</sup> **(40 CFR 63.7490(b))**
  - a. New if the permittee commences construction of the boiler or process heater after June 4, 2010, and the permittee meets the applicability criteria at the time the permittee commences construction.
3. If the permittee has a new or reconstructed boiler or process heater, the permittee must comply with 40 CFR Part 63, Subpart DDDDD by April 1, 2013, or upon startup of each boiler or process heater, whichever is later.<sup>2</sup> **(40 CFR 63.7495(a))**
4. The permittee must be in compliance with the work practice standards of 40 CFR Part 63, Subpart DDDDD.<sup>2</sup> **(40 CFR 63.7505(a))**
5. The permittee must demonstrate continuous compliance with the work practice standards in Table 3 of 40 CFR Part 63, Subpart DDDDD that applies according to the methods specified in paragraphs (a)(10) through (13) of 40 CFR 63.7540, as listed below.<sup>2</sup> **(40 CFR 63.7540(a))**
  - a. If the boiler or process heater has a heat input capacity of 10 MMBtu per hour or greater, the permittee must conduct an annual tune-up of the boiler or process heater to demonstrate continuous compliance as specified in paragraphs (a)(10)(i) through (vi) of 40 CFR 63.7540, as listed below. The tune-up must be conducted while burning the type of fuel or fuels in case of units that routinely burn a mixture) that provided the majority

of the heat input to the boiler or process heater over the 12-months prior to the tune-up. This frequency does not apply to units with continuous oxygen trim systems that maintain an optimum air to fuel ratio.

**(40 CFR 63.7540(a)(10))**

- i. As applicable, inspect the burner, and clean or replace any components of the burner as necessary (the permittee may perform the burner inspection any time prior to the tune-up or delay the burner inspection until the next scheduled unit shutdown). Units that produce electricity for sale may delay the burner inspection until the first outage, not to exceed 36-months from the previous inspection. At units where entry into a piece of process equipment or into a storage vessel is required to complete the tune-up inspections, inspections are required only during planned entries into the storage vessel or process equipment. **(40 CFR 63.7540(a)(10)(i))**
  - ii. Inspect the flame pattern, as applicable, and adjust the burner as necessary to optimize the flame pattern. The adjustment should be consistent with the manufacturer's specifications, if available. **(40 CFR 63.7540(a)(10)(ii))**
  - iii. Inspect the system controlling the air-to-fuel ratio, as applicable, and ensure that it is correctly calibrated and functioning properly (the permittee may delay the inspection until the next scheduled unit shutdown). Units that produce electricity for sale may delay the inspection until the first outage, not to exceed 36-months from the previous inspection. **(40 CFR 63.7540(a)(10)(iii))**
  - iv. Optimize total emissions of CO. This optimization should be consistent with the manufacturer's specifications, if available, and with any NO<sub>x</sub> requirement to which the unit is subject. **(40 CFR 63.7540(a)(10)(iv))**
  - v. Measure the concentrations in the effluent stream of CO in parts per million, by volume, and oxygen in volume percent, before and after the adjustments are made (measurements may be either on a dry or wet basis, as long as it is the same basis before and after the adjustments are made). Measurements may be taken using a portable CO analyzer. **(40 CFR 63.7540(a)(10)(v))**
  - vi. Maintain on-site and submit, if requested by the Administrator, a report containing the information in paragraphs (a)(10)(vi)(A) through (C) of 40 CFR 63.7540, as listed below. **(40 CFR 63.7540(a)(10)(vi))**
    - (1) The concentrations of CO in the effluent stream in ppm by volume, and oxygen in volume percent, measured at high fire or typical operating load, before and after the tune-up of the boiler or process heater. **(40 CFR 63.7540(a)(10)(vi)(A))**
    - (2) A description of any corrective actions taken as a part of the tune-up. **(40 CFR 63.7540(a)(10)(vi)(B))**
    - (3) The type and amount of fuel used over the 12-months prior to the tune-up, but only if the unit was physically and legally capable of using more than one type of fuel during that period. Units sharing a fuel meter may estimate the fuel used by each unit. **(40 CFR 63.7540(a)(10)(vi)(C))**
  - b. If the boiler or process heater has a continuous oxygen trim system that maintains an optimum air to fuel ratio, or a heat input capacity of less than or equal to 5 MMBtu per hour and the unit is in the units designed to burn gas 1 subcategory, the permittee must conduct a tune-up of the boiler or process heater every 5-years as specified in paragraphs (a)(10)(i) through (vi) of 40 CFR 63.7540 to demonstrate continuous compliance. The permittee may delay the burner inspection specified in paragraph (a)(10)(i) of 40 CFR 63.7540 until the next scheduled or unscheduled unit shutdown, but the permittee must inspect each burner at least once every 72-months. If an oxygen trim system is utilized on a unit without emission standards to reduce the tune-up frequency to once every 5-years, set the oxygen level no lower than the oxygen concentration measured during the most recent tune-up. **(40 CFR 63.7540(a)(12))**
  - c. If the unit is not operating on the required date for a tune-up, the tune-up must be conducted within 30-calendar days of startup. **(40 CFR 63.7540(a)(13))**
6. Table 10 of 40 CFR Part 63, Subpart DDDDD shows which parts of the General Provisions in 40 CFR 63.1 through 63.15 applies to the permittee.<sup>2</sup> **(40 CFR 63.7565)**

**Footnotes:**

<sup>1</sup>This condition is state only enforceable and was established pursuant to Rule 201(1)(b).

<sup>2</sup>This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

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## **E. NON-APPLICABLE REQUIREMENTS**

At the time of the ROP issuance, the AQD has determined that no non-applicable requirements have been identified for incorporation into the permit shield provision set forth in the General Conditions in Part A pursuant to Rule 213(6)(a)(ii).



## APPENDICES

### Appendix 1. Abbreviations and Acronyms

The following is an alphabetical listing of abbreviations/acronyms that may be used in this permit.

AQD	Air Quality Division	MM	Million
acfm	Actual cubic feet per minute	MSDS	Material Safety Data Sheet
BACT	Best Available Control Technology	MW	Megawatts
BTU	British Thermal Unit	NA	Not Applicable
°C	Degrees Celsius	NAAQS	National Ambient Air Quality Standards
CAA	Federal Clean Air Act	NESHAP	National Emission Standard for Hazardous Air Pollutants
CAM	Compliance Assurance Monitoring	NMOC	Non-methane Organic Compounds
CEM	Continuous Emission Monitoring	NOx	Oxides of Nitrogen
CFR	Code of Federal Regulations	NSPS	New Source Performance Standards
CO	Carbon Monoxide	NSR	New Source Review
COM	Continuous Opacity Monitoring	PM	Particulate Matter
department	Michigan Department of Environment, Great Lakes, and Energy	PM-10	Particulate Matter less than 10 microns in diameter
dscf	Dry standard cubic foot	pph	Pound per hour
dscm	Dry standard cubic meter	ppm	Parts per million
EPA	United States Environmental Protection Agency	ppmv	Parts per million by volume
EU	Emission Unit	ppmw	Parts per million by weight
°F	Degrees Fahrenheit	PS	Performance Specification
FG	Flexible Group	PSD	Prevention of Significant Deterioration
GACS	Gallon of Applied Coating Solids	psia	Pounds per square inch absolute
GC	General Condition	psig	Pounds per square inch gauge
gr	Grains	PeTE	Permanent Total Enclosure
HAP	Hazardous Air Pollutant	PTI	Permit to Install
Hg	Mercury	RACT	Reasonable Available Control Technology
hr	Hour	ROP	Renewable Operating Permit
HP	Horsepower	SC	Special Condition
H <sub>2</sub> S	Hydrogen Sulfide	scf	Standard cubic feet
HVLP	High Volume Low Pressure *	sec	Seconds
ID	Identification (Number)	SCR	Selective Catalytic Reduction
IRSL	Initial Risk Screening Level	SO <sub>2</sub>	Sulfur Dioxide
ITSL	Initial Threshold Screening Level	SRN	State Registration Number
LAER	Lowest Achievable Emission Rate	TAC	Toxic Air Contaminant
lb	Pound	Temp	Temperature
m	Meter	THC	Total Hydrocarbons
MACT	Maximum Achievable Control Technology	tpy	Tons per year
MAERS	Michigan Air Emissions Reporting System	µg	Microgram
MAP	Malfunction Abatement Plan	VE	Visible Emissions
EGLE	Michigan Department of Environment, Great Lakes, and Energy	VOC	Volatile Organic Compounds
mg	Milligram	yr	Year
mm	Millimeter		

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

## Appendix 2. Schedule of Compliance

The permittee certified in the ROP application that this stationary source is in compliance with all applicable requirements and the permittee shall continue to comply with all terms and conditions of this ROP. A Schedule of Compliance is not required. (R 336.1213(4)(a), R 336.1119(a)(ii))

## Appendix 3. Monitoring Requirements

The following monitoring procedures, methods, or specifications are the details to the monitoring requirements identified and referenced in EU KILN1.

### NO<sub>x</sub> Monitoring Continuous Emission Monitoring System (CEMS) Requirements

1. The span value shall be 2.0 times the lowest emission standard or as specified in the federal regulations.
2. Each calendar quarter, the permittee shall perform the Quality Assurance Procedures of the CEMS set forth in Appendix F of 40 CFR, Part 60. Within 30 days following the end of each calendar quarter, the permittee shall submit the results to the AQD in the format of the data assessment report (Figure 1, Appendix F).
3. In accordance with 40 CFR 60.7(c) and (d), the permittee shall submit two copies of an excess emission report (EER) and summary report in an acceptable format to the AQD, within 30 days following the end of each calendar quarter. The Summary Report shall follow the format of Figure 1 in 40 CFR 60.7(d). The EER shall include the following information:
  - a. A report of each exceedance above 2270 lbs NO<sub>x</sub>/hr during normal operations, measured on a 30-day rolling average. This includes the date, time, magnitude, cause and corrective actions of all occurrences during the reporting period.
  - b. A report of all periods of CERMS downtime and corrective action.
  - c. A report of the total operating time of EUKILN1 during the reporting period.
  - d. A report of any periods that the CERMS exceeds the instrument range.
  - e. If no exceedances or CERMS downtime occurred during the reporting period, the permittee shall report that fact.

## Appendix 4. Recordkeeping

The permittee shall use the following approved formats and procedures for the recordkeeping requirements referenced in EUOREDRIYER1, EUOREDRIYER2, EUKILN1, ~~and EUKILN2, EUBOILER1 and EUBOILER3~~, as applicable. Alternative formats must be approved by the AQD District Supervisor.

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### Coal Analysis

1. For each fuel shipment barge received, the permittee shall obtain from the supplier a laboratory analysis of the ash content, sulfur content, and BTU content. The determination of sulfur content shall be carried out in accordance with a procedure acceptable to the Air Quality Division. For each fuel shipment received, the permittee shall record the date received, source of fuel and shipper, and tons received.
2. At least once per calendar year, the permittee shall have one analysis performed of the ash content, sulfur content, and BTU content for the coal burned:

The analyses, required in Paragraph 2, shall be independent of the analyses received from the supplier with each fuel delivery in Paragraph 1. The determination of fuel sulfur content shall be carried out in accordance with ASTM Method 3177-75, Method 4239-85, or a method approved by the District Supervisor.

### Used Oil Analysis

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1. For each month that fuel oil is combusted, the permittee shall obtain a representative sample of the used oil in the ~~1.5 million~~ 15,000 gallon used oil tank. By the fifteenth day of each month, the permittee shall perform an analysis of the used oil for the following parameters for the previous calendar month's sample:
  - a. Density, in pounds per gallon
  - b. Total halogens, in parts per million by weight
  - c. Sulfur content, in percent by weight
  - d. Arsenic content, in parts per million by weight
  - e. Cadmium content, in parts per million by weight
  - f. Chromium (total) content, in parts per million by weight
  - g. Lead content, in parts per million by weight

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These analyses shall be carried out in accordance with procedures specified or approved by the Air Quality Division. The determination of sulfur content shall be carried out in accordance with one of the following procedures: ASTM Method D129-64 or ASTM Method 1552-83 or ASTM Method 2622-87 or ASTM Method 1266-87, or a method approved by the District Supervisor.

**Appendix 5. Testing Procedures**

Specific testing requirement plans, procedures, and averaging times are detailed in the appropriate Source-Wide, Emission Unit and/or Flexible Group Special Conditions. Therefore, this appendix is not applicable.

**Appendix 6. Permits to Install**

The following table lists any PTIs issued or ROP revision applications received since the effective date of the previously issued ROP No. MI-ROP-B4885-2008. Those ROP revision applications that are being issued concurrently with this ROP renewal are identified by an asterisk (\*). Those revision applications not listed with an asterisk were processed prior to this renewal.

Source-Wide PTI No MI-PTI-B4885-2008 is being reissued as Source-Wide PTI No. MI-PTI-B4885-20XX.

Permit to Install Number	ROP Revision Application Number	Description of Equipment or Change	Corresponding Emission Unit(s) or Flexible Group(s)
NA	201600132	Add EUBOILER6 and EUBOILER7, these units and supporting structures were purchased from Empire Iron Mining Partnership.	FGBOILERS6-7
147-13	NA	A General Permit for one or more propane or natural gas-fired boilers, each with a maximum rated heat input of 100 million Btu per hour, and each controlled by a low-NOx burner.	FGBOILERS
148-12A	NA	Modify methods of compliance with best available retrofit technology (BART) to address Michigan's regional haze SIP. Company is choosing to add a NOx CERMS to EUKILN1 to show compliance with the emission limit.	EUOREDRIYER1 EUKILN1 FGBOILERS1-2
NA	200900028	All references to and the ability to utilize coke breeze and petroleum coke were removed from MI-ROP-B4885-2008.	EUKILN1 EUKILN2

The following ROP amendments or modifications were issued after the effective date of ROP No. MI-ROP-B4885-2017.

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Permit to Install Number	ROP Revision Application Number/Issuance Date	Description of Equipment or Change	Corresponding Emission Unit(s) or Flexible Group(s)
202-16	201800064 / August 14, 2018	Incorporate PTI 202-16 which was to install a 300MMBtu/hr natural gas boiler with low NOx burners (EU-BOILER4). EUBOILER2 has been permanently dismantled and remove from the facility, so this emission unit has been removed from the ROP, and FGBOILERS1-2, has been changed to an emission unit table (EUBOILER1) instead of a Flexible Group Table.	EUBOILER1 EUBOILER2 EU-BOILER4 FGNESHAP5D

### Appendix 7. Emission Calculations

The permittee shall use the following calculations in conjunction with monitoring, testing or recordkeeping data to determine compliance with the applicable requirements referenced in EUOREDRIYER1, ~~and EUOREDRIYER2, EUKILN1, EUKILN2, EUBOILER1 and EUBOILER3.~~

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#### Formula and Procedure for Determining Emissions

The calendar month emission rate, in ton(s), is calculated using the following equation:

$$E_r = (\text{ppm}_w \times D_n \times U_r \times (1.0 - (R_e / 100))) / 1,000,000 / 2000$$

Where:

- $E_r$  = the calendar month emission rate calculated for each contaminant in ton(s);
- $\text{ppm}_w$  = the concentration of each contaminant in part(s) per million, by weight;
- $D_n$  = the density of the used oil in pounds per gallon;
- $U_r$  = the calendar month usage rate of used oil burned in gallons;
- $R_e$  = the percentage removal efficiency of each contaminant using the values in the following table:

Pollutant	<del>EUKILN1</del>	<del>EUKILN2</del>	<del>EUBOILER1</del>	<del>EUBOILER3</del>	EUOREDRIYER1	EUOREDRIYER2
Arsenic	<del>95</del>	<del>95</del>	<del>0</del>	<del>0</del>	95	95
Cadmium	<del>95</del>	<del>95</del>	<del>0</del>	<del>0</del>	95	95
Total Chromium	<del>95</del>	<del>95</del>	<del>0</del>	<del>0</del>	95	95
Lead	<del>95</del>	<del>95</del>	<del>0</del>	<del>0</del>	95	95

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The values for  $\text{ppm}_w$  and  $D_n$  shall be based on the most recent used oil analysis results.

The rolling 12-calendar month emission rate is calculated by summing the  $E_r$ 's for the previous 12 calendar months.

Applicant shall keep a record of each calendar month's usage rate of used oil burned in each process or process equipment referenced in this permit. By the fifteenth day of each calendar month, the applicant shall calculate the emissions of arsenic, cadmium, chromium and lead for the previous calendar month and 12-calendar month period for each process or process equipment referenced in this permit. All data and calculations shall be kept on file, in a format acceptable to the District Supervisor, for a period of at least five years and shall be submitted to the Air Quality Division with the semiannual reports specified in requirement tables in this Renewable Operating Permit.

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## **Appendix 8. Reporting**

### **A. Annual, Semiannual, and Deviation Certification Reporting**

The permittee shall use the EGLE, AQD, Report Certification form (EQP 5736) and EGLE, AQD, Deviation Report form (EQP 5737) for the annual, semiannual and deviation certification reporting referenced in the Reporting Section of the Source-Wide, Emission Unit and/or Flexible Group Special Conditions. Alternative formats must meet the provisions of Rule 213(4)(c) and Rule 213(3)(c)(i), respectively, and be approved by the AQD District Supervisor.

### **B. Other Reporting**

Specific reporting requirement formats and procedures are detailed in Part A or the appropriate Source-Wide, Emission Unit and/or Flexible Group Special Conditions. Therefore, Part B of this appendix is not applicable.

## PERMIT TO INSTALL

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## COMMON ACRONYMS

AQD	Air Quality Division
BACT	Best Available Control Technology
CAA	Clean Air Act
CAM	Compliance Assurance Monitoring
CEMS	Continuous Emission Monitoring System
CFR	Code of Federal Regulations
COMS	Continuous Opacity Monitoring System
Department/department/EGLE	Michigan Department of Environment, Great Lakes, and Energy
EU	Emission Unit
FG	Flexible Group
GACS	Gallons of Applied Coating Solids
GC	General Condition
GHGs	Greenhouse Gases
HVLP	High Volume Low Pressure*
ID	Identification
IRSL	Initial Risk Screening Level
ITSL	Initial Threshold Screening Level
LAER	Lowest Achievable Emission Rate
MACT	Maximum Achievable Control Technology
MAERS	Michigan Air Emissions Reporting System
MAP	Malfunction Abatement Plan
MSDS	Material Safety Data Sheet
NA	Not Applicable
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standard for Hazardous Air Pollutants
NSPS	New Source Performance Standards
NSR	New Source Review
PS	Performance Specification
PSD	Prevention of Significant Deterioration
PTE	Permanent Total Enclosure
PTI	Permit to Install
RACT	Reasonable Available Control Technology
ROP	Renewable Operating Permit
SC	Special Condition
SCR	Selective Catalytic Reduction
SNCR	Selective Non-Catalytic Reduction
SRN	State Registration Number
TBD	To Be Determined
TEQ	Toxicity Equivalence Quotient
USEPA/EPA	United States Environmental Protection Agency
VE	Visible Emissions

### POLLUTANT / MEASUREMENT ABBREVIATIONS

acfm	Actual cubic feet per minute
BTU	British Thermal Unit
°C	Degrees Celsius
CO	Carbon Monoxide
CO <sub>2e</sub>	Carbon Dioxide Equivalent
dscf	Dry standard cubic foot
dscm	Dry standard cubic meter
°F	Degrees Fahrenheit
gr	Grains
HAP	Hazardous Air Pollutant
Hg	Mercury
hr	Hour
HP	Horsepower
H <sub>2</sub> S	Hydrogen Sulfide
kW	Kilowatt
lb	Pound
m	Meter
mg	Milligram
mm	Millimeter
MM	Million
MW	Megawatts
NMOC	Non-Methane Organic Compounds
NO <sub>x</sub>	Oxides of Nitrogen
ng	Nanogram
PM	Particulate Matter
PM <sub>10</sub>	Particulate Matter equal to or less than 10 microns in diameter
PM <sub>2.5</sub>	Particulate Matter equal to or less than 2.5 microns in diameter
pph	Pounds per hour
ppm	Parts per million
ppmv	Parts per million by volume
ppmw	Parts per million by weight
psia	Pounds per square inch absolute
psig	Pounds per square inch gauge
scf	Standard cubic feet
sec	Seconds
SO <sub>2</sub>	Sulfur Dioxide
TAC	Toxic Air Contaminant
Temp	Temperature
THC	Total Hydrocarbons
tpy	Tons per year
µg	Microgram
µm	Micrometer or Micron
VOC	Volatile Organic Compounds
yr	Year



## GENERAL CONDITIONS

1. The process or process equipment covered by this permit shall not be reconstructed, relocated, or modified, unless a Permit to Install authorizing such action is issued by the Department, except to the extent such action is exempt from the Permit to Install requirements by any applicable rule. **(R 336.1201(1))**
2. If the installation, construction, reconstruction, relocation, or modification of the equipment for which this permit has been approved has not commenced within 18 months, or has been interrupted for 18 months, this permit shall become void unless otherwise authorized by the Department. Furthermore, the permittee or the designated authorized agent shall notify the Department via the Supervisor, Permit Section, Air Quality Division, Michigan Department of Environment, Great Lakes, and Energy, P.O. Box 30260, Lansing, Michigan 48909-7760, if it is decided not to pursue the installation, construction, reconstruction, relocation, or modification of the equipment allowed by this Permit to Install. **(R 336.1201(4))**
3. If this Permit to Install is issued for a process or process equipment located at a stationary source that is not subject to the Renewable Operating Permit program requirements pursuant to Rule 210 (R 336.1210), operation of the process or process equipment is allowed by this permit if the equipment performs in accordance with the terms and conditions of this Permit to Install. **(R 336.1201(6)(b))**
4. The Department may, after notice and opportunity for a hearing, revoke this Permit to Install if evidence indicates the process or process equipment is not performing in accordance with the terms and conditions of this permit or is violating the Department's rules or the Clean Air Act. **(R 336.1201(8), Section 5510 of Act 451, PA 1994)**
5. The terms and conditions of this Permit to Install shall apply to any person or legal entity that now or hereafter owns or operates the process or process equipment at the location authorized by this Permit to Install. If the new owner or operator submits a written request to the Department pursuant to Rule 219 and the Department approves the request, this permit will be amended to reflect the change of ownership or operational control. The request must include all of the information required by subrules (1)(a), (b), and (c) of Rule 219 and shall be sent to the District Supervisor, Air Quality Division, Michigan Department of Environment, Great Lakes, and Energy. **(R 336.1219)**
6. Operation of this equipment shall not result in the emission of an air contaminant which causes injurious effects to human health or safety, animal life, plant life of significant economic value, or property, or which causes unreasonable interference with the comfortable enjoyment of life and property. **(R 336.1901)**
7. The permittee shall provide notice of an abnormal condition, start-up, shutdown, or malfunction that results in emissions of a hazardous or toxic air pollutant which continue for more than one hour in excess of any applicable standard or limitation, or emissions of any air contaminant continuing for more than two hours in excess of an applicable standard or limitation, as required in Rule 912, to the Department. The notice shall be provided not later than two business days after start-up, shutdown, or discovery of the abnormal condition or malfunction. Written reports, if required, must be filed with the Department within 10 days after the start-up or shutdown occurred, within 10 days after the abnormal conditions or malfunction has been corrected, or within 30 days of discovery of the abnormal condition or malfunction, whichever is first. The written reports shall include all of the information required in Rule 912(5). **(R 336.1912)**
8. Approval of this permit does not exempt the permittee from complying with any future applicable requirements which may be promulgated under Part 55 of 1994 PA 451, as amended or the Federal Clean Air Act.
9. Approval of this permit does not obviate the necessity of obtaining such permits or approvals from other units of government as required by law.
10. Operation of this equipment may be subject to other requirements of Part 55 of 1994 PA 451, as amended and the rules promulgated thereunder.



11. Except as provided in subrules (2) and (3) or unless the special conditions of the Permit to Install include an alternate opacity limit established pursuant to subrule (4) of Rule 301, the permittee shall not cause or permit to be discharged into the outer air from a process or process equipment a visible emission of density greater than the most stringent of the following. The grading of visible emissions shall be determined in accordance with Rule 303 (R 336.1303). **(R 336.1301)**
  - a) A six-minute average of 20 percent opacity, except for one six-minute average per hour of not more than 27 percent opacity.
  - b) A visible emission limit specified by an applicable federal new source performance standard.
  - c) A visible emission limit specified as a condition of this Permit to Install.
12. Collected air contaminants shall be removed as necessary to maintain the equipment at the required operating efficiency. The collection and disposal of air contaminants shall be performed in a manner so as to minimize the introduction of contaminants to the outer air. Transport of collected air contaminants in Priority I and II areas requires the use of material handling methods specified in Rule 370(2). **(R 336.1370)**
13. The Department may require the permittee to conduct acceptable performance tests, at the permittee's expense, in accordance with Rule 1001 and Rule 1003, under any of the conditions listed in Rule 1001. **(R 336.2001)**

### EMISSION UNIT SPECIAL CONDITIONS

#### EMISSION UNIT SUMMARY TABLE

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

<b>Emission Unit ID</b>	<b>Emission Unit Description (Including Process Equipment &amp; Control Device(s))</b>	<b>Installation Date / Modification Date</b>	<b>Flexible Group ID</b>
EU-CONV14-15-16	Transfer points from Conveyor 14 to 15 to 16, concentrator building, with wet scrubber	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-CONV15.8-15.9	Transfer point from Conveyor 15.8 to 15.9, pellet plant, with wet scrubber. <b>(PTI No. 731-80)</b>	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-CONV15.9-16.1	Transfer point from Conveyor 15.9 to 16.1, pellet plant, with wet scrubber. <b>(PTI No. 347-76)</b>	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-CONV16.1-17.1	Transfer point from Conveyor 16.1 to 17.1, concentrator building, with wet scrubber	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-CONV17.1-17.2	Transfer point from Conveyor 17.1 to 17.2, pellet plant, with wet scrubber. <b>(PTI No. 485-80)</b>	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-CONV19 & 19A-17	Transfer points from Conveyors 19 & 19A to 17 and screen, concentrator building, with wet scrubber	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-CONV13-17.1	Transfer point from Conveyor 13 to 17.1, concentrator building, with wet scrubber	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-CONV15-15.1	Transfer point from Conveyor 15 to 15.1, concentrator building, with wet scrubber	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-CONVEYOR1	Ore handling, transfer point from Conveyor 1 to 2, with wet scrubber	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-CONVEYOR12A-13	Transfer point from Conveyor 12A to 13, concentrator building, with wet scrubber	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-CONVEYOR12B-13	Transfer point from Conveyor 12B to 13, concentrator building, with wet scrubber. <b>(PTI No. 485-80)</b>	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-CONVEYOR4A-4A1	Transfer point from Conveyor 4A to 4A1, secondary crusher, with wet scrubber. <b>(PTI No. 279-86)</b>	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-CONVEYOR4B-4C	Transfer points from Conveyors 4B & 4B1 to 4C, at secondary crusher, with wet scrubber	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-CONVEYOR4C-4D	Transfer points from Conveyors 4C to 4D, secondary crusher, with wet scrubber. <b>(PTI No. 278-86)</b>	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-FEEDMIXER1	Bentonite feeders and blender mixers for Tilden 1 (lines 1 to 7), pellet plant, with wet scrubber. <b>(PTI No. 354-75)</b>	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-FEEDMIXER2	Bentonite feeders and blender mixers for Tilden 2, (lines 8 to 14), pellet plant, with wet scrubber. <b>(PTI No. 354-75)</b>	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-PRIMARYCRUSHER	Primary Ore Crusher, with wet scrubber. <b>(PTI No. 275-72)</b>	1975	FGDUSTCOLLECTORS FGTACONITEMACT

Emission Unit ID	Emission Unit Description (Including Process Equipment & Control Device(s))	Installation Date / Modification Date	Flexible Group ID
EU-SCREENSRECLAIM	Transfer points from Conveyor 19 to 19A to 19B & screen, concentrator building with wet scrubber	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-COOLER1	Tilden 1 Cooler Discharge Hopper and Finished Product Conveyors with wet scrubber. <b>(PTI No. 354-75)</b>	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-COOLER2	Tilden 2 Cooler Discharge Hopper and Finished Product Conveyor with wet scrubber. <b>(PTI No. 354-75)</b>	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-TRANSFERTOWER1	Tilden 1 Pellet Loadout with wet scrubber. <b>(PTI No. 616-82)</b>	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-TRANSFERTOWER2	Tilden 2 Pellet Loadout with wet scrubber <b>(PTI No. 616-82)</b>	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-UNIT1LHF	Tilden 1 Low Head Feeder with wet scrubber	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-UNIT2LHF	Tilden 2 Low Head Feeder with wet scrubber	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EU-PROD CONV2	Transfer points for finished product conveyors 31.4, 31.5, 31.6, and 31.7 with wet scrubber	1975	FGDUSTCOLLECTORS FGTACONITEMACT
EUOREDRIYER1	Ore Concentrate Dryer 1 is rated at 400 tons per hour throughput and 70 MMBTU/hr heat input. This dryer is fired with natural gas and used oil. The used oil is supplied only from the 1.5 million gallon storage tank which may contain used oil and virgin fuel oil. All oil burned from this tank is considered used oil. Concentrate Dryer 1 is controlled with a cyclone precleaner and a wet scrubber. <b>(PTI Nos. 511-87C and 148-12A)</b>	1974 / 1996	FGTACONITEMACT
EUOREDRIYER2	Ore Concentrate Dryer 2 is rated at 800 tons per hour throughput and 125 MMBTU/hr heat input. This dryer is fired with natural gas and used oil. The used oil is supplied only from the 1.5 million gallon storage tank which may contain used oil and virgin fuel oil. All oil burned from this tank is considered used oil. Concentrate Dryer 2 is controlled with two cyclone precleaners and two wet scrubbers. <b>(PTI No. 511-87C)</b>	1978 / 1996	FGTACONITEMACT

<b>Emission Unit ID</b>	<b>Emission Unit Description (Including Process Equipment &amp; Control Device(s))</b>	<b>Installation Date / Modification Date</b>	<b>Flexible Group ID</b>
EUKILN1	Unit 1 Grate Kiln Indurating Furnace dries and preheats pellets on a traveling grate and then heats the pellets in a rotary kiln for final induration. Unit 1 main burners are rated at 590 MMBTU/hr heat input. The Tilden facility produces hematite pellets and magnetite pellets. Unit 1 is fired with coal, natural gas, or used oil supplied from the 1.5 million gallon storage tank which may contain used oil and virgin fuel oil. All oil burned from this tank is considered used oil. The unit is controlled with dry electrostatic precipitators. <b>(PTI Nos. 511-87C, 70-02 and 148-12A)</b>	1974 / 1996 / 2002	FGTACONITEMACT
EUKILN2	Unit 2 Grate Kiln Indurating Furnace dries and preheats pellets on a traveling grate and then heats the pellets in a rotary kiln for final induration. Unit 2 main burners are rated at 590 MMBTU/hr heat input. The Tilden facility produces hematite pellets and magnetite pellets. Unit 2 is fired with coal, natural gas, or used oil supplied from the 1.5 million gallon storage tank which may contain used oil and virgin fuel oil. All oil burned from this tank is considered used oil. The unit is controlled with dry electrostatic precipitators. <b>(PTI Nos. 511-87C, and 70-02)</b>	1978 / 1996 / 2002	FGTACONITEMACT

Changes to the equipment described in this table are subject to the requirements of R 336.1201, except as allowed by R 336.1278 to R 336.1291.

**FLEXIBLE GROUP SPECIAL CONDITIONS**

**FLEXIBLE GROUP SUMMARY TABLE**

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

Flexible Group ID	Flexible Group Description	Associated Emission Unit IDs
FGTACONITEMACT	The affected source is an existing taconite iron ore processing plant, that is (or is part of) a major source of hazardous air pollutant (HAP) emissions. An existing affected source is a source that commenced construction or reconstruction before December 18, 2002. The regulations cover emissions from ore crushing and handling emission units, ore dryer stacks, indurating furnace stacks, finished pellet handling emission units, and fugitive dust emissions.	EUOREDRIYER1 EUOREDRIYER2 EUKILN1 EUKILN2 FGDUSTCOLLECTORS
FGDUSTCOLLECTORS	Various ore, concentrate, and finished pellet handling processes throughout the facility, including primary and secondary ore crushing, conveyor transfer points, bentonite feeders and mixer blenders, pellet cooler discharge hoppers, low head feeders, transfer towers, etc. The various emission units are controlled with wet scrubbers.	EU-CONV14-15-16 EU-CONV15.8-15.9 EU-CONV15.9-16.1 EU-CONV16.1-17.1 EU-CONV17.1-17.2 EU-CONV19 & 19A-17 EU-CONV13-17.1 EU-CONV15-15.1 EU-CONVEYOR1 EU-CONVEYOR12A-13 EU-CONVEYOR12B-13 EU-CONVEYOR4A-4A1 EU-CONVEYOR4B-4C EU-CONVEYOR4C-4D EU-FEEDMIXER1 EU-FEEDMIXER2 EU-PRIMARYCRUSHER EU-SCREENSRECLAIM EU-COOLER1 EU-COOLER2 EU-TRANSFERTOWER1 EU-TRANSFERTOWER2 EU-UNIT1LHF EU-UNIT2LHF EU-PROD CONV2

**FGDUSTCOLLECTORS  
 FLEXIBLE GROUP CONDITIONS**

**DESCRIPTION**

Various ore, concentrate, and finished pellet handling processes throughout the facility, including primary and secondary ore crushing, conveyor transfer points, bentonite feeders and mixer blenders, pellet cooler discharge hoppers, low head feeders, transfer towers, etc. The various emission units are controlled with wet scrubbers.

**Emission Unit:** EU-CONV14-15-16, EU-CONV15.8-15.9, EU-CONV15.9-16.1, EU-CONV16.1-17.1, EU-CONV17.1-17.2, EU-CONV19&19A-17, EU-CONV13-17.1, EU-CONV15-15.1, EU-CONVEYOR1, EU-CONVEYOR12A-13, EU-CONVEYOR12B-13, EU-CONVEYOR4A-4A1, EU-CONVEYOR4B-4C, EU-CONVEYOR4C-4D, EU-FEEDMIXER1, EU-FEEDMIXER2, EU-PRIMARYCRUSHER, EU-SCREENSRECLAIM, EU-COOLER1, EU-COOLER2, EU-TRANSFERTOWER1, EU-TRANSFERTOWER2, EU-UNIT1LHF, EU-UNIT2LHF, EU-PROD CONV2

**Related Flexible Group ID:** FGTACONITEMACT

**POLLUTION CONTROL EQUIPMENT**

Wet Scrubbers

**I. EMISSION LIMIT(S)**

<b>Pollutant</b>	<b>Limit</b>	<b>Time Period / Operating Scenario</b>	<b>Equipment</b>	<b>Monitoring / Testing Method</b>	<b>Underlying Applicable Requirements</b>
1. PM	0.10 lb./1000 lbs. of exhaust gases, calculated on a dry gas basis	Hourly	FGDUSTCOLLECTORS	See FG TACONITEMACT SC V.1	R 336.1331

**II. MATERIAL LIMIT(S)**

NA

**III. PROCESS/OPERATIONAL RESTRICTION(S)**

NA

**IV. DESIGN/EQUIPMENT PARAMETER(S)**

1. The permittee shall equip each wet scrubber with at least one of the following: **(R 336.1910)**
  - a) Operable water pressure gauge
  - b) Operable water flow meter
  - c) Viewport with pivoted cover or quick-release hatch
  - d) Scrubber drain with readily visible sump to verify scrubber water flow

**V. TESTING/SAMPLING**

See FGTACONITEMACT



**VI. MONITORING/RECORDKEEPING**

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

NA

**VII. REPORTING**

NA

**VIII. STACK/VENT RESTRICTION(S)**

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

<b>Stack &amp; Vent ID</b>	<b>Maximum Exhaust Diameter / Dimensions (inches)</b>	<b>Minimum Height Above Ground (feet)</b>	<b>Underlying Applicable Requirements</b>
2 - 145 sly impinjet scrubbers (731-80)	26 <sup>1</sup>	85 <sup>1</sup>	R 336.1901
140 sly impinjet scrubber (485-80)	20 <sup>1</sup>	45 <sup>1</sup>	R 336.1901
150 sly impinjet scrubber (485-80)	25 <sup>1</sup>	35 <sup>1</sup>	R 336.1901
160 sly impinjet scrubber (485-80)	30 <sup>1</sup>	35 <sup>1</sup>	R 336.1901

**IX. OTHER REQUIREMENT(S)**

NA

**Footnotes:**

<sup>1</sup> This condition is state only enforceable and was established pursuant to Rule 201(1)(b).

**FGTACONITEMACT  
 FLEXIBLE GROUP CONDITIONS**

**DESCRIPTION**

The affected source is an existing taconite iron ore processing plant, that is (or is part of) a major source of hazardous air pollutant (HAP) emissions. An existing affected source is a source that commenced construction or reconstruction before December 18, 2002. The regulations cover emissions from ore crushing and handling emission units, ore dryer stacks, indurating furnace stacks, finished pellet handling emission units, and fugitive dust emissions.

**Emission Unit:** EUOREDRIYER1, EUOREDRIYER2, EUKILN1, EUKILN2, FGDUSTCOLLECTORS

**POLLUTION CONTROL EQUIPMENT**

Cyclone pre-cleaners, wet scrubbers and dry electrostatic precipitators

**I. EMISSION LIMIT(S)**

<b>Pollutant</b>	<b>Limit</b>	<b>Time Period / Operating Scenario</b>	<b>Equipment</b>	<b>Monitoring / Testing Method</b>	<b>Underlying Applicable Requirements</b>
1. PM	0.008 gr/dscf	Test Protocol/Flow weighted mean concentration	All affected source Ore Crushing and Handling Emission Units: EU-CONV14-15-16 EU-CONV15.8-15.9 EU-CONV15.9-16.1 EU-CONV16.1-17.1 EU-CONV17.1-17.2 EU-CONV19 & 19A-17 EU-CONV13-17.1 EU-CONV15-15.1 EU-CONVEYOR1 EU-CONVEYOR12A-13 EU-CONVEYOR12B-13 EU-CONVEYOR4A-4A1 EU-CONVEYOR4B-4C EU-CONVEYOR4C-4D EU-FEEDMIXER1 EU-FEEDMIXER2 EU-PRIMARYCRUSHER EU-SCREENSRECLAIM	SC V.1	40 CFR 63.9590(a), 63.9621(a), (b), 40 CFR Part 63, Subpart RRRRR, Table 1(1)
2. PM	0.008 gr/dscf	Test Protocol/Flow weighted mean concentration	All affected Finished Pellet Handling emission units: EU-COOLER1 EU-COOLER2 EU-TRANSFERTOWER1 EU-TRANSFERTOWER2 EU-UNIT1LHF EU-UNIT2LHF EU-PROD CONV2	SC V.2	40 CFR 63.9590(a) 40 CFR Part 63, Subpart RRRRR, Table 1(5)

<b>Pollutant</b>	<b>Limit</b>	<b>Time Period / Operating Scenario</b>	<b>Equipment</b>	<b>Monitoring / Testing Method</b>	<b>Underlying Applicable Requirements</b>
3. PM	0.052 gr/dscf	Test Protocol	Each individual ore dryer: EUOREDRIYER1 EUOREDRIYER2	SC V.3	40 CFR 63.9590(a), 63.9621(a),(c), 40 CFR Part 63, Subpart RRRRR, Table 1(6)
4. PM	0.01 gr/dscf	Test Protocol/When processing <b>magnetite</b>	Each individual indurating furnace: EUKILN1 EUKILN2	SC V.4	40 CFR 63.9590(a), 63.9621(a), (c), 40 CFR Part 63, Subpart RRRRR, Table 1(3)
5. PM	0.03 gr/dscf	Test Protocol/When processing <b>hematite</b>	Each individual indurating furnace: EUKILN1 EUKILN2	SC V.5	40 CFR 63.9590(a), 63.9621(a), (c), 40 CFR Part 63, Subpart RRRRR, Table 1(4)
* Test protocol shall specify averaging time					

**II. MATERIAL LIMIT(S)**

NA

**III. PROCESS/OPERATIONAL RESTRICTION(S)**

1. Except as provided in paragraph (2) of this section, for each wet scrubber applied to meet any particulate matter emission limit in Section I, the permittee must maintain the daily average pressure drop and daily average scrubber water flow rate at or above the minimum levels established during an initial or subsequent performance test. If the daily average pressure drop or water flow rate is below the established operating limits, the permittee must follow the corrective action procedures specified in Condition 4 of this Section. **(40 CFR 63.9590(b)(1), 40 CFR 63.9622(a), 40 CFR 63.9622(f), 40 CFR 63.9634(e), and 40 CFR 63.9636)**
2. For each dynamic wet scrubber applied to meet any particulate matter emission limit in Section I, the permittee must maintain the daily average scrubber water flow rate and either the daily average fan amperage (a surrogate for fan speed as revolutions per minute) or the daily average pressure drop at or above the minimum levels established during an initial or subsequent performance test. If the daily average pressure drop or water flow rate is below the established operating limits, the permittee must follow the corrective action procedures specified in Condition 4 of this Section. **(40 CFR 63.9590(b)(2), 40 CFR 63.9622(a), 40 CFR 63.9622(f), 40 CFR 63.9634(f) and 40 CFR 63.9636)**
3. For each dry electrostatic precipitator applied to meet any particulate matter emission limit in Section I, the permittee must maintain either (1) the 6-minute average opacity of emissions exiting the control device stack; or (2) the daily average secondary voltage and daily average secondary current for each field, at or below the levels established during an initial or subsequent performance test. If demonstrating compliance using opacity, if the daily average opacity is above the operating limits established for the corresponding emission unit, the permittee must follow the corrective action procedures specified in Condition 4 of this section. If demonstrating compliance using daily average secondary voltage and secondary current, if the daily average is below the operating limit established for the corresponding emission unit, the permittee must follow the

corrective action procedures specified in Condition 5 of this section. **(40 CFR 63.9590(b)(3), 40 CFR 63.6922(c), 40 CFR 63.6922(f), 40 CFR 63.9634(g) and 40 CFR 63.9636)**

4. If the daily average operating parameter value for an emission unit or group of similar emission units does not meet the corresponding established operating limit, the permittee must follow the procedures in paragraphs (a) through (d) of this section.
  - a) You must initiate and complete initial corrective action within 10 calendar days and demonstrate that the initial corrective action was successful. During any period of corrective action, you must continue to monitor and record all required operating parameters for equipment that remains in operation. After 10 calendar days, measure and record the daily average operating parameter value for the emission unit or group of similar emission units on which corrective action was taken. After the initial corrective action, if the daily average operating parameter value for the emission unit or group of similar emission units meets the operating limit established for the corresponding unit or group, then the corrective action was successful and the emission unit or group of similar emission units is in compliance with the established operating limits. **(40 CFR 63.9634(j)(1))**
  - b) If the initial corrective action required in paragraph (a) of this section was not successful, then you must complete additional corrective action within 10 calendar days and demonstrate that the subsequent corrective action was successful. During any period of corrective action, you must continue to monitor and record all required operating parameters for equipment that remains in operation. After the second set of 10 calendar days allowed to implement corrective action, you must again measure and record the daily average operating parameter value for the emission unit or group of similar emission units. If the daily average operating parameter value for the emission unit or group of similar emission units meets the operating limit established for the corresponding unit or group, then the corrective action was successful and the emission unit or group of similar emission units is in compliance with the established operating limits. **(40 CFR 63.9634(j)(2))**
  - c) (3) If the second attempt at corrective action required in paragraph (b) of this section was not successful, then you must repeat the procedures of paragraph (j)(2) of this section until the corrective action is successful. If the third attempt at corrective action is unsuccessful, you must conduct another performance test in accordance with the procedures in 40 CFR 63.9622(f) and report to the Administrator as a deviation the third unsuccessful attempt at corrective action. **(40 CFR 63.9634(j)(3))**
  - d) (4) After the third unsuccessful attempt at corrective action, you must submit to the Administrator the written report required in paragraph (c) of this section within 5 calendar days after the third unsuccessful attempt at corrective action. This report must notify the Administrator that a deviation has occurred and document the types of corrective measures taken to address the problem that resulted in the deviation of established operating parameters and the resulting operating limits. **(40 CFR 63.9634(j)(4))**
5. As required by 40 CFR 63.6(e)(1)(i), the permittee must always operate and maintain the affected source, including air pollution control and monitoring equipment, in a manner consistent with good air pollution control practices for minimizing emissions at least to the levels required by Section I. **(40 CFR 63.9600(a))**
6. The permittee shall operate FGTACTIONEMACT consistent with the Operation and Maintenance Plan (O&M Plan) as described in Appendix A of the EPA Consent Decree dated May 9, 2019, for operation of the wet scrubbers and electrostatic precipitators (ESPs) in compliance with the Taconite MACT (40 CFR Part 63 Subpart RRRRR), is implemented and maintained. **(R 336.1331, R 336.1910, R 336.1911, EPA Consent Decree, Civil Action No. 2:19-cv-095, Act 451 324.5503(b))**

See Appendix A

#### **IV. DESIGN/EQUIPMENT PARAMETER(S)**

NA

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

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

1. The permittee shall demonstrate compliance with the particulate matter emission limit specified in SC I.1 for the Ore Crushing and Handling emission units (EU-CONV14-15-16, EU-CONV15.8-15.9, EU-CONV15.9-

- 16.1, EU-CONV16.1-17.1, EU-CONV17.1-17.2, EU-CONV19 & 19A-17, EU-CONV13-17.1, EU-CONV15-15.1, EU-CONVEYOR1, EU-CONVEYOR12A-13, EU-CONVEYOR12B-13, EU-CONVEYOR4A-4A1, EU-CONVEYOR4B-4C, EU-CONVEYOR4C-4D, EU-FEEDMIXER1, EU-FEEDMIXER2, EU-PRIMARYCRUSHER, EU-SCREENSRECLAIM) by testing at owner's expense, in accordance the requirements in 40 CFR 63.9621(b). The permittee may elect to test a representative unit in accordance with 40 CFR 63.9260(e – g) in lieu of testing each and every Ore Crushing and Handling emission unit. Testing will be conducted at least once during the five-year permit term and once every five years thereafter. **(R 336.1205, R 336.2001(3) & (4), 40 CFR 63.9621(b), 40 CFR 63.9630(a) & 40 CFR 63.9640)**
2. The permittee shall demonstrate compliance with the particulate matter emission limit in SC I.2 for the Finished Pellet Handling emission units (EU-COOLER1, EU-COOLER2, EU-TRANSFERTOWER1, EU-TRANSFERTOWER2, EU-UNIT1LHF, EU-UNIT2LHF, EU-PROD CONV2) by testing at owner's expense, in accordance with the requirements in 40 CFR 63.9621(b). The permittee may elect to test a representative unit in accordance with 40 CFR 63.9620(e)-(g) in lieu of testing each and every Finished Pellet Handling emission unit. Testing will be conducted at least once during the five-year permit term and once every five years thereafter. **(40 CFR 63.9620(e), 40 CFR 63.9621(b), 40 CFR 63.9630(c), 40 CFR 63.9640)**
  3. The permittee shall demonstrate compliance with the particulate matter emission limit in SC I.3 for EUOREDRIYER1 and EUOREDRIYER2 by testing at owner's expense, in accordance with the requirements in 40 CFR 63.9621(c). Testing will be conducted at least once during the five-year permit term and once every five years thereafter. **(40 CFR 63.9621(c), 40 CFR 63.9630(d), 40 CFR 63.9640)**
  4. The permittee shall demonstrate compliance with the particulate matter emission limit, when processing magnetite, specified in SC I.4 for EUKILN1 and EUKILN2 by testing at owner's expense, in accordance with the requirements in 40 CFR 63.9621(a). Testing will be conducted at least twice during the five-year permit term and twice every five year term thereafter. If magnetite is not processed during the five year permit term, testing will not be required. **(40 CFR 63.9621(a), 40 CFR 63.9630(a), 40 CFR 63.9630(b), 40 CFR 63.9640)**
  5. The permittee shall demonstrate compliance with the particulate matter emission limit, when processing magnetite, specified in SC I.4 for EUKILN1 and EUKILN2 by testing at owner's expense, in accordance with the requirements in 40 CFR 63.9621(a). Testing will be conducted at least twice during the five-year permit term and twice every five year term thereafter. If magnetite is not processed during the five year permit term, testing will not be required. **(40 CFR 63.9621(a), 40 CFR 63.9630(a), 40 CFR 63.9630(b), 40 CFR 63.9640)**

## **VI. MONITORING/RECORDKEEPING**

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

1. Except as provided in paragraph (2) of this section, for each wet scrubber subject to the operating limits for pressure drop and scrubber water flow rate in 40 CFR 63.9590(b)(1), the permittee must install, operate, and maintain a CPMS according to the requirements in 40 CFR 63.9632(b) through (e) and monitor the daily average pressure drop and daily average scrubber water flow rate according to the requirements in 40 CFR 63.9633. The permittee shall record all information needed to document conformance with these requirements. **(40 CFR 63.9631(b), 40 CFR 63.9632(b)-(e), 40 CFR 63.9633, and 40 CFR 63.9634(e)(2),(3))**
2. For each dynamic wet scrubber subject to the scrubber water flow rate and either the fan amperage or pressure drop operating limits in 40 CFR 63.9590(b)(2), the permittee must install, operate, and maintain a CPMS according to the requirements in 40 CFR 63.9632(b) through (e) and monitor the daily average scrubber water flow rate and either the daily average fan amperage or the daily average pressure drop according to the requirements in 40 CFR 63.9633. The permittee shall record all information needed to document conformance with these requirements. **(40 CFR 63.9631(c), 40 CFR 63.9632(b)-(e), 40 CFR 63.9633, and 40 CFR 63.9634(f)(2)-(3))**

3. For each dry electrostatic precipitator subject to the operating limits in 40 CFR 63.9590(b)(3), the permittee must follow the monitoring requirements in paragraph (a) or (b). **(40 CFR 63.9631(d))**
  - a) If the operating limit the permittee chooses to monitor is the 6-minute average opacity of emissions in accordance with 40 CFR 63.9590(b)(3)(i), the permittee must install, operate, and maintain a COMS according to the requirements in 40 CFR 63.9632(f) and monitor the 6-minute average opacity of emissions exiting each control device stack according to the requirements in 40 CFR 63.9633.
  - b) If the operating limit the permittee chooses to monitor is average secondary voltage and average secondary current for each dry electrostatic precipitator field in accordance with 40 CFR 63.9590(b)(3)(ii), the permittee must install, operate, and maintain a CPMS according to the requirements in 40 CFR 63.9632(b) through (e) and monitor the daily average secondary voltage and daily average secondary current according to the requirements in 40 CFR 63.9633.

The permittee shall record all information needed to document conformance with these requirements.  
**(40 CFR 63.9631(b), 40 CFR 63.9632(b)-(e), 40 CFR 63.9633, 40 CFR 63.9634(g)(2))**

4. The permittee must keep the following records:
  - a) A copy of each notification and report that you submitted to comply with this subpart, including all documentation supporting any initial notification or notification of compliance status that you submitted, according to the requirements in 40 CFR 63.10(b)(2)(xiv).
  - b) The records in 40 CFR 63.6(e)(3)(iii) through (v) related to startup, shutdown, and malfunction.
  - c) Records of performance tests and performance evaluations as required in 40 CFR 63.10(b)(2)(viii).  
**(40 CFR 63.9642(a))**
5. For each COMS, the permittee must keep the following records:
  - a) Records described in 40 CFR 63.10(b)(2)(vi) through (xi).
  - b) Monitoring data for COMS during a performance evaluation as required in 40 CFR 63.6(h)(7)(i) and (ii).
  - c) Previous (that is, superseded) versions of the performance evaluation plan as required in 40 CFR 63.8(d)(3).
  - d) Records of the date and time that each deviation started and stopped and whether the deviation occurred during a period of startup, shutdown, or malfunction or during another period.  
**(40 CFR 63.9642(b))**
6. The permittee must keep the records required in 40 CFR 63.9634 through 63.9636 to show continuous compliance with each emission limitation, work practice standard, and operation and maintenance requirement that applies to you. **(40 CFR 63.9642(c))**
7. Your records must be in a form suitable and readily available for expeditious review, according to 40 CFR 63.10(b)(1). **(40 CFR 63.9643(a))**
8. As specified in 40 CFR 63.10(b)(1), you must keep each record for 5 years following the date of each occurrence, measurement, maintenance, corrective action, report, or record. **(40 CFR 63.9643(b))**
9. You must keep each record on site for at least 2 years after the date of each occurrence, measurement, maintenance, corrective action, report, or record according to 40 CFR 63.10(b)(1). You can keep the records offsite for the remaining 3 years. **(40 CFR 63.9643(c))**
10. If the permittee uses any air pollution control device other than a baghouse, wet scrubber, dry electrostatic precipitator, or wet electrostatic precipitator, the permittee must submit a site-specific monitoring plan that includes the information in paragraphs (a) through (d). The monitoring plan is subject to approval by the Administrator. The permittee must maintain a current copy of the monitoring plan onsite, and it must be available for inspection upon request, and kept for the life of the affected source or until the affected source is no longer subject to the requirements of this subpart. **(40 CFR 63.9631(f), 40 CFR 63.9634(i))**
  - a) A description of the device.
  - b) Test results collected in accordance with 40 CFR 63.9621 verifying the performance of the device for reducing emissions of particulate matter to the atmosphere to the levels required by this subpart.
  - c) A copy of the operation and maintenance plan required in 40 CFR 63.9600(b).

- d) Appropriate operating parameters that will be monitored to maintain continuous compliance with the applicable emission limitation(s).
11. For each CPMS required in 40 CFR 63.9631, the permittee must develop and make available for inspection upon request by the permitting authority a site-specific monitoring plan that addresses the requirements in paragraphs (a) through (g) of this section. **(40 CFR 63.9632(b))**
- a) Installation of the CPMS sampling probe or other interface at a measurement location relative to each affected emission unit such that the measurement is representative of control of the exhaust emissions (e.g., on or downstream of the last control device).
  - b) Performance and equipment specifications for the sample interface, the parametric signal analyzer, and the data collection and reduction system.
  - c) Performance evaluation procedures and acceptance criteria (e.g., calibrations).
  - d) Ongoing operation and maintenance procedures in accordance with the general requirements of 40 CFR 63.8(c)(1), (3), (4)(ii), (7), and (8).
  - e) Ongoing data quality assurance procedures in accordance with the general requirements of 40 CFR 63.8(d).
  - f) Ongoing recordkeeping and reporting procedures in accordance with the general requirements of 40 CFR 63.10(c), (e)(1), and (e)(2)(i).
  - g) Corrective action procedures that you will follow in the event an air pollution control device, except for a baghouse, exceeds an established operating limit as required in 40 CFR 63.9600(b)(3).
12. Unless otherwise specified, each CPMS must meet the requirements in paragraphs (a) and (b). **(40 CFR 63.9632(c))**
- a) Each CPMS must complete a minimum of one cycle of operation for each successive 15-minute period and must have valid data for at least 95 percent of every daily averaging period.
  - b) Each CPMS must determine and record the daily average of all recorded readings.
13. The permittee must conduct a performance evaluation of each CPMS in accordance with the site-specific monitoring plan. **(40 CFR 63.9632(d))**
14. The permittee must operate and maintain the CPMS in continuous operation according to the site-specific monitoring plan. **(40 CFR 63.9632(e))**
15. For each dry electrostatic precipitator subject to the opacity operating limit in 40 CFR 63.9590(b)(3)(i), the permittee must install, operate, and maintain each COMS according to the requirements in paragraphs (a) through (d) of this section. **(40 CFR 63.9632(f))**
- a) The permittee must install each COMS and conduct a performance evaluation of each COMS according to 40 CFR 63.8 and Performance Specification 1 in appendix B to 40 CFR Part 60.
  - b) The permittee must develop and implement a quality control program for operating and maintaining each COMS according to 40 CFR 63.8. At a minimum, the quality control program must include a daily calibration drift assessment, quarterly performance audit, and annual zero alignment of each COMS.
  - c) The permittee must operate and maintain each COMS according to 40 CFR 63.8(e) and the quality control program. The permittee must also identify periods the COMS is out of control, including any periods that the COMS fails to pass a daily calibration drift assessment, quarterly performance audit, or annual zero alignment audit.
  - d) The permittee must determine and record the 6-minute average opacity for periods during which the COMS is not out of control.
16. Except for monitoring malfunctions, associated repairs, and required quality assurance or control activities (including as applicable, calibration checks and required zero and span adjustments), the permittee must monitor continuously (or collect data at all required intervals) at all times an affected source is operating. **(40 CFR 63.9633(a))**
17. The permittee may not use data recorded during monitoring malfunctions, associated repairs, and required quality assurance or control activities in data averages and calculations used to report emission or operating

levels, or to fulfill a minimum data availability requirement. The permittee must use all the data collected during all other periods in assessing compliance. **(40 CFR 63.9633(b))**

18. A monitoring malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring system to provide valid data. Monitoring failures that are caused in part by poor maintenance or careless operation are not considered malfunctions. **(40 CFR 63.9633(c))**

## **VII. REPORTING**

1. The permittee must report each instance in which you did not meet an emission limitation in 40 CFR Part 63, Subpart RRRRR, including during periods of startup, shutdown or malfunction, and each instance in which you did not meet a work practice standard in 40 CFR 63.9591 or an operation and maintenance requirement in 40 CFR 63.9600. Deviations occurring during a period of startup, shutdown, or malfunction are not violations if you demonstrate to the Department's satisfaction that you were operating in accordance with 40 CFR 63.6(e)(1). Deviations shall be reporting semiannually. **(40 CFR 63.9637, 40 CFR 63.9641(a), 40 CFR 63.9641(b), 40 CFR 63.9641(d), 40 CFR 63.9650, 40 CFR 63.6(e), 40 CFR 63.10(d)(5)(i))**
2. If the permittee had a startup, shutdown, or malfunction during the semiannual reporting period that was not consistent with your Malfunction Abatement Plan, you must submit an immediate Malfunction Abatement report according to the requirements in 40 CFR 63.10(d)(5)(ii). **(40 CFR 63.9641(c))**
3. If the permittee had three unsuccessful attempts of applying corrective action as described in 40 CFR 63.9634(j), then you must submit an immediate corrective action report. Within 5 calendar days after the third unsuccessful attempt at corrective action, you must submit to the District Supervisor a written report in accordance with 40 CFR 63.9634(j)(3) and (4). This report must notify that a deviation has occurred and document the types of corrective measures taken to address the problem that resulted in the deviation of established operating parameters and the resulting operating limits. **(40 CFR 63.9641(e))**
4. The permittee shall submit two complete test protocols to the AQD, one to the Technical Programs Unit Supervisor and one to the District Supervisor for approval at least 60 days prior to the anticipated test date. The protocol shall describe the test method(s) and the maximum routine operating conditions, including targets for key operational parameters associated with air pollution control equipment to be monitored and recorded during testing. **(R 336.12001(3))**
5. The permittee shall notify the AQD Technical Programs Unit Supervisor and the District Supervisor no less than 7 days prior to the anticipated test date. **(R 336.2001(4))**
6. The permittee shall submit two complete test reports of the test results to the AQD, one to the Technical Programs Unit Supervisor and one to the District Supervisor, within 60 days following the last date of the test. **(R 336.2001(5))**
7. Every six months after the Effective Date (to be submitted on September 15 and March 15) Defendant shall submit a report that includes each instance, or related group of instances, except for an isolated instance that is the only 6-minute block average exceeding 20% but not exceeding 27% occurring within an hour, in which the 6-minute block average reading of the COM data for each ESP exceeds 20% opacity. For each instance or related group of instances, Defendant shall: **(EPA Consent Decree No. 2:19-cv-095, Paragraph 15, Act 451 324.5503(b))**
  - a) Identify the root cause of each instance in which the 6-minute block average reading exceeds 20% opacity;
  - b) When the root cause is unknown, provide a description of efforts taken by Defendant to investigate the root cause of each 6-minute block average reading that exceeds 20% opacity, including a copy of any related ESP operating records;
  - c) Describe corrective actions taken in response to the root cause of each instance in which the 6-minute block average reading exceeds 20% opacity, and attach relevant documents produced to address the cause of the high reading(s), if any; and



- d) Describe preventative actions taken, if any, and actions to be taken, if any, by Defendant to eliminate such instances of 6-minute block average readings that exceed 20% opacity in the future, along with a proposed schedule for taking such corrective action, or, alternatively, a justification for taking no additional action to address such instances.

### **VIII. STACK/VENT RESTRICTION(S)**

NA

### **IX. OTHER REQUIREMENT(S)**

1. The permittee shall comply with all applicable requirements of the National Emission Standards for Hazardous Air Pollutants: Taconite Iron Ore Processing as specified in 40 CFR Part 63, Subparts A and RRRRR. **(40 CFR Part 63, Subparts A and RRRRR)**
2. The permittee must prepare, and at all times operate according to, a fugitive dust emissions control plan that describes in detail the measures that will be put in place to control fugitive dust emissions from the locations listed in paragraphs (a) through (f) below. **(40 CFR 63.9591(a)(1-6), (b) and 40 CFR 63.9635)**
  - a) Stockpiles (includes, but is not limited to, stockpiles of uncrushed ore, crushed ore, or finished pellets);
  - b) Material transfer points;
  - c) Plant roadways;
  - d) Tailings basin;
  - e) Pellet loading areas; and
  - f) Yard areas.
3. The permittee must maintain a current copy of the fugitive dust emissions control plan onsite for the life of the affected source or until the source is no longer subject to the requirements of 40 CFR Part 63, Subpart RRRRR. The permittee must make the plan available for inspection upon request. **(40 CFR 63.9591(d))**
4. As required by 40 CFR 63.6(e)(1)(i), the permittee must always operate and maintain the affected source, including air pollution control and monitoring equipment, in a manner consistent with good air pollution control practices for minimizing emissions at least to the levels required by Section I. **(40 CFR 63.9600(a))**
5. The permittee must prepare, and at all times operate according to, a written operation and maintenance plan for each control device applied to meet any particulate matter emission limit in Section I and to meet the requirement of each indurating furnace subject to good combustion practices (GCP). The plan must explain why the chosen practices (i.e., quantified objectives) are effective in performing corrective actions or GCP in minimizing the formation of formaldehyde (and other products of incomplete combustion). The permittee must maintain a current copy of the operation and maintenance plan onsite, and make it available for inspection upon request. Each operation and maintenance plan must address the elements in paragraphs (a) through (c). **(40 CFR 63.9600(b), 40 CFR 63.9636)**
  - a) Preventative maintenance for each control device, including a preventative maintenance schedule that is consistent with the manufacturer's instructions for routine and long-term maintenance. **(40 CFR 63.9600(b)(1))**
  - b) Corrective action procedures for continuous parameter monitoring systems (CPMS) for all air pollution control devices except for baghouses. In the event the permittee exceeds an established operating limit for an air pollution control device except for a baghouse, the permittee must initiate corrective action to determine the cause of the operating limit exceedance and complete the corrective action within 10 calendar days. The corrective action procedures the permittee takes must be consistent with the installation, operation, and maintenance procedures listed in your site-specific CPMS monitoring plan in accordance with 40 CFR 63.9632(b). **(40 CFR 63.9600(b)(3), 40 CFR 63.9634(j))**
  - c) The permittee must identify and implement a set of site-specific Good Combustion Practices (GCP) for each type of indurating furnace at the plant. These GCP should correspond to the permittee's standard operating procedures for maintaining the proper and efficient combustion within each indurating furnace.

Good combustion practices include, but are not limited to, the elements listed in paragraphs (i) through (v). **(40 CFR 63.9600(b)(4))**

- i) Proper operating conditions for each indurating furnace (e.g., minimum combustion temperature, maximum carbon monoxide concentration in the furnace exhaust gases, burner alignment, or proper fuel-air distribution/mixing).
  - ii) Routine inspection and preventative maintenance and corresponding schedules of each indurating furnace.
  - iii) Performance analyses of each indurating furnace.
  - iv) Keeping applicable operator logs.
  - v) Keeping applicable records to document compliance with each element.
6. The permittee must develop a written startup, shutdown, and malfunction plan according to the provisions in 40 CFR 63.6(e)(3). **(40 CFR 63.9610(c), 40 CFR 63.9650, 40 CFR 63.6(e)(3))**

**Footnotes:**

<sup>1</sup> This condition is state only enforceable and was established pursuant to Rule 201(1)(b).

## **APPENDIX 1**

### **Definitions associated with the Consent Decree**

The following phrases and terms are specifically defined in relation to those special conditions associated with “U.S. v Tilden Mine Company, L.C., Civil Action No. 2:19-cv-095, 2019”

- “Act” or “CAA” shall mean the Clean Air Act, 42 U.S.C. §§ 7401 et seq.
- “Complaint” shall mean the complaint filed by the United States in this action.
- “Consent Decree” or “Decree” shall mean this Decree and all appendices attached hereto (listed in Section XXV).
- “Continuous Opacity Monitor” or “COM” shall mean the automated monitor of opacity readings from an ESP stack designed to control emissions from an indurating furnace at the Tilden Mine.
- “Day” shall mean a calendar day unless expressly stated to be a business day. In computing any period of time under this Consent Decree, where the last day would fall on a Saturday, Sunday, or federal holiday, the period shall run until the close of business of the next business day.
- “Defendant” or “Tilden” shall mean Tilden Mining Company, L.C.
- “EPA” shall mean the United States Environmental Protection Agency.
- “Effective Date” shall have the definition provided in Section XVI.
- “Electrostatic Precipitator” or “ESP” shall mean the primary particulate emissions control equipment for the indurating furnaces at the Tilden Mine.
- “MDEQ” shall mean the Michigan Department of Environmental Quality.
- “O&M Plan” shall mean the Operations & Maintenance Plan, attached hereto as Appendix A, that sets forth operating parameters and maintenance procedures for key and auxiliary pollution control equipment at the Tilden Mine.
- “Paragraph” shall mean a portion of this Decree identified by an Arabic numeral.
- “Parties” shall mean the United States and the Defendant.
- “Section” shall mean a portion of this Decree identified by a roman numeral.
- “Tilden Mine” shall mean Tilden’s taconite mine and processing plant located in Ishpeming, Marquette County, Michigan.
- “United States” shall mean the United States of America, acting on behalf of EPA.

## **APPENDIX A**

## *Wet Scrubber and ESP Monitoring and Response Plan*



**Tilden Mining Company L.C.**

**November 2018**

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# Wet Scrubber and ESP Monitoring and Response Plan

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## 1. Purpose

Certain emissions units at Tilden Mining Company L.C. facility are subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Taconite Iron Ore Processing [40 Code of Federal Regulations (CFR) Part 63 Subpart RRRRR]. This regulation is commonly referred to as the Taconite MACT and requires development and implementation of a Startup, Shutdown, and Malfunction (SSM) Plan.

The SSM Plan is applicable to air pollution control equipment that is used to demonstrate compliance with the Taconite MACT. This includes pollution control equipment used to control particulate emissions from the following sources:

- Ore Crushing and Handling Emission Units;
- Ore Drying;
- Indurating Furnaces; and
- Finished Pellet Handling Emission Units.

The sections of this document addressing roles and responsibilities, recordkeeping, reporting, and revisions are not required by the Taconite MACT and therefore deviations from these elements of the Plan are not necessarily deviations from the Taconite MACT or from the Title V permit unless expressly included in the permit.

In addition, sections of this document address control device operation, monitoring and response procedures associated with Tilden's obligations under the Michigan rule requirements incorporated into the Tilden Renewable Operating Permit, which establish a 20% opacity limit applicable to the dry electrostatic precipitators on-site. The Michigan obligations are distinct from those required by the Taconite MACT even though similar parametric monitoring instrumentation is required.

The primary purpose of the Plan is:

- To ensure that the equipment is operated in a manner consistent with safety and good air pollution control practices for minimizing emissions during periods of startup, shutdown, and malfunction; and
- To correct malfunctions which could result in particulate emissions exceedances as soon as practicable after their occurrence, consistent with safety and good air pollution control practices.



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## 2. Responsibilities

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The following is a summary of the responsibilities for each position involved in the implementation of this plan.

### 2.1 Operators

- 2.1.1 Operating the scrubbers and dry ESPs according to the Plan;
- 2.1.2 Assisting in the development and updating of SSM procedures and the Plan; and
- 2.1.3 Notifying the shift supervisor of problems with the monitoring systems for the scrubbers and dry ESPs.

### 2.2 Shift Supervisors

- 2.2.1 Ensuring that the operators are completing their responsibilities;
- 2.2.2 Following the Plan, as required;
- 2.2.3 Assisting with the identification of the steps to prevent a reoccurrence; and
- 2.2.4 Following the Plan procedures and assisting the Section Managers in the completion of the forms required by this plan.

### 2.3 Section Managers

- 2.3.1 Ensuring that the operators and shift supervisors are completing their responsibilities;
- 2.3.2 Following the Plan procedures and completing the forms required by this plan; and
- 2.3.3 Submitting the completed forms required by this plan to the Environmental Department.
- 2.3.4 Section Managers shall notify the Environmental Department as soon as practicable with enough time to ensure that any incident is reported to the state within 2 working days where: this Plan is not followed AND the source experiences a deviation of an applicable emission limitation;

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- 2.3.5 If actions to prevent a reoccurrence are identified for implementation, ensure they are completed in a timely manner;
- 2.3.6 Assisting in the development and updating of the SSM procedures and the Plan; and
- 2.3.7 Coordinating initial training and refresher training of all affected operators and coordinators.

## **2.4 Training Department**

- 2.4.1 Maintaining records for all training
- 2.4.2 Identifying individuals requiring training; and
- 2.4.3 Ensuring all training is completed

## **2.5 Environmental Engineers**

- 2.5.1 Developing and updating the SSM procedures and Plan;
- 2.5.2 Creating reports to satisfy reporting obligations. Obtaining responsible official approval (sign-off) and submitting reports as required by the regulation; and
- 2.5.3 Facilitating resolution of inquiries and clarification of Taconite MACT rule requirements as requested to assist personnel described herein in the completion of their responsibilities.

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### 3. Definitions

*Administrator* means the regulatory agency that is responsible for the administration of the Taconite MACT regulation; this could be EPA, or MDEQ.

*CFR* means Code of Federal Regulations.

*Dynamic Wet Scrubber* means an air emissions control device which utilizes a mechanically powered fan to cause contact between the process exhaust gas stream and the scrubbing liquid which are introduced concurrently into the fan inlet.

*EPA* means United States Environmental Protection Agency.

*ESP* means dry electrostatic precipitator.

*Finished Pellet Handling* means the transfer of fired taconite pellets from the indurating furnace to the finished pellet stockpiles at the plant. Finished pellet handling includes, but is not limited to:

- Furnace discharge or grate discharge;
- Finished pellet screening;
- Finished pellet transfer; and
- Finished pellet storage.

The atmospheric pellet cooler vent stack and gravity conveyor gallery vents designed to remove heat and water vapor from the structure are not included as part of the finished pellet handling affected source.

*Indurating* means the process whereby unfired taconite pellets, called green balls, are hardened at high temperature in an indurating furnace.

*MACT* means Maximum Achievable Control Technology.

*Malfunction* means any sudden, infrequent, and not reasonably preventable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner which causes, or has the potential to cause, the emission limitations in an applicable standard to be exceeded. Failures that are caused in part by poor maintenance or careless operation are not malfunctions.

*MDEQ* means the Michigan Department of Environmental Quality.

*Ore Crushing and Handling Emission Units* means the process whereby dry taconite ore is crushed and screened. Ore crushing and handling includes, but is not limited to:

- Dry crushing operations (e.g. primary, secondary, and tertiary crushing);
- Dry ore conveyance and transfer points;
- Dry ore classification and screening;
- Dry ore storage and stockpiling;
- Dry milling;

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- Dry cobbing (i.e. dry magnetic separation); and
- Grate feed.

Ore crushing and handling specifically excludes any operations where the dry crushed ore is saturated with water, such as wet milling and wet magnetic separation.

*O&M Plan* means Operation and Maintenance Plan.

*Shutdown* means the cessation of operation of an affected source or portion of an affected source for any purpose.

*SSM Plan* means Startup, Shutdown, and Malfunction Plan.

*Startup* means the setting in operation of an affected source or portion of an affected source for any purpose.

#### 4. Equipment Covered by this Plan

##### 4.1 Wet Scrubbers

The following is a list of wet scrubbers as particulate matter control equipment covered by this plan.

Table 4.1 – Wet Scrubbers

Air Permit Stack ID Number	Control Equipment Description	Process Description
SVA0007880	EU-CONVEYOR4B-4C	Conveyors 4B & 4B1 to 4C
SVA0013480	EU-CONVEYOR4A-4A1	Conveyor 4A to 4A-1
SVA0007910	EU-CONVEYOR4C-4D	Conveyor 4C to 4D
SVA0011570	EU-PRIMARYCRUSHER	Primary Ore Crusher
SVA0010460	EU-CONVEYOR1	Conveyor 1 to 2
SVC0005037	EU-CONVEYOR12A-13	Conveyor 12A to 13
SVC0005042	EU-CONVEYOR12B-13	Conveyor 12B to 13
SVC0005047	EU-CONV13-17.1	Conveyor 13 to 17.1
SVC0005057	EU-CONV15-15.1	Conveyor 15 to 15.1
SVP0033820	EU-CONV15.8-15.9	Conveyor 15.8 to 15.9
SVP0033940	EU-CONV15.9-16.1	Conveyor 15.9 to 16.1
SVC0005062	EU-CONV16.1-17.1	Conveyor 16.1 to 17.1
SVP0016830	EU-CONV17.1-17.2	Conveyor 17.1 to 17.2
SVC0005052	EU-CONV14-15-16	Conveyor 14 to 15 to 16
SVC0005067	EU-CONV19&19A-17	Conveyor 19 & 19A to 17 & screen
SVC0005072	EU-SCREENSRECLAIM	Conveyor 19 to 19A to 19B & screen
SVP0016100	EU-FEEDMIXER1	T1 Bentonite feeders and blender
SVP0014430	EU-COOLER1	T1 Cooler Discharge & Conveyor
SVP0014160	EU-UNIT1LHF	T1 Low Head Feeder
SVP0016230	EU-FEEDMIXER2	T2 Bentonite feeders and blender
SVP0014490	EU-COOLER2	T2 Cooler Discharge & Conveyor
SVP0014290	EU-UNIT2LHF	T2 Low Head Feeder
SVE3100694	EU-PROD CONV2	Conveyors 31.4, 31.5, 31.6, & 31.7
SVP0016620	EU-TRANSFERTOWER1	Tilden Unit 1 Pellet Loadout
SVP0016690	EU-TRANSFERTOWER2	Tilden Unit 2 Pellet Loadout

##### 4.2 Ore Concentrate Dryers with Dynamic Wet Scrubbers

The following table is a list of the ore concentrate dryers with dynamic wet scrubbers as particulate matter control equipment covered by this plan.

Table 4.2 – Ore Concentrate Dryers with Dynamic Wet Scrubbers

Air Permit ID Number	Control Equipment Description	Process Description
SVP0082951	EU-OREDRIYER1 - Dynamic Scrubber	Ore Concentrate Dryer #1
SVP0082851	EU-OREDRIYER2 - Dynamic Scrubber	Ore Concentrate Dryer # 2 North Stack
SVP0082861	EU-OREDRIYER2 - Dynamic Scrubber	Ore Concentrate Dryer # 2 South Stack

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### 4.3 Indurating Furnaces with Dry ESPs

The following table lists the indurating furnace stacks and the associated air pollution control equipment covered by this plan.

**Table 4.3 – Indurating Furnaces with Dry ESPs**

Air Permit ID Number	Control Equipment Description	Process Description
SVP0051981	EU-KILN1 - Dry ESP 2C-1	Grate-Kiln Pelletizing Unit 1 North Stack
SVP0051711	EU-KILN1 - Dry ESPs 2A-1 & 2B-1	Grate-Kiln Pelletizing Unit 1 South Stack
SVP0052431	EU-KILN2 - Dry ESP 2C-2	Grate-Kiln Pelletizing Unit 2 North Stack
SVP0052131	EU-KILN2 - Dry ESPs 2A-2 & 2B-2	Grate-Kiln Pelletizing Unit 2 South Stack

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## **5. Procedures for Responding to Monitoring Excursions**

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The general procedure for responding to monitoring excursions include:

- All startup and shutdown events must follow the procedures for minimizing emissions presented in Section 5.1, 5.2 and 5.3.
- If a startup, shutdown or malfunction event results in an exceedance of the Taconite MACT daily threshold (pressure drop and water flow for scrubbers, opacity for ESPs) for 10 consecutive days, the form in Appendix C will be utilized as appropriate to the event. A separate form will be completed for each 10-day consecutive period. See Section 6 for further detail.
- If a startup, shutdown or malfunction event or non SSM event results in an instance or related group of instances which exceeds the 6 minute 20% opacity threshold, the process in Appendix B and form in Appendix C will be utilized as appropriate to the event. See Section 6 for further detail.
- The recordkeeping for all startup, shutdown and malfunction events must be consistent with the requirements of section 7; and
- The reporting requirements for all startup and shutdown events must be consistent with the requirements of section 8.

### **5.1 Wet Scrubbers**

The primary purpose of the wet scrubbers is to address housekeeping and industrial hygiene issues. For buildings under negative pressure, if the dust collector fan is not operating, the dust will be contained within the building. The general operating guidelines for the wet scrubbers is to ensure that the scrubber is operating at all times when the fan is operating.

One of the options for resolving a malfunction for a dust collector with a wet scrubber that is located in a building is to shut down the fan to stop the emissions. By shutting down the fan, the emissions will be contained within the building, and the problem can be resolved without causing excess emissions or an emissions exceedance. During this time, visual inspections or other process modifications may be implemented to ensure compliance.

The startup and shutdown definitions for the dust collectors with wet scrubbers are:

- Startup Definition:
  - Beginning of Startup: Startup begins when water is flowing through the scrubber and the fan is started.

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- End of Startup: Startup is complete when both of the following conditions occur for 60 consecutive minutes (1) the pressure drop is equal to or greater than the minimum operating requirement and (2) the scrubber water flow rate is equal to or greater than the minimum operating requirement.
- Shutdown Definition:
  - Beginning of Shutdown: Shutdown begins when the fan is shut down.
  - End of Shutdown: Shutdown is complete when the fan is shut down for ten minutes.
- The required recordkeeping for all monitoring excursions is outlined in Appendix C.

## 5.2 Ore Concentrate Dryers with Dynamic Wet Scrubbers

The primary purpose of the dynamic wet scrubbers is to remove particulate from the flue gas prior to being discharged into the atmosphere.

The general operating guidelines for the dynamic wet scrubbers for the ore concentrate dryers is to ensure that the particulate control equipment is operating at all times when the dryer is operating under normal conditions.

The startup and shutdown definitions for the ore concentrate dryers with dynamic wet scrubbers are:

- Startup Definition:
  - Beginning of Startup: Startup begins when water is flowing through the scrubber and the fan is started to move air through the dryer.
  - End of Startup: Startup is complete when both of the following two conditions occurs for 1 consecutive hour, (1) the fan amps or the pressure drop is equal to or greater than the minimum operating requirement and (2) the scrubber water flow rate is equal to or greater than the minimum operating requirement.
- Shutdown Definition:
  - Beginning of Shutdown: Shutdown begins when the fan is shut down.
  - End of Shutdown: Shutdown is complete when the fan is down for ten minutes.
- The required recordkeeping for all monitoring excursions is outlined in Appendix C.



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### 5.3 Indurating Furnaces with Dry ESPs

The primary purpose of the dry ESPs for the indurating furnace stacks is to remove particulate from the flue gas prior to being discharged into the atmosphere. The general operating guidelines for the dry ESPs for the indurating furnaces is to ensure that the particulate control equipment is operating at all times when the furnace is operating under normal conditions.

The stack cap is an integral part of the grate kiln furnace design, and operates as part of normal safe operation practices. The stack cap opens when necessary to release excess heat that would otherwise build up in the furnace when the grate stops and cause severe equipment damage and unsafe working conditions. Stack cap openings are necessary responses to startup and shutdown of the furnace grate, and are managed so that only the minimum amount of heat necessary to retain safe operations is released from the furnace. This limits the amount of fuel that must be combusted to bring the furnace back to temperature when the furnace begins accepting new feed. Federal regulations define “startup” as “the setting in operation of an affected source or portion of an affected source for any purpose” and “shutdown” as “the cessation of operation of an affected source or portion of an affected source for any purpose.” 40 C.F.R § 63.2. At cold startup, natural gas is fired to bring the furnace up to temperature. The stack cap is opened during this process when necessary to regulate the temperature increase and prevent rapid heating of the furnace that could damage the equipment and control device. The shutdown sequence begins when the grate stops, preventing more feed from entering the furnace. The stack cap must be opened when the grate stops to prevent a buildup of heat that would melt the grate and create dangerous pressure changes in the furnace.

#### **Startup:**

Startup Definition:

- Beginning of Startup: Startup begins when a flame is established.
- End of Startup: Defined in the Appendix A procedure.

Steps for minimizing emissions during a startup are identified in Appendix A, Tilden Opacity Reduction Procedures During Startups document which shall be followed for each startup event.

#### **Shutdown:**

Shutdown Definition:

- Beginning of Shutdown: Shutdown begins when the grate stops.
- End of Shutdown: Shutdown is complete when the ESPs are shut down and the kiln process fans are shut down.

Steps for minimizing emissions during a shutdown event may include but are not limited to raising the stack cap, reducing primary burner firing rate, dampering fans back, halting feed of greenballs to the grate, running pellet load out of the kiln, reducing kiln and pellet cooler speed and continuing use of dust collection system on portion of total airstream. In addition, the DCS has been programmed to issue an automatic “stop” command to the coal stock feeder when both conditions are true: 1) coal stock feeder is running, and stack cap >30% to ensure a rapid fuel switch to 100% natural gas in the event of a kiln shutdown.

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**Malfunctions:**

## Malfunction Definition:

Malfunctions are any sudden, infrequent, and not reasonably preventable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner which causes, or has the potential to cause, the emission limitations in an applicable standard to be exceeded. Failures that are caused in part by poor maintenance or careless operation are not malfunctions.

The general procedures for responses to malfunctions include:

- Take steps to safely secure the operation of the ESP;
- Initiate steps to identify the cause of the malfunction;
- Take actions to resolve the malfunction as soon as practicable; and
- Follow all recordkeeping and reporting requirements as described in Sections 7 and 8 of this plan.

**Other 6-Minute 20% Opacity Events:**

If a 6-minute opacity average or related series of 6-minute opacity averages exceeds 20%, the flowsheet presented in Appendix B will be utilized to complete the Environmental Signal or Corrective Action Report presented in Appendix C of this document as appropriate.

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## 6. Corrective Action Requirements

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### **Taconite MACT Daily Thresholds**

If there is an excursion of a Taconite MACT daily threshold (pressure drop and water flow for scrubbers, opacity for ESPs) the form in Appendix C will be utilized as appropriate to the event. A separate form will be completed for each 10-day consecutive period if the daily average value does not return to acceptable levels. The process described here is consistent with in the requirements set forth in 40 CFR 63.9634(j).

After the third unsuccessful attempt at corrective action, submit to the Administrator a written report within 5 calendar days after the third unsuccessful attempt at corrective action. This report must notify the Administrator that a deviation has occurred and document the types of corrective measures taken to address the problem that resulted in the deviation of established operating parameters and the resulting operating limits. (40 CFR 63.9634(j)(4))

### **6 Minute 20% Opacity Thresholds for the ESPs**

If a 6-minute opacity average or related series of 6-minute opacity averages exceeds 20%, refer to the flowsheet presented in Appendix B and complete the Environmental Signal or Corrective Action Report presented in Appendix C of this document as appropriate.

### **Review and Update Process**

Procedures contained herein to minimize emissions will be reviewed and updated annually as appropriate. Prior 6-minute 20% opacity events will be reviewed along with documentation regarding equipment and reason descriptions for the events. Information obtained during this review will be used to identify any issues that may warrant further investigation, identify any operational or equipment changes that need to be made and update the procedures contained herein to continue to minimize emissions during startup events.

Operators will be retrained to this plan annually.

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## **7. Recordkeeping Requirements**

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The following is a summary of the recordkeeping required. The purpose of the recordkeeping program is to maintain records that demonstrate conformance with this Plan.

- All records will be maintained for a minimum of 5 years
- Records will be maintained in a manner that can be readily accessed
- Records can be maintained as a hard copy or a computer-readable form.

The following records will be maintained:

- Completed Environmental Signal or Corrective Action Reports; The Environmental Signal or Corrective Action Report form is provided in Appendix C. These completed forms will be managed through the site's Environmental Management System (EMS).
- Associated monitoring data from the plant historian. Operating data relevant to the Plan obligations from the plant historian is preserved in the historian for at least 5 years; and
- Superseded revisions of the SSM plan will be maintained by the environmental department.

## 8. Reporting Requirements

The following is a summary of the reports required per the Taconite MACT regulations. All report preparation and submittal to outside agencies is the responsibility of the Environmental Department.

### 8.1 Semiannual Reports

The MACT regulations require submittal of semiannual reports. The reporting requirements are detailed in 40 CFR 63.9641. It is important to note that one semiannual report is submitted for compliance with all of the Taconite MACT requirements.

The site's Renewable Operating Permit (ROP) also requires submittal of semiannual reports. The 6 minute 20% opacity excursion are described in this report.

**[Placeholder to add in any consent decree required reporting upon finalization of document]**

The reporting due dates are:

Reporting Period	Dates	Report Due Date
1 <sup>st</sup> Semiannual Period	January 1 – June 30	September 15
2 <sup>nd</sup> Semiannual Period	June 30 – December 31	March 15

The report must include:

1. Company name and address;
2. Statement by responsible official, with the official's name, title, and signature, certifying the truth, accuracy, and completeness of the content of the report.
3. Dates of report and beginning and ending dates of the reporting period.
4. If there was an opacity event during a Startup, Shutdown, or Malfunction during the reporting period and actions were consistent with the SSM Plan, the compliance report will include the date(s), duration, and description of each event, as required by 40 CFR 63(10)(d)(5)(i).
5. If there were no deviations from the continuous compliance requirements in 40 CFR 63.9634 through 63.9636, then a statement will be provided that states that there were no deviations from the emission limitations, work practice standards, or operation and maintenance requirements during the operating period.
6. If there were no periods during which a continuous monitoring system (CPMS or COMS) was out-of-control as specified in 40 CFR 63.8(c)(7), then a statement will

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be provided that states that there were no periods during which a continuous monitoring system was out-of-control during the reporting period.

7. For each deviation from a MACT emission limitation using a continuous monitoring system (including CPMS or COMS) to comply with an emission limitation for the Taconite MACT, the compliance report must contain the following information (including for periods of startup, shutdown, and malfunction):
  - (i) The date and time that each malfunction started and stopped;
  - (ii) The date and time that each CPMS and/or COMS was inoperative, except for zero (low-level) and high-level checks;
  - (iii) The date, time and duration that each CPMS and/or COMS was out-of-control, including the information in 40 CFR 63.8(c)(8);
  - (iv) The date and time that each deviation started and stopped, and whether each deviation occurred during a period of startup, shutdown, or malfunction or during another period;
  - (v) A summary of the total duration of the deviations during the reporting period and the total duration as a percent of the total source operating time during the reporting period;
  - (vi) A breakdown of the total duration of the deviations during the reporting period, including those due to startup, shutdown, control equipment problems, process problems, other known causes, and unknown causes;
  - (vii) A summary of the total duration of continuous monitoring system downtime during the reporting period and the total duration of continuous monitoring system downtime as a percent of the total source operating time during the reporting period;
  - (viii) A brief description of the process units;
  - (ix) A brief description of the continuous monitoring system;

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- (x) The date of the latest continuous monitoring system certification or audit; and
- (xi) A description of any changes in continuous monitoring systems, processes, or controls since the last reporting system.

Reports required by other regulations, can be submitted in place of or as part of the semiannual report.

This facility will comply with the reporting requirements as follows:

- The Taconite MACT Report will be submitted in combination with the Title V (Renewable Operating Permit) Certification Report.

### **8.2 Immediate Corrective Action Reports**

As outlined in section 6 of this plan, after three unsuccessful attempts at applying corrective actions to an emission unit or emission groups, an immediate corrective action report must be submitted as required by 40 CFR 63.6934(j):

- The report must be submitted to the Administrator within 5 calendar days of the third unsuccessful attempt at corrective action;
- This written report must state that a deviation has occurred and must document the types of corrective measures that have been taken to address the problem.

### **8.3 Reports for Actions Not Consistent with SSM Plan**

If a source experiences a deviation from an applicable emissions limitation during an SSM event and the action taken in response was not consistent with the procedures specified in the SSM plan, submit an immediate notification and a written report, as required by 40 CFR 63.6(e)(3)(iv) and 63.10(d)(5)(ii):

- An immediate notification, which consists of a phone call or a fax, to the Administrator within 2 working days after commencing action that is inconsistent with the SSM Plan.
- A written report to the Administrator within 7 working days after the end of the event.

The report shall include:

- Certification of truth, accuracy, and completeness of report by a responsible official; (including name and title)
- Explanation of circumstances of the event;

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- Reasons for not following the SSM Plan;
- Description of all excess emissions and/or CPMS monitoring exceedances which are believed to have occurred.
- Actions taken to minimize emissions in conformance with §63.6(e)(1)(i).

#### **8.4 Reports for Opacity Events Lasting Longer than 2 hours**

If an opacity event occurred during any abnormal condition, startup, shutdown or malfunction lasts for greater than 2 hours above 20%, a notice to the MDEQ is required within 2 business days after the event. (MI R. 336.1912 (3)). Reporting shall consist of:

- An immediate notification, which consists of a phone call or a fax, to the Administrator within 2 working days after the event.
- A written report to the MDEQ within 10 days after startup or shutdown occurred, within 10 days after the abnormal conditions or malfunction was corrected, or within 30 days of discovery of the abnormal conditions or malfunction, whichever is first. The report shall include:
  - Time, date and probable causes or reasons for, and the duration of the abnormal conditions, startup, shutdown or malfunction.
  - An identification of the source, process, or process equipment that experienced abnormal conditions, was started up or shut down, or which malfunctioned and all other affected process or process equipment that have emissions in excess of an applicable requirement, including a description of the type and, where known or where it is reasonably possible to estimate, the quantity or magnitude of emissions in excess of applicable requirements.
  - Information describing the measures taken and air pollution control practices followed to minimize emissions.
  - For abnormal conditions and malfunctions, the report shall also include a summary of the actions taken to correct and to prevent a reoccurrence of the abnormal conditions or malfunction and the time taken to correct the malfunction.



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- Actions taken to correct and prevent a reoccurrence of an abnormal condition or a malfunction shall become a part of any preventative maintenance and malfunction abatement plan required by R 336.1911.

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## **9. Revisions of the SSM Plan**

### **9.1 Revisions Required by the Administrator**

As stated in 40 CFR 63.6(e)(3)(vii), the Administrator may require changes to the SSM plan if the Administrator believes that the SSM Plan:

- Does not address a startup, shutdown, and malfunction event that has occurred;
- Fails to provide for the operation of the source (including associated air pollution control and monitoring equipment) during an SSM event in a manner consistent with the general duty to minimize emissions;
- Does not provide adequate procedures for correcting malfunctioning process and/or air pollution control and monitoring equipment as quickly as practicable; or
- Includes an event that does not meet the definition of startup, shutdown, and malfunction.

### **9.2 Revisions Initiated by the Tilden Mine**

As stated in 40 CFR 63.6(e)(3)(viii), the Tilden Mine may periodically revise the SSM Plan, as necessary, to satisfy the requirements of this part or to reflect changes in equipment or procedures at the affected source.

Unless the MDEQ provides otherwise, the Tilden Mine may make such revisions to the SSM Plan without prior approval by the Administrator.

### **9.3 Revisions to Correct Procedures**

As stated in 40 CFR 63.6(e)(3)(viii), if the SSM Plan fails to address or inadequately addresses an event that meets the characteristics of a malfunction but was not included in the SSM Plan, the plans must be revised within 45 days after the event to include detailed procedures for operating and maintaining the source during similar malfunction events and a program for corrective action for similar malfunctions of process or air pollution control and monitoring equipment. The revisions to correct procedures shall meet the requirements described in sections 9.2 and 9.4.

### **9.4 Revisions Which Change Scope of SSM Events**

As stated in 40 CFR 63.6(e)(3)(viii), in the event that a revision to the SSM Plan alters the scope of activities which are deemed to be a startup, shutdown, or malfunction, or otherwise modifies the applicability of any emission limit, work practice requirement, or other requirement in a standard established under this part, the revised plan shall not take effect until after the facility provides a written notice describing the revision to the MDEQ.

***Appendix A***  
***Opacity Reduction Procedure During Startup***

# Tilden Mining Co. L.C.

	Environmental Management System Document	
	Title:	Opacity Reduction Procedures During Startups
	Date/Rev:	October 19, 2018

## Objective

The objective of this document is to capture procedures for minimizing opacity during startup.

These procedures are developed based on knowledge gained over time and reflects the current best understanding of startup sequences best situated to minimize opacity excursions during startup. It is anticipated to continue to evolve with increased understanding of the startup sequence and its effects on opacity.

It is important to recognize that startup of the kiln and all associated components like the ESPs is a dynamic process that depends upon numerous variables. The procedure in this document is a critical operational instruction for the operators, but relies on the technical expertise of the operators to manage the startup in the safest, most efficient way possible.

## Definitions

- **Cold Startup:** a unit start-up sequence including both a heat up and production start which is initiated when kiln off-gas temperatures are less than 200°F. Neither the process fans nor the ESPs are in operation at the commencement of a cold startup.
- **Hot Idle Startup:** a unit start where production has stopped, but the kiln off-gas is held at temperatures that minimize the energy required to resume production. The process fans and ESPs remain in operation during a hot idle startup.

## Equipment Availability

1. Perform weekly start-up check on T1 air heater to ensure it is in working order
2. Perform weekly start-up check on T2 air heater to ensure it is in working order

## Cold Startup Sequence

1. Kiln burner started on natural gas only
2. Kiln rotation started
3. All available ESP fields are energized when the associated fan is started.
  - a. 2A precips started when 2A fan is started
  - b. 2B precips started when 2B fan is started
  - c. 2C precips started when 2C fan is started
  - d. Alarm will sound if ESP does not energize when fan is running. If a field does not start during a cold start-up, enter a priority work order to troubleshoot and correct.
4. Grate bedding: Unfired pellets are loaded on grate prior to start of air heater.
5. Air Heater started up after the grate is bedded.
  - a. If air heater will not start, write a priority work order to troubleshoot and correct.
6. Place bed depth setpoint at 7.0" of pellets and adjust pellet feed as necessary.
7. Check 1B bypass damper. Set to 100% to route heated air into the ESPs.

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8. 2A damper: Run the fan damper in AUTO (to a pre-set pressure setpoint) or if in manual, do not exceed -1.0 inH<sub>2</sub>O UDD furnace pressure (2A).

Startup is complete when the grate run condition is fulfilled; green ball bed depth > 3", grate speed >30"/min, the stack cap is closed; and AND the secondary air temperature reaches > 1850 kF.

### Hot Idle Startup Sequence

1. Kiln burner running on natural gas only; ESPs already in operation.
2. Air Heater started up before the grate is started.
  - a. If air heater will not start, write a priority work order to troubleshoot and correct.
3. Place bed depth setpoint at 7.0" of pellets and adjust pellet feed as necessary.
4. Check 1B bypass damper. Set to 100% to route heated air into the ESPs.
5. 2A damper: Run the fan damper in AUTO (to a pre-set pressure setpoint) or if in manual, do not exceed -1.0 inH<sub>2</sub>O UDD furnace pressure (2A).
6. The startup is typically completed when the primary cooler fan has achieved its pressure setpoint.

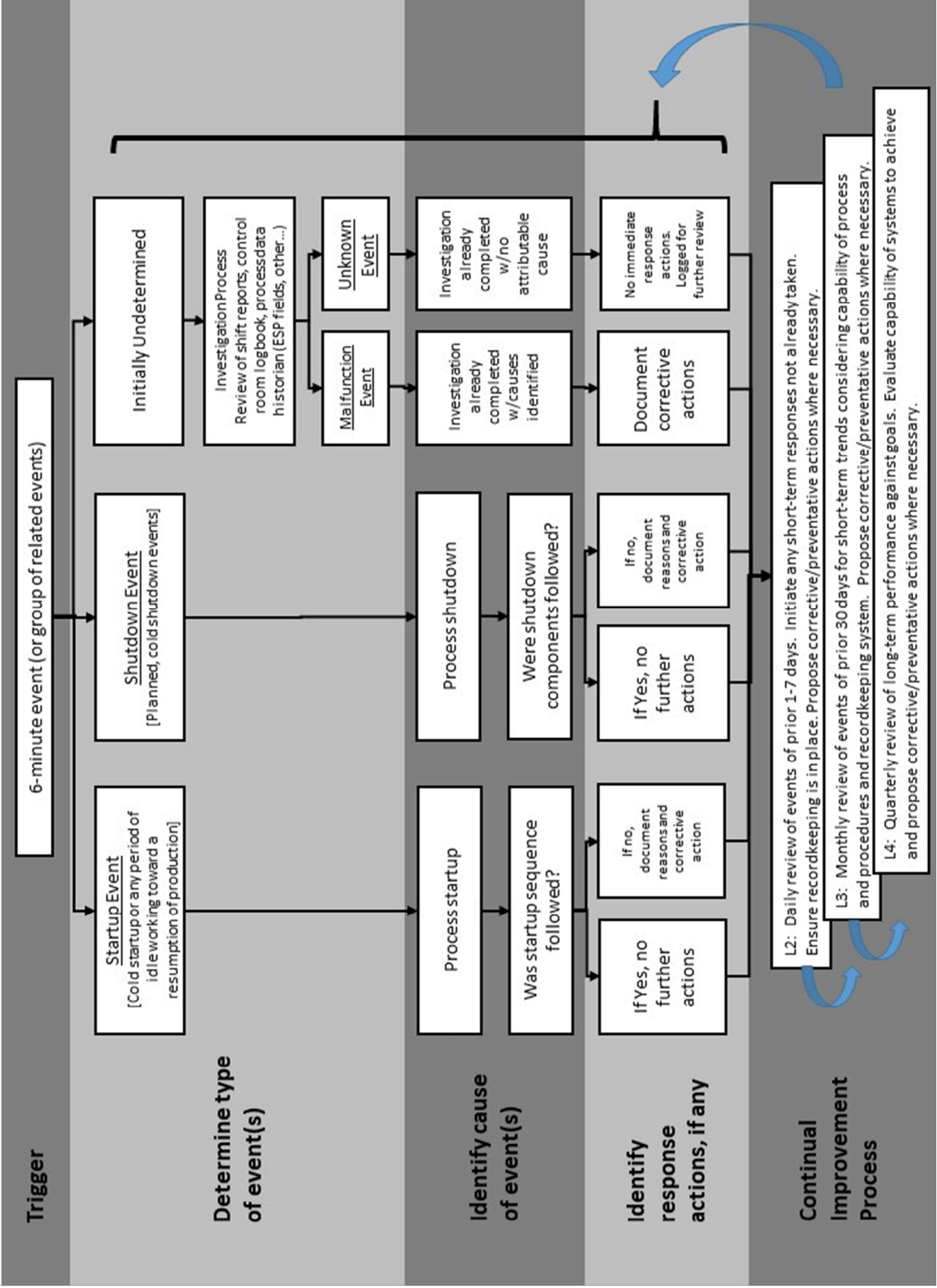
### Annual Review and Update Process

Procedures contained herein to minimize emissions during startup activities will be reviewed and updated annually as appropriate. Startup and shutdown-related 6-minute opacity events that occurred during the previous year will be reviewed along with documentation regarding equipment and reason descriptions for the events. Information obtained during this review will be used to identify any issues that may warrant further investigation, identify any operational or equipment changes that need to be made and update the procedures contained herein to continue to minimize emissions during startup events. The revision date of this document will be used to demonstrate this review has been completed.

Operators will be retrained to the opacity reduction procedures after any updates are completed.

***Appendix B***  
***Opacity Event Recording and Follow Up Flowsheet***

# Tilden Opacity Event Recording and Follow Up Flowsheet



*Appendix C*  
Environmental Signal or Corrective Action Report



Tilden Mining Company  
**Environmental Signal or Corrective Action Report**

Due 30 days from date of event

ESCAR # \_\_\_\_\_

**1. DETERMINE TYPE OF EVENT - TO BE COMPLETED BY SUBMITTER**

Event: \_\_\_\_\_

Submitted By: \_\_\_\_\_ Event Date: \_\_\_\_\_ Shift (if applicable): \_\_\_\_\_

**TYPE OF EVENT**

- |  |   |   |
|--|---|---|
| Wet scrubber   | <input type="checkbox"/> 24 hr dP excursion     | <input type="checkbox"/> 24 hr Water Flow excursion   |
| Wet scrubber   | <input type="checkbox"/> 10 Day dP excursion    | <input type="checkbox"/> 10 Day Water Flow excursion  |
| Electrostatic Precipitator   | <input type="checkbox"/> Startup Event          | (Cold startup or any period of idle working toward a resumption of production)<br>(Planned cold shutdown events)<br>Attach results of investigation process - review of shift reports, control room logbook, process data historian (ESP fields, other) |
| Electrostatic Precipitator   | <input type="checkbox"/> Shutdown Event         |   |
| Electrostatic Precipitator   | <input type="checkbox"/> Initially Undetermined |   |
|  |   |   |
| If marked "Initially Undetermined" and after completing investigation, event classification: |   | <input type="checkbox"/> Malfunction Event <input type="checkbox"/> Unknown Event   |

**2. INVESTIGATION & INITIAL CORRECTION (CONTAINMENT OF ISSUE) - TO BE COMPLETED BY TECHNICAL REPRESENTATIVE/INVESTIGATOR**  
 (Attach any supporting documents)

Department/Area: \_\_\_\_\_

Cause: \_\_\_\_\_

Initial Action Taken: \_\_\_\_\_

Corrective Action: \_\_\_\_\_

Is corrective Action complete?     Yes (sign below the table)     No – complete step by step Corrective Action Plan below

**Corrective Action Plan for ESCAR# \_\_\_\_\_**

**Expected Completion Date (required):** \_\_\_\_\_

Action Step	Responsible	Target Date	Date Done	By

(Use tab key to add rows as needed)

Note: "Date Done" and "By" to be updated as work progresses

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Title: \_\_\_\_\_

Tilden Mining Company  
**Environmental Signal or Corrective Action Report**

Due 30 days from date of event

ESCAR #

---

**3. ACTION LEVEL DETERMINATION – TO BE COMPLETED BY DEPARTMENT MANAGER OR DESIGNEE (Check one)**  
(Attach any supporting documents)

Action Level     ES: Process Adjustment – quick resolution completed     CAR: Corrective Action – root causality determined

Comments or  
Additional Info:

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Title \_\_\_\_\_

---

**4. MANAGEMENT REPRESENTATIVE REVIEW**

Status:     Close pending follow-up audit     Close

Comments or  
Additional Info:

If designated "CAR" and closed at this stage provide verification of corrective action effectiveness

Verification:

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Title    Environmental Manager

---

**5. AUDIT RESULTS (VERIFICATION)**

Verification Audit Conducted

Results and/or  
Comments:  
(continue below if  
needed)

Is Corrective Action Complete?     Yes     No     Partial

Extension Needed?     No     Yes

CAR Status:     Closed     Open

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Title \_\_\_\_\_

*TILDEN MINING COMPANY L.C.*

1 Tilden Mine Road  
Ishpeming, Michigan 49849

PTI No: MI-PTI-B4885-2017b

Compliance Assurance Monitoring Plan  
EUOREDRYER1, EUOREDRYER2,  
FGDUSTCOLLECTORS

November 2021

**TILDEN MINING COMPANY L.C.  
COMPLIANCE ASSURANCE MONITORING (CAM) PLAN**

**Introduction**

The Compliance Assurance Monitoring (CAM) Rule (40 CFR Part 64) requires submission of a CAM plan for each individual emission unit with uncontrolled emissions of 100 tons per year or more that uses control equipment to achieve compliance with an applicable emissions standard. This CAM Plan is organized into three sections: (1) Ore concentrate dryer #1, (2) Ore concentrate dryer #2 and (3) FG Dust Collectors . Without emission control equipment, each of these emission units would emit greater than 100 tons of PM per year. Tilden Mining Company L.C. employs wet scrubbers on each emission unit to control PM emissions to meet the applicable standards pursuant to R336.1331. This CAM Plan is being submitted with the Title V permit renewal application in accordance with 40 CFR §64.5.

**Facility** Tilden Mining Company L.C. (MI-PTI-B4885-2017b)  
1 Tilden Mine Road  
Ishpeming, Michigan 49849

**CAM PLAN SECTION #1**

**I. Background**

**A. Emissions Unit:** Ore concentrate dryer

**Description:** Ore concentrate dryer #1 is rated at 400 tons per hour throughput and 70 million BTU per hour heat input. The dryer is fired with natural gas or used oil. Dryer #1 is controlled with a cyclone pre-cleaner and a wet scrubber.

**Identification:** Ore concentrate dryer #1

**B. Applicable Regulation, Emissions Limits, and Monitoring Requirements**

**Regulation No.:** R336.1331

**Regulated Pollutant:** Particulate Matter (PM)

**Emissions Limit:** 0.10 pounds per 1000 pounds of exhaust gases for particulate matter pursuant to R336.1331

**Monitoring Requirements:** Pursuant to 40 CFR 63 Subpart RRRRR §63.9631(c), the operating limit is a daily average scrubber water

flow rate and either the fan amperage or pressure drop operating limits in accordance with §63.9590(b)(2). Monitoring shall be performed by a Continuous Parameter Monitoring System (CPMS) which shall be installed, operated, and maintained in accordance with §63.9632 (b) through (e).

### **C. Control Technology Description**

Ore concentrate dryer #1 employs a dynamic wet scrubber control device to control PM emissions. The scrubber is equipped with Rosemount pressure transmitters and Yamatake electromagnetic flowmeters. The devices are set to output pressure drop and water flow as referenced in Tilden's renewable operating permit.

## **II. Monitoring Approach**

The monitoring approach in this CAM Plan utilizes two indicators of emission control performance: pressure drop and water flow, measured by a Continuous Parameter Monitoring System (CPMS). Part A summarizes the key elements the CPMS.

### **A. Pressure drop and water flow as Indicators**

#### **1. General Criteria**

**(a) Measurement Approach:** Pressure drop and water flow will be continuously monitored and recorded using a Continuous Parameter Monitoring System (CPMS).

**(b) Indicator Range:** The pressure drop and water flow that corresponds to optimal dynamic wet scrubber operation is unique to each device and based on values observed during operations and performance testing on a 24 hour average basis.

#### **2. Performance Criteria**

**(a) Exceedance Reporting Required by Regulation:** Reports must be submitted to Michigan Air Quality Division (AQD) within 30 days following the end of each calendar quarter documenting all instances of pressure drop and water flow values below the limitation specified as provided in R336.1213(3)(c). These reports are required to describe the reasons for each deviation and the actions taken to minimize or correct each deviation.

**(b) Exceedance Period to be used by CAM Plan:** The exceedance period for the CAM Plan will be a 24 hour average and reports of these

exceedances will be submitted semiannually pursuant to General Permit Condition 23.

**(c) QA/QC Practices and Criteria:** In accordance with 40 CFR §63.9632(b) through (e), the CPMS shall be installed, operated and maintained according to the following requirements:

1. Develop and make available a Site Specific Monitoring Plan
2. Complete a minimum of one cycle of operation for each successive 15-minute period and must have valid data for at least 95 percent of every daily averaging period. Determine and record the daily average of all recorded readings.
3. Conduct performance evaluations in accordance with the Site Specific Monitoring Plan

**(d) Verification of Operational Status:** In accordance with 40 CFR §§ 63.9632(e) the CPMS shall be operated and maintained in continuous operation according to the Site Specific Monitoring Plan.

### **III. Justification**

#### **A. Rationale for Selection of Monitoring Approach and Performance Indicators**

##### **1. Selection of pressure drop and water flow as an Indicator**

Tilden Mining Company L.C. selects pressure drop and water flow as a performance indicator because Tilden is required by its permit to operate Continuous Parameter Monitoring Systems (CPMS) for this emission unit per the Taconite MACT. In accordance with 40 CFR §64.3, Tilden is obligated to use a required CPMS system as one of the monitoring design criteria for this CAM Plan. Pressure drop and water flow are an indicators of good operation and maintenance of the wet scrubbers and are the same indicators obligated in rule by the Taconite MACT. Optimal performance of the wet scrubbers minimizes PM emissions.

#### **B. Rationale for Selection of Indicator Ranges**

##### **1. Selection of Range for Pressure Drop and Water Flow**

The selected upper bound of the range for the CPMS readings corresponds with the pressure drop and water flow observed during performance testing conducted for Taconite MACT compliance. PM limits prescribed by the MACT are more restrictive than the 0.10 pounds per 1000 pounds of exhaust gas limit for which CAM applies. To accommodate spikes and monitoring equipment variability, the CAM Plan defines an excursion as pressure drop and water flow outside

of this range for a 24 hour averaging period. When an excursion occurs, corrective action will be initiated, beginning with an evaluation of the occurrence to determine if further action is required to correct the situation. All excursions resulting in a deviation as defined in 40 CFR 63.9634(j) will be documented and reported semiannually. Excursions are not violations of applicable requirements; they are triggers for actions directed toward finding and correcting a potential problem.

## **CAM PLAN SECTION #2**

### **I. Background**

- A. Emissions Unit:** Ore concentrate dryer
- Description:** Ore concentrate dryer #2 is rated at 800 tons per hour throughput and 125 million BTU per hour heat input. The dryer is fired with natural gas or used oil. Dryer #2 is controlled with a two cyclone pre-cleaners and two wet scrubbers.
- Identification:** Ore concentrate dryer #2

### **B. Applicable Regulation, Emissions Limits, and Monitoring Requirements**

- Regulation No.:** R336.1331
- Regulated Pollutant:** Particulate Matter (PM)
- Emissions Limit:** 0.10 pounds per 1000 pounds of exhaust gases for particulate matter pursuant to R336.1331
- Monitoring Requirements:** Pursuant to 40 CFR 63 Subpart RRRRR §63.9631(c), the operating limit is a daily average scrubber water flow rate and either the fan amperage or pressure drop operating limits in accordance with §63.9590(b)(2). Monitoring shall be performed by a Continuous Parameter Monitoring System (CPMS) which shall be installed, operated, and maintained in accordance with §63.9632 (b) through (e).

### **C. Control Technology Description**

Ore concentrate dryer #2 employs two dynamic wet scrubber control devices to control PM emissions. The scrubbers are equipped with Rosemount pressure transmitters and Yamatake electromagnetic flowmeters. The devices are set to output pressure drop and water flow as referenced in Tilden's renewable operating permit.

## II. Monitoring Approach

The monitoring approach in this CAM Plan utilizes two indicators of emission control performance: pressure drop and water flow, measured by a Continuous Parameter Monitoring System (CPMS). Part A summarizes the key elements the CPMS.

### A. Pressure drop and water flow as Indicators

#### 1. General Criteria

**(a) Measurement Approach:** Pressure drop and water flow will be continuously monitored and recorded using a Continuous Parameter Monitoring System (CPMS).

**(b) Indicator Range:** The pressure drop and water flow that corresponds to optimal dynamic wet scrubber operation is unique to each device and based on values observed during operations and performance testing on a 24 hour average basis.

#### 2. Performance Criteria

**(a) Exceedance Reporting Required by Regulation:** Reports must be submitted to Michigan Air Quality Division (AQD) within 30 days following the end of each calendar quarter documenting all instances of pressure drop and water flow values below the limitation specified as provided in R336.1213(3)(c). These reports are required to describe the reasons for each deviation and the actions taken to minimize or correct each deviation.

**(b) Exceedance Period to be used by CAM Plan:** The exceedance period for the CAM Plan will be a 24 hour average and reports of these exceedances will be submitted semiannually pursuant to General Permit Condition 23.

**(c) QA/QC Practices and Criteria:** In accordance with 40 CFR §63.9632(b) through (e), the CPMS shall be installed, operated and maintained according to the following requirements:

1. Develop and make available a Site Specific Monitoring Plan
2. Complete a minimum of one cycle of operation for each successive 15-minute period and must have valid data for at least 95 percent of every daily averaging period. Determine and record the daily average of all recorded readings.



3. Conduct performance evaluations in accordance with the Site Specific Monitoring Plan

**(d) Verification of Operational Status:** In accordance with 40 CFR §§ 63.9632(e) the CPMS shall be operated and maintained in continuous operation according to the Site Specific Monitoring Plan.

### **III. Justification**

#### **A. Rationale for Selection of Monitoring Approach and Performance Indicators**

##### **1. Selection of pressure drop and water flow as an Indicator**

Tilden Mining Company L.C. selects pressure drop and water flow as a performance indicator because Tilden is required by its permit to operate Continuous Parameter Monitoring Systems (CPMS) for this emission unit per the Taconite MACT. In accordance with 40 CFR §64.3, Tilden is obligated to use a required CPMS system as one of the monitoring design criteria for this CAM Plan. Pressure drop and water flow are an indicators of good operation and maintenance of the wet scrubbers and are the same indicators obligated in rule by the Taconite MACT. Optimal performance of the wet scrubbers minimizes PM emissions.

#### **B. Rationale for Selection of Indicator Ranges**

##### **1. Selection of Range for Pressure Drop and Water Flow**

The selected upper bound of the range for the CPMS readings corresponds with the pressure drop and water flow observed during performance testing conducted for Taconite MACT compliance. PM limits prescribed by the MACT are more restrictive than the 0.10 pounds per 1000 pounds of exhaust gas limit for which CAM applies. To accommodate spikes and monitoring equipment variability, the CAM Plan defines an excursion as pressure drop and water flow outside of this range for a 24 hour averaging period. When an excursion occurs, corrective action will be initiated, beginning with an evaluation of the occurrence to determine if further action is required to correct the situation. All excursions resulting in a deviation as defined in 40 CFR 63.9634(j) will be documented and reported semiannually. Excursions are not violations of applicable requirements; they are triggers for actions directed toward finding and correcting a potential problem.

## CAM PLAN SECTION #3

### I. Background

- A. Emissions Unit:** FG Dust Collectors
- Description:** Various ore, concentrate and finished pellet handling processes throughout the facility including primary and secondary ore crushing, conveyor transfer points, bentonite feeders and mixer blenders, pellet cooler discharge hoppers, low head feeders, transfer towers, etc. The various emission units are controlled with wet scrubbers.

**Identification:** FG DUSTCOLLECTORS

### B. **Applicable Regulation, Emissions Limits, and Monitoring Requirements**

**Regulation No.:** R336.1331

**Regulated Pollutant:** Particulate Matter (PM)

**Emissions Limit:** 0.10 pounds per 1000 pounds of exhaust gases for particulate matter pursuant to R336.1331

**Monitoring Requirements:** Pursuant to 40 CFR 63 Subpart RRRRR §63.9631(c), the operating limit is a daily average scrubber water flow rate and pressure drop operating limits in accordance with §63.9590(b)(2). Monitoring shall be performed by a Continuous Parameter Monitoring System (CPMS) which shall be installed, operated, and maintained in accordance with §63.9632 (b) through (e).

### C. **Control Technology Description**

Various emissions units described above utilize wet scrubbers to control PM emissions. The scrubbers are equipped with Rosemount pressure transmitters and Yamatake electromagnetic flowmeters. The devices are set to output pressure drop and water flow as referenced in Tilden's renewable operating permit.

### II. Monitoring Approach

The monitoring approach in this CAM Plan utilizes two indicators of emission control performance: pressure drop and water flow, measured by a Continuous Parameter Monitoring System (CPMS). Part A summarizes the key elements the CPMS.

**A. Pressure drop and water flow as Indicators**

**1. General Criteria**

**(a) Measurement Approach:** Pressure drop and water flow will be continuously monitored and recorded using a Continuous Parameter Monitoring System (CPMS).

**(b) Indicator Range:** The pressure drop and water flow that corresponds to optimal dynamic wet scrubber operation is unique to each device and based on values observed during operations and performance testing on a 24 hour average basis.

**2. Performance Criteria**

**(a) Exceedance Reporting Required by Regulation:** Reports must be submitted to Michigan Air Quality Division (AQD) within 30 days following the end of each calendar quarter documenting all instances of pressure drop and water flow values below the limitation specified as provided in R336.1213(3)(c). These reports are required to describe the reasons for each deviation and the actions taken to minimize or correct each deviation.

**(b) Exceedance Period to be used by CAM Plan:** The exceedance period for the CAM Plan will be a 24 hour average and reports of these exceedances will be submitted semiannually pursuant to General Permit Condition 23.

**(c) QA/QC Practices and Criteria:** In accordance with 40 CFR §63.9632(b) through (e), the CPMS shall be installed, operated and maintained according to the following requirements:

1. Develop and make available a Site Specific Monitoring Plan
2. Complete a minimum of one cycle of operation for each successive 15-minute period and must have valid data for at least 95 percent of every daily averaging period. Determine and record the daily average of all recorded readings.
3. Conduct performance evaluations in accordance with the Site Specific Monitoring Plan

**(d) Verification of Operational Status:** In accordance with 40 CFR §§ 63.9632(e) the CPMS shall be operated and maintained in continuous operation according to the Site Specific Monitoring Plan.

### **III. Justification**

#### **A. Rationale for Selection of Monitoring Approach and Performance Indicators**

##### **1. Selection of pressure drop and water flow as an Indicator**

Tilden Mining Company L.C. selects pressure drop and water flow as a performance indicator because Tilden is required by its permit to operate Continuous Parameter Monitoring Systems (CPMS) for this emission unit per the Taconite MACT. In accordance with 40 CFR §64.3, Tilden is obligated to use a required CPMS system as one of the monitoring design criteria for this CAM Plan. Pressure drop and water flow are an indicators of good operation and maintenance of the wet scrubbers and are the same indicators obligated in rule by the Taconite MACT. Optimal performance of the wet scrubbers minimizes PM emissions.

#### **B. Rationale for Selection of Indicator Ranges**

##### **1. Selection of Range for Pressure Drop and Water Flow**

The selected upper bound of the range for the CPMS readings corresponds with the pressure drop and water flow observed during performance testing conducted for Taconite MACT compliance. PM limits prescribed by the MACT are more restrictive than the 0.10 pounds per 1000 pounds of exhaust gas limit for which CAM applies. To accommodate spikes and monitoring equipment variability, the CAM Plan defines an excursion as pressure drop and water flow outside of this range for a 24 hour averaging period. When an excursion occurs, corrective action will be initiated, beginning with an evaluation of the occurrence to determine if further action is required to correct the situation. All excursions resulting in a deviation as defined in 40 CFR 63.9634(j) will be documented and reported semiannually. Excursions are not violations of applicable requirements; they are triggers for actions directed toward finding and correcting a potential problem.

*TILDEN MINING COMPANY L.C.*

1 Tilden Mine Road  
Ishpeming, Michigan 49849

PTI No: MI-PTI-B4885-2017b

Compliance Assurance Monitoring Plan  
EUKILN1, EUKILN2

November 2021

**TILDEN MINING COMPANY L.C.  
COMPLIANCE ASSURANCE MONITORING (CAM) PLAN**

**Introduction**

The Compliance Assurance Monitoring (CAM) Rule (40 CFR Part 64) requires submission of a CAM plan for each individual emissions unit with uncontrolled emissions of 100 tons per year or more that uses control equipment to achieve compliance with an applicable emissions standard. This CAM Plan is organized into two sections: one for each indurating furnace that meets the CAM requirements (1) Unit 1 Furnace and (2) Unit 2 Furnace. Without emission control equipment, each of these furnaces would emit greater than 100 tons of PM per year. Tilden Mining Company L.C. employs dry electrostatic precipitators (ESP) on each furnace to control PM emissions to meet the applicable standards pursuant to R336.1331. This CAM Plan is being submitted with the Title V permit renewal application in accordance with 40 CFR §64.5.

**Facility**                      Tilden Mining Company L.C. (MI-PTI-B4885-2017b)  
1 Tilden Mine Road  
Ishpeming, Michigan 49849

**CAM PLAN SECTION #1**

**I.     Background**

- A.     Emissions Unit:**                      Indurating Furnace
- Description:**                      Unit 1 Grate Kiln Indurating Furnace receives pellets from the balling section, dries and preheats them on a traveling grate which discharges them into a rotary kiln for final induration. Unit 1 is fired with natural gas or coal. Unit 1 has a maximum total heat input of 590 million BTU per hour. The unit has dry electrostatic precipitator dust collectors.
- Identification:**                      Unit 1 Furnace
- B.     Applicable Regulation, Emissions Limits, and Monitoring Requirements**
- Regulation No.:**                      R336.1331
- Regulated Pollutant:**                      Particulate Matter (PM)

**Emissions Limit:** 0.065 pounds per 1000 pounds of exhaust gases and 200 pounds per hour for particulate matter pursuant to R336.1331

**Monitoring Requirements:** Pursuant to 40 CFR 63 Subpart RRRRR §63.9631(d)(1), the operating limit is a 6-minute average opacity of emissions in accordance with §63.9590(b)(3)(i). Monitoring shall be performed by a Continuous Opacity Monitoring System (COMS) which shall be installed, operated, and maintained in accordance with §63.9632(f).

### C. **Control Technology Description**

Unit 1 Furnace employs dry electrostatic precipitator control devices to control PM emissions, which are equipped with Durag DR290 Opacity Monitors. The DR290 Opacity Monitors measure the intensity attenuation of a light beam caused by dust particles as it passes through the duct. The physical measured variable is the transmission. The devices are set to output opacity as referenced in Tilden's renewable operating permit.

## II. **Monitoring Approach**

The monitoring approach in this CAM Plan utilizes one indicator of emission control performance: visible stack emissions, measured by a Continuous Opacity Monitoring System (COMS). Part A summarizes the key elements the COMS.

### A. **Visible Emissions (Opacity) as Indicator**

#### 1. **General Criteria**

**(a) Measurement Approach:** Visible emissions (opacity) will be continuously monitored and recorded using a Continuous Opacity Monitoring System (COMS).

**(b) Indicator Range:** The opacity that corresponds to optimal ESP operation is unique to each device and based on the requirements set forth in the Taconite MACT as maintained on a 24 hour block average basis.

#### 2. **Performance Criteria**

**(a) Exceedance Reporting Required by Regulation:** Reports must be submitted to Michigan Air Quality Division (AQD) within 30 days following the end of each calendar quarter documenting all instances of opacity values in excess of the limitation specified as provided in

R336.1213(3)(c). These reports are required to describe the reasons for each deviation and the actions taken to minimize or correct each deviation.

**(b) Exceedance Period to be used by CAM Plan:** The exceedance period for the CAM Plan will be a 24 hour average and reports of these exceedances will be submitted semiannually pursuant to General Permit Condition 23.

**(c) QA/QC Practices and Criteria:** In accordance with 40 CFR §63.9632(f), the COM shall be installed, operated and maintained according to the following requirements:

1. Performance evaluations shall be performed according to 40 CFR §63.8 and Performance Specification 1 appendix B to 40 CFR Part 60.
2. A quality control program for operating and maintenance shall be developed and implemented according to 40 CFR §63.8, which at a minimum will include a daily calibration drift assessment, quarterly performance audit, and annual zero alignment of each COMS.

**(d) Verification of Operational Status:** In accordance with 40 CFR §§ 63.9632(f)(3), (4) the COMS shall be operated and maintained according to 40 CFR §63.8(3) and the quality control program, and all periods where the COMS is out of control, including any period that the COMS fails to pass a daily calibration drift assessment, quarterly performance audit, or annual zero alignment audits shall be identified. All 6-minute average opacity periods during which the COMS is not out of control shall be recorded.

### **III. Justification**

#### **A. Rationale for Section of Monitoring Approach and Performance Indicators**

##### **1. Selection of Visible Emissions (Opacity) as an Indicator**

Tilden Mining Company L.C. selects visible emissions (opacity) as a performance indicator because Tilden is required by its permit to operate Continuous Opacity Monitors (COMs) for this emission unit per the Taconite MACT. In accordance with 40 CFR §64.3(d), Tilden is obligated to use a required COM system as one of the monitoring design criteria for this CAM Plan. Opacity is an indicator of good operation and maintenance of the ESP, and is the same indicator obliged in rule by the Taconite MACT. Optimal performance of the ESP minimizes PM emissions.

#### **B. Rationale for Selection of Indicator Ranges**



## 1. Selection of Range for Parametric Indicators

The selected upper bound of the range for the Continuous Opacity Monitor readings corresponds with the opacity observed during performance testing conducted for Taconite MACT compliance. PM limits prescribed by the MACT are more restrictive than the 0.065 pounds per 1000 pounds of exhaust gas limit for which CAM applies. To accommodate spikes and monitoring equipment variability, the CAM Plan defines an excursion as opacity outside of this range for a 24 hour averaging period which is consistent with the requirements prescribed in the Taconite MACT. When an excursion occurs, corrective action will be initiated, beginning with an evaluation of the occurrence to determine if further action is required to correct the situation. All excursions resulting in a deviation as defined in 40 CFR 63.9634(j) will be documented and reported semiannually. Excursions are not violations of applicable requirements; they are triggers for actions directed toward finding and correcting a potential problem.

### CAM PLAN SECTION #2

#### I. Background

A. **Emissions Unit:** Indurating Furnace

**Description:** Unit 2 Grate Kiln Indurating Furnace receives pellets from the balling section, dries and preheats them on a traveling grate which discharges them into a rotary kiln for final induration. Unit 2 is fired with natural gas or coal. Unit 2 has a maximum total heat input of 590 million BTU per hour. The unit has dry electrostatic precipitator dust collectors.

**Identification:** Unit 2 Furnace

#### B. **Applicable Regulation, Emissions Limits, and Monitoring Requirements**

**Regulation No.:** R336.1331

**Regulated Pollutant:** Particulate Matter (PM)

**Emissions Limit:** 0.065 pounds per 1000 pounds of exhaust gases and 200 pounds per hour for particulate matter pursuant to R336.1331

**Monitoring Requirements:** Pursuant to 40 CFR 63 Subpart RRRRR §63.9631(d)(1), the operating limit is a 6-minute average opacity of emissions in accordance with §63.9590(b)(3)(i). Monitoring shall be performed by

a Continuous Opacity Monitoring System (COMS) which shall be installed, operated, and maintained in accordance with §63.9632(f).

### **C. Control Technology Description**

Unit 2 Furnace employs dry electrostatic precipitator control devices to control PM emissions, which are equipped with Durag DR290 Opacity Monitors. The DR290 Opacity Monitors measure the intensity attenuation of a light beam caused by dust particles as it passes through the duct. The physical measured variable is the transmission. The devices are set to output opacity as referenced in Tilden's renewable operating permit.

## **II. Monitoring Approach**

The monitoring approach in this CAM Plan utilizes one indicator of emission control performance: visible stack emissions, measured by a Continuous Opacity Monitoring System (COMS). Part A summarizes the key elements the COMS.

### **A. Visible Emissions (Opacity) as Indicator**

#### **1. General Criteria**

**(a) Measurement Approach:** Visible emissions (opacity) will be continuously monitored and recorded using a Continuous Opacity Monitoring System (COMS).

**(b) Indicator Range:** The opacity that corresponds to optimal ESP operation is unique to each device and based on the requirements set forth in the Taconite MACT as maintained on a 24 hour block average basis.

#### **2. Performance Criteria**

**(a) Exceedance Reporting Required by Regulation:** Reports must be submitted to Michigan Air Quality Division (AQD) within 30 days following the end of each calendar quarter documenting all instances of opacity values in excess of the limitation specified as provided in R336.1213(3)(c). These reports are required to describe the reasons for each deviation and the actions taken to minimize or correct each deviation.

**(b) Exceedance Period to be used by CAM Plan:** The exceedance period for the CAM Plan will be a 24 hour average and reports of these exceedances will be submitted semiannually pursuant to General Permit Condition 23.

**(c) QA/QC Practices and Criteria:** In accordance with 40 CFR §63.9632(f), the COM shall be installed, operated and maintained according to the following requirements:

1. Performance evaluations shall be performed according to 40 CFR §63.8 and Performance Specification 1 appendix B to 40 CFR Part 60.
2. A quality control program for operating and maintenance shall be developed and implemented according to 40 CFR §63.8, which at a minimum will include a daily calibration drift assessment, quarterly performance audit, and annual zero alignment of each COMS.

**(d) Verification of Operational Status:** In accordance with 40 CFR §§ 63.9632(f)(3), (4) the COMS shall be operated and maintained according to 40 CFR §63.8(3) and the quality control program, and all periods where the COMS is out of control, including any period that the COMS fails to pass a daily calibration drift assessment, quarterly performance audit, or annual zero alignment audits shall be identified. All 6-minute average opacity periods during which the COMS is not out of control shall be recorded.

### **III. Justification**

#### **A. Rationale for Section of Monitoring Approach and Performance Indicators**

##### **1. Selection of Visible Emissions (Opacity) as an Indicator**

Tilden Mining Company L.C. selects visible emissions (opacity) as a performance indicator because Tilden is required by its permit to operate Continuous Opacity Monitors (COMs) for this emission unit per the Taconite MACT. In accordance with 40 CFR §64.3(d), Tilden is obligated to use a required COM system as one of the monitoring design criteria for this CAM Plan. Opacity is an indicator of good operation and maintenance of the ESP, and is the same indicator obliged in rule by the Taconite MACT. Optimal performance of the ESP minimizes PM emissions.

#### **B. Rationale for Selection of Indicator Ranges**

##### **1. Selection of Range for Visible Emissions**

The selected upper bound of the range for the Continuous Opacity Monitor readings corresponds with the opacity observed during performance testing conducted for Taconite MACT compliance. PM limits prescribed by the MACT are more restrictive than the 0.065 pounds per 1000 pounds of exhaust gas limit for which CAM applies. To accommodate spikes and monitoring equipment variability, the CAM Plan defines an excursion as opacity outside of this range for a 24 hour averaging period which is consistent with the requirements prescribed in the Taconite MACT.

When an excursion occurs, corrective action will be initiated, beginning with an evaluation of the occurrence to determine if further action is required to correct the situation. All excursions resulting in a deviation as defined in 40 CFR 63.9634(j) will be documented and reported semiannually. Excursions are not violations of applicable requirements; they are triggers for actions directed toward finding and correcting a potential problem.



# Tilden Mining Company Fugitive Dust Control Plan



This document has been assembled to meet the requirements laid out in 40 Code of Federal Regulations (CFR) Part 63 Subpart RRRRR, which is commonly referred to as the Taconite MACT.

April 2021

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## 1. Introduction

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Cleveland Cliffs Inc.'s Tilden Mining Company L.C. (Tilden) is the owner operator of a taconite ore mine and processing facility located in Marquette County, Michigan operating under Renewable Operating Permit (ROP) number MI-ROP-B4885-2017a which requires that Tilden prepare, and at all times operate according to, a fugitive emission control plan that describes in detail the measures in place to control fugitive dust emissions. Additionally, Tilden is subject to the requirements of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Taconite Iron Ore Processing [40 Code of Federal Regulations (CFR) Part 63 Subpart RRRRR]. This regulation is commonly referred to as the Taconite MACT. The Taconite MACT requires the development of a written Fugitive Dust Emissions Control Plan (40 CFR 63.9591) that describes in detail the measures in place to control fugitive dust emissions. Considering both regulatory requirements, the scope of this plan encompasses the following sources:

- Stockpiles (includes, but is not limited to, stockpiles of uncrushed ore, crushed ore, or finished pellets)
- Pellet loading areas
- Material transfer points
- Plant roadways and yard areas
- Tailings basin
- Mining areas (includes, but is not limited to, areas in which drilling, blasting, digging and hauling, and dumping is conducted)

This plan fulfills the requirements set forth in the ROP, as well as the Taconite MACT. A current copy of the plan is maintained on site and available for inspection upon request.



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## 2. Plan Objectives

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The Fugitive Dust Control Plan identifies the control measures and practices to minimize and control avoidable fugitive dust as required by the ROP and the Taconite MACT. The plan describes the procedures Tilden personnel will follow to:

- (1) control avoidable fugitive emissions,
- (2) conduct inspections to assess when preventive and/or corrective actions should be implemented,
- (3) assess the effectiveness of preventive and/or corrective actions, and
- (4) maintain records to verify conformance to this plan.

To meet these objectives, the Fugitive Dust Control Plan:

- identifies the fugitive emission sources addressed by this plan (Section 4),
- identifies the control measures and operating practices designed to control and minimize avoidable fugitive emissions (Section 5),
- identifies fugitive dust control recordkeeping and reporting requirements,
- identifies fugitive dust control notification requirements, and
- describes fugitive dust control training elements.

In addition, Section 6 describes the requirements for maintaining and updating the fugitive dust control plan.

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### **3. Training**

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Training is periodically conducted to ensure understanding of responsibilities for actions and recordkeeping related to the management of fugitive dust. Job-specific training is given to all applicable employee whose duties involve triggering or implementing potential controls to mitigate fugitive dust. Annual awareness training on fugitive dust control is given to all employees as part of general environmental refresher training.

Records are kept of all training conducted under this Plan.

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## **4. Fugitive Dust Sources Covered by this Plan**

---

The fugitive emission sources covered by this plan are listed below. The operating practices and control measures that will be implemented and recorded for the fugitive dust sources identified in this section are described in detail in Section 5.0.

- Stockpiles (ore, concentrate and pellets)
- Pellet loading areas
- Material transfer points
- Plant roadways and yard areas
- Tailings basin
- Mining areas (includes, but is not limited to, areas in which drilling, blasting, digging and hauling and dumping is conducted)

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## 5. Operating Practices and Control Measures

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Operating practices and potential control measures that may be implemented as dictated by conditions throughout the facility and recorded for the fugitive dust sources identified in Section 4 are described below. Each of the following subsections contains a list of potential options for controlling fugitive emissions and include both preventative and active ongoing measures. The operating practices and control measures may be implemented simultaneously or independently depending on the conditions surrounding any event as determined by Tilden personnel.

### 5.1 Stockpiles

#### Potential Controls:

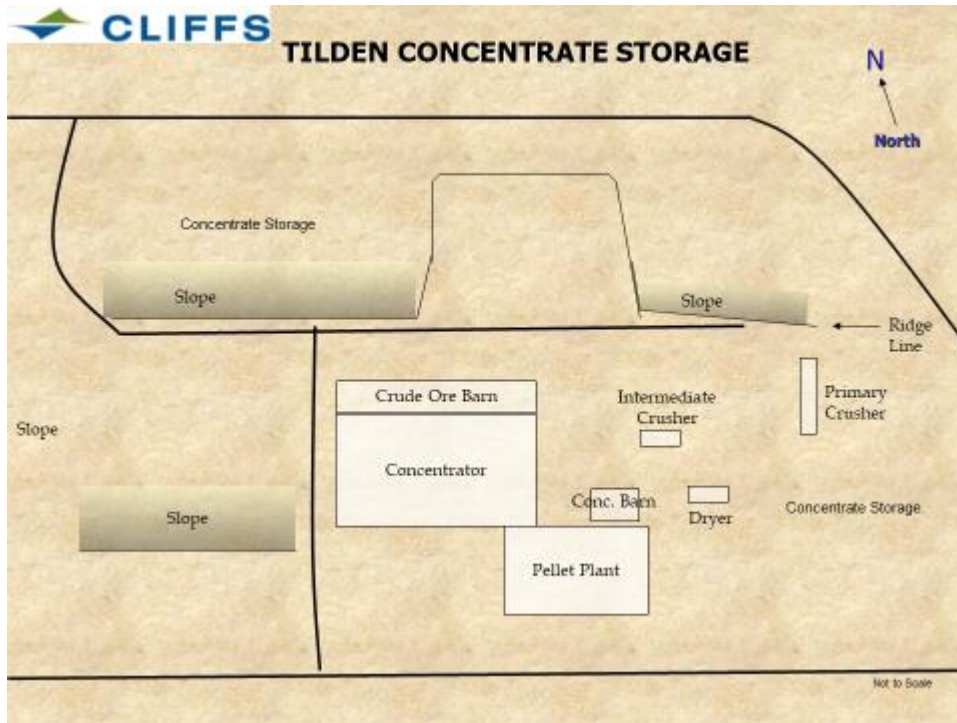
- As a baseline engineering control, and inherent to the layout of the Tilden facility, stockpiles of concentrate and pellets are placed reasonably distant and at least 0.95 miles from property boundaries which reduces the likelihood of residential impact in the event of dust liftoff. The height and size of outdoor stockpiles is managed by maximizing indoor storage.
- Operators and supervision monitor active ore mining/dumping sites in the mining area on a daily basis for visible dust emissions. When excessive dust is observed, or conditions are favorable for dust generation, dust suppression activities occur above and beyond baseline engineering controls. Primary dust suppression consists of the application of water to the ground with water trucks. If further reduction activities are necessary, traffic speeds and/or the amount of activity in the area is reduced until conditions are improved.<sup>1</sup>
- Ore fed to plant passes through a covered crude ore storage barn.
- Maximized use of the concentrate storage barn. Concentrate has a nominal moisture content of 11.5%, which minimizes dust generation during periods when the storage barn is at capacity, and concentrate is required to be stored in outdoor stockpiles. The concentrate stockpile area located to the northwest of the plant is bounded on two sides by rock walls.

<sup>1</sup> The observation of excessive dust for purposes of this Plan is not indicative of the state of compliance of Tilden with any applicable requirements but is being used as a basis to trigger the use of appropriate controls.

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- Pellets are primarily treated with water at the cooler dump point to reduce potential for fugitive dust. Water can be added to subsequent loadout conveyors for additional control when excessive dust is observed. During freezing conditions, a foam dust control system is used. The water system is returned to service when freezing weather conditions are no longer a concern. The specific timing varies from year to year.

### Plant Stockpile and Indoor Storage Map



### Recordkeeping:

- Materials management system and vendor usage records of dust suppressant application quantities.
- Stockpile maps
- Process historian and dispatch records of material movement.

## 5.2 Pellet loading areas

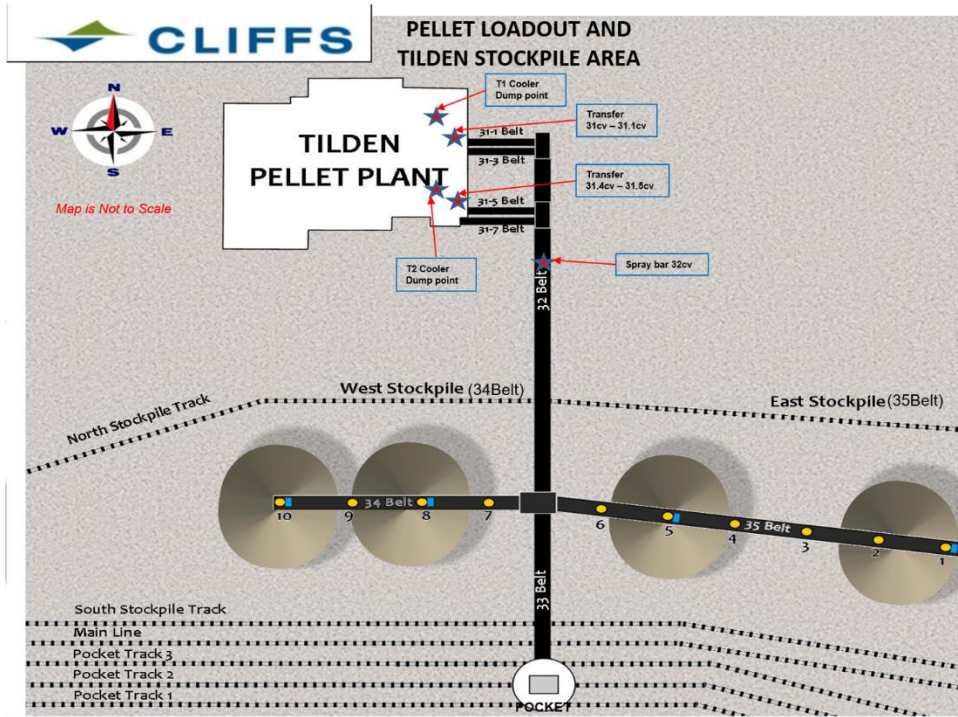
### Potential Controls:

- Pellets are primarily treated with water at the cooler dump point to reduce potential for fugitive dust. Water can be added to subsequent loadout conveyors for additional control when excessive dust is observed. During freezing conditions, a foam dust control system is used. The water system is returned to service when freezing weather conditions are no longer a concern. The specific timing varies from year to year.

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- Limiting material drop distances. Pellet ladders are used to limit the height from which pellets are deposited onto pellet stockpiles. Trippers are used to move along the pile once pellets have reached the top of the ladder to minimize drop distance and dust generation. These actions are taken out of both an interest to preserve pellet quality by limiting pellet breakage due to long drops, and to limit fugitive dust potential.

### Pellet Loadout and Stockpile Area Map



### Recordkeeping:

- Materials management system and vendor usage records of dust suppressant application quantities.
- Process historian of train watering water flows.
- Process historian of tripper location.

### 5.3 Material Transfer Points

#### Potential Controls:

- As a baseline engineering control, the majority of the Tilden Plant’s conveyor transfer points are inside the plant or are contained in transfer towers, which are buildings to house the drop points. This minimizes the potential for fugitive dust.
- Pellets are primarily treated with water at all times except for freezing conditions at the cooler dump point to reduce potential for fugitive dust. Water can be added to

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subsequent loadout conveyors for additional control when excessive dust is observed. During freezing conditions, a foam dust control system is used. The water system is returned to service when freezing weather conditions are no longer a concern. The specific timing varies from year to year.

- Limiting material drop distances. Pellet ladders are used to limit the height from which pellets are deposited onto pellet stockpiles. Trippers are used to move along the pile once pellets have reached the top of the ladder to minimize drop distance and dust generation. These actions are taken out of both an interest to preserve pellet quality by limiting pellet breakage due to long drops, but also to limit fugitive dust potential.

### **Recordkeeping**

- Materials management system and vendor usage records of dust suppressant application quantities.

## **5.4 Plant roadways and yard areas**

### **Potential Controls:**

- Unpaved roads and yard areas around the plant are monitored daily for conditions favorable for dust generation. When such conditions are observed dust suppressants are dispatched for application on that day delivering water or chemical suppressants to the segments identified.
- Unpaved road maintenance is performed as needed to maintain road conditions to operational standards. Timing and frequency of road maintenance varies based on a number of factors such as amount of usage/traffic, season, precipitation, and the road construction materials. Road maintenance activities can include grading/rolling the road surface, spreading/covering the surface with crushed rock (gravel), re-establishing required crown/slope, filling washouts and potholes, repairing undulations, and other such activities. Preserving roads in good operating condition maintains a smooth operating surface which results in smoother operations on the roadway and reduces excessive buildup of fines on the road surface, both of which reduce the potential for dust generation from traffic.
- Secondary/service roads and yard (i.e. excluding roads that do not carry mining production traffic addressed in the section on Mining Areas below) are treated annually with an approved dust suppression chemical, such as magnesium chloride. Dust suppressant application is typically in late spring or in early fall. The specific roads treated can vary, depending on expected use and previous experience. Application of water is an alternative measure that may be used at the operator's discretion to control dust on secondary roads.
- The paved access road condition is inspected daily, and sweeping and/or watering is performed as needed to avoid build-up of concentrate or dirt that might increase the potential for dust generated from access road traffic. In the limited circumstances

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when production equipment needs to cross the access road, specific crossings are used and crossing conditions are monitored during and after use.

- There are posted speeds around the mine site to restrict speed to an appropriate level on unpaved roads for each segment (10-35 MPH) which contributes to minimizing fugitive emissions that employees are required to follow . Safe driving speeds are reviewed with employees at annual refresher safety training at a minimum.

**Recordkeeping:**

- Materials management system records of dust suppressant application quantities and locations
- Water truck operating hours.
- Dispatch records.
- Training records
- Posted speed limit designations.



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## 5.5 Tailings basin

Tilden's tailings basin covers approximately 2500 acres with three types of surfaces; water pond, reclaimed areas and freshly deposited beaches. Discharge of tailings at approximately 10,000 gpm at 50-55% solids at the basin continuously generates new beach areas. The discharge location must be periodically moved to different basin perimeter points according to the engineering design plan.

Because the pond and reclaimed areas have limited potential for fugitives, the focus remains on the freshly deposited beaches. Crimped hay mulch remains the primary method for practical and effective dust minimization on the beach areas. Access to these areas can be challenging as they are initially too soft to safely utilize ground machinery and dewater at different rates depending on basin conditions. Temperature swings, pond level fluctuations, and other uncontrollable factors can add to these challenges. These conditions, which become more likely in the late fall or early spring, have the potential for areas within the basin to experience freeze-dry conditions and become susceptible to dust lift-off. Evaluations to prevent and minimize exposed beach areas, while maintaining employee safety, as a result of these conditions are performed on an ongoing basis.

As described herein, Tilden has developed and executes a mature, robust program to address fugitive dust at the tailings basin. The program includes both preventative and active controls and practices are routinely reviewed for effectiveness and improvement. Long term agreements are maintained with onsite contractors to assist with implementation of the potential controls described below.

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**Tailings Basin Map**



**Construction Activities**

Construction of upstream dikes and water retention dams occurs each year between April-November weather permitting with a phased approach. Earth moving equipment is utilized to haul sand embankment from one of the borrow area sources and are placed around the tailings basin as designed. The haul roads used for travel are sprayed with water via water truck on dry roads. Water trucks are not needed during rain events and seasonal changes that add moisture on the haul roads. The contractor is required to provide dust control as part of their earth moving contract. Additionally, the main service road to our water clarifier is treated with magnesium chloride or similar agent at least annually for dust suppression.

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Once the dikes and dams are constructed, the reclamation contractor seeds, fertilizes, & mulches the downstream slopes and benches which stabilizes these areas and provides long term dust mitigation. The upstream slope is not seeded as the dikes use filter fabric to cover this area. The dike constructed during the summer months becomes the active discharge area for that following fall/winter/spring. Once the discharge in these areas is complete, the reclamation contractor applies hay mulch on top of the beaches once the tailings are able to support low ground pressure equipment.

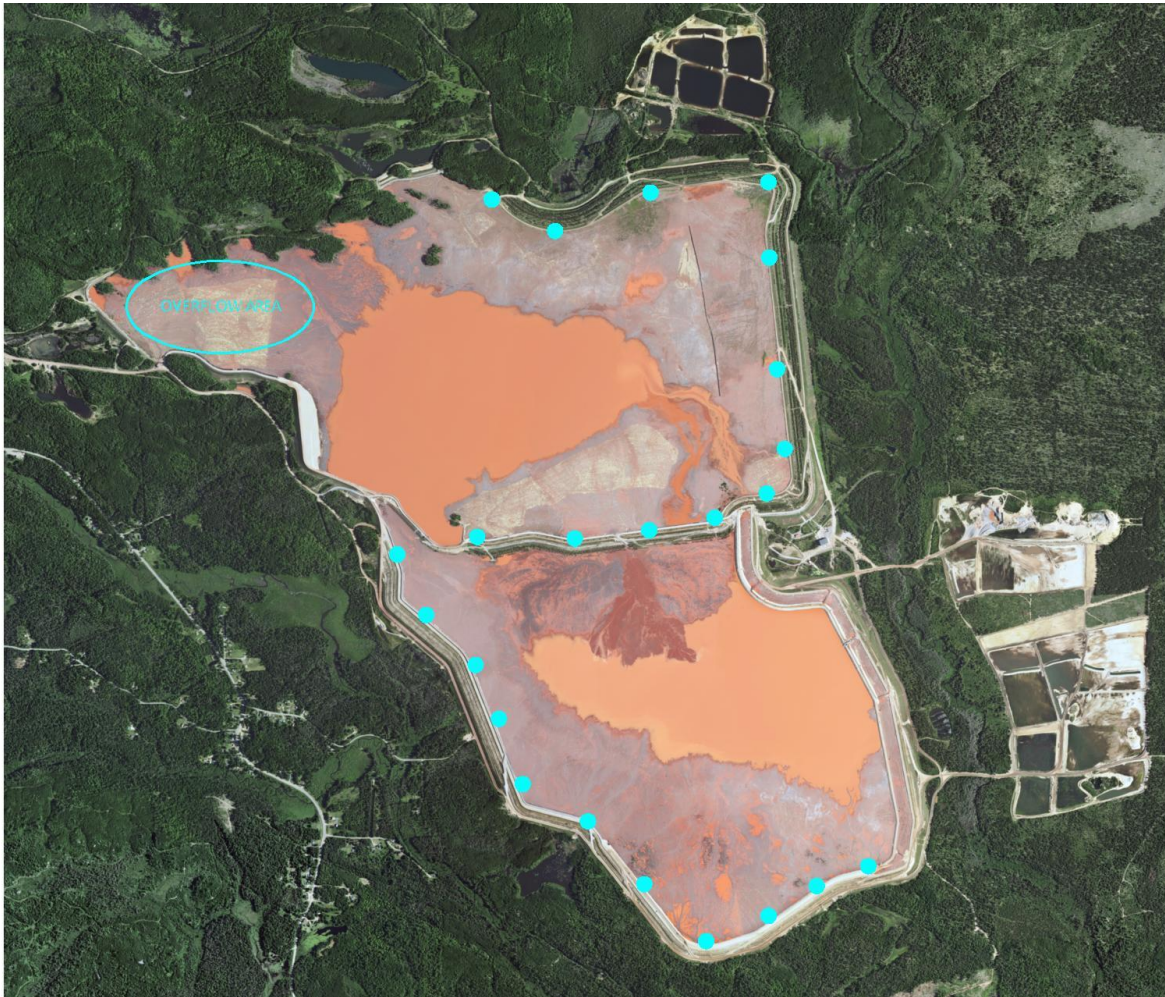
### **Operation Activities**

Each shift, concentrator operators inspect our active tailings discharge point. If dust is observed, it is noted on their reports and the appropriate notifications are made.

Weekly meetings are held with the Tailings Basin Engineer and the reclamation contractor to discuss reclamation and dust control activities.

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In the figure below the blue dots represent dump locations under normal operations.



### Potential Controls:

- Water inundation of the tailings consistent with dam safety requirements
  - The basin is comprised of a north and south section with a north decant, south decant and the infrastructure to transfer water between sections allowing for management of a relatively steady water pond in one pond while withdrawing excess water for treatment and subsequent discharge out of the other.
- Manage tailings discharge point (DP)
  - Basin planning seeks to maintain tailings discharge at one DP going into the fall/winter which keeps a wetted area for a longer time and limits the creation of numerous separate beach areas. This practice also minimizes the need to

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route tailings to a backup discharge location near the pump house area which similarly minimizes creation of numerous separate beach areas.

- Ground-based mulching of hay or straw on inactive areas, including placement of hay and straw over snow cover during winter to ensure adequate material dust suppressant coverage after snowmelt in the spring.
  - Tailings deposition patterns at the Gribben basin, and thus the elevation and shape of fresh beach areas, are constantly changing due to the inherent nature and fine grind of the hematite. Tailings at the discharge point stack up and may rapidly channel great distances to create additional beach area at varying intervals ranging from a day to several weeks. The rapid and variable channeling can result in beach areas without a constant wetted area. As beach areas become safely accessible, crimped hay mulch is applied to reduce potential for fugitive dust liftoff.
  - Forecasting hay needs is a standard part of the basin planning process. Amount of exposed areas, drying weather conditions, pond levels and seasonal weather patterns are all monitored to inform annual hay projections. A portion of necessary hay supply is secured and stockpiled onsite for use in dust suppression. This includes planning for the critical points in the shoulder seasons when the potential for freeze-dry conditions and dust lift-off are elevated. Long-term base contracts for hay procurement are maintained with an extensive network of local and regional suppliers. Monitoring of the conditions described above is ongoing and the contracted base supply is bolstered based on need.
  - Long-term arrangements are made in advance to have contractor personnel and equipment available which reduces time to mobilize mulching activities when conditions become conducive to application of crimped hay mulch.
- Application of fertilizer, seed, and mulch to establish vegetation on exposed areas
- Utilize repurposed scrap tire windbreaks (as permitted by EGLE)
- Compact snow, as available, to slow melting and extend the coverage afforded by the compacted cover into the warm season
- Supplementing ground-based mulch application with targeted aerial application of hay mulch for dust suppression on areas that may be most prone to freeze-drying and are otherwise not accessible by ground-based equipment.
- Capillary action of water on unsubmerged tailings beaches
- Speed at the tailings basin areas is limited to 15mph on unbermed roadways in the and 30mph for other roads. Safe driving speeds are reviewed with employees at annual refresher safety training at a minimum.

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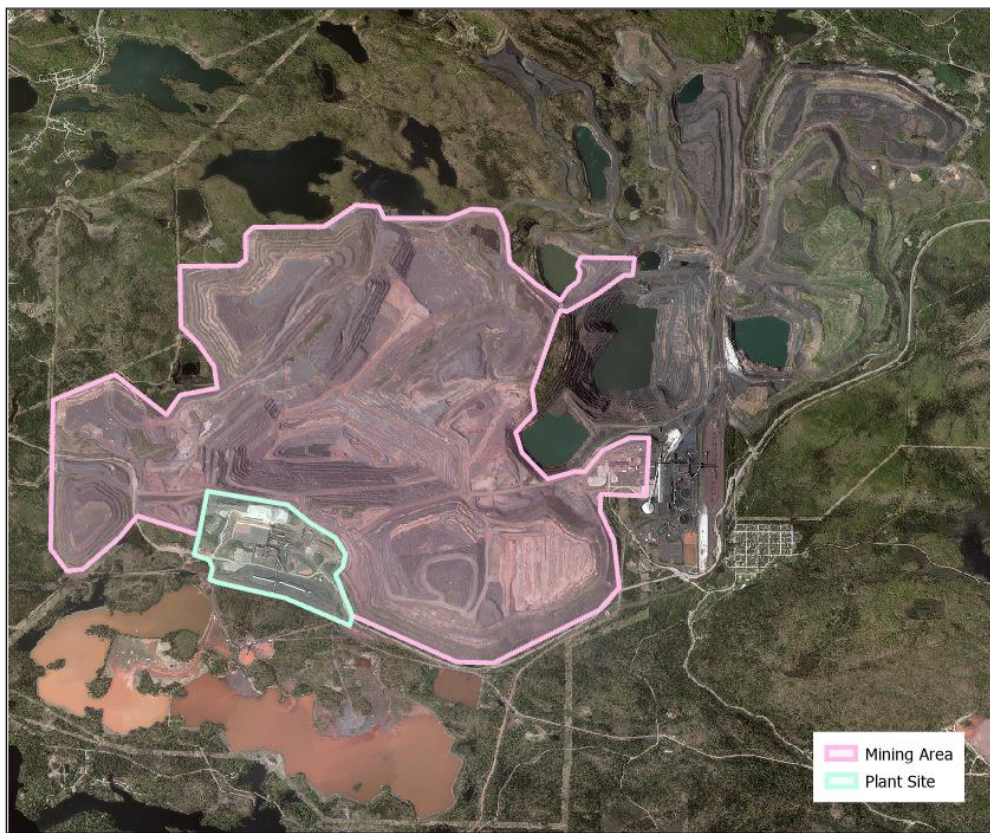
### Recordkeeping:

- Materials management system records of dust suppressant application quantities and locations
- Documentation of seeding, fertilizing and mulching on areas of construction
- Documentation of mulching on tailings beaches
- Documentation of basin construction activities
- Documentation of basin discharge point activities
- Regular fugitive dust inspection observations as completed on the shift logs
- Dust event reports

## 5.6 Mining areas

(includes, but is not limited to, areas in which drilling, blasting, digging and hauling is conducted)

### Plant and Mining Areas Map



Cleveland-Cliffs Tilden Mine

0 1,250 2,500 5,000 7,500 10,000 Feet

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## Potential Controls:

- Operating methods that reduce potential for fugitive dust:
  - Use of modern blast design/practices that seek to minimize “venting” of blast holes (releasing energy and material fines into the air)
- Operating practices that reduce potential for fugitive dust:
  - Active production haul roads within the mining area are monitored daily for excessive dust. When road conditions warrant, road maintenance is performed to restore road conditions to operational standards. Timing and frequency of road maintenance varies based on a number of factors such as amount of usage/traffic, season, precipitation, and materials road is constructed from. Road maintenance activities can include grading/rolling the road surface, spreading/covering the surface with crushed rock (gravel), re-establishing required crown/slope, filling washouts and potholes, repairing undulations, and other such activities. Inactive haul roads are inspected and repaired before being returned to active status.
  - Haul roads and active mining/dumping sites in the mining area are monitored throughout each day for dust emissions, by operators and supervision. When emissions are observed, or conditions are favorable for dust generation, dust suppression activities occur. Primary dust suppression consists of the application of water to the ground with water trucks. If the application of water is not sufficient to control dust in an area, traffic speeds are reduced or the amount of traffic or mining activity is reduced or ceased until conditions are improved.
  - Secondary/service roads (i.e. roads that do not carry mining production traffic) are currently treated once or twice per year with an approved dust suppression chemical, such as magnesium chloride. Timing and frequency of the dust suppressant is based on actual conditions observed or expected, typically once in late spring and again in early fall. The specific roads treated can vary, depending on expected use and previous experience. Application of water is an alternative measure to control dust on secondary roads.
  - Use of large capacity loading and hauling equipment requires fewer shovel scoops and haul trips than prior generation equipment resulting in lower potential for fugitive dust generation and longer life to water and chemical dust suppressants applied to roadways and work areas.
  - Material segregation and barricading practices that rely on drill core and production drill cutting sampling and analysis to identify areas of naturally occurring amphibole or serpentine fibrous minerals (NOAM). The relative elevation of the areas currently identified as potential for containing NOAM is low compared to natural ground surface and surrounding rock stockpile elevations, which increases the likelihood of any residual windblown particulate to be retained within the pit complex.

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- If identified, NOAM are delineated and segregated in a separate storage area and covered with clean fill to eliminate the potential for any long-term windblown exposure.

**Recordkeeping:**

- Materials management system records of dust suppressant application quantities and locations
- Water truck operating hour records.
- Dispatch records.



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## 6. Record Retention

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The records identified in each subsection of “Potential Controls” in this plan will be maintained for a period of five years in accordance with Taconite MACT requirements in 40 CFR § 63.9643. Records will be available on site at Tilden for a minimum of two years from date of issuance.

Records will be maintained in a form suitable and readily available for review.

## 7. Revisions of the Fugitive Dust Control Plan

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Revisions of the Fugitive Dust Control Plan are the responsibility of the Environmental Department.

As described herein, Tilden has developed and executes a mature, robust program to address fugitive dust. The program includes both preventative and active controls and practices that are periodically reviewed for effectiveness and improvement.

### Revisions Required by the Permitting Authority

As stated in 40 CFR 63.9591 and 40 CFR 63.9624(b), the facility must develop this plan and submit it for approval by the Administrator. If the permitting authority determines that any portion of the plan is not adequate, the facility will address the issues as agreed upon with the permitting authority.

### Revisions Initiated by the Tilden Mine

The Tilden Mine may periodically revise this plan, as necessary, to satisfy the requirements of the regulation or to reflect changes in equipment or procedures at the affected source. Provided such changes are no less restrictive than the last version of the plan and the requirements of the rule, Tilden will make such changes and retain a current copy of the plan on file onsite. The copy will be available for inspection upon request.

Rev. No.	Date	Responsible Person	Description Of Change

*Site-Specific Monitoring Plan  
for  
Continuous Parametric Monitoring Systems*



*Tilden Mining Company L.C.*

*November 2021*

# Site Specific Monitoring Plan

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## 1. Purpose

---

Cleveland Cliffs' Tilden Mining Company L.C. facility is subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Taconite Iron Ore Processing [40 Code of Federal Regulations (CFR) Part 63 Subpart RRRRR]. This regulation is commonly referred to as the Taconite MACT. The regulation requires the development and implementation of a Site Specific Monitoring Plan for the Continuous Parametric Monitoring Systems (CPMS) that are used for compliance with the Taconite MACT (40 CFR 63.9632(b)). The plan must be available for inspection upon request by the facility's permitting authority. The plan must be completed and implemented by the Taconite MACT compliance date of October 30, 2006.

This plan is applicable to CPMS that is used to demonstrate compliance with the Taconite MACT. This includes the CPMS used on indurating furnace(s) for the Good Combustion Practices (GCP) and on pollution control equipment used to control particulate emissions from the following sources:

- Ore Crushing and Handling Emission Units;
- Indurating Furnace(s); and
- Finished Pellet Handling Emission Units.

The general purpose of the site-specific monitoring plan is to address the installation, performance, operation and maintenance, quality assurance, and recordkeeping and reporting procedures. In addition to the general requirements, this document also addresses roles, responsibilities, and revisions.

## 2. Responsibilities

The following is a summary of the responsibilities for each position involved in the implementation of the SSM Plans.

Document Section	Description of Requirement	Responsible Person(s)
5	Installation Requirements	Electrical Engineer/Instrumentation Dept
6	Performance and equipment specifications for the sample interface, the parametric signal analyzer, and the data collection and reduction system	Electrical Engineer/Instrumentation Dept/OT Dept/IT Dept
7	CPMS calibrations	Instrumentation Dept
7	CPMS calibration recordkeeping	Instrumentation Dept
8 + 9	CPMS spare parts	Maintenance / Instrumentation Dept
8	CPMS monitoring systems status before performance tests	Environmental Dept
8	Determining CPMS “out of control” periods	Environmental Dept
8 + 10	Recordkeeping for CPMS “out of control” periods and CPMS “down time”	Environmental Dept
9	CPMS preventative maintenance	Maintenance / Instrumentation Dept
9	CPMS preventative maintenance recordkeeping	Maintenance / Instrumentation Dept
9	CPMS data recording and calculations	Environmental Dept
9	Corrective actions for CPMS	Maintenance / Instrumentation Dept
10	CPMS monitoring data recordkeeping	Environmental Dept
10	CPMS reporting (per the SSM Plan)	Environmental Dept

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### 3. Definitions

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*Administrator* means the regulatory agency that is responsible for the administration of the Taconite MACT regulation; this could be EPA, or EGLE.

*Bypass* means to route gas around a control device.

*CEMS* means continuous emissions monitoring system, such as a NO<sub>x</sub> or SO<sub>2</sub> system.

*CMS* means continuous monitoring system, and could be used to describe CEMS and CPMS.

*COMS* means continuous opacity monitoring system.

*CPMS* means continuous parametric monitoring system.

*CFR* means Code of Federal Regulations.

*Dynamic Wet Scrubber* means an air emissions control device which utilizes a mechanically powered fan to cause contact between the process exhaust gas stream and the scrubbing liquid which are introduced concurrently into the fan inlet.

*EGLE* means State of Michigan Department of Environment, Great Lakes, and Energy

*EPA* means United States Environmental Protection Agency.

*ESP* means electrostatic precipitator.

*Finished Pellet Handling* means the transfer of fired taconite pellets from the indurating furnace to the finished pellet stockpiles at the plant. Finished pellet handling includes, but is not limited to:

- Furnace discharge;
- Finished pellet screening;
- Finished pellet transfer; and
- Finished pellet storage.

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The atmospheric pellet cooler vent stack and gravity conveyor gallery vents designed to remove heat and water vapor from the structure are not included as part of the finished pellet handling affected source.

*GCP* means the Good Combustion Practices.

*HAPS* means Hazardous Air Pollutants.

*Indurating* means the process whereby unfired taconite pellets, called green balls, are hardened at high temperature in an indurating furnace. Types of indurating furnaces include straight-grate indurating furnaces and grate-kiln indurating furnaces.

*MACT* means Maximum Achievable Control Technology.

*Malfunction* means any sudden, infrequent, and not reasonably preventable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner which causes, or has the potential to cause, the emission limitations in an applicable standard to be exceeded. Failures that are caused in part by poor maintenance or careless operation are not malfunctions. Malfunctions are specifically defined in the SSM Plan.

*O&M Plan* means the Operation and Maintenance Plan.

*Ore Crushing and Handling Emission Units* means the process whereby dry taconite ore is crushed and screened. Ore crushing and handling includes, but is not limited to:

- Dry crushing operations (e.g. primary, secondary, and tertiary crushing);
- Dry ore conveyance and transfer points;
- Dry ore classification and screening;
- Dry ore storage and stockpiling;
- Dry milling;
- Dry cobbing (i.e. dry magnetic separation);and
- Grate feed.



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Ore crushing and handling specifically excludes any operations where the dry crushed ore is saturated with water, such as wet milling and wet magnetic separation.

*Shutdown* means the cessation of operation of an affected source or portion of an affected source for any purpose.

*SOP* means standard operating procedure.

*SSM Plan* means Startup, Shutdown, and Malfunction Plan.

*Startup* means the setting in operation of an affected source or portion of an affected source for any purpose.

## 4. Continuous Parametric Monitoring Systems Covered by this Plan

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This Plan has been developed for three categories of CPMS.

### 4.1 Wet Scrubbers

The following two tables contain CPMS utilized by the wet scrubbers to monitor the parameters.

**Table 4.1 –Wet Scrubber**

Control Equipment Description	Process Description	Scrubber Flow Meter	Scrubber Pressure Drop Indicator
Wet Scrubbers	Ore Crushing and handling, finished pellet handling	Yamatake Mag-flow meter	Rosemount Differential Pressure Transmitter, 0-25 in H <sub>2</sub> O

**Table 4.2 –Dynamic Wet Scrubbers**

Control Equipment Description	Process Description	Scrubber Flow Meter	Scrubber Fan Amps	Scrubber Pressure Drop Indicator
Dynamic Wet Scrubber	Ore Drying	Yamatake Mag-flow meter	Amp/hp monitor	Rosemount Differential Pressure Transmitter, 0-25 in H <sub>2</sub> O

### 4.2 Indurating Furnaces with Dry ESPs

The following table lists the indurating furnace(s) that utilize dry ESPs as particulate matter control equipment that are covered by this plan.

**Table 4.3 – Indurating Furnaces with Dry ESPs**

Air Permit ID Number	Control Equipment Description	Process Description	Opacity Meter
EU-KILN1	Dry Electrostatic Precipitators	Grate-Kiln Pelletizing Unit 1	Durag DR290 Opacity Monitors
EU-KILN2	Dry Electrostatic Precipitators	Grate-Kiln Pelletizing Unit 2	Durag DR290 Opacity Monitors

### 4.3 Indurating Furnaces with Good Combustion Practices

The following table lists the indurating furnace(s) for the facility. The indurating furnaces are all required to follow Good Combustion Practices and, therefore, are covered by this plan.

**Table 4.4 – Indurating Furnaces with Good Combustion Practices**

<b>Air Permit ID Number</b>	<b>Control Equipment Description</b>	<b>Process Description</b>	<b>GCP Monitoring Parameters</b>
EU-KILN1	Dry Electrostatic Precipitator	Grate-Kiln Pelletizing Unit 1	See GCP located in O & M Plan
EU-KILN2	Dry Electrostatic Precipitator	Grate-Kiln Pelletizing Unit 2	See GCP located in O & M Plan

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## 5. Installation Requirements

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The requirements presented in this section of the Site-Specific Monitoring Plan apply to all of the CPMS presented in the tables which are presented in section 4.

Per 40 CFR 63.9632(b)(1), the Site-Specific Monitoring Plan must address the following:

*Installation of the CPMS sampling probe or other interface at a measurement location relative to each affected emission unit such that the measurement is representative of control of the exhaust emissions (e.g. on or downstream of the last control device).*

In order to comply with this requirement, this facility has followed standard industry practices for the installation of monitoring equipment in order to ensure that the measurement is representative.

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## 6. Performance and Equipment Specifications

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The requirements presented in this section of the Site-Specific Monitoring Plan apply to all of the CPMS presented in the tables, which are presented in section 4.

Per 40 CFR 63.9632(b)(2), the Site-Specific Monitoring Plan must address the following:

*Performance and equipment specifications for the sample interface, the parametric signal analyzer, and the data collection and reduction system.*

In order to comply with this requirement, this facility has followed these procedures for the installation of scrubber instrumentation to ensure representative measurement:

- **Sample Interface:**
  - **Water Flow Meters:** Water flow meters were installed using the manufacturer's specifications taking into account access, safety and a suitable flow meter environment.
  - **Differential Pressure Transmitters:** Differential pressure transmitters were installed based on proximity to the process, minimizing piping, easy access, personnel safety, practical field calibration and a suitable transmitter environment.
- **Parametric Signal Analyzer:**
  - **Water Flow Meter:** Yamatake MagneW Two-wire PLUS
  - **Differential Pressure Transmitters:** Rosemount Differential Pressure Transmitter, 0-25 in H<sub>2</sub>O
- **Data Collection and Reduction System:**
  - **Data Collection and Reduction System:** Data is collected in a Distributive Control System (DCS) that is fed into an OSI PI data historian. Cirrus software is used to reduce and manage the data from the PI system.

## 7. Performance Evaluation Procedures

The requirements presented in this section of the Site-Specific Monitoring Plan apply to all of the CPMS presented in the tables, which are presented in section 4.

Per 40 CFR 63.9632(b)(3), the Site-Specific Monitoring Plan must address the following:

*Performance evaluation procedures and acceptance criteria (e.g., calibrations)*

In order to comply with this requirement, this facility has implemented the following procedures for performance evaluation procedures:

**Table 7.1 – CPMS Calibration Frequency and Calibration Acceptance Criteria**

Measurement Type	Instrument Type	Calibration Frequency	Calibration Acceptance Criteria
<b>Flow Meters</b> (Wet Scrubbers, Dynamic Wet Scrubbers):	Yamatake Mag-flow meter	NA	Factory Calibrated
<b>Pressure Drop Indicators</b> (Wet Scrubbers, Dynamic Wet Scrubbers, Baghouses)	Rosemount Differential Pressure Transmitter, 0-25 in H <sub>2</sub> O	Yearly	NA
<b>Fan Amp Meters</b> (Dynamic Wet Scrubbers)	Amp/hp meters	NA	NA
<b>Opacity Meters</b> (dry ESPs)	Durag DR290 Opacity Monitor	Daily (Zero and Span)	CD less than 4x
	Durag DR290 Opacity Monitor	Quarterly (Performance Evaluation)	See 40 CFR Part 60 Appendix B PS-1
	Durag DR290 Opacity Monitor	Annually (Zero Alignment)	Re-align meter

Additional details regarding the performance evaluation procedures are provided in the appendices.

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## 8. Operation and Maintenance

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The requirements presented in this section of the Site-Specific Monitoring Plan apply to all of the CPMS presented in the tables which are presented in section 4.

Per 40 CFR 63.9632(b)(4), the Site-Specific Monitoring Plan must address the following:

*Ongoing operation and maintenance procedures in accordance with the general requirements of 63.8(c)(1), (3), (4)(ii), (7), and (8).*

These sections of the regulation address the following:

**40 CFR 63.8(c)(1):** *The owner or operator of an affected source shall maintain and operate each Continuous Monitoring System (CMS) as specified in this section, or in a relevant standard, and in a manner consistent with good air pollution control practices.*

- (i) *The owner or operator of an affected source must maintain and operate each CMS as specified in 63.6(e)(1) [Presented below].*
- (ii) *The owner or operator must keep the necessary parts for routine repairs of the affected CMS equipment readily available.*
- (iii) *The owner or operator of an affected source must develop and implement a written startup, shutdown, and malfunction plan for CMS as specified in 63.6(e)(3).*

**40 CFR 63.8(c)(3):** *All CMS shall be installed, operational, and data verified as specified in the relevant standard either prior to or in conjunction with conducting performance tests in 63.7. Verification of operation status shall, at a minimum, include completion of the manufacturers written specifications or recommendations for installation, operation, and calibration of the system.*

**40 CFR 63.8(c)(4)(ii):** *All CMS for measuring emissions other than opacity shall complete a minimum of once cycle of operation (sampling, analyzing, and data recording) each successive 15-minute period.*

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**40 CFR 63.8(c)(7):**

- (i) *A CMS is out of control if –*
  - (A) *The zero (low-level), mid-level (if applicable), or high level calibration drift (CD) exceeds two times the applicable CD specification in the applicable performance specification or relevant standard; or*
  - (B) *The CMS fails a performance test audit (e.g., cylinder gas audit), relative accuracy test audit, or linearity test audit; or*
  - (C) *The COMS CD exceeds two times the limit in the applicable performance specification in the relevant standard.*
- (ii) *When the CMS is out of control, the owner or operator of the affected source shall take the necessary corrective action and shall repeat all necessary tests which indicate that the system is out of control. The owner or operator shall take corrective action and conduct retesting until the performance requirements are below the applicable limits. The beginning of the out-of-control period is the hour the owner or operator conducts a performance test (e.g., calibration drift) that indicates an exceedence of the performance requirement established under this part. The end of the out-of-control period is the hour following the completion of corrective action and successful demonstration that the system is within the allowable limits. During the period the CMS is out of control, recorded data shall not be used in data averages and calculations or to meet any data availability requirement established under this part.*

**40 CFR 63.8(c)(4)(ii):** *The owner or operator of a CMS that is out of control as defined in paragraph (c)(7) of this section shall submit all information concerning out-of-control periods, including start and end dates and hours and descriptions of corrective actions taken, in the excess emission and continuous monitoring system performance report required in 63.10(e)(3).*

**40 CFR 63.6(e)(1): Operation and Maintenance Requirements**

- (i) *At all times, including periods of startup, shutdown, and malfunction, the owner or operator must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent*



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*with safety and good air pollution control practices for minimizing emissions. During a period of startup, shutdown, or malfunction, this general duty to minimize emissions requires that the owner or operator reduce emissions from the affected source to the greatest extent which is consistent with good air pollution control practices. This general duty to minimize emissions during periods of startup, shutdown, or malfunction does not require the owner or operator to achieve emission levels that would be required by the applicable standard at other times if this is not consistent with safety and good air pollution control practices, nor does it require the owner or operator to make any further efforts to reduce emissions if levels required by the applicable standard have been achieved. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures (including the startup, shutdown, and malfunction plan required in paragraph (e)(3) of this section) review of operation and maintenance records, and inspection of the source.*

- (ii) Malfunctions must be corrected as soon as practicable after their occurrence in accordance with the startup, shutdown, and malfunction plan required in paragraph (e)(3) of this section. To the extent that an unexpected event arises during a startup, shutdown, or malfunction, an owner or operator must comply by minimizing emissions during such startup, shutdown, and malfunction event consistent with safety and good pollution control practices.*
- (iii) Operation and maintenance requirements established pursuant to section 112 of the Act are enforceable independent of emission limitations of other requirements in relevant standards.*

In order to comply with this requirement, this facility has implemented the following procedures:

- **Spare Parts:** This facility maintains the necessary spare parts for routine repair of the monitoring equipment required by the Taconite MACT. The facility spare parts that typically take 1 week or less to order are set up as an order on demand. Spare parts necessary for routine maintenance that typically take longer than a week to receive are stocked in the warehouse. Spare parts are also addressed in Appendix A.

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- **Startup, Shutdown, and Malfunction Plan:** This facility has developed and implemented an SSM Plan for all of the equipment that is regulated by the Taconite MACT regulation. Additional details regarding this requirement are found in the SSM Plan.
- **Monitoring Prior to Performance Testing:** Prior to conducting performance testing as required by the Taconite MACT regulation, all required monitoring systems are installed, operational, and data verified. Verification of operation status shall, at a minimum, include completion of the manufacturers written specifications or recommendations for installation, operation, and calibration of the system.
- **Sampling Frequency:** All required monitoring equipment completes at least one sampling cycle (sampling, analyzing, and data recording) each successive 15-minute period.
- **Out-of-Control Periods:** As required in the regulation, this facility takes the necessary corrective actions to repair the CPMS. During the period the monitoring equipment is out of control, the facility does not use the recorded data in data averages and calculations or to meet any data availability requirement.

The out-of-control periods, as defined in 40 CFR 63.8(c)(7)(i) addresses continuous opacity monitoring systems (COMS). Except for opacity meters which could be used for dry ESPs, these definitions do not apply to Taconite MACT monitoring. The definition of “out of control” is typically based on daily calibration drift checks for COMS. However, the type of monitoring equipment that is used for compliance with the taconite MACT do not typically involve frequent periodic drift tests because the equipment is not designed for that purpose. Therefore, the facility has developed the following general definition of an out of control period for the CPMS for this facility:

- *The beginning of the out-of-control period* is defined by the facility as the hour that the CPMS reading is noted to be operating outside of the quality control limits. This can include a review of operating data in order to identify events, such as power outages, that may have caused the meter to go out of control.
- *The end of the out-of-control period* is defined by the facility as the hour following the completion of corrective action and successful demonstration that the system is within the allowable quality control limits.

In addition, the facility has developed specific definitions for “out of control” for each type of monitoring equipment. These definitions are based on the general premise of defining when the data is “good” versus when the data is “bad”. The definitions are presented in Table 8.1 and in Appendix A.

**Table 8.1 – CPMS Definitions of “Out of Control”**

<b>Measurement Type</b>	<b>Instrument Type</b>	<b>Definition of “Out of Control”</b>
<b>Flow Meters</b> (Wet Scrubbers, Dynamic Wet Scrubbers):	Yamatake Mag-flow meter	The data is considered “out of control” for this equipment if the flow rate is out of the normal range.
<b>Pressure Drop Indicators</b> (Wet Scrubbers, Dynamic Wet Scrubbers)	Rosemount Differential Pressure Transmitter, 0-25 in H <sub>2</sub> O	The data is considered “out of control” for this equipment if the pressure drop is below 0 in. H <sub>2</sub> O or above 24 in. H <sub>2</sub> O.
<b>Fan Amp Meters</b> (Dynamic Wet Scrubbers)	Fan/hp/amp meter	The data is considered “out of control” for this equipment if the reading is out of the normal range.
<b>Opacity Meters</b> (dry ESPs)	Durag DR290 Opacity Monitor	The data is considered “out of control” if the zero, or high-level calibration drift (CD) exceeds two times the applicable CD specification in the applicable performance specification.

- **Reporting Out-of-Control Periods:** The facility reports out of control periods as required by the regulation. Reporting procedures are presented in section 10 of this document.
- **Operation and Maintenance during SSM Events:** This facility has developed and implemented an SSM Plan for all of the equipment that is regulated by the Taconite MACT regulation. The plan includes procedures for operating in a manner “consistent with safety and good air pollution control practices for minimizing emissions. Additional details regarding this requirement are found in the SSM Plan.

Additional details regarding the operation procedures are provided in the appendices.

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## 9. Data Quality Assurance

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The requirements presented in this section of the Site-Specific Monitoring Plan apply to all of the CPMS presented in the tables which are presented in section 4.

Per 40 CFR 63.9632(b)(5), the Site-Specific Monitoring Plan must address the following:

*Ongoing data quality assurance procedures in accordance with the general requirements of 63.8(d).*

This section of the regulation addresses the following:

**40 CFR 63.8(d):** *Quality control program.*

- (1) *The results of the quality control program required in this paragraph will be considered by the Administrator when he/she determines the validity of monitoring data.*
- (2) *The owner or operator of an affected source that is required to use a CMS and is subject to the monitoring requirements of this section and a relevant standard shall develop and implement a CMS quality control program. As part of the quality control program, the owner or operator shall develop and submit to the Administrator for approval upon request a site-specific performance evaluation test plan for the CMS performance evaluation required in paragraph (e)(3)(i) of this section, according to the procedures specified in paragraph (e). In addition, each quality control program shall include, at a minimum, a written protocol that describes procedures for each of the following operations:*
  - (i) *Initial and any subsequent calibration of the CMS;*
  - (ii) *Determination and adjustment of the calibration drift of the CMS;*
  - (iii) *Preventive maintenance of the CMS, including spare parts inventory;*
  - (iv) *Data recording, calculations, and reporting;*

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- (v) *Accuracy audit procedures, including sampling and analysis methods; and*
  - (vi) *Program of corrective action for a malfunctioning CMS.*
- (3) *The owner or operator shall keep these written procedures on record for the life of the affected source or until the affected source is no longer subject to the provisions of this part, to be made available for inspection, upon request, by the Administrator. If the performance evaluation plan is revised, the owner or operator shall keep previous (i.e., superseded) versions of the performance evaluation plan on record to be made available for inspection, upon request, by the Administrator, for a period of 5 years after each revision to the plan. Where relevant, e.g., program of corrective action for a malfunctioning CMS, these written procedures may be incorporated as part of the affected source's startup, shutdown, and malfunction plan to avoid duplication of planning and recordkeeping efforts.*

In order to comply with this requirement, this facility has implemented the following procedures:

- **Initial and any subsequent calibration of the CMS**  
Calibration and adjustment procedures are presented in Appendix .B
- **Determination and adjustment of the calibration drift of the CMS**  
Calibration and adjustment procedures are presented in Appendix B.
- **Preventive maintenance of the CMS, including spare parts inventory;**  
Preventative maintenance procedures are conducted based on standard industry practices and facility maintenance experience. Additional details regarding preventative maintenance are presented in the appendices.  
  
The spare parts inventory is maintained based on manufacturer recommendations and has been adjusted based on facility maintenance experience. Additional details regarding the spare parts inventory is presented in the appendices.
- **Data recording, calculations, and reporting;**  
Data recording is conducted as follows:

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- Data is collected in a Distributive Control System (DCS) that is fed into an OSI PI data historian. Cirrus software is used to reduce and manage the data from the PI system.

Calculations of the appropriate averages are conducted as follows:

- Averages are calculated based on the arithmetic mean.

Recordkeeping and reporting is addressed in section 10.

- **Accuracy audit procedures**

Performance evaluation procedures were addressed in Section 7.

- **Program of corrective action for a malfunctioning CMS**

Corrective action procedures are addressed in the SSM Plan. Resources that the facility uses for corrective actions for malfunctioning monitors include manufacturer guidelines and maintenance personnel training and experience.

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## 10. Recordkeeping and Reporting Procedures

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The requirements presented in this section of the Site-Specific Monitoring Plan apply to all of the CPMS presented in the tables which are presented in section 4.

Per 40 CFR 63.9632(b)(6), the Site-Specific Monitoring Plan must address the following:

*Ongoing recordkeeping and reporting procedures in accordance with the general requirements of 63.10(c), (e)(1), and (e)(2)(i).*

These sections of the regulation address the following:

**40 CFR 63.10(c):** *Additional recordkeeping requirements for sources with continuous monitoring systems. In addition to complying with the requirements specified in paragraphs (b)(1) and (b)(2) of this section, the owner or operator of an affected source required to install a CMS by a relevant standard shall maintain records for such source of—*

- (1) *All required CMS measurements (including monitoring data recorded during unavoidable CMS breakdowns and out-of-control periods);*
- (2) *[Reserved]*
- (3) *[Reserved]*
- (4) *[Reserved]*
- (5) *The date and time identifying each period during which the CMS was inoperative except for zero (low-level) and high-level checks;*
- (6) *The date and time identifying each period during which the CMS was out of control, as defined in §63.8(c)(7);*
- (7) *The specific identification (i.e., the date and time of commencement and completion) of each period of excess emissions and parameter monitoring exceedances, as defined in the relevant standard(s), that occurs during startups, shutdowns, and malfunctions of the affected source;*

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- (8) *The specific identification (i.e., the date and time of commencement and completion) of each time period of excess emissions and parameter monitoring exceedances, as defined in the relevant standard(s), that occurs during periods other than startups, shutdowns, and malfunctions of the affected source;*
- (9) *[Reserved]*
- (10) *The nature and cause of any malfunction (if known);*
- (11) *The corrective action taken or preventive measures adopted;*
- (12) *The nature of the repairs or adjustments to the CMS that was inoperative or out of control;*
- (13) *The total process operating time during the reporting period; and*
- (14) *All procedures that are part of a quality control program developed and implemented for CMS under §63.8(d).*
- (15) *In order to satisfy the requirements of paragraphs (c)(10) through (c)(12) of this section and to avoid duplicative recordkeeping efforts, the owner or operator may use the affected source's startup, shutdown, and malfunction plan or records kept to satisfy the recordkeeping requirements of the startup, shutdown, and malfunction plan specified in §63.6(e), provided that such plan and records adequately address the requirements of paragraphs (c)(10) through (c)(12).*

**40 CFR 63.10(e)(1):** *Additional reporting requirements for sources with continuous monitoring systems – General. When more than one CMS is used to measure the emissions from one affected source (e.g., multiple breechings, multiple outlets), the owner or operator shall report the results as required for each CMS.*

**40 CFR 63.10(e)(2)(i):** *Reporting results of continuous monitoring system performance evaluations. (i) The owner or operator of an affected source required to install a CMS by a relevant standard shall furnish the Administrator a copy of a written report of the results of the CMS performance evaluation, as required under §63.8(e), simultaneously with the results of the performance test required under §63.7, unless otherwise specified in the relevant standard.*



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In order to comply with this requirement the facility maintains the following records for a minimum of 5 years:

- All required monitoring data. This includes monitoring data from the beginning of startup until the end of shutdown, as defined in the SSM Plan. This includes monitoring data recorded during unavoidable CPMS breakdowns and out-of-control periods. Records are maintained as follows:
  - Records are maintained electronically in the Cirrus System
- The date and time identifying each period during which the monitoring system was inoperative. These records are maintained electronically in the Cirrus System.
- The date and time identifying each period during which the CMS was out of control, as defined in Section 8. These records are maintained electronically in the Cirrus System.
- The specific identification (i.e., the date and time of commencement and completion) of each period of excess emissions and parametric monitoring exceedences, as defined in the *SSM Plan*. The recordkeeping requirements for these incidents are presented in the SSM Plan for this facility.
- The nature and cause of each malfunction (if known), as defined in the *SSM Plan*. The recordkeeping requirements for these incidents are presented in the *SSM Plan* for this facility.
- The corrective action taken or preventive measures adopted as defined in the *SSM Plan*. The recordkeeping requirements for these incidents are presented in the *SSM Plan* for this facility.
- The nature of the repairs or adjustments to the CMS that was inoperative or out of control. Records are maintained as follows:
  - Records are maintained electronically in the Cirrus System
  - Maintenance records are kept in the Ellipse System.
- The total process operating time during the reporting period. This information is maintained as required by the SSM Plan for this facility.

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- All procedures that are part of a quality control program developed and implemented for the monitoring equipment. This document is intended to present this required information.

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## 11. Corrective Action Procedures

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The requirements presented in this section of the Site-Specific Monitoring Plan apply to all of the CPMS presented in the tables which are presented in section 4.

Per 40 CFR 63.9632(b)(7), the Site-Specific Monitoring Plan must address the following:

*Corrective action procedures that you will follow in the event an air pollution control device, except for a baghouse, exceeds an established operating limit as established in 63.9600(b)(3).*

In order to comply with this requirement, the facility has developed and implemented a Startup, Shutdown, and Malfunction (SSM) Plan for the affected equipment. Additional details regarding corrective action procedures can be found in the *SSM Plan*.

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## **12. Revisions of the Site-Specific Monitoring Plan**

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Revisions of the Site Specific monitoring plan is the responsibility of the Environmental Department.

### **12.1 Revisions Required by the Permitting Authority**

As stated in 40 CFR 63.9632(b), the facility must develop this plan and make it available for inspection by the permitting authority. If the permitting authority inspects the plan and determines that any portion of the plan is not adequate, the facility will address the issues as agreed upon with the permitting authority.

### **12.2 Revisions Initiated by the Tilden Mine**

This facility may periodically revise this plan, as necessary, to satisfy the requirements of the regulation or to reflect changes in equipment or procedures at the affected source. In order to make these changes, the facility will use the following procedure:

- The facility will develop the revised plan and can implement the changes, as appropriate, upon completion of the revisions.
- The facility will maintain copies of the previous versions of this plan for a minimum of 5 years.
- Major changes to the plan will be noted in the SSM Plan semiannual report, as required by the SSM Plan.

*Appendix A*

*Site Specific Monitoring Plan Summary*

Control Equipment Type	Measurement Type	Instrument Type	Calibration frequency (Section 7)	Calibration Acceptance Criteria (Section 7)	Spare Parts (Sections 8 + 9)	Definition of Out-of-Control (Section 8)	Preventative Maintenance (Section 9)
Wet Scrubbers, Dynamic Wet Scrubbers	Flow Meters	Yamatake Mag-flow meter	NA	NA	Spare flow meters	The data is considered “out of control” for this equipment if the flow rate is out of the normal range.	NA
Wet Scrubbers, Dynamic Wet Scrubbers	Differential Pressure Indicators	Rosemount Differential Pressure Transmitter, 0-25 in H <sub>2</sub> O	Yearly	NA	Spare Pressure Transmitter	The data is considered “out of control” for this equipment if the pressure drop is below 0 in. H <sub>2</sub> O or above 24 in. H <sub>2</sub> O.	Clean transmitter lines
Dynamic Wet Scrubbers	Fan Amp Meters	Amp Meter	NA	NA	See Ellipse	The data is considered “out of control” for this equipment if the amps are out of the normal range.	NA
Dry ESPs	Opacity Meters	Durag DR290 Opacity Monitor	Daily (Zero and Span)	CD less than 4x	See Ellipse	The data is considered “out of control” if the zero, or high-level calibration drift (CD) exceeds two times the applicable CD specification in the applicable performance specification.	As needed clean monitor lenses and change filters on the purge air unit

Control Equipment Type	Measurement Type	Instrument Type	Calibration frequency (Section 7)	Calibration Acceptance Criteria (Section 7)	Spare Parts (Sections 8 + 9)	Definition of Out-of-Control (Section 8)	Preventative Maintenance (Section 9)
Indurating Furnaces	GCP Monitoring Parameters	GCP Equipment	Scheduled with major repairs (appx. 12-18 months)	NA	See Ellipse	NA	Instrumentation Inspection

## *Appendix B*

### *Calibration Procedures and Adjustment*



## JOB DESCRIPTION:

Instrumentation Dynamic

MACT Compliance D/P Transmitter Calibration.

Loveland Test Group: MACT PT's.

## PURPOSE:

To insure that MACT Compliance Instrumentation components are calibrated on a regular basis.

## SAFETY:

Take 5, perform pre-shift inspection and be aware of your surroundings.

Lockout/isolate appropriate valves during transmitter calibration.

## GENERAL:

It is important to use the Loveland database as the Master source of calibration data. Record "AS FOUND" and "AS LEFT" data so we have a history of equipment condition.

Refer to the ER Shop Procedures Folder, ER Manual,

- Loveland - for details concerning testing transmitters

using the 2020 calibrators. Word Document B1007

(Differential Pressure), & B1009 (Pressure).

Reference Rosemount 3051 Transmitter manual 00809-0100-4001 as necessary.

## TOOLS:

- Standard hand tools.

- Loveland calibrator, hand-held pump.

- If new transmitters are needed, see APL for stock code.

## PROCEDURE:

1. Access the Loveland Database and load the tag(s) listed below as found in the Loveland test group "MACT PT's"

into the 2020 calibrator. Loveland contains location information for these instruments. Select proper pressure transducers for the process ranges listed below:

Test Group MACT PT's:

a) Scrubber Name, 20-PDT-041.

0-25.0" H2O = 20-4 Ma.

2. Isolate the process from the transmitters. Note that process lines may need to be blown down to reduce scaling. Insure that line do not contribute to the ingress of condensation due to mounting issues.

Init:\_\_\_\_\_

3. Calibrate units using the Loveland system.

4. Return all valves, and pressure connections back to their operational ready positions. Insure that Loop Identification Tags are attached to each transmitter.

Notify the CCMO Environmental Engineer of the date/time you performed calibration activities so data can be entered into the MACT Compliance Computer!

Init:\_\_\_\_\_

5. Notify the Electrical RBM Engineer if any changes are required for this procedure.

6. Write work orders and document any anomalies found for this equipment.

END OF DOCUMENT

*Startup, Shutdown, and Malfunction (SSM) Plan*



**Tilden Mining Company L.C.**

**December 2021**

# Startup, Shutdown, and Malfunction (SSM) Plan

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# 1. Purpose

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Certain emissions units at Tilden Mining Company L.C. facility are subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Taconite Iron Ore Processing [40 Code of Federal Regulations (CFR) Part 63 Subpart RRRRR]. This regulation is commonly referred to as the Taconite MACT and requires development and implementation of a Startup, Shutdown, and Malfunction (SSM) Plan by October 30, 2006.

The SSM Plan is applicable to air pollution control equipment that is used to demonstrate compliance with the Taconite MACT. This includes pollution control equipment used to control particulate emissions from the following sources:

- Ore Crushing and Handling Emission Units;
- Ore Drying;
- Indurating Furnaces; and
- Finished Pellet Handling Emission Units.

The primary purpose of the SSM Plan is:

- To ensure that the equipment is operated in a manner consistent with safety and good air pollution control practices for minimizing emissions at all times, including periods of startup, shutdown, and malfunction; and
- To correct malfunctions which could result in particulate emissions exceedances as soon as practicable after their occurrence, consistent with safety and good air pollution control practices.

The sections of this document addressing roles and responsibilities, recordkeeping, reporting, and revisions are not required by the Taconite MACT and therefore deviations from these requirements are not necessarily deviations from the Taconite MACT or Title V permit.

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## 2. Responsibilities

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The following is a summary of the responsibilities for each position involved in the implementation of the SSM Plans.

### 2.1 Operators

- 2.1.1 Operating the scrubbers, dry ESPs, and other applicable air pollution control equipment according to the Standard Operating Procedures (SOPs) and the SSM Plan;
- 2.1.2 Assisting in the development and updating of SSM procedures and the SSM Plan; and
- 2.1.3 Notifying the shift supervisor of problems with the monitoring systems for the scrubbers and the dry ESPs.

### 2.2 Shift Supervisors

- 2.2.1 Ensuring that the operators are completing their responsibilities;
- 2.2.2 Following the SSM Plan, as required;
- 2.2.3 Assisting with the root cause analyses and identification of the steps to prevent a reoccurrence; and
- 2.2.4 Following the SSM Plan procedures and assisting the Section Managers in the completion of Corrective Action forms, as required.

### 2.3 Section Managers

- 2.3.1 Ensuring that the operators and shift supervisors are completing their responsibilities;
- 2.3.2 Following the SSM Plan procedures and completing the Corrective Action forms, as required; and
- 2.3.3 Submitting the completed Corrective Action forms to the Environmental Department.

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- 2.3.4 If actions to prevent a reoccurrence are identified during the review process described herein, ensure they are completed in a timely manner;
- 2.3.5 Assisting in the development and updating of the SSM procedures and the SSM Plan; and
- 2.3.6 Coordinating initial training and refresher training of all affected operators and coordinators.

## **2.4 Maintenance Coordinators**

- 2.4.1 Coordinating preventative maintenance activities, per the O&M Plan;
- 2.4.2 Coordinating maintenance activities, per the O&M Plan;
- 2.4.3 Coordinating critical spare parts specifications and management, per the O&M Plan; and
- 2.4.4 Maintaining equipment repair histories through the Ellipse maintenance tracking system.

## **2.5 Training Department**

- 2.5.1 Maintaining records for all training
- 2.5.2 Identifying individuals requiring training; and
- 2.5.3 Ensuring all training is completed

## **2.6 Environmental Engineers**

- 2.6.1 Developing and updating the SSM procedures and SSM Plan;
- 2.6.2 Creating reports to satisfy reporting obligations. obtaining responsible official approval (sign-off) and submitting reports as required by the regulation; and
- 2.6.3 Facilitating resolution of inquiries and clarification of Taconite MACT rule as requested to assist personnel described herein in the completion of their responsibilities.



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### 3. Definitions

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*Administrator* means the regulatory agency that is responsible for the administration of the Taconite MACT regulation; this could be EPA, or EGLE.

*Bypass* means to route gas around a control device.

*CPMS* means continuous parametric monitoring system.

*CFR* means Code of Federal Regulations.

*Dynamic Wet Scrubber* means an air emissions control device which utilizes a mechanically powered fan to cause contact between the process exhaust gas stream and the scrubbing liquid which are introduced concurrently into the fan inlet.

*EGLE* means State of Michigan Department of Environment, Great Lakes, and Energy

*EPA* means United States Environmental Protection Agency.

*ESP* means dry electrostatic precipitator.

*Finished Pellet Handling* means the transfer of fired taconite pellets from the indurating furnace to the finished pellet stockpiles at the plant. Finished pellet handling includes, but is not limited to:

- Furnace discharge;
- Finished pellet screening;
- Finished pellet transfer; and
- Finished pellet storage.

The atmospheric pellet cooler vent stack and gravity conveyor gallery vents designed to remove heat and water vapor from the structure are not included as part of the finished pellet handling affected source.

*HAPS* means Hazardous Air Pollutants.

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*Indurating* means the process whereby unfired taconite pellets, called green balls, are hardened at high temperature in an indurating furnace.

*MACT* means Maximum Achievable Control Technology.

*Malfunction* means any sudden, infrequent, and not reasonably preventable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner which causes, or has the potential to cause, the emission limitations in an applicable standard to be exceeded. Failures that are caused in part by poor maintenance or careless operation are not malfunctions.

*Ore Crushing and Handling Emission Units* means the process whereby dry taconite ore is crushed and screened. Ore crushing and handling includes, but is not limited to:

- Dry crushing operations (e.g. primary, secondary, and tertiary crushing);
- Dry ore conveyance and transfer points;
- Dry ore classification and screening;
- Dry ore storage and stockpiling;
- Dry milling;
- Dry cobbing (i.e. dry magnetic separation);and
- Grate feed.

Ore crushing and handling specifically excludes any operations where the dry crushed ore is saturated with water, such as wet milling and wet magnetic separation.

*O&M Plan* means Operation and Maintenance Plan.

*Shutdown* means the cessation of operation of an affected source or portion of an affected source for any purpose. Specifically for the kilns, shutdown initiates when the grate is stopped and the stack cap is raised per the conditions defined later in this document.

*SOP* means standard operating procedure.

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*SSM Event* means a startup or shutdown event or malfunction that causes the source to cease producing fired pellets.

*SSM Plan* means Startup, Shutdown, and Malfunction Plan.

*Startup* means the setting in operation of an affected source or portion of an affected source for any purpose.

## 4. Equipment Covered by this Plan

### 4.1 Wet Scrubbers

The following is a list of wet scrubbers as particulate matter control equipment covered by this plan.

**Table 4.1 – Wet Scrubbers**

Air Permit Stack ID Number	Control Equipment Description	Process Description
SVA0007880	EU-CONVEYOR4B-4C	Conveyors 4B & 4B1 to 4C
SVA0013480	EU-CONVEYOR4A-4A1	Conveyor 4A to 4A-1
SVA0007910	EU-CONVEYOR4C-4D	Conveyor 4C to 4D
SVA0011570	EU-PRIMARYCRUSHER	Primary Ore Crusher
SVA0010460	EU-CONVEYOR1	Conveyor 1 to 2
SVC0005037	EU-CONVEYOR12A-13	Conveyor 12A to 13
SVC0005042	EU-CONVEYOR12B-13	Conveyor 12B to 13
SVC0005047	EU-CONV13-17.1	Conveyor 13 to 17.1
SVC0005057	EU-CONV15-15.1	Conveyor 15 to 15.1
SVP0033820	EU-CONV15.8-15.9	Conveyor 15.8 to 15.9
SVP0033940	EU-CONV15.9-16.1	Conveyor 15.9 to 16.1
SVC0005062	EU-CONV16.1-17.1	Conveyor 16.1 to 17.1
SVP0016830	EU-CONV17.1-17.2	Conveyor 17.1 to 17.2
SVC0005052	EU-CONV14-15-16	Conveyor 14 to 15 to 16
SVC0005067	EU-CONV19&19A-17	Conveyor 19 & 19A to 17 & screen
SVC0005072	EU-SCREENSRECLAIM	Conveyor 19 to 19A to 19B & screen
SVP0016100	EU-FEEDMIXER1	T1 Bentonite feeders and blender
SVP0014430	EU-COOLER1	T1 Cooler Discharge & Conveyor
SVP0014160	EU-UNIT1LHF	T1 Low Head Feeder
SVP0016230	EU-FEEDMIXER2	T2 Bentonite feeders and blender
SVP0014490	EU-COOLER2	T2 Cooler Discharge & Conveyor
SVP0014290	EU-UNIT2LHF	T2 Low Head Feeder
SVE3100694	EU-PRODCONV2	Conveyors 31.4, 31.5, 31.6, & 31.7
SVP0016620	EU-TRANSFERTOWER1	Tilden Unit 1 Pellet Loadout
SVP0016690	EU-TRANSFERTOWER2	Tilden Unit 2 Pellet Loadout

## 4.2 Ore Concentrate Dryers with Dynamic Wet Scrubbers

The following table is a list of the ore concentrate dryers with dynamic wet scrubbers as particulate matter control equipment covered by this plan.

**Table 4.2 – Ore Concentrate Dryers with Dynamic Wet Scrubbers**

Air Permit ID Number	Control Equipment Description	Process Description
SVP0082951	EU-OREDRIYER1 - Dynamic Scrubber	Ore Concentrate Dryer #1
SVP0082851	EU-OREDRIYER2 - Dynamic Scrubber	Ore Concentrate Dryer # 2 North Stack
SVP0082861	EU-OREDRIYER2 - Dynamic Scrubber	Ore Concentrate Dryer # 2 South Stack

## 4.3 Indurating Furnaces with Dry ESPs

The following table lists the indurating furnace stacks and the associated air pollution control covered by this plan.

**Table 4.3 – Indurating Furnaces with Dry ESPs**

Air Permit ID Number	Control Equipment Description	Process Description
SVP0051981	EU-KILN1 - Dry ESP 2C-1	Grate-Kiln Pelletizing Unit 1 North Stack
SVP0051711	EU-KILN1 - Dry ESPs 2A-1 & 2B-1	Grate-Kiln Pelletizing Unit 1 South Stack
SVP0052431	EU-KILN2 - Dry ESP 2C-2	Grate-Kiln Pelletizing Unit 2 North Stack
SVP0052131	EU-KILN2 - Dry ESPs 2A-2 & 2B-2	Grate-Kiln Pelletizing Unit 2 South Stack

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## 5. Startup, Shutdown, and Malfunction Procedures

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The Taconite MACT regulation defines startups, shutdowns, and malfunctions as follows:

- *Startup* means the setting in operation of an affected source or portion of an affected source for any purpose.
- *Shutdown* means the cessation of operation of an affected source or portion of an affected source for any purpose.
- *Malfunction* means any sudden, infrequent, and not reasonably preventable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner which causes, or has the potential to cause, the emission limitations in an applicable standard to be exceeded. Failures that are caused in part by poor maintenance or careless operation are not malfunctions.

The general startup, shutdown and malfunction procedure requirements include:

- All startup and shutdown events must follow the procedures for minimizing emissions presented in Sections 5.1, 5.2., and 5.3.
- If a startup, shutdown or malfunction event results in not meeting a Taconite MACT parametric limitation (including water flow, differential pressure, amperage, or opacity), the forms in Appendices A, B or C will be completed as appropriate. The Corrective Action forms provided in Appendices A, B and C will be utilized when the daily average operating parameter value for an emission unit does not meet the corresponding established operating limit for a 10 day consecutive period. A separate form will be completed for each 10 day consecutive period in compliance of 40CFR 63.9634(j).
- If actions taken during a startup, shutdown or malfunction event are consistent with this plan, the procedures in section 7 must be followed.
- If actions taken during a startup or shutdown event are not consistent with this plan, the procedures in section 8 must be followed.

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- The recordkeeping for all startup, shutdown and malfunction events must be consistent with the requirements of section 9; and

The reporting requirements for all startup and shutdown events must be consistent with the requirements of section 10.

The general malfunction procedures include:

- ✓ Take steps to safely secure the operation of the dust collector system;
- ✓ Initiate steps to identify the cause of the malfunction;
- ✓ Take actions to resolve the malfunction.

## 5.1 Wet Scrubbers

The primary purpose of the wet scrubbers is to address housekeeping and industrial hygiene issues. For buildings under negative pressure, if the dust collector fan is not operating, the dust will be contained within the building. The general operating guidelines for the wet scrubbers is to ensure that the scrubber is operating at all times when the fan is operating.

One of the options for resolving a malfunction for a dust collector with a wet scrubber that is located in a building is to shut down the fan to stop the emissions. By shutting down the fan, the emissions will be contained within the building, and the problem can be resolved without causing excess emissions or an emissions exceedance. During this time, visual inspections or other process modifications may be implemented to ensure compliance.

The startup and shutdown definitions for the dust collectors with wet scrubbers are:

- Startup Definition:
  - Beginning of Startup: Startup begins when water is flowing through the scrubber and the fan is started.
  - End of Startup: Startup is complete when both of the following conditions occur for 60 consecutive minutes (1) the pressure drop is equal to or greater than the minimum operating requirement and (2) the scrubber water flow rate is equal to or greater than the minimum operating requirement.

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- Shutdown Definition:
  - Beginning of Shutdown: Shutdown begins when the fan is shut down.
  - End of Shutdown: Shutdown is complete when the fan is shut down for ten minutes.

The Corrective Action forms for wet scrubbers experiencing an emission exceedances during startup, shutdown and malfunction events are presented in Appendices A, B and C.

## **5.2 Ore Concentrate Dryers with Dynamic Wet Scrubbers**

The primary purpose of the dynamic wet scrubbers is to remove particulate from the concentrate dryer flue gas prior to being discharged into the atmosphere. The general operating guidelines for the dynamic wet scrubbers is to ensure that the scrubber is operating at all times when the concentrate dryer is operating.

The startup and shutdown definitions for the ore concentrate dryers with dynamic wet scrubbers are:

- Startup Definition:
  - Beginning of Startup: Startup begins when water is flowing through the scrubber and the fan is started.
  - End of Startup: Startup is complete when both of the following two conditions occurs for 1 consecutive hour, (1) the fan motor amps or the pressure drop is equal to or greater than the minimum operating requirement and (2) the scrubber water flow rate is equal to or greater than the minimum operating requirement.
- Shutdown Definition:
  - Beginning of Shutdown: Shutdown begins when the fan is shut down.
  - End of Shutdown: Shutdown is complete when the fan is down for ten minutes.

The Corrective Action forms for ore concentrate dryers with dynamic wet scrubbers experiencing a emission exceedance during startup, shutdown and malfunction events are presented in Appendices A, B and C.



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### 5.3 Indurating Furnaces with Dry ESPs

The primary purpose of the dry ESPs for the indurating furnace stacks is to remove particulate from the flue gas prior to being discharged into the atmosphere. The general operating guidelines for the dry ESPs for the indurating furnaces is to ensure that the particulate control equipment is operating at all times when the furnace is operating under normal conditions.

Steps for minimizing emissions during a startup may include but are not limited to raising/lowering the stack cap, sole use of natural gas as fuel, adjusting primary burner firing rate, dampering fans, adjusting feed of greenballs to the grate, and continuing use of dust collection system on portion of total airstream.

Steps for minimizing emissions during a shutdown event may include but are not limited to raising the stack cap, switching fuel from solid fuel firing to natural gas, reducing primary burner firing rate, dampering fans back, halting feed of greenballs to the grate, running pellet load out of the kiln, reducing kiln and pellet cooler speed and continuing use of dust collection system on portion of total airstream.

The startup and shutdown definitions for indurating furnaces with dry ESPs are:

- Startup Definition:
  - Beginning of Startup: Startup begins when a flame is established.
  - End of Startup: Startup is complete when the run condition is fulfilled; green ball bed depth  $\geq 3''$ , grate speed  $\geq 30''/\text{min}$ , the stack cap is closed and the secondary air temperature reaches  $\geq 1850$  °F.
- Shutdown Definition:
  - Beginning of Shutdown: Shutdown begins when the grate stops.
  - End of Shutdown: Shutdown is complete when the ESPs are shutdown and the kiln process fans are shut down.

Process start-ups are conducted following Grate Kiln Startup standard operating procedures. Similarly, process shutdowns are conducted following Grate Kiln Shutdown standard operating procedures and

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are dependent on the expected duration of the shutdown. In the standard operating procedures cited above, stack cap operation is an integral part of the safe start up or shutdown of the furnaces.

The stack cap is an integral part of the grate kiln furnace design, and operates as part of normal safe operation practices. The stack cap opens when necessary to release excess heat that would otherwise build up in the furnace when the grate stops and cause severe equipment damage and unsafe working conditions. The stack cap may also be utilized during cold startups to manage the incremental increase in temperature necessary to protect equipment. Stack cap openings are necessary responses to the shutdown of the furnace grate but they are managed so that only the minimum amount of heat necessary to retain safe operations is released from the furnace. This limits the amount of fuel that must be combusted to bring the furnace back to temperature when the furnace begins accepting new feed.

Federal regulations define “startup” as “the setting in operation of an affected source or portion of an affected source for any purpose” and “shutdown” as “the cessation of operation of an affected source or portion of an affected source for any purpose.” 40 C.F.R § 63.2. Stack cap events can typically be classified as one of three events: (1) cold start up; (2) shutdown after cold startup; and (3) shutdown after normal operations. In each of these scenarios, the stack cap is opened because the first step of the “setting in operation” or “cessation of operation” of the furnace has commenced. At cold startup, natural gas is fired to bring the furnace up to temperature. The stack cap is opened during this process when necessary to regulate the temperature increase and prevent rapid heating of the furnace that could damage the equipment and control devices. The shutdown sequence begins when the grate stops, preventing more feed from entering the furnace. The stack cap must be opened when the grate stops to prevent a buildup of heat that would melt the grate and create dangerous pressure changes in the furnace.

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## 6. Corrective Action Requirements

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If the daily average operating parameter value for an emission unit does not meet the corresponding established operating limit, the permittee must follow the procedures in paragraphs (a) through (d) of this section.

a. You must initiate and complete initial corrective action within 10 calendar days and demonstrate that the initial corrective action was successful. During any period of corrective action, you must continue to monitor and record all required operating parameters for equipment that remains in operation. After 10 calendar days, measure and record the daily average operating parameter value for the emission unit on which corrective action was taken. After the initial corrective action, if the daily average operating parameter value for the emission unit meets the operating limit established for the corresponding unit, then the corrective action was successful and the emission unit is in compliance with the established operating limits. (40 CFR 63.9634(j)(1))

b. If the initial corrective action required in paragraph (a) of this section was not successful, then you must complete additional corrective action within 10 calendar days and demonstrate that the subsequent corrective action was successful. During any period of corrective action, you must continue to monitor and record all required operating parameters for equipment that remains in operation. After the second set of 10 calendar days allowed to implement corrective action, you must again measure and record the daily average operating parameter value for the emission unit. If the daily average operating parameter value for the emission unit meets the operating limit established for the corresponding unit, then the corrective action was successful and the emission unit is in compliance with the established operating limits. (40 CFR 63.9634(j)(2))

c. (3) If the second attempt at corrective action required in paragraph (b) of this section was not successful, then you must repeat the procedures of paragraph (j)(2) of this section until the corrective action is successful. If the third attempt at corrective action is unsuccessful, you must conduct another performance test in accordance with the procedures in 40 CFR 63.9622(f) and report to the Administrator as a deviation the third unsuccessful attempt at corrective action. (40 CFR 63.9634(j)(3))

d. (4) After the third unsuccessful attempt at corrective action, you must submit to the Administrator the written report required in paragraph (c) of this section within 5 calendar days after the third unsuccessful attempt at corrective action. This report must notify the Administrator that a deviation

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has occurred and document the types of corrective measures taken to address the problem that resulted in the deviation of established operating parameters and the resulting operating limits. (40 CFR 63.9634(j)(4))

The Corrective Action forms provided in Appendices A, B and C will be utilized when the daily average operating parameter value for an emission unit does not meet the corresponding established operating limit for a 10 day consecutive period. A separate form will be completed for each 10 day consecutive period.

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## **7. Requirements when Actions Are Consistent with the Plan**

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If an action taken during an SSM event is consistent with this plan, the facility must do the following in compliance with 40 CFR 63.6(e)(3)(iii) and 63.10(d)(5)(i):

- Maintain documentation indicating actions during the SSM event were consistent with this plan.
- The semi-annual report will list any times that actions taken during the SSM event were inconsistent with the plan. (see section 11.1).

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## **8. Requirements when Actions Are Not Consistent with the Plan**

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If an action taken during an SSM event is not consistent with this plan, and the source exceeds any applicable emission limit, then facility must do the following in compliance with 40 CFR 63.6(e)(3)(iv) and 63.10(d)(5)(ii):

- Record the actions taken for that event
- Report such actions via phone call or facsimile to the Administrator within 2 working days; and
- Submit a letter to the Administrator within 7 working days

The letter shall include the following information:

- Name, title, and signature of the responsible official who is certifying its accuracy;
- Explanation of the circumstances of the event
- Description of the reason(s) for not following the SSM Plan; and
- Description of all excess emissions and/or monitoring exceedances which are believed to have occurred.

In order to meet this requirement, the following procedure will be followed and is documented on the Corrective Action forms:

- Operating Department Notification:
  - Section Managers will be advised of all exceedances through the site's daily operating and process review structure and are responsible to document compliance or noncompliance with the SSM plan;
- Notification of Environmental Department:
  - Section Managers shall notify the Environmental Department as soon as practicable with enough time to ensure that the incident is reported to the state within 2 working days;
- Notification of the Administrator:

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- The Environmental Department shall notify the Administrator via phone or email within 2 working days and a written notification within 7 working days.

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## 9. Recordkeeping Requirements

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The following is a summary of the recordkeeping required for the SSM Plan. All recordkeeping is the responsibility of the Environmental Department.

The purpose of the recordkeeping program is to maintain records that demonstrate conformance with the SSM Plan. The following general recordkeeping requirements apply as required by 40 CFR 63.6(e)(3)(v):

- All records will be maintained for a minimum of 5 years
- Records will be maintained in a manner that can be readily accessed
- Records can be maintained as a hard copy or a computer-readable form.
- The most recent 2 years of records will be maintained on-site. The remaining 3 years of records may be retained off-site.
- Copies of reports that have been submitted to the applicable EPA Regional office are not required to be maintained.

The following records will be maintained:

- Completed Corrective Action forms; The Corrective Action forms provided in Appendices A, B and C will be utilized when the daily average operating parameter value for an emission unit does not meet the corresponding established operating limit for a 10 day consecutive period. A separate form will be completed for each 10 day consecutive period.
- Associated monitoring data, as detailed in the site-specific monitoring plan; and
- Superseded revisions of the plan.



## 10. Reporting Requirements

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The following is a summary of the reports required per the Taconite MACT regulations. All report preparation and submittal to outside agencies is the responsibility of the Environmental Department.

### 10.1 Semiannual Reports

The MACT regulations require submittal of semiannual reports. The reporting requirements are detailed in 40 CFR 63.9641. It is important to note that one semiannual report is submitted for compliance with all of the Taconite MACT requirements.

The reporting due dates are:

Reporting Period	Dates	Report Due Date
1 <sup>st</sup> Semiannual Period	January 1 – June 30	September 15
2 <sup>nd</sup> Semiannual Period	June 30 – December 31	March 15

The report must include:

1. Company name and address;
2. Statement by responsible official, with the official's name, title, and signature, certifying the truth, accuracy, and completeness of the content of the report.
3. Dates of report and beginning and ending dates of the reporting period.
4. If there was a Startup, Shutdown, or Malfunction during the reporting period and actions were consistent with the SSM Plan, the compliance report will include the number (during reporting period; if actions taken are the same for each event ), duration, and description of each SSM Event, as required by 40 CFR 63.10(d)(5)(i).
5. If there were no deviations from the continuous compliance requirements in 40 CFR 63.9634 through 63.6936, then a statement will be provided that states that there were no deviations from the emission limitations, work practice standards, or operation and maintenance requirements during the operating period.

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6. If there were no periods during which a continuous monitoring system (CPMS or COMS) was out-of-control as specified in 40 CFR 63.8(c)(7), then a statement will be provided that states that there were no periods during which a continuous monitoring system was out-of-control during the reporting period.
  
7. For each deviation from a MACT emission limitation where you are not using a continuous monitoring system (including CPMS or COMS) to comply with an emission limitation for the Taconite MACT, the compliance report must contain the following information (including for periods of startup, shutdown, and malfunction):
  - (i) The total operating time of each affected source during the reporting period; and
  - (ii) Information on the number, duration, and cause of deviations (including unknown causes) as applicable, and the corrective action taken.
  
8. For each deviation from a MACT emission limitation where you are using a continuous monitoring system (including CPMS or COMS) to comply with an emission limitation for the Taconite MACT, the compliance report must contain the following information (including for periods of startup, shutdown, and malfunction):
  - (i) The date and time that each malfunction started and stopped;
  - (ii) The date and time that each CPMS and/or COMS was inoperative, except for zero (low-level) and high-level checks;
  - (iii) The date, time and duration that each CPMS and/or COMS was out-of-control, including the information in 40 CFR 63.8(c)(8);
  - (iv) The date and time that each deviation started and stopped, and whether each deviation occurred during a period of startup, shutdown, or malfunction or during another period;
  - (v) A summary of the total duration of the deviations during the reporting period and the total duration as a percent of the total source operating time during the reporting period;

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- (vi) A breakdown of the total duration of the deviations during the reporting period, including those due to startup, shutdown, control equipment problems, process problems, other known causes, and unknown causes;
- (vii) A summary of the total duration of continuous monitoring system downtime during the reporting period and the total duration of continuous monitoring system downtime as a percent of the total source operating time during the reporting period;
- (viii) A brief description of the process units;
- (ix) A brief description of the continuous monitoring system;
- (x) The date of the latest continuous monitoring system certification or audit; and
- (xi) A description of any changes in continuous monitoring systems, processes, or controls since the last reporting system.

Reports required by other regulations, can be submitted in place of or as part of the semiannual report.

This facility will comply with the reporting requirements as follows:

- The Taconite MACT Reporting requirements are submitted in combination with the Title V (Renewable Operating Permit) Certification Report.

## **10.2 Immediate Corrective Action Reports**

As discussed, after three unsuccessful attempts at applying corrective actions to an emission unit, an immediate corrective action report must be submitted as required by 40 CFR 63.6934(j):

- The report must be submitted to the Administrator within 5 calendar days of the third unsuccessful attempt at corrective action;
- This written report must state that a deviation has occurred and must document the types of corrective measures that have been taken to address the problem.

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### **10.3 Reports for Actions Not Consistent with SSM Plan**

If an SSM event occurred that was not consistent with the SSM plan, you must submit an immediate notification and a written report, as required by 40 CFR 63.6(e)(3)(iv) and 63.10(d)(5)(ii):

- An immediate notification, which consists of a phone call or email, to the Administrator within 2 working days after commencing action that is inconsistent with the SSM Plan.
- A written report to the Administrator within 7 working days after the end of the event. The report shall include:
  - Certification of truth, accuracy, and completeness of report by a responsible official; (including name and title)
  - Explanation of circumstances of the event;
  - Reasons for not following the SSM Plan;
  - Description of all excess emissions and/or CPMS monitoring exceedances which are believed to have occurred.
  - Actions taken to minimize emissions in conformance with §63.6(e)(1)(i).

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## **11. Revisions of the SSM Plan**

### **11.1 Revisions Required by the Administrator**

As stated in 40 CFR 63.6(e)(3)(vii), the Administrator may require changes to the SSM plan if the Administrator believes that the SSM Plan:

- Does not address a startup, shutdown, and malfunction event that has occurred;
- Fails to provide for the operation of the source (including associated air pollution control and monitoring equipment) during an SSM event in a manner consistent with the general duty to minimize emissions;
- Does not provide adequate procedures for correcting malfunctioning process and/or air pollution control and monitoring equipment as quickly as practicable; or
- Includes an event that does not meet the definition of startup, shutdown, and malfunction.

### **11.2 Revisions Initiated by the Tilden Mine**

As stated in 40 CFR 63.6(e)(3)(viii), the Tilden Mine may periodically revise the SSM Plan, as necessary, to satisfy the requirements of this part or to reflect changes in equipment or procedures at the affected source.

Unless EGLE provides otherwise, the Tilden Mine may make such revisions to the SSM Plan without prior approval by the Administrator.

However, each such revision to a SSM Plan must be reported in the semiannual report as discussed in section 11.

### **11.3 Revisions to Correct Procedures**

As stated in 40 CFR 63.6(e)(3)(viii), if the SSM Plan fails to address or inadequately addresses an event that meets the characteristics of a malfunction but was not included in the SSM Plan, the plans must be revised within 45 days after the event to include detailed procedures for operating and maintaining the source during similar malfunction events and a program for corrective action for similar malfunctions of process or air pollution control and monitoring equipment.

*Appendix A*

*Corrective Action Form*

*Wet Scrubbers*

## Corrective Action Form Equipment with Wet Scrubbers

1	Identification of Equipment	Equipment Name		
1.1	On which equipment did the Excursion Occur:			
2 Reason for Completing Form				
2.1	<input type="checkbox"/> Startup <input type="checkbox"/> Shutdown <input type="checkbox"/> Excursion	<input type="checkbox"/> 10-day Exceedance		
3 Beginning and End of Excursion		Date and Time		
3.1	Beginning:			
3.2	End:			
4 Operations Personnel		Name		
4.1	Operator:			
5 Type (select all that apply)				
5.1	<input type="checkbox"/> <b>Low Pressure Drop</b> occurs when the daily average scrubber pressure drop is below the minimum operating requirement.			
	<input type="checkbox"/> <b>Low Scrubber Water Flow</b> occurs when the daily average scrubber water flow rate is below the minimum operating requirement.			
	<input type="checkbox"/> <b>Other Issue</b>			
6 Description of Excursion (select all that apply)				
6.1	<input type="checkbox"/> Fan failure <input type="checkbox"/> Pump failure <input type="checkbox"/> Power outage <input type="checkbox"/> Plugged dP transmitter lines	<input type="checkbox"/> Instrument failure <input type="checkbox"/> Plugged screen or strainer <input type="checkbox"/> Plugged nozzles <input type="checkbox"/> Other		
6.2	Detailed description of excursion:			
7 Response to Issue		Yes	No	NA
7.1	Did the immediate response resolve the excursion?			
7.2	Were all actions consistent with "steps for minimizing emissions" as set forth in the SSM Plan?			
7.3	If the answer to 7.2 is "No":			
	Explain why the "steps for minimizing emissions" were not followed:			
	Describe all excess emissions and/or CPMS monitoring issues which are believed to have occurred:			
7.6	Corrective Action Taken:	Date Corrective Action Taken:		
	Note: Steps for minimizing emissions may include but are not limited to safely secure the operation of the dust collector system including shutdown of the unit, initiating steps to identify the cause of the malfunction and taking actions to resolve the malfunction			

## *Appendix B*

### *Corrective Action Form*

#### *Ore Concentrate Dryers with Dynamic Wet Scrubbers*



## Corrective Action Form

### Ore Concentrate Dryers with Dynamic Wet Scrubbers

1	Identification of Equipment	Equipment and Stack Name			
1.1	On which equipment did the excursion Occur:				
2	Reason for Completing Form				
2.1	<input type="checkbox"/> Startup <input type="checkbox"/> Shutdown <input type="checkbox"/> Excursion	<input type="checkbox"/> 10-day Exceedance			
3	Beginning and End of Excursion		Date and Time		
3.1	Beginning:				
3.2	End:				
4	Operations Personnel		Name		
4.1	Operator:				
5	Type (select all that apply)				
5.1	<input type="checkbox"/> <b>Low Pressure Drop</b> occurs when the daily average scrubber pressure drop is below the minimum operating requirement.				
	<input type="checkbox"/> <b>Low Scrubber Water Flow</b> occurs when the daily average scrubber water flow rate is below the minimum operating requirement.				
	<input type="checkbox"/> <b>Low Amperage</b> (applicable to dynamic wet scrubbers in lieu of using pressure drop) occurs when the daily average amperage is below the minimum operating requirement.				
	<input type="checkbox"/> <b>Other Issue</b>				
6	Description of Excursion (select all that apply)				
6.1	<input type="checkbox"/> Fan failure <input type="checkbox"/> Pump failure <input type="checkbox"/> Power outage <input type="checkbox"/> Plugged dP transmitter lines	<input type="checkbox"/> Instrument failure <input type="checkbox"/> Plugged screen or strainer <input type="checkbox"/> Plugged nozzles <input type="checkbox"/> Other			
6.2	Detailed description of issue:				
7	Response to Issue		Yes	No	NA
7.1	Did the immediate response resolve the excursion?				
7.2	Were all actions consistent with "steps for minimizing emissions" as set forth in the SSM Plan?				
7.3	If the answer to 7.2 is "No":				
	Explain why the "steps for minimizing emissions" were not followed:				
	Describe all excess emissions and/or CPMS monitoring issue which are believed to have occurred:				
7.4	Corrective Action Taken:		Date Corrective Action Taken:		
Note: Steps for minimizing emissions may include but are not limited to safely secure the operation of the dust collector system including shutdown of the unit, initiating steps to identify the cause of the malfunction and taking actions to resolve the malfunction					

## *Appendix C*

### *Corrective Action Form*

#### *Indurating Furnaces with Dry ESPs*

## Corrective Action Form Indurating Furnaces with Dry ESPs

<b>1</b>	<b>Identification of Indurating Furnace</b>	<b>Indurating Furnace Name</b>		
1.1	On which Unit (Indurating Furnace) did the Excursion occur:			
<b>2</b>	<b>Reason for Completing Form</b>			
2.1	<input type="checkbox"/> Startup <input type="checkbox"/> Shutdown <input type="checkbox"/> Excursion		<input type="checkbox"/> 10-day Exceedance	
<b>3</b>	<b>Operations Personnel</b>		<b>Name</b>	
3.1	Operator:			
<b>4</b>	<b>Beginning and End of Excursion</b>		<b>Date and Time</b>	
4.1	Beginning :			
4.2	End :			
<b>5</b>	<b>Type (select all that apply)</b>			
5.1	<input type="checkbox"/> Opacity <input type="checkbox"/> Startup <input type="checkbox"/> Shutdown <input type="checkbox"/> Other Issue			
<b>6</b>	<b>Description of Excursion (select all that apply)</b>			
6.1	<input type="checkbox"/> Hopper <input type="checkbox"/> Electrical		<input type="checkbox"/> Mechanical <input type="checkbox"/> Other	
6.2	Detailed description of issue:			
<b>7</b>	<b>Response to Excursion</b>			
7.1	<b>Process Start-up</b>		<b>Yes</b>	<b>No</b>
	<b>Were all actions</b> consistent with “steps for minimizing emissions” as set forth in the SSM Plan?  Note: Steps for minimizing emissions during a startup may include but are not limited to raising/lowering the stack cap, sole use of natural gas as fuel, adjusting primary burner firing rate, dampering fans, adjusting feed of greenballs to the grate, and continuing use of dust collection system on portion of total airstream.  NOTE: In order to minimize emissions during startup procedures, the answer to section 7.1 should be “Yes.”			
	<b>Before the ESP was started as the kiln off gas temperature above 1000 °F</b> <b>If the answer to 7.1 is “No”:</b>			
	Explain why the “steps for minimizing emissions” were not followed:			
	Describe all excess emissions and/or COMs monitoring exceedances which are believed to have occurred:			
7.2	<b>Process Shutdown</b>		<b>Yes</b>	<b>No</b>
				<b>NA</b>

	<p><b>Were all actions</b> consistent with “steps for minimizing emissions” as set forth in the SSM Plan?</p> <p>Note: Steps for minimizing emissions during a shutdown may include but are not limited to raising the stack cap, switching fuel from solid fuel firing to natural gas, reducing primary burner firing rate, dampering fans back, halting feed of greenballs to the grate, running pellet load out of the kiln, reducing kiln and pellet cooler speed and continuing use of dust collection system on portion of total airstream.</p> <p>NOTE: In order to minimize emissions during shutdown procedures, the answer to section 7.2 should be “Yes.”</p>			
	<p>Before the ESP was shutdown, were the ESP fans shutdown?</p>			
	<p><b>If the answer to 7.2 is “No,”</b> Explain (continue on back, if necessary):</p>			
	<p>Explain why the “steps for minimizing emissions” were not followed:</p>			
	<p>Describe all excess emissions and/or COMs monitoring exceedances which are believed to have occurred:</p>			
<p><b>7.3</b></p>	<p><b>Opacity/Other Excursion (10-day)</b></p>	<p><b>Yes</b></p>	<p><b>No</b></p>	<p><b>NA</b></p>
	<p><b>Were all actions</b> consistent with “steps for minimizing emissions” as set forth in the SSM Plan?</p>			
	<p><b>If the answer to 7.3 is “No,”</b> Explain (continue on back, if necessary):</p>			
	<p><b>Corrective Actions Taken</b></p>	<p><b>Date Corrective Action Taken</b></p>		



**MONITORING PLAN**

**CONTINUOUS EMISSION  
MONITORING SYSTEMS (CEMS)**

**TILDEN MINE**  
**UNIT 1 GRATE KILN INDURATING FURNACE**  
**STACKS T-1 NORTH AND T-1 SOUTH**

**Source Designation:**

Tilden Mine  
Unit 1 Grate Kiln Indurating Furnace  
Ishpeming, Michigan

**Concerning:**

Teledyne Monitor Labs T200H/O<sub>2</sub> NO<sub>x</sub> and O<sub>2</sub> Analyzers  
Teledyne Monitor Labs T100H SO<sub>2</sub> Analyzers  
MAC 155 Moisture Monitors  
Teledyne Monitor Labs Ultraflow 150 Stack Flow Monitors

Order No. 1000083

**Prepared by:**

Teledyne Monitor Labs, Inc • 35 Inverness Drive East • Englewood, CO 80112

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Revision Number	Revision Date	Comments
Rev 0	09/12/2013	Teledyne Monitor Labs
Rev 1	06/2017	Tilden Mine
Rev 2	12/2021	Tilden Mine

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## **SITE SPECIFIC INFORMATION**

The Unit 1 Grate Kiln Indurating Furnace receives pellets from the balling section, dries and preheats them on a traveling grate which discharges them into a rotary kiln for final induration. Unit 1 main burners are rated at 590 million BTU per hour heat input (mmBtu/hr). The Tilden facility produces hematite pellets and magnetite pellets. Unit 1 is fired with natural gas or coal. The unit is controlled with dry electrostatic precipitators.

At Tilden, continuous emission monitoring systems (CEMS) were installed to meet the specific requirements of the Federal Implementation Plan for Regional Haze (FIP), 40 CFR 52, Subpart X, as it applies to the State of Michigan, and the State of Michigan Permit to Install. The FIP requires monitoring of sulfur dioxide (SO<sub>2</sub>) in lb/hr and nitrogen dioxides (NO<sub>x</sub>) in lb/mmBtu from each stack associated with the indurating furnace. This Monitoring Plan addresses the emissions from the North and South stacks of the indurating furnace. There is also an un-monitored bypass stack. This source is not subject to the monitoring and reporting requirements of the Acid Rain Program.

Tilden Mining Company L.C.  
P.O. Box 2000  
Ishpeming, MI 49849

## **OBJECTIVES OF THE MONITORING PROGRAM**

Continuous emission monitoring of NO<sub>x</sub> and SO<sub>2</sub> is performed via test ports on the indurating furnace stacks. This monitoring plan addresses continuous emission monitoring of NO<sub>x</sub> lb/mmBtu and SO<sub>2</sub> lb/hr, as reported by this FIP source. These CEMS must be operated in accordance with the FIP, as well as 40CFR60.

Emissions monitoring requires CEMS that measure:

- 1) NO<sub>x</sub> and SO<sub>2</sub> emissions in dry parts per million (ppm);
- 2) Stack flow in wet scfh;
- 3) Percent moisture; and
- 4) Percent oxygen

Data processing and reporting for the monitoring system is performed by a personal computer-based data acquisition and handling system (DAHS) that receives data collected by the input sources. This monitoring approach is consistent with the FIP and 40CFR60.



Figure 1 below illustrates the location of CEMS and test ports for the monitoring program at Tilden.

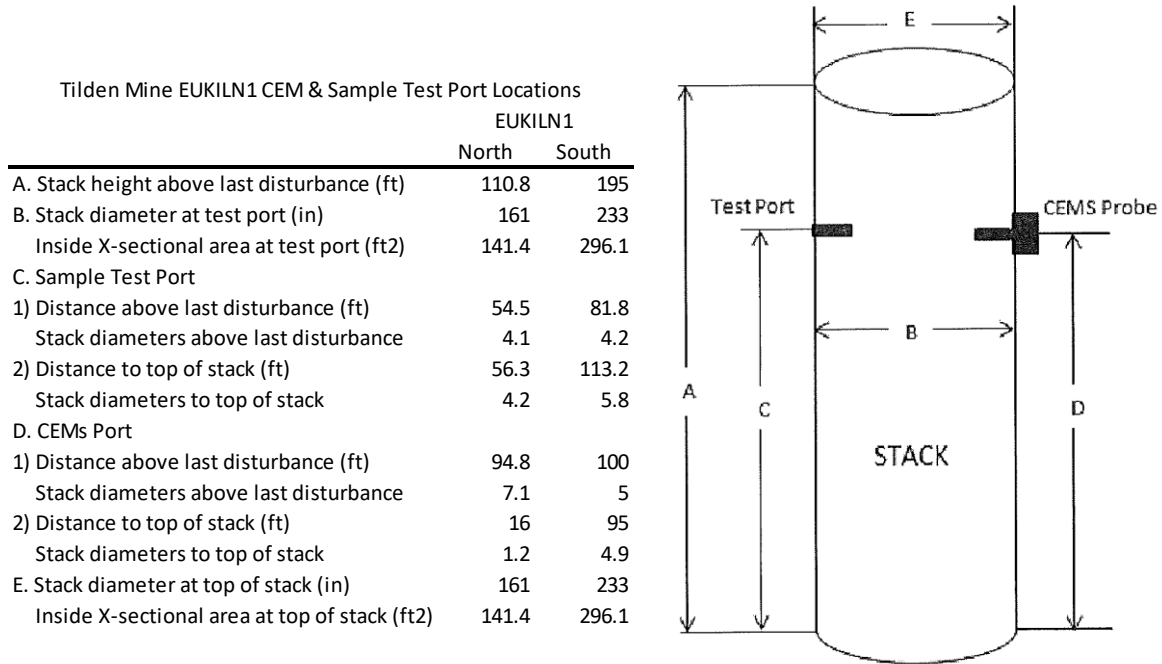


Figure 2 shows the schematic stack diagram.

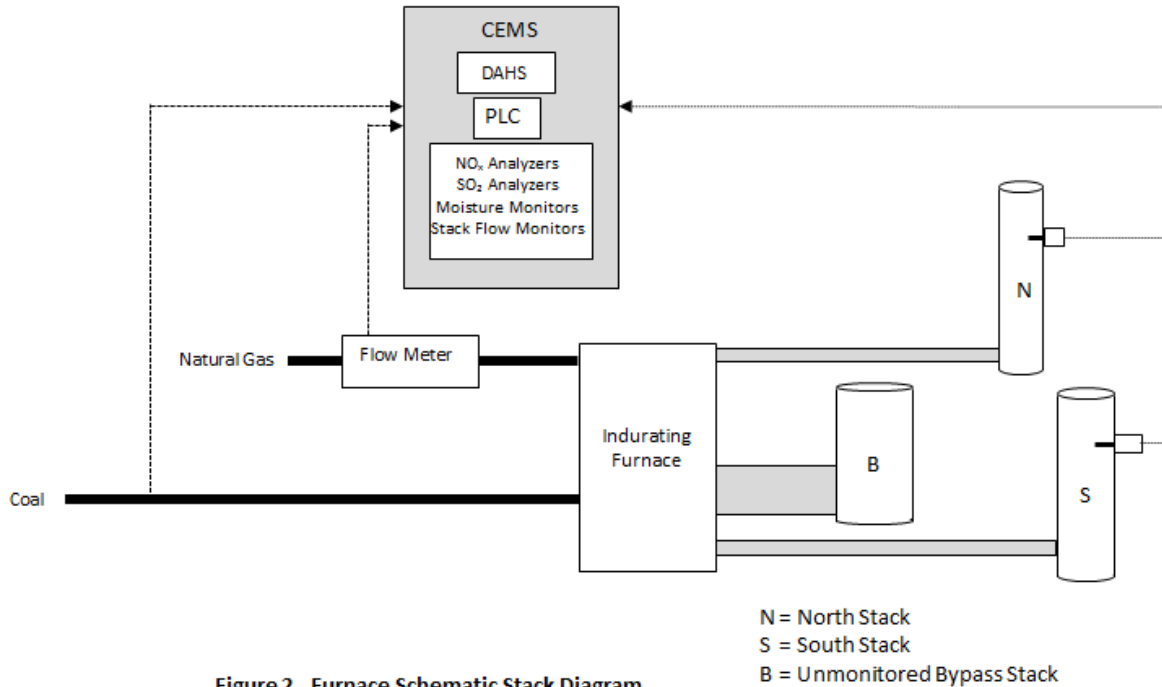
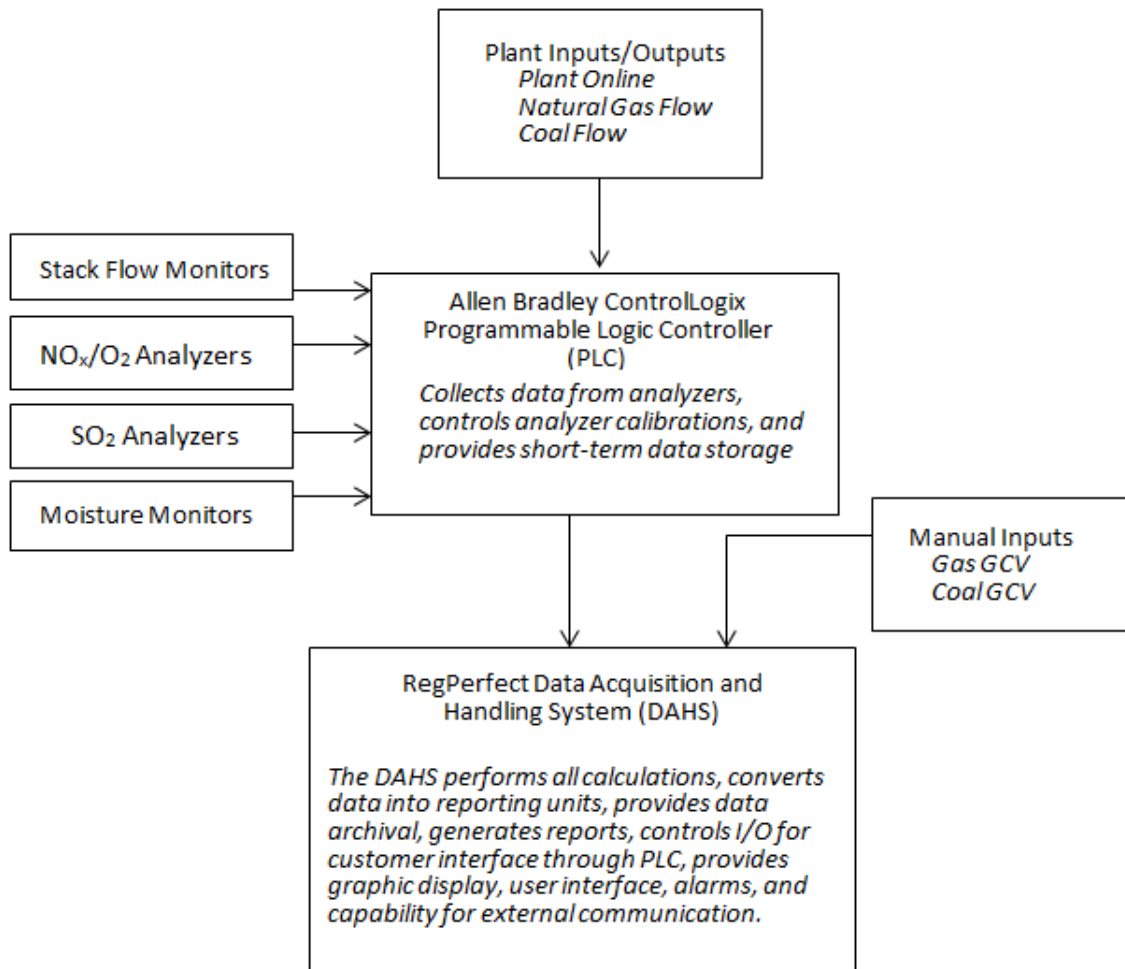


Figure 2. Furnace Schematic Stack Diagram

Figure 3 shows flow of data from the point of measurement to DAHS.



**Figure 3. Data Flow Diagram**

The DAHS hardware and software components include the following:

Hardware:

A. Allen Bradley ControlLogix Programmable Logic Controller (PLC) with functions to:

- Receive analyzer inputs.
- Receive other field input.
- Control calibration.
- Transmit data to the DAHS.
- Provides Data Storage Buffer.

B. DAHS with the following features and functions:

- IBM compatible Pentium based microcomputer.
- Receives and stores data.
- Transmits data to the Operator and Technician Stations, as applicable.
- Generates reports.

Software:

- A. Custom RegPerfect application software program by Teledyne Monitor Labs for data acquisition, storage, display, and reporting.
- B. Windows 2008 Operating System Software by Microsoft. The Windows 2008 Operating System Software allows the user to access the menu-driven Data Acquisition, Storage, Display, and Reporting Software while the DAHS collects and stores current data.
- C. The PLC ladder logic software resides in the central processing unit.

## EMISSION RATE CALCULATIONS

Each of the stack-mounted CEMS at Tilden includes dry extractive SO<sub>2</sub> and NO<sub>x</sub> analyzers, wet stack flow monitors, oxygen analyzers, and moisture analyzers. Tables in Appendix A show the manufacturer, model number, and serial number for each installed component. The Michigan FIP sets emission limits at Tilden for SO<sub>2</sub> in lb/hr and for NO<sub>x</sub> in lb/mmBtu, while the State of Michigan Permit sets a limit for NO<sub>x</sub> in lb/hr. Each of these parameters is calculated as described here.

SO<sub>2</sub> lb/hr

$$SO_2M = K \times C_{hd} \times Q_{hw} \times \frac{100.0 - \%H_2O}{100.0}$$

where:

- SO<sub>2</sub> M = SO<sub>2</sub> emission rate in lb/hr
- K = 1.660 x 10<sup>-7</sup> (lb/scf) / ppm
- C<sub>hd</sub> = SO<sub>2</sub> ppm, dry
- Q<sub>hw</sub> = Stack Flow scfh, wet
- %H<sub>2</sub>O = Stack moisture %

NO<sub>x</sub> lb/hr

$$NO_xM = K \times C_{hd} \times Q_{hw} \times \frac{100.0 - \%H_2O}{100.0}$$

where:

- NO<sub>x</sub> M = NO<sub>x</sub> emission rate in lb/hr
- K = 1.194 x 10<sup>-7</sup> (lb/scf) / ppm
- C<sub>hd</sub> = NO<sub>x</sub> ppm, dry
- Q<sub>hw</sub> = Stack Flow scfh, wet
- %H<sub>2</sub>O = Stack moisture %

### NO<sub>x</sub> lb/mmBtu

The emission rate for NO<sub>x</sub> in lb/mmBtu is calculated based on the following formula. The formula will be finalized upon EPA approval of Tilden's requested NO<sub>x</sub> emission limit.

$$NOxR = K \times C_h \times F_d \times \frac{20.9}{20.9 - \%O_2}$$

where:

- NO<sub>x</sub>R = NO<sub>x</sub> emission rate in lb/mmBtu
- K = 1.194 x 10<sup>-7</sup>
- C<sub>h</sub> = Stack NO<sub>x</sub> ppm
- F<sub>d</sub> = Fuel factor, dscf/mmBtu
- %O<sub>2</sub> = Stack O<sub>2</sub>%

### F<sub>d</sub>, dscf/mmBtu

A prorated fuel factor (dscf/mmBtu) is calculated as follows:

$$F_d = (HIGas * FdGas * BurnGas + HICoal * FdCoal * BurnCoal) / (HITotal * OpTime)$$

Where:

- HIGas = Natural gas heat input, mmBtu per hour
- FdGas = Dscf/mmBtu natural gas
- BurnGas = Duration of natural gas burning, hours
- HICoal = Coal heat input, mmBtu per hour
- FdCoal = Dscf/mmBtu coal
- BurnCoal = Duration of coal burning, hours
- HITotal = Total heat input, mmBtu per hour
- OpTime = Duration of operation, hours

## **DATA ESTIMATION WHEN CEMS DATA IS UNAVAILABLE**

The Michigan FIP states that emission data must be obtained using other monitoring systems or emission estimation methods whenever data from the CEMS are not available due to CEMS breakdowns, repairs, calibration checks, or zero and span adjustments. Such emission estimation methods must be used to ensure the required 18 out of every 24 hours of data and 22 out of 30 days of data are obtained. The Tilden DAHS will flag data (NO<sub>x</sub>, SO<sub>2</sub>, moisture, and stack flow) as invalid whenever such a situation occurs. The user will evaluate the "missing" data period and determine how to best estimate representative data for that period. Typically, such periods of unavailable CEMS data will be estimated by averaging the valid data from immediately before and after the missing data period.

As stated in the Taconite FIP, the induration unit is in operation any time fuel is combusted regardless of whether pellets are produced. Therefore the CEMS will be in operation during all

times fuel is combusted in the induration unit, including startup, shutdown, or malfunctions. The facility follows its operational startup, shutdown, and malfunction plan during such periods to ensure that good combustion practices, in accordance with the Taconite MACT (40CFR63, Subpart RRRRR) are observed during the operation of the indurating furnace at all times.

## **DESCRIPTION OF THE QA/QC PROGRAM**

At Tilden, NO<sub>x</sub>, SO<sub>2</sub>, stack flow, oxygen, and moisture CEMS were installed to meet the specific requirements of the Michigan FIP. The FIP states that a Quality Control Program must be developed and implemented for all CEMS required by this section in accordance with 40 CFR Part 60. The quality assurance requirements of 40CFR60, are outlined in the site-specific QA/QC Plan, under separate title.

## **CEMS SPARE PARTS**

See CEMS Comprehensive Operation and Maintenance Manual and Ellipse system for stock coded CEMS spare parts

## **ROLLING AVERAGE CALCULATIONS**

### 30-Day Averages

Hourly average values of NO<sub>x</sub> lb/mmBtu and SO<sub>2</sub> lb/hr are calculated as described in the “Emission Rate Calculations” section above. Daily average values are calculated for each of these parameters, each average requiring a minimum data capture of 75%, or 18 hours in each 24-hour period. Each day a new 30-day average is calculated based on the previous 30-unit operating days. This rolling 30-day calculation requires a minimum data capture of 22 out of the 30 operating days.

### 720-Hour Averages

40 CFR 52.1183(k)(1) establishes a rolling 720-hour average NO<sub>x</sub> limit of 2.8 lb/mmBtu. This limit becomes effective the following two events:

1. 60 months following May 12, 2016 (i.e., May 12, 2021); and
2. EPA confirms or modifies this limit in accordance with procedures in 40 CFR 52.1183(k)(1)(ii) – (viii).

As of this version of the monitoring plan (December 14, 2021), EPA has not acted on the limit pursuant to the regulatory requirements. Therefore, at present, the 720-hour average NO<sub>x</sub> limit does not apply.

## **EXCESS EMISSION ROOT CAUSE AND ACTION**

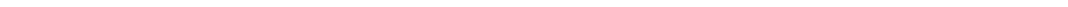
Please see the site-specific QAQC Manual for details regarding recommendations for avoiding excess emissions and monitor downtime. The following list provides general guidance for ensuring ongoing quality assurance and monitor availability.

- Review the year's data to ensure that there weren't any recurring systematic errors generated in the RegPerfect DAHS. Generate reports of invalid data and assign root cause to each invalid data point and put in place procedures to avoid future recurrences of these problems. Review submitted reports to verify all of the reports and records submitted were in accordance with the regulations.
- Once it has been established that the data collected for the specified year is acceptable, set the data lock date feature in the DAHS. This will lock the data so that it cannot be inadvertently modified by a re-calculation, error, or mistake that might affect quality-assured data that has already been submitted and verified prior to the locked date setting.
- Set up a meeting to collectively examine the latest changes to the regulations to ensure that the CEMS is still current with the specifications required for your process. If the latest changes to the regulations now specify that it is necessary to change/modify the CEMS, establish an action plan to make the modifications in a timely manner in order to comply with the most recent regulations.
- Review the training requirements to ensure that employees are trained in compliance with any new or modified regulations.
- Review excess emissions events and correlate with their root cause. Put into practice procedures to ensure that these events will be minimized in the future. A sample of the Quarterly Excess Emissions Report is available in Appendix C.
- Generate an inventory of current spare parts for the CEMS and restock any necessary spare parts for the upcoming year.
- Make sure that all preventative maintenance was performed for the prior year. If all maintenance was not performed, find out why and ensure that any outstanding maintenance is completed.
- Review CEMS maintenance agreements for any applicable contract dates.

## **COAL SULFUR SAMPLING**

The indurating furnace at Tilden is fired with natural gas or coal. A description of the sampling and calculation methodology for determining the percent sulfur by weight as a monthly block average for coal used during each month, as required by 40CFR52.1183(n)(8)(x), is included in Appendix B.

## **APPENDICES**



## APPENDIX A – CEMS Components

### CEMS Components

Stack	Parameter	Range	Manufacturer	Model	Serial Number
T-1 North	NO <sub>x</sub>	0 - 600 ppm	Teledyne	T200H/O2	149
	O <sub>2</sub>	0 - 25%			
	SO <sub>2</sub>	0 - 100 ppm	Teledyne	T100H	147
	Stack Flow	0 - 24,000 kscfh	Teledyne	Ultraflow 150	1501325
	Moisture	0 - 30%	MAC	MAC155	3139
T-1 South	NO <sub>x</sub>	0 - 600 ppm	Teledyne	T200H/O2	148
	O <sub>2</sub>	0 - 25%			
	SO <sub>2</sub>	0 - 100 ppm	Teledyne	T100H	146
	Stack Flow	0 - 53,000 kscfh	Teledyne	Ultraflow 150	1501324
	Moisture	0 - 30%	MAC	MAC155	3141

---



## **APPENDIX B – Coal Sulfur Sampling**

One coal sample is collected each week the induration is burning coal. The samples are forwarded to the laboratory, which will composite the samples by calendar month and provide an analysis.

---

# APPENDIX C – Sample of Quarterly Excess Emissions Report

MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

## AIR QUALITY DIVISION

### Summary Report for Gaseous and Opacity Excess Emission and Monitoring System Performance

Pollutant: \_\_\_\_\_ Reporting period: \_\_\_\_\_

Diluent: \_\_\_\_\_ Volumetric Flow: yes/no

Company: \_\_\_\_\_ Unit Description: \_\_\_\_\_

Emission Limit: \_\_\_\_\_ Total Source Operation Time: \_\_\_\_\_

Monitor Manufacturer, Model No., & Serial No.: \_\_\_\_\_

#### **Emission Data Summary**

1. Duration of Excess Emissions (EE) in reporting period due to:
  - a. Startup/Shutdown \_\_\_\_\_
  - b. Soot Blowing \_\_\_\_\_
  - c. Control Equipment Problems \_\_\_\_\_
  - d. Process Problems \_\_\_\_\_
  - e. Other Known Causes \_\_\_\_\_
  - f. Unknown Causes \_\_\_\_\_
2. Total Duration of EE's \_\_\_\_\_
3. Total Duration of EE's/Total Source Operation Time X 100 \_\_\_\_\_%

#### **CEM System Summary**

1. CEM system downtime in reporting period due to:
  - a. Monitor Equipment Malfunctions \_\_\_\_\_
  - b. Non-Monitor Equipment Malfunctions \_\_\_\_\_
  - c. Quality Assurance Calibrations (Excess) \_\_\_\_\_
  - d. Other Known Causes \_\_\_\_\_
  - e. Unknown Causes \_\_\_\_\_
2. Total CEM System Downtime \_\_\_\_\_
3. Total CEM System Downtime/Total Source Operation Time X 100 \_\_\_\_\_%

**Comments:** \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

I certify that the information contained in this report is true, accurate and complete.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

\*Opacity operation time is to be recorded in minutes, Gaseous is recorded in hours.

\_\_\_\_\_



**QUALITY ASSURANCE/QUALITY CONTROL PLAN**

**CONTINUOUS EMISSION  
MONITORING SYSTEMS (CEMS)**

**TILDEN MINING COMPANY  
UNIT 1 GRATE KILN INDURATING FURNACE  
STACKS T-1 NORTH AND T-1 SOUTH**

**Source Designation:**

Tilden Mining Company  
Unit 1 Grate Kiln Indurating Furnace  
1 Tilden Mine Road  
Ishpeming, Michigan, 49849

**Concerning:**

Teledyne Monitor Labs T200H/O<sub>2</sub> NO<sub>x</sub> and O<sub>2</sub> Analyzers  
Teledyne Monitor Labs T100H SO<sub>2</sub> Analyzers  
MAC 155 Moisture Monitors  
Teledyne Monitor Labs Ultraflow 150 Stack Flow Monitors

Order No. 1000083

**Prepared by:**

Teledyne Monitor Labs, Inc • 35 Inverness Drive East • Englewood, CO 80112

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NOTE: This is a living document; please refer to current versions of any referenced documents.

## ACRONYM LIST

<u>Acronym</u>	<u>Definition</u>
µgm/scm	micrograms per standard cubic meter
%	Percent
°F	degrees Fahrenheit
40CFR60	Title 40, Code of Federal Regulations, Part 60
40CFR75	Title 40, Code of Federal Regulations, Part 75
ACA	absolute correction audit
Btu	British thermal unit
CD	calibration drift
CEMS	continuous emission monitoring systems
CGA	cylinder gas audit
CO	carbon monoxide
CO <sub>2</sub>	carbon dioxide
COA	certificate of analysis
COMS	continuous opacity monitoring systems
DAHS	data acquisition and handling system
ECMPS	emissions collection and monitoring plan system
EDR	electronic data reporting
EGLE	State of Michigan Department of Environment, Great Lakes, & Energy
EPA	U.S. Environmental Protection Agency
ESP	electrostatic precipitator
ETPM	EPA traceability protocol materials
fps	feet per second
Hg	mercury
HMI	human-machine interface
HSL	heated sample line
HVAC	heating, ventilating, and air conditioning
lb/hr	pounds per hour
lb/mmBtu	pounds per million British thermal units
mmBtu/hr	million British thermal units per hour
MW	Megawatts
NO <sub>x</sub>	nitrogen oxides
PLC	programmable logic controller
PM	particulate matter
ppm	parts per million
PS	performance specification
psi	pounds per square inch
QA	quality assurance
QA operating quarter	quarterly operating time ≥ 168 hours during quarter
QC	quality control
RA	relative accuracy
RATA	relative accuracy test audit
RCA	response correlation audit
RM	reference method
RRA	relative response audit
scfm	standard cubic feet per minute
SCR	selective catalytic reduction
SO <sub>2</sub>	sulfur dioxide
SVA	sample volume audit
TCP/IP	Transmission Control Protocol/Internet Protocol
UPS	uninterruptible power supply
WESP	wet electrostatic precipitator
WFGD	wet flue gas desulfurization



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## **SECTION 1 – INTRODUCTION**

This Quality Assurance/Quality Control (QA/QC) Plan has been prepared for operators of the continuous emissions monitoring systems (CEMS) at the Tilden Mining Company L.C. (Tilden) Unit 1 Grate Kiln Indurating Furnace in Ishpeming, Michigan. The CEMS and associated data acquisition and handling system (DAHS) are used for measuring the emissions associated with Stacks T-1 North and South. The goal of this QA/QC Plan is to establish procedures, which provide emission data of known acceptable quality and quantity.

It is the policy of Tilden to efficiently operate and maintain its facilities and CEMS in accordance with the best operating practices and applicable environmental regulations. Tilden is committed to collecting necessary data to demonstrate that its operations comply with its applicable permits. Tilden is also committed to see that all environmental control systems operate within acceptable limits.

Tilden recognizes that the reliability and acceptability of CEMS data depend on completion of all activities stipulated in a well-defined QA/QC Plan. Accordingly, the objective of this QA/QC Plan is to define those activities necessary to guarantee that CEMS data quality is maintained at acceptable levels. This plan also provides the framework for carrying out QA activities by addressing items such as documentation, training, corrective actions, and preventive maintenance activities.

### **1.1 Quality Assurance and Quality Control Defined**

Quality Assurance (QA) and Quality Control (QC) are two independent and interrelated functions. Quality Control can be defined as the series of activities performed to provide a quality product (data). Quality Assurance can be defined as the system of activities to provide assurance that the QC is adequately performed.

A QA/QC Plan has the following two functions: (1) QA – the assessment of the quality of the data (accuracy and precision), and (2) QC – activities that maintain or improve data quality. Both functions form a control loop. When accuracy or precision is unacceptable, QC must increase until the quality of data is acceptable.

This QA/QC Plan was developed from guidelines contained in 40CFR60 established by the U.S. Environmental Protection Agency (EPA). This plan also describes necessary support services and activities, such as data reduction and report preparation, which are required to maintain data quality. Periodic evaluations (daily, quarterly, semiannual, and annual) are required to ensure the accuracy and the precision of the data attained to monitor emissions on site. The required evaluations for 40CFR60 are summarized in Table V.

At Tilden, nitrogen oxide (NO<sub>x</sub>), oxygen (O<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), moisture (H<sub>2</sub>O), and stack flow CEMS were installed on both furnace stacks to meet the specific requirements of the State of Michigan Permit to Install and the Federal Implementation Plan for Regional Haze (FIP), 40CFR52 Subpart X, as it applies to the State of Michigan. The FIP states that a Quality Control Program must be developed and implemented for all CEMS required by this section in accordance with 40 CFR Part 60. The quality assurance requirements of 40CFR60, Appendix F, Procedure 1, Section 3 are outlined in this QA/QC Plan.

Quality data shall be assured through routine preventive maintenance, daily checks, daily calibrations, and quarterly/annual audits. Please note that this QA/QC Plan does not completely address all QA/QC activities. Those activities not fully addressed are included in the Comprehensive CEMS Operations and Maintenance Manual, plant operating procedures, and plant internal procedures for procurement and inventory control. These procedures are referenced in this QA/QC Plan and may be updated as the CEMS program develops through operational experience. Any updates that require revising the QA/QC Plan will be identified within the Plan's revision page.

### **1.2 Organization and Responsibilities**

Specific facility personnel or designated subcontractors are assigned responsibility for the CEMS operational status, instrument maintenance, and system control. The following list provides a guideline of responsibilities for the operation and maintenance of the CEMS.

*Electrical Instrument Repairman (ER)*

- Responsible for regular inspection, maintenance, and repair documentation of each CEMS.
- Communicates to facility management all CEMS performance and maintenance problems.
- Performs CEMS preventative maintenance and corrective action activities.
- Performs and documents all preventive maintenance checks.
- Performs routine QA/QC and maintenance activities.
- Responds to CEMS alarms requiring corrective maintenance.
- Troubleshoots and repairs all CEMS equipment, as necessary.
- Maintains CEMS maintenance log and records.
- Maintain calibration gases for scheduled tests.

*CEMS Process Engineer*

- Ensures daily operational status of the CEMS.
- Performs management of CEMS spare parts and calibration gases.
- Ensures that personnel are adequately trained to take the appropriate corrective action when CEMS alarms or system faults occur.
- Has shared responsibility for CEMS maintenance, training, spare parts, documentation of repairs, and preventive maintenance program.
- Manages CEMS database.
- Coordinates quarterly cylinder gas audits (subcontracted).
- Assists with annual stack test certification.

### *Environmental Department*

- Has overall responsibility for preparation and submittal of required CEMS reports to regulatory agencies.
- Overall responsibility for interpreting current, new, and proposed regulations.
- Works closely with maintenance and operations to ensure that each CEMS is operated and maintained as required.
- Provides strategic planning regarding the replacement/upgrade of CEMS and DAHS equipment.
- Communicates CEMS test notifications to regulatory agencies.
- Receives, evaluates, and processes QA/QC Plan revision requests. Approves all QA/QC Plan revisions.
- Ensures CEMS regulatory training is provided.
- Reviews all quarterly, semiannual, and annual QA audits and activity for the CEMS.
- Manages CEMS database and reporting.
- Serves as regulatory and support services interface, including CEMS Quarterly and Annual Reporting.

### **1.3 Training and Qualification Policy**

Training is an essential element of a successful QA/QC program and the framework by which activities are performed in a consistent manner regardless of whom completes them. It provides the basic knowledge required to correctly complete procedures and an understanding of a given task or procedure, thus enabling the individual involved to make effective decisions. If the system is modified or new personnel become responsible for CEMS operation, thorough training must be provided to ensure CEMS operate at its full potential.

Employees directly involved in the CEMS program must review this QA/QC Plan, as well as applicable regulatory documents (such as the facility operating permit, 40CFR60, etc.). Affected employees must, at a minimum, be familiar with and review appropriate standard operating procedures as they are developed or revised.

### **1.4 CEMS Description and Design Considerations**

The Unit 1 Grate Kiln Indurating Furnace receives pellets from the balling section, dries and preheats them on a traveling grate, which discharges them into a rotary kiln for final induration. Unit 1 main burners are rated at 590 million BTU per hour heat input (mmBtu/hr). The Tilden facility produces hematite pellets and magnetite pellets. Unit 1 is fired with natural gas or coal. The unit is controlled with dry electrostatic precipitators. The Michigan FIP requires monitoring of SO<sub>2</sub> (lb/hr) and NO<sub>x</sub> (lb/mmBtu) from each stack associated with the indurating furnace. This QA Plan addresses the emissions from the indurating furnace.

#### **1.4.1 CEMS Descriptions**

The CEMS are located in an environmentally controlled shelter including analyzers and their associated DAHS. The dry extractive system analyzers monitor NO<sub>x</sub>, SO<sub>2</sub>, and O<sub>2</sub>. Each analyzer system draws a volumetric sample of flue gases through the sample probe located in the stack. The sample, conditioned for moisture removal, is routed to gas analyzers for dry measurement. The probe is installed in a location that is accessible at all times and during any weather conditions, so that routine maintenance can be performed on schedule, as outlined in the QA/QC manual.

The operation of the CEMS is controlled by the programmable logic controller (PLC) in the analysis cabinet that enables monitoring and adjustment of the critical flow and pressure parameters and indicates operational modes such as sampling, calibration, back purge, and by-pass. The CEMS cabinet contains gauges and meters for calibration and blowback flow, vacuum, and diluent pressure. A diagnostic control center performs complete system diagnostics and provides access to all diagnostic data. The standard diagnostics package performs real-time failure warnings, such as excessive calibration drift, and provides a fail-safe startup of the CEMS. The electronic signals processed by the analyzer controller are sent to the DAHS.

The CEMS use nitrogen oxides analyzers that measure the chemiluminescent reaction between oxides of nitrogen and ozone, as well as oxygen via paramagnetic sensors; and sulfur dioxide analyzers that measure the concentration of sulfur dioxides by exposing sulfur dioxide molecules to ultraviolet light, which excites the molecules, and causes the excited molecules to return to natural state by fluorescing. Stack flow is measured with an ultrasonic stack flow monitor. The volumetric flow measurement is on a wet basis, while the extractive gas analyzers measure on a dry basis. The CEMS include a moisture monitor to account for the difference between wet and dry measurements in the calculation of mass emission.

Table I below illustrates the CEMS that have been installed and certified at Tilden. This table is to be managed and periodically updated as equipment is modified, and certification testing is performed.

**Table I. CEMS Installed at Tilden**

<b>Emissions Analyzed (Ranges)</b>	<b>MFR/Model</b>	<b>Stack T-1 North</b>	<b>Stack T-1 South</b>
NO <sub>x</sub> (H)	Teledyne T200H/O2	148	149
O <sub>2</sub> (H)			
SO <sub>2</sub> (H)	Teledyne T100H	146	147
Stack Flow	Teledyne Ultraflow 150	1501324	1501325
Moisture	MAC 155-L	3141	3139

#### 1.4.2 Data Acquisition Handling System

The DAHS is the electronic component of the CEMS designed to interpret and convert individual output signals from the pollutant concentration monitors, diluent monitors and other components of the CEMS to produce a continuous readout of the measured parameters in units required by the regulatory agency. The DAHS is an automated system that records CEMS data as instantaneous readings, creates one-minute averages, and then averages the data for subsequent calculations and report preparation. Reports prepared by the system include alarm, calibration, and routine emission reports.

The DAHS is capable of reading all values over the full range of each measurement device and creating a permanent record of all required raw and calculated data for storage, review, and reporting. In addition, a continuous readout in units of each applicable emission standard or operating criteria is displayed for the user.

#### 1.4.3 Security – CEMS/DAHS

RegPerfect is the software used to compile and store data. Database security for RegPerfect is accomplished using standard Windows Integrated Security. The Windows operating system, in conjunction with SQL Server, identifies a Windows user and determines if the user has access to the portion of the database requested. Aside from the standard Windows users and groups, four RegPerfect user groups are added to RegPerfect servers and workstations to accommodate varying levels of security access permissions. The RegPerfect Manual contained within the Comprehensive CEMS Operations and Maintenance Manual (Reference 10 in Section 5) has specific information regarding security permissions.

The CEMS shelter is equipped with a set of keys, which deny unauthorized physical access into the CEMS. The CEMS shelter is to be locked under normal operating conditions.

## SECTION 2 – QUALITY CONTROL PROCEDURES

Quality control checks are those checks performed on a routine basis. System inspections, periodic calibrations and routine maintenance are standard operating procedures (SOPs) illustrated here.

### 2.1 Initial Certification / Recertification

Whenever a continuous emission monitoring system is installed to meet regulatory requirements, where no continuous emission or opacity monitoring system was previously installed, initial certification is required. Whenever a significant replacement, modification, or change in a certified continuous emission monitoring system is made, recertification of the continuous emission monitoring system may be necessary. Following 40CFR60 as it applies to NO<sub>x</sub>, SO<sub>2</sub>, O<sub>2</sub>, moisture, and stack flow, initial certification consists of a 7-day calibration error test and a RATA.

### 2.1.1 7-Day Calibration Error Test

For initial certification (or in some instances recertification) of a CEMS, it is necessary to perform a seven-day calibration error test, which measures the CEMS drift over an extended operational period. The measurement of calibration error for the seven-day calibration error test must be done while the unit is combusting fuel. The test is performed over seven consecutive operating days, but the seven consecutive unit-operating days need not be seven consecutive calendar days.

Manual or automatic adjustments to the monitor settings may not be made until after taking measurements at both the zero and high-level concentrations for a given day of testing. If automatic adjustments are made following both injections, conduct the calibration error test such that the magnitude of the adjustments can be determined and recorded.

The calibration error tests should be performed approximately twenty-four hours apart, unless the seven-day test is performed over non-consecutive calendar days. The calibration error tests must be performed at both a zero-level concentration (0-20% of span), and a high-level concentration (50-100% of span). Typically, an EPA Traceability Protocol Materials (ETPM) gas is an acceptable gas to use for a calibration error test. The ETPM gas must have a specialty gas-producer uncertainty less than 2.0% of the certified concentration of the gas mixture.

During the calibration, reference gases will be injected so as to pass through all filters, scrubbers, conditioners, and other monitor components used during normal sampling and through as much of the sampling probe as is practical. The analyzers must be operating under the normal sampling mode.

### 2.1.2 Relative Accuracy Test Audit

Perform relative accuracy testing as described in Section 2.2.5

## 2.2 Periodic Testing

Periodic Testing for the NO<sub>x</sub> SO<sub>2</sub>, O<sub>2</sub>, moisture, and stack flow systems include daily calibrations checks, quarterly cylinder gas audits (does not apply to stack flow), and annual RATAs.

### 2.2.1 Daily Inspection

An inspection of the CEMS on a routine basis ensures the maximum capability of the system. A trained CEMS technician is able to recognize a problem based upon discrepancies in the daily operation check procedure. An electronic CEMS maintenance log is maintained to document daily system operational status information, record any maintenance performed, and track long-term performance of the system. An electronic file stored in the DAHS contains a record of the CEMS daily calibration activities.

The routine inspection begins with a visual inspection of the electrical and plumbing systems and components, which include air lines, sample lines, and support bundles, as relevant. This procedure allows early detection of accidental damage to the CEMS. The daily operational checks include a check of the calibration gas cylinders to verify sufficient supply for the next 24 hours (at least 200 psi, assuming one CEMS is drawing gas from the cylinder).

The CEMS ER examines the daily calibrations to verify proper CEMS operation and monitor for excessive calibration drift. Daily calibration results are automatically emailed to all personnel responsible for CEMS maintenance and operation.

Indicator lights and alarms on the system or monitor control panel are also examined. The system indicator lights notify the operator of out-of-range conditions or other potential problems associated with the CEMS. Action is initiated immediately if an indicator light is illuminated, as subsequent data acquired may be suspect and flagged accordingly.

To maintain quality control in the CEMS, the system is set to perform daily zero and high-reference calibration checks. The system will run a check on each gas analyzer with an ETPM grade gas bottle testing the span value of the system. While the daily span calibration for the O<sub>2</sub> analyzer is being checked, the daily zero calibration for the NO<sub>x</sub> and SO<sub>2</sub> analyzers are checked. Alternately, while the daily high-reference calibration for the NO<sub>x</sub> and/or SO<sub>2</sub> analyzers are being checked, the daily zero calibration for the O<sub>2</sub> analyzers are checked. These checks are used to ensure that the system's data is accurate day-to-day.

Another daily quality control check to be performed is to observe the DAHS to find any errors or alarms that have been logged in the past day. Visually inspect the CEMS for any unusual readings on flowmeters, rotameters, vacuum gauges, pressure gauges. Check the front of the analyzers for faults to ensure the analyzers are not experiencing any degradation under normal operating conditions.

### 2.2.2 Calibration Checks

Calibration error is the difference between the response of a gaseous monitor to a calibration gas and the known concentration of the calibration gas. Each analyzer is checked daily to verify that the calibration error is within acceptable limits.

#### *Test Gases*

Test gases must be ETPM grade. Gases used during the calibration drift and response time tests must be certified to an accuracy of 2.0% by the supplier, but protocol gases may be used if desired.

To ensure that the correct bottle values are maintained within the DAHS, the Editor application can log: 1) the bottle value, 2) the bottle certification date, 3) the bottle serial number, and 4) the bottle expiration date to keep all values for calibrations up to date, so that the date remains valid after changing a calibration bottle.

An inventory of three spare cylinders of daily calibration gas are maintained in addition to the in-service cylinder. The CEMS PE orders replacement cylinders when a spare cylinder is put into service. One bottle each should be sufficient for all other cylinder gases. Each gas cylinder has a balance of N<sub>2</sub> to fill the bottles. Always make sure to open the bottle valves and verify gas bottle pressure regulator readings after installing a new bottle.

Dynamic calibration checks are performed by challenging the entire sampling and analysis system of the CEMS with a zero and high-level gas of known concentration once every 24 hours. A programmable timer automatically initiates the daily check, based on the time set in the DAHS constant file. A manual calibration can be performed by following the step-by-step procedure illustrated in the Calibration Section of each analyzer's Operator Manual (see References 11 and 12 in Section 5).

During the calibration check of the CEMS, the data system verifies the proper completion of the calibration cycle. For the NO<sub>x</sub> and SO<sub>2</sub> analyzers, should any zero or high-level drift exceed 2.5% of the instrument span, an alarm condition is indicated, and remedial actions are initiated. For the O<sub>2</sub> monitors, should any zero or high-level drift exceed 0.5% O<sub>2</sub>, an alarm condition is indicated, and remedial actions are initiated. For the moisture monitors, should any zero or high-level drift exceed 5.0% of the instrument full scale, an alarm condition is indicated, and remedial actions are initiated. For the stack flow monitors, should any zero or upscale drift exceed 3.0% of the instrument span, an alarm condition is indicated, and remedial actions are initiated.

Cylinder gases are required for certification, daily calibration, and quarterly quality assurance/quality control assessments. Table II below illustrates the instrument spans and measurement ranges.

**Table II. Instrument Measurement Range of the CEMS**

Location	Parameter	Range	Span	Full-Scale Range
	NO <sub>x</sub>	High	800 ppm	0 – 1,000 ppm

Stack T-1 North	O <sub>2</sub>	High	18 %	0 – 25 %
	SO <sub>2</sub>	High	95.9 ppm	0 – 125 ppm
	Stack Flow	N/A	14,500 kscfh	0 – 24,000 kscfh
	Moisture	N/A	12 %	6 – 15 %
Stack T-1 South	NO <sub>x</sub>	High	800 ppm	0 – 1000 ppm
	O <sub>2</sub>	High	18 %	0 – 25 %
	SO <sub>2</sub>	High	95.9 ppm	0 – 125 ppm
	Stack Flow	N/A	32,000 kscfh	0 – 53,000 kscfh
	Moisture	N/A	12 %	6 – 15 %

A calibration is performed for each instrument installed in the CEMS that is measuring and reporting emissions. The zero and high-level calibration is programmed to be performed once every twenty-four (24) hours. The calibration standards consist of calibration cylinder gases. The zero gas calibration is conducted at a measurement level at or between 0 – 20% of instrument measurement span. The high-level gas calibration is conducted between 50 – 100% of the instrument measurement span for gases regulated under 40CFR60.

It is critical that the correct calibration reference gas standard is entered in the DAHS constants file. The calibration standard (concentration) is illustrated on the certification sheet that accompanies the calibration cylinder at the time of delivery. The date at which the bottle was put in service shall be recorded in the CEMS maintenance log. The certification sheet that accompanied the calibration cylinder will be filed, for future reference. The date and hour that the calibration cylinder was replaced for system use will also be recorded within the CEMS log.

Zero gases will be certified by the gas vendor not to contain concentrations of SO<sub>2</sub>, NO<sub>x</sub> or total hydrocarbons above 0.1 ppm, a concentration of CO greater than 1 ppm, or a concentration of CO<sub>2</sub> greater than 400 ppm, as per 40CFR72, Subpart A, 72.2 *Zero Air Material* (1) (This standard will also meet the applicable Part 60 standard). Zero gases shall not contain concentrations of other gases that will interfere with instrument readings or cause the instrument to read concentrations of the gas being analyzed. Traceability of the daily calibration cylinder gases to higher standards, such as ETPM gas following the most recent edition of EPA’s Traceability Protocol No. 1, is required.

The time for the calibration to occur is set at the same time daily to meet the daily CEMS inspection schedule. The daily calibration sequence introduces calibration gases into the system at the CEMS probe. The calibration gases are analyzed in the same method as the gases, for verifying the instrument’s entire sampling and analysis system.

The gases are analyzed, and the data is recorded and archived by the DAHS. Daily calibration results are automatically emailed to all personnel responsible for CEMS maintenance and operation.

#### *Daily CEMS Drift Assessment and Corrective Action*

The CEMS performs a calibration once every twenty-four (24) hours. The CEMS are out-of-control and re-adjustment is required when:

Under 40CFR60:

- Either the zero or high-level calibration drift exceeds twice (2x) the applicable standard (40CFR60, Appendix B Performance Specifications) for calibration error for a period of five (5) consecutive days.
- Either the zero or high-level calibration drift exceeds four times (4x) the applicable standard for calibration error for one (1) twenty-four (24) hour period.

Refer to Table V for the applicable standards for calibration error that warrant an out-of-control condition.

If an out-of-control condition exists, corrective action is initiated immediately. Corrective action steps are identified in the Operation and Maintenance Manuals or the analyzer’s manual for each specific CEMS. Corrective action steps may include but are not limited to: adjustment of the analyzer potentiometers, calibration of gas flow rates and pressures, or correction of any problem associated with calibration gas, instrument air lines, or sample lines installed



on the stack. Calibration drift checks are repeated following corrective action to verify the CEMS meets calibration requirements and is no longer out-of-control.

For a pollutant gas regulated under 40CFR60, an out-of-control period begins after the fifth, consecutive, daily CD check resulting in a CD in excess of twice the allowable limit; or, the time corresponding to the completion of the daily CD check preceding the daily CD check that results in a CD in excess of four times the allowable limit. The end of the out-of-control period is the time corresponding to the completion of the CD check following corrective action that results in the CD's at both the zero (or low-level) and high-level measurement points being within their allowable CD limit (either twice, or four times the allowable limit specified in Appendix B).

### 2.2.3 Quarterly Cylinder Gas Audit

A cylinder gas audit (CGA) is conducted three of four calendar quarters, but in no more than three quarters in succession. A CGA may be performed when the unit is either on-line or off-line. Also, successive quarterly audits shall occur no closer than two months since the previous quarter's CGA.

For the NO<sub>x</sub>, O<sub>2</sub>, and SO<sub>2</sub> analyzers, a total of six (6) non-consecutive measurements are taken using low and mid-level calibration gases (see Table IV). The mean response and calibration errors for the low and mid concentration levels are calculated. The calibration error must not exceed 15% or 5 ppm (whichever is greater) of the absolute difference. The CGA is conducted in accordance with the procedures contained in 40CFR60, Appendix F, Procedure 1.

The CEMS are considered out-of-control if the quarterly CGA error for any instrument exceeds the applicable performance standard. The data collected by the instrument is considered invalid until the next acceptable CGA is completed. The CEMS are also considered out-of-control if the required quarterly CGA is not conducted during a calendar quarter. Data for the following quarter is considered invalid until a successful CGA is completed.

#### *Prerequisites for Performing a CGA:*

- 1) The analyzer(s) should have recently completed (within the last 12 hours) a successful automatic calibration error test prior to starting the cylinder gas audit check.
- 2) Each monitor shall be operating at its normal operating temperature and conditions.
- 3) Only ETPM calibration gases certified by the vendor to be within 2 percent of the bottle value shall be used for the audit check. Copies of the vendor cylinder Certificate of Analysis (COA) shall be kept on file with the test data sheets.
- 4) No actions should be taken to cause the calibration gases to not pass through all filters, scrubbers, conditioners, and other monitoring components used during normal sampling.
- 5) The calibration gas flow should be at a minimum of 2-liters per minute on the flow-indicating gauge.
- 6) Stage the low and mid-level concentrations of ETPM gas cylinders at the CEMS regulators.
- 7) All values recorded must be from the respective analyzer's database and correspond to the database time stamps. Data taken from the Current Values Screen is not acceptable.

Table IV below illustrates acceptable gas ranges for conducting the cylinder gas audit and linearity error tests for each CEMS instrument.

**TABLE IV. CGA Test Gas Requirements**

Location	Parameter	Range	Low-Level Gas	Mid-Level Gas
All Stacks	NO <sub>x</sub>	High	247 ppm	500 ppm
	O <sub>2</sub>	High	4 – 6 %	18 %
	SO <sub>2</sub>	High	35 ppm	70 ppm

Adjustments shall not be made to the system or monitors during the cylinder gas audit check.

#### *Procedure for Performing a CGA:*

All values shall be recorded and retained for a minimum of five years from the date the CGA is performed.

For EACH Monitor:

1. The RegPerfect DAHS will automatically record CGA data.
2. Install and connect the calibration gas cylinders containing the low-level and mid-level concentrations to the appropriate regulator.
3. Verify that the concentrations specified in each bottle's certificate of analysis (COA) are also the values listed in the DAHS. Open 'Editor' from the Spotlight display and click on the 'Calibrations' tab. In this window, click on the 'Linearity/CGA' tab. Now select a gas to verify that the values for low, mid and high are correct. In the 'Edit Reference Values' window choose the range to edit (i.e. Low, Mid, High) then click the 'Edit Reference Values' button. In the window that opens verify the bottle values, certification dates, bottle serial numbers, etc., to ensure that the bottle attached to the calibration valves are correct. If they are incorrect use the 'Add New' button to add a new calibration bottle value.
4. Using the Human-Machine Interface (HMI) located near the CEMS, toggle to the Linearity/CGA button on the HMI. Push the Linearity/CGA start button and it should display the time. On the start of a new minute, the PLC will start a new CGA calibration and will execute the timing of the calibration. The PLC should then run through each gas and each range to produce a complete CGA audit. The PLC is programmed to perform a CGA audit in accordance with the specifications of 40CFR60, Appendix F.
5. In the RegPerfect DAHS generate a CGA report to ensure that the CGA passed.
6. With the data sheet include copies of the ETPM gas vendor certification sheets and printouts of the monitor's DAHS database corresponding to the time frame of the test.

Note that 40CFR60, Appendix F, Section 5.1.4 states that cylinder gas audits are not required for calendar quarters in which the affected facility does not operate.

Reminder: Ensure that the original calibration gas cylinders are properly re-connected upon completion of the tests if any bottles were changed to perform the quarterly audit.

## 2.2.4 [Reserved]

## 2.2.5 Relative Accuracy Test Audit

Another measure of the accuracy of a CEMS is the Relative Accuracy Test Audit (RATA), which is required for initial certification of a CEMS and for on-going quality assurance. The RATA ensures that the installed monitors measure the "true" pollutant concentration when comparing the monitoring results to a reference method. The lower the relative accuracy result indicates an increase in accuracy of the monitor. A RATA may not be performed if the CEMS is out-of-control with respect to any daily or quarterly QAQC assessments.

A RATA may be performed under any of the following three circumstances:

- The RATA may be performed "cold", or in other words, without corrective maintenance, repairs, calibration adjustments, etc. prior to the test.
- The RATA may be performed following routine or non-routine calibration adjustments, without corrective maintenance, repairs, re-linearization or reprogramming.
- The RATA may also be performed following repairs, corrective maintenance, or reprogramming. In this case, the CEMS is considered out-of-control from the hour in which the repair, re-linearization or reprogramming begins until the RATA passes.

A RATA is performed at least once every four calendar quarters in accordance with the procedures in 40CFR60, Appendix F. The RATA requires the support of a third-party stack-sampling contractor who is required to use the reference method stack monitoring procedures of 40CFR60, Appendix A. The source must operate at or above 50% of the maximum operating capacity. Data from the stack-sampling contractor along with data from the CEMS is correlated to determine relative accuracy. The RATA is performed "hands-off", meaning that no adjustment to the CEMS is permitted during the RATA. If a daily calibration error test is failed during a RATA, the RATA must be

repeated. Data from the monitor is invalidated prospectively from the hour the calibration error test failed until the next passing calibration error test is completed.

The CEMS are considered out-of-control under the following conditions:

- If the RATA is not conducted during the required quarter.
- If the CEMS fails relative accuracy testing, data is considered invalid from the time results of the failed test are received until the commencement of the next passing RATA.

The designated plant personnel would notify plant management (Maintenance, Operations, Environmental, etc...) of the results and what corrective maintenance was performed on the CEMS to correct any deficiency. Prompt follow-up testing is scheduled and performed after the corrective maintenance is complete to verify the monitor meets the acceptable criteria. The out-of-control period ends at the time corresponding to completion of the subsequent successful audit.

For each monitoring system, the results of all completed and partial RATAs affecting data validation are reported in the quarterly report. RATA attempts that are aborted or invalidated due to problems with the Reference Method or due to operational problems with the affected unit are not reported but are kept in the CEMS maintenance log for future reference.

Perform annual RATAs for the NO<sub>x</sub>, SO<sub>2</sub>, O<sub>2</sub>, moisture, and stack flow CEMS using the following procedures:

- 1) Record monitoring system output from the data acquisition and handling system.
- 2) Synchronize the stack sampler's data acquisition clock to the CEMS DAHS clock.
- 3) Perform concurrent relative accuracy test audits for each pollutant/diluent monitor every year at or above 50% of the maximum operating level.
- 4) Compare CEMS data for each individual run with the results from the reference method testing. Calculate the relative accuracy.

All 40CFR60 regulated pollutants qualify for annual RATA testing, no matter the results of the previous RATA.

Concurrent relative accuracy test audits may be performed by conducting simultaneous relative accuracy test audit runs. This procedure is acceptable until all relative accuracy test audit runs are completed. Where two or more probes are in the same proximity, care should be taken to prevent probes from interfering with each other's sampling.

Complete each RATA within a 168-hour period while the unit is combusting fuel under normal operating conditions for that unit. Do not perform corrective maintenance, repairs, replacements or adjustments during the RATA other than as required in the analyzer's CEMS Operation and Maintenance Manuals (see References 11 and 12 in Section 5).

Select a location for reference method measurements that:

- 1) Is accessible;
- 2) Is in proximity with the monitor or monitoring system location; and
- 3) Meets the requirements of Performance Specification 2 in Appendix B of 40CFR60 for the NO<sub>x</sub> and SO<sub>2</sub> analyzers, Performance Specification 3 in Appendix B of 40CFR60 for the O<sub>2</sub> analyzers, and Performance Specification 6 in Appendix B of 40CFR60 for the stack flow monitors.

Select traverse points that:

- 1) Ensure acquisition of representative samples of pollutant and diluent concentrations, moisture content, temperature, and flue gas flow rate over the flue cross section; and
- 2) Meet the requirements of Performance Specification 2 in Appendix B of 40CFR60 (for NO<sub>x</sub> and SO<sub>2</sub>), Performance Specification 3 in Appendix B of 40CFR60 (for O<sub>2</sub>), Performance Specification 4 in Appendix B of 40CFR60 (for CO), Method 3 (for molecular weight), and Method 4 (for moisture determination) in Appendix A of 40CFR60.

Conduct the reference method tests so they will yield results representative of the pollutant concentration, emission rate, moisture, temperature, and flue gas flow rate and can be correlated with the CEMS. Conduct the diluent (O<sub>2</sub>) measurements that may be needed simultaneously with the pollutant concentration. To properly correlate individual

CEMS data with the reference method data, mark the beginning and end of each reference method test run including the exact time of day.

Confirm that the monitor or monitoring system and reference method test results are on consistent moisture, pressure, temperature, and diluent concentration basis. Also, consider the response times of the pollutant concentration monitor, the continuous emission monitoring system, to ensure comparison of simultaneous measurements.

For each relative accuracy test audit run, compare the measurements obtained from the CEMS (in ppm, percent O<sub>2</sub>, lb/mmBtu, lb/hr or any other applicable units) against the corresponding reference method values: 40CFR60, Appendix A, Method 2 for stack flow; Method 3A for O<sub>2</sub>; Method 6C of SO<sub>2</sub>; and Method 7E for NO<sub>x</sub> are the reference methods for performing RATAs.

Perform a minimum of nine sets of paired monitor (or monitoring system) and reference method test data for every required relative accuracy. For integrated samples, e.g., Method 6 and Method 4, make a sample traverse of at least 21 minutes, sampling for 7 minutes at each traverse point. For grab samples, e.g., Method 7, take one sample at each traverse point, scheduling the grab samples so that they are taken simultaneously (within a 3-minute period) or are an equal interval of time apart over a 21-minute (or less) period. A test run for grab samples must be made up of at least three separate measurements.

Note: The tester may choose to perform more than nine sets of reference method tests. If this option is chosen, the tester may reject a maximum of three sets of the test results if the total number of test results used to determine the relative accuracy or bias is greater than or equal to nine. Report all data, including the rejected data, and reference method test results.

**Table V. Daily, Quarterly, and Annual Performance Evaluations Summary – 40CFR60**

Parameter	Component	Range	Specification	References	
				Specifications	Test Procedures
<b>Daily Performance Evaluations</b>					
24-hour Calibration Drift	Moisture Monitors	Low Level (12% moisture)	$\leq 5.0$ % Span	40CFR60 App B-PS4, 13.1	40CFR60.13 (d)
		High Level (24% moisture)			
		Out-of-control condition†	2x above limits for 5 days invalidates data until next passing calibration or 4x the above limits for 1 day backward invalidates data until last passing calibration and forward invalidates data until next passing calibration	40CFR60 App F, Proc 1, 4.3	
	NO <sub>x</sub> & SO <sub>2</sub> Analyzers	Low Level (0 – 20% Span)	$\leq 2.5$ % Span	40CFR60 App B-PS2, 13.1	
		High Level (50 – 100% Span)			
		Out-of-control condition†	2x above limits for 5 days invalidates data until next passing calibration or 4x the above limits for 1 day backward invalidates data until last passing calibration and forward invalidates data until next passing calibration	40CFR60 App F, Proc 1, 4.3	
	O <sub>2</sub> Analyzers	Low Level (0 – 20% Span)	$\leq 0.5$ % O <sub>2</sub>	40CFR60 App B-PS3, 13.1	
		High Level (50 – 100% Span)			
		Out-of-control condition†	2x above limits for 5 days invalidates data until next passing calibration or 4x the above limits for 1 day backward invalidates data until last passing calibration and forward invalidates data until next passing calibration	40CFR60 App F, Proc 1, 4.3	
	Stack Flow Monitors	Low Level (0 – 20% Span)	$\leq 3.0$ % Span	40CFR60 App B-PS6, 13.1	
		High Level (50 – 100% Span)			
		Out-of-control condition†	2x above limits for 5 days invalidates data until next passing calibration or 4x the above limits for 1 day backward invalidates data until last passing calibration and forward invalidates data until next passing calibration	40CFR60 App F, Proc 1, 4.3	
<b>Quarterly Performance Evaluations</b>					
CGA Audit	NO <sub>x</sub> & SO <sub>2</sub> Analyzers	Low Level (20 – 30% Span)	$\pm 15\%$ of average audit value or $\pm 5$ ppm, whichever is greater	40CFR60 App F-Proc. 1 5.2.3	40CFR60 App F-Proc. 1 5.1.2
		Mid Level (50 – 60% Span)			
		Out-of-control condition	Exceedance of the above limits*		
	O <sub>2</sub> Analyzers	Low Level (4 – 6% by volume)	$\pm 15\%$ of average audit value		
		Mid Level (8 – 12% by volume)			
		Out-of-control condition††	Exceedance of the above limits <sup>1</sup>		

**Table V, continued**

<b>Annual Performance Evaluations</b>					
Relative Accuracy	H <sub>2</sub> O Analyzer	-	< 10% RA or ≤ 1.5 % H <sub>2</sub> O absolute	40CFR75, App A-3.3.6†††	40CFR60 App B-PS2, 8.4
		Out-of-control condition††	Exceedance of the above limits		
	NO <sub>x</sub> & SO <sub>2</sub> Analyzers	-	≤ 20% RA or ≤ 10% of App. Std. **	40CFR60 App B-PS2, 13.2	40CFR60 App B-PS2, 8.4
		Out-of-control condition††	Exceedance of the above limits		
	O <sub>2</sub> Analyzers	-	≤ 1.0 % absolute O <sub>2</sub>	40CFR60 App B-PS3, 13.2	40CFR60 App B-PS3, 8.1
		Out-of-control condition††	Exceedance of the above limits		
	Stack Flow Monitor	-	≤ 20% RA or ≤ 10% of App. Std. **	40CFR60 App B-PS6, 13.2	40CFR60 App B-PS6, 8.2
		Out-of-control condition††	Exceedance of the above limits		

\* Exceedance of limits in a CGA audit, invalidates data until next passing CGA Audit

\*\* App. Std. refers to the applicable standard (emission limit) the unit must comply with under the applicable air permit.

† 40CFR60, App. F, 4.3.1 – The beginning of the out-of-control period is the time corresponding to the completion of the 5<sup>th</sup>, consecutive, daily calibration drift (CD) check with an excess of two times the allowable limit, or the time corresponding to the completion of the daily CD check preceding the daily CD check that results in a CD in excess of four times the allowable limit. The end of the out-of-control period is the time corresponding to the completion of the CD check following corrective action that results in the CD’s at both the zero and high-level measurement points being within the corresponding allowable CD limit.

†† 40CFR60, App. F, 5.2 – If the RA exceeds the given limits in Table I for the RATA or CGA, the CEMS is out-of-control. If the CEMS is out-of-control, take the necessary corrective action to eliminate the problem. Following corrective action, the source owner/operator must audit the CEMS with a RATA or CGA to determine if the CEMS is operating within the specifications. If the RA exceeds the given limits for a RATA, only a subsequent RATA must be used to alleviate the out-of-control condition, however, if the RA exceeds the given limits for a CGA, either a CGA or a RATA may be used to alleviate the out-of-control condition. Both audit results, the results showing the CEMS to be out-of-control, and the results following corrective action showing the CEMS to be operating within specifications must be reported.

†††40CFR75 RA limit is listed here, as no such limit is addressed in 40CFR60.

### 2.3 Preventive Maintenance Procedures

The CEMS requires a certain level of maintenance to assure a high level of confidence in the validity of the data. A good periodic maintenance program will help prevent major and costly equipment failures.

The sample maintenance schedule (See Table VI below) is included as a guideline. Complete lists of preventive maintenance checks and procedures are identified in the Maintenance and Troubleshooting section in each of the analyzer’s Operator Manual (see References 11 and 12 in Section 5).

**Table VI. Summarized Scheduled Preventative Maintenance**

Maintenance Item	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Inspect/Replace All Analyzer Filters	x	x	x	x	x	x	x	x	x	x	x	x
Exercise System Alarms			x			x			x			x
Check/Fill All Consumables	x	x	x	x	x	x	x	x	x	x	x	x
Inspect/Replace Dilution Probe Filter Elements and O-Rings			x			x			x			x
Replace HVAC Filter			x			x			x			x
Inspect/Replace Opacity Purge Filter, Flex Hoses, Desiccator			x			x			x			x
Inspect Flow Transducers						x						x
Check Valves			x			x			x			x
Clean Sample Lines (as required)												

Some items on the recommended periodic maintenance chart, such as filter changes, will not exhibit a failure condition until possible damage to other components has resulted. These items require attention in determining replacement frequency. Other items will exhibit non-destructive indications, such as reduced analyzer response due to blockage. Close observation of the operating characteristics of the system, with particular notation to any sudden or prolonged change of any of the many visual indicators in the system, should prompt a maintenance response to prevent loss of data and/or equipment damage.

The system’s equipment alarms are indications that maintenance is required; they do not necessarily indicate the data is invalid. These alarms indicate that the system is operating outside of design tolerance, and invalid data or equipment damage may occur if the system is allowed to continue operating with the problems. The alarms should be tested on a regular basis to assure that they are operational.

One of the best indicators of system performance is the validity of the data the CEMS is generating. The CEMS are programmed to conduct an automatic calibration check once every 24 hours. Daily scrutiny of these results will indicate whether or not there is a need for maintenance.

Table VII includes a guideline of the recommended scheduled preventative maintenance to be performed in the CEMS shelter to ensure extended life out of the system. A complete list of preventive maintenance checks and procedures are identified in the CEMS Operation and Maintenance Manual.

**Table VII. Scheduled Preventative Maintenance of the CEMS Shelter**

<b>Description</b>	<b>Weekly</b>	<b>Monthly</b>	<b>Quarterly</b>	<b>Yearly</b>
Recalibrate the analyzers	X			
Inspect sample pump		X		
Inspect NO <sub>x</sub> exhaust pump		X		
Replace NH <sub>3</sub> scrubber assembly			X	
Replace O <sub>3</sub> scrubber media			X	
Replace charcoal scrubber media				X
Clean heated sample line				X
Rebuild sample pump				X
Rebuild NO <sub>x</sub> exhaust pump				X
Rebuild redundant sample pump				X
Inspect probe filter and gaskets		X		
Inspect HSL for condensation or particulate build up		X		
Inspect probe straw		X		
Inspect all valves and tubing	X			
Inspect instrument air coalescing filter	X			
Analyzer particulate filter	X			
Inspect HVAC evaporator	X			
Inspect HVAC condenser	X			
Inspect HVAC cabinet	X			
Inspect HVAC drains	X			
Inspect HVAC lubrication system				X
Rebuild drying tower (CO <sub>2</sub> absorber)				X
Rebuild heated CO scrubber				X
Inspect PLC Battery			X	
Replace PLC Battery				X
Replace Smoke Alarm 9VDC Battery			X	

Predictive diagnostic functions including data acquisition, failure warnings and alarms built into the analyzer allow the user to determine when repairs are necessary without performing unnecessary preventative maintenance procedures. When performed regularly, a minimal number of simple procedures will ensure that the analyzers continue to operate accurately and reliably.

#### **2.4 Spare Parts List and Inventory Procedures**

Recommended spare parts lists are included in the Comprehensive CEMs Operation and Maintenance Manual. Adequate reserves of critical spares are maintained at the plant site to minimize CEMS downtime. A routine supply of common replacement parts and consumables are available at the site (Stock coded in Ellipse and maintained in the warehouse) for completing preventive maintenance checks on a monthly, quarterly, and annual basis.



## SECTION 3 - DATA MANAGEMENT

### 3.1 Data Reporting Procedures

All records should be maintained, in a permanent form suitable for inspection for at least five years following the date of such measurements, maintenance, and reports. Tilden shall submit reports of excess emissions for all periods of unit operation, including startup, shutdown, and malfunction. Quarterly compliance reports are postmarked to the agency within thirty days of the end of the calendar quarter as defined in the operating permit.

40CFR60 stipulates that anytime the CEMS is in startup, shutdown, or the CEMS malfunctions, records of these events must be documented. A CEMS malfunction is deemed anytime the monitoring equipment fails or is inoperative. When the CEMS fails, a calibration or another event causing the sample to become invalid, the data is marked as downtime.

These events must be fully documented and submitted to the applicable regulating body as specified in 40 CFR 60 Subpart A, 60.7. The regulations require a description of the event which occurred if it hasn't occurred due to an excess emission.

Tilden shall submit a written report for each calendar quarter to the State of Michigan, Department of Environment, Great Lakes, and Energy and the Air and Radiation Division, U.S. Environmental Protection Agency, Region 5. This report contains a summary of NO<sub>x</sub> and SO<sub>2</sub>, system downtime and excess emissions, as well as details of any downtime and/or excess emission events if required.

### 3.2 Data Backup Procedures

The RegPerfect DAHS performs a periodic data backup of the data it has collected most recently. In this backup, the DAHS is able to store one-minute data for up to 135 days, and hourly data for up to five (5) years. Each backup is stored for two (2) days on the C drive, in the folder C:\backup on the DAHS. All of these procedures are automated by the DAHS on the server. At 12:05 am daily, the DAHS server backs up this data onto an external hard drive. Besides the backup files, the DAHS backs up files from the C:\bin folder, the Spotlight display, and all of the reports generated by the RegPerfect DAHS.

### 3.3 Data Estimation when CEMS Data is Unavailable

The Michigan FIP states that emission data must be obtained using other monitoring systems or emission estimation methods whenever data from the CEMS are not available due to CEMS breakdowns, repairs, calibration checks, or zero and span adjustments. Such emission estimation methods must be used to ensure the required 18 out of every 24 hours of data and 22 out of 30 days of data are obtained. The Tilden DAHS will flag data (NO<sub>x</sub>, SO<sub>2</sub>, moisture, and stack flow) as invalid whenever such a situation occurs. The user will evaluate the "missing" data period and determine how to best estimate representative data for that period. Typically such periods of unavailable CEMS data will be estimated by averaging the valid data from immediately before and after the missing data period.

### 3.4 Document Control System

When modifications to the QA/QC Plan become necessary, Tilden's Environmental Department is responsible for ensuring that all revisions in the new QA/QC Plan are implemented, and distribution of these revisions are provided to all applicable parties. This QA/QC Plan must be kept on site and available for agency review.

#### Maintenance of the QA/QC Plan:

To properly maintain the QA/QC Plan, the following activities are monitored:

- 1) QA/QC Plan holders; Maintenance, Process Engineering, and Environmental Departments
- 2) Prepare revisions and updates of the QA/QC Plan as a result of the following:
  - Changes in regulations.
  - Modifications or improvements of QA/QC procedures.
  - Changes in personnel or organization.

- Replacement of CEMS components.
- Modifications to operating permit.

### **3.5 Maintenance Records**

All pertinent maintenance records for the CEMS are stored in the CEMS maintenance log. Within this system, there are many records and documents tracking activities associated with CEMS maintenance, daily testing performed, and preventative or corrective repairs performed on the CEMS. By storing these data in a single place, it is possible to keep track of the required maintenance on the CEMS, and the results of that maintenance. This supports reliable CEMS operation at all times.

After certain maintenance activities or repairs, it may be necessary for recertification testing to be performed. The date, time, person performing the recertification testing, the results of the testing, and the procedure to perform the testing is recorded. All of these data and reports are then placed in the CEMS maintenance log.

On a regular basis, it will be necessary to exchange an expended calibration gas cylinder with a new, full gas cylinder for daily calibrations, quarterly audits, etc. Each CEMS will have a record of the calibration bottle in use, and all bottles used prior, in a spreadsheet or calibration gas management system, which lists the date and time the bottle came into service, the cylinder gas concentrations, the cylinder number, the cylinder gas supplier, and the date and time the bottle was retired. This allows for easy access to all records for calibration bottles and the effective dates the bottles were in service.

Also stored in the CEMS maintenance log are the quarterly and annual tests: all CGA tests, trial gas injections, and test attempts (reported or not), and RATA results for RATA tests, trial RATA runs, and test attempts (reported or not).

The CEMS maintenance log includes the activity and task schedules of all weekly, monthly, quarterly, and annual maintenance to be performed on the CEMS. The log should include schedules of the maintenance activities to be performed listing each maintenance item, the frequency the maintenance, responsible personnel, and the actual date and time the maintenance was performed.

The CEMS maintenance log maintains records and data of all repairs performed on the CEMS; preventative, non-preventative or corrective maintenance, including date and time performed, who performed the repair, a reason why the repair was necessary, testing that was performed before and after the repair, and the results of the testing.

## **SECTION 4 – ONGOING QUALITY ASSURANCE/CONTROL**

### **4.1 Preventive/Corrective Maintenance Policy**

The preventive maintenance program for the CEMS is based on the equipment manufacturers recommended procedures. As experience dictates, these procedures may be modified to be more appropriate for the site. The Electrical Instrument Repairman will schedule, ensure the maintenance is performed, and record all maintenance in a timely manner.

Due to the complexity of the CEMS, a detailed written procedure cannot be provided for a malfunctioning CEMS. Each problem is evaluated by plant personnel utilizing References 10, 11, 12, and/or factory assistance from Technical Service personnel. A troubleshooting section is included in References 11 and 12.

Additionally, zero and calibration drift checks are to be conducted immediately following any maintenance. If the post-maintenance zero or calibration drift checks show drift in excess of twice the applicable performance specifications, any CEMS adjustments or recalibration is conducted in accordance with References 11 and 12.

Whenever the CEMS are found to be out-of-control the data generated from the system will not be used to demonstrate compliance with permit emission limits or data capture requirements. Corrective action is performed “as soon as

possible” after determining the CEMS is not operating within 40CFR60 Appendix B or Appendix F specifications, as applicable. Corrective action is defined as the resolution of problems that occur on a non-routine basis. A summary of out-of-control conditions may be found in Table V.

References to specific CEMS troubleshooting procedures are listed in References 11 and 12.

Immediately after learning the CEMS are non-operational, the designated plant personnel would notify plant management (Maintenance, Operations, Environmental, etc...) of the results and undertake corrective maintenance on the CEMS to correct any deficiency.

## **4.2 Modifications and Upgrades**

To prevent any data loss and to ensure that there aren't any adverse effects resulting from modifying existing equipment or upgrading equipment to newer models, it is imperative to understand the upgrade and all of the necessary equipment, tools, spare parts, cables, software, etc., to complete the modification/upgrade.

Before making changes to any existing equipment, the CEMS supplier is consulted to verify that the changes to be made will not cause any interferences with existing equipment, is compatible with the installed RegPerfect DAHS, and that there will not be any negative effects to the system by making this change. By ensuring that these upgrades/modifications are compatible with the existing system, it is possible to minimize or prevent any damages to the existing equipment and any costly data losses.

Prior to any CEMS modifications all regulatory requirements are examined, as modifications may require recertification of the CEMS. Failure to re-certify the CEMS system after a major change may invalidate the data collected.

Although the Tilden CEMS are certified according to 40CFR60, Appendix B Performance Specifications, provisions for more specific recertification events (e.g. analyzer replacement, component replacements, etc.) can be found in 40CFR75, Subpart C, 75.20(b) and the Part 75 Emissions Monitoring Policy Manual, Section 12, where the required tests for recertification of the CEMS are listed by event.

A list of the modifications made, any recertification events performed, documentation of the results of recertification testing, the name of the technician who performed the testing, and the date and time the testing was performed should be included in the CEMS maintenance log.

### 4.3 Internal System Check

System audit procedures should be completed to ensure continued system performance:

- Review the data (quarterly reports) to ensure that there weren't any recurring systematic errors generated in the RegPerfect DAHS. Generate reports of invalid data and assign root cause to each invalid data point and put in place procedures to avoid future recurrences of these problems. Review submitted reports to verify all reports and records submitted were in accordance with the regulations.
- Once it has been established that the data collected for the specified time frame is acceptable, set the data lock date feature in the DAHS. This will lock the data so that it cannot be inadvertently modified by a recalculation, error, or mistake that might affect quality assured data that has already been submitted and verified.
- Conduct periodic regulatory reviews to ensure that the CEMS is current with the specifications required for your process.
- Periodically review training requirements to ensure that employees are trained in compliance with any new or modified regulations.
- Review excess emissions events and correlate with their root cause. Put into practice procedures to ensure that these events will be minimized in the future.
- Review CEMS vendor maintenance agreements for any applicable contract dates.

Upon a major change in regulations, it is necessary to review the change and to decide whether the current system still meets the regulation. If it is apparent that a change must be made to the current CEMS, it is necessary to devise a plan of action to address the inadequacies of the current CEMS and follow that plan to remain in compliance with the current regulations. Typically, a change of this magnitude will require recertification of the CEMS.

## **SECTION 5 – REFERENCED DOCUMENTS & ENVIRONMENTAL REGULATIONS**

1. Code of Federal Regulations, Title 40 Part 60, Appendix A (Test Methods)
2. Code of Federal Regulations, Title 40 Part 60, Appendix B (Performance Specifications)
3. Code of Federal Regulations, Title 40 Part 60, Appendix F (Quality Assurance)
4. Code of Federal Regulations, Title 40 Part 75, Subpart C (Initial Certification and Recertification Procedures)
5. Code of Federal Regulations, Title 40 Part 75, Appendix A (Specifications and Test Procedures)
6. Code of Federal Regulations, Title 40 Part 75, Appendix B (Quality Assurance and Quality Control Procedures)
7. Part 75 Emissions Monitoring Policy Manual (June 2013)
8. Quality Assurance Handbook for Air Pollution Measurement Systems, Volume I: Principles (EPA 600/9-76-0276)
9. Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III: Stationary Source Specific Methods (EPA 600/0-76-027b)
10. Teledyne Monitor Labs Incorporated, CEMS Operations and Maintenance Manuals
11. Teledyne Monitor Labs Incorporated, Model T200H/M Nitrogen Oxides Analyzer, Instruction Manual
12. Teledyne Monitor Labs Incorporated, Model T100H UV Fluorescence SO<sub>2</sub> Analyzer, Instruction Manual
13. Teledyne Monitor Labs Incorporated, Ultraflow 150 Gas Flow and Temperature Monitor, Operations Manual
14. MAC Instruments, Instruction Manual for the MAC 155L & MAC155H Moisture Analyzer
15. Code of Federal Regulations, Title 40 Part 52, Subpart X (Michigan)
16. Code of Federal Regulations, Title 40 Part 63, Subpart RRRRR (Taconite MACT)

**SECTION 6 – APPENDICES**

**APPENDIX A – FEDERAL IMPLEMENTATION PLAN FOR REGIONAL HAZE, IN MICHIGAN (§**

**52.1183(k-n)**Tilden Mining Company, or any subsequent owner/operator of the Tilden Mining Company facility in Ishpeming, Michigan, shall meet the following requirements:

**(1) NOX Emission Limits.**

**(i)** An emission limit of 2.8 lbs NOX/MMBTU, based on a 720-hour rolling average, shall apply to Tilden Grate Kiln Line 1 when burning natural gas, and an emission limit of 1.5 lbs NOX/MMBTU, based on a 720-hour rolling average, shall apply to Tilden Grate Kiln Line 1 when burning coal or a mixture of coal and natural gas. These emission limits will become enforceable 60 months after May 12, 2016 (May 2021) and only after EPA's confirmation or modification of the emission limit in accordance with the procedures set forth in paragraphs (k)(1)(ii) through (viii) of this section.

**(ii)** Compliance with these emission limits shall be demonstrated with data collected by a continuous emissions monitoring system (CEMS) for NOX. The owner or operator must start collecting CEMS data for NOX upon May 12, 2016 and submit the data to EPA no later than 30 days from the end of each calendar quarter. Any remaining data through the end of the 57th month from May 12, 2016 (February 2021), that does not fall within a calendar quarter, must be submitted to EPA no later than 30 days from the end of the 57th month (March 28, 2021). Although CEMS data must continue to be collected, it does not need to be submitted to EPA starting 57 months after May 12, 2016 (March 28, 2021).

**(iii)** No later than 48 months from May 12, 2016 (May 2020), the owner or operator must submit to EPA a report, including any final report(s) completed by the selected NOX reduction technology supplier and furnace retrofit engineer, containing a detailed engineering analysis and modeling of the NOX reduction control technology being installed on Tilden Grate Kiln Line 1. This report must include a list of all variables that can reasonably be expected to have an impact on NOX emission control technology performance, as well as a description of how these variables can be adjusted to reduce NOX emissions to meet the NOX design emission limit. This NOX reduction control technology must be designed to meet emission limits of 2.8 lbs NOX/MMBTU when burning natural gas and 1.5 lbs NOX/MMBTU when burning coal or a mixture of coal and natural gas.

**(iv)** The NOX reduction control technology shall be installed on Tilden Grate Kiln Line 1 furnace no later than 50 months from May 12, 2016 (July 2020) .

**(v)** Commencing on the earlier of: Six months from the installation of the NOX reduction control technology or 50 months from May 12, 2016 (July 2020), the owner or operator must provide to EPA the results from pellet quality analyses. The owner or operator shall provide the results from pellet quality analyses no later than 30 days from the end of each calendar quarter up until 57 months after May 12, 2016 (February 2021). Any remaining results through the end of the 57th month (February 2021) that do not fall within a calendar quarter must be submitted to EPA no later than 30 days from the end of the 57th month (March 28, 2021). The pellet quality analyses shall include results for the following factors: Compression, reducibility, before tumble, after tumble, and low temperature disintegration. For each of the pellet quality analysis factors the owner or operator must explain the pellet quality analysis factor as well as the defined acceptable range for each factor using the applicable product quality standards based upon customers' pellet specifications that are contained in Tilden's ISO 9001 quality management system. The owner or operator shall provide pellet quality analysis testing results that state the date and time of the analysis and, in order to define the time period when pellets were produced outside of the defined acceptable range for the pellet quality factors listed, provide copies of the production logs that document the starting and ending times for such periods. The owner or operator shall provide an explanation of causes for pellet samples that fail to meet the acceptable range for any pellet quality analysis factor. Pellet quality information and data may be submitted to EPA as Confidential Business Information.

**(vi)** No later than 57 months after May 12, 2016 (February 2021), the owner or operator may submit to EPA a report to either confirm or modify the NOX limits for Tilden Grate Kiln Line 1 within the upper and lower bounds described below. EPA will review the report and either confirm or modify the NOX limits. If the CEMS data collected during operating periods between months 50 and 57 (July 2020 and February 2021) that

both meet pellet quality specifications and proper furnace/burner operation is normally distributed, the limit adjustment determination shall be based on the appropriate (depending upon whether data are statistically independent or dependent) 95% upper predictive limit (UPL) equations in paragraph (p) of this section. If the CEMS data collected during operating periods between months 50 and 57 (July 2020 and February 2021) that both meet pellet quality specifications and proper furnace/burner operation are not normally distributed, the limit adjustment determination shall be based on the non-parametric equation provided in paragraph (p) of this section. The data set for the determination shall exclude periods when pellet quality did not fall within the defined acceptable ranges of the pellet quality factors identified pursuant to paragraph (k)(1)(v) of this section and for any subsequent period when production had been reduced in response to pellet quality concerns consistent with Tilden's ISO 9001 operating standards. Any excluded period will commence at the time documented on the production log demonstrating pellet quality did not fall within the defined acceptable range and shall end when pellet quality within the defined acceptable range has been re-established at planned production levels, which will be presumed to be the level that existed immediately prior to the reduction in production due to pellet quality concerns. EPA may also exclude data where operations are inconsistent with the reported design parameters of the NOX reduction control technology that were installed.

(vii) EPA will take final agency action by publishing its final confirmation or modification of the NOX limits in the FEDERAL REGISTER no later than 60 months after May 12, 2016 (May 2021). The confirmed or modified NOX limit for Tilden Grate Kiln Line 1 when burning only natural gas may be no lower than 2.8 lbs NOX/MMBTU, based on a 720-hour rolling average, and may not exceed 3.0 lbs NOX/MMBTU, based on a 720-hour rolling average. The confirmed or modified NOX limit for Tilden Grate Kiln Line 1 when burning coal or a mixture of coal and natural gas may be no lower than 1.5 lbs NOX/MMBTU, based on a 720-hour rolling average, and may not exceed 2.5 lbs NOX/MMBTU, based on a 720-hour rolling average.

(viii) If the owner or operator submits a report proposing a single NOX limit for all fuels, EPA may approve the proposed NOX limit for all fuels based on a 30-day rolling average. The confirmed or modified limit will be established and enforceable within 60 months from May 12, 2016 (May 2021).

(2) *SO<sub>2</sub>Emission Limits.* A fuel sulfur content limit of no greater than 1.20 percent sulfur content by weight shall apply to fuel combusted in Process Boiler #1 (EUBOILER1) and Process Boiler #2 (EUBOILER2) beginning three months from March 8, 2013. A fuel sulfur content limit of no greater than 1.50 percent sulfur content by weight shall apply to fuel combusted in the Line 1 Dryer (EUDRYER1) beginning 3 months from March 8, 2013. The sampling and calculation methodology for determining the sulfur content of fuel must be described in the monitoring plan required at paragraph (n)(8)(x) of this section.

(3) The owner or operator of the Tilden Grate Kiln Line 1 furnace shall meet an emission limit of 500 lbs SO<sub>2</sub>/hr based on a 30-day rolling average beginning six months after May 12, 2016 (November 2016). Compliance with these emission limits shall be demonstrated with data collected by a continuous emissions monitoring system (CEMS) for SO<sub>2</sub>. The owner or operator must start collecting CEMS data for SO<sub>2</sub> beginning six months after May 12, 2016 (November 2016) and submit the data to EPA no later than 30 days from the end of each calendar quarter. The Tilden Grate Kiln Line 1 furnace shall not be limited to natural gas fuel. Beginning six months after May 12, 2016 (November 2021), any coal burned on Tilden Grate Kiln Line 1 shall have no more than 0.60 percent sulfur by weight based on a monthly block average. The sampling and calculation methodology for determining the sulfur content of coal must be described in the monitoring plan required for this furnace. The owner or operator must calculate an SO<sub>2</sub> limit based on 12 continuous months of CEMS emissions data and submit such limit, calculations, and CEMS data to EPA no later than 36 months after May 12, 2016 (May 2019). If the submitted CEMS SO<sub>2</sub> hourly data are normally distributed, the SO<sub>2</sub> lbs/hr emission rate shall be based on the appropriate (depending upon whether data are statistically independent or dependent) 99% upper predictive limit (UPL) equation. If the submitted CEMS SO<sub>2</sub> hourly data are not normally distributed, the SO<sub>2</sub> lbs/hr emission rate shall be based on the non-parametric equation provided in paragraph (p) of this section. Compliance with the SO<sub>2</sub> lbs/hr emission rate shall be determined on a 30-day rolling average basis. EPA will take final agency action by publishing a confirmation or modification of the SO<sub>2</sub> limit in the FEDERAL REGISTER no later than 39 months after May 12, 2016 (August 2019). EPA may adjust the 500 lbs SO<sub>2</sub>/hr limit downward to reflect the calculated SO<sub>2</sub> emission rate; however, EPA will not increase the SO<sub>2</sub> limit above 500 lbs SO<sub>2</sub>/hr.

(4) Starting 26 months from May 12, 2016 (July 2018), records shall be kept for any day during which fuel oil is burned as fuel (either alone or blended with other fuels) in Grate Kiln Line 1. These records must include, at a



minimum, the gallons of fuel oil burned per hour, the sulfur content of the fuel oil, and the SO<sub>2</sub> emissions in pounds per hour.

(5) Starting 26 months from May 12, 2016 (July 2018), the SO<sub>2</sub> limit for Grate Kiln Line 1 does not apply for any hour in which it is documented that there is a natural gas curtailment beyond Cliffs' control necessitating that the supply of natural gas to Tilden's Line 1 indurating furnace is restricted or eliminated. Records must be kept of the cause of the curtailment and duration of such curtailment. During such curtailment, the use of backup coal is restricted to coal with no greater than 0.60 percent sulfur by weight.

**(l) Testing and monitoring.**

(1) The owner or operator shall install, certify, calibrate, maintain, and operate a CEMS for NO<sub>x</sub> on Tilden Grate Kiln Line 1. Compliance with the emission limits for NO<sub>x</sub> shall be determined using data from the CEMS.

(2) The owner or operator shall install, certify, calibrate, maintain, and operate a CEMS for SO<sub>2</sub> on Tilden Grate Kiln Line 1. Compliance with the emission standard selected for SO<sub>2</sub> shall be determined using data from the CEMS.

(3) The owner or operator shall install, certify, calibrate, maintain, and operate one or more continuous diluent monitor(s) (O<sub>2</sub> or CO<sub>2</sub>) and continuous flow rate monitor(s) on Tilden Grate Kiln Line 1 to allow conversion of the NO<sub>x</sub> and SO<sub>2</sub> concentrations to units of the standard (lbs/MMBTU and lbs/hr, respectively) unless a demonstration is made that a diluent monitor and continuous flow rate monitor are not needed for the owner or operator to demonstrate compliance with applicable emission limits in units of the standards.

(4) For purposes of this section, all CEMS required by this section must meet the requirements of paragraphs (l)(4)(i) through (xiv) of this section.

(i) All CEMS must be installed, certified, calibrated, maintained, and operated in accordance with 40 CFR part 60, appendix B, Performance Specification 2 (PS-2) and appendix F, Procedure 1.

(ii) All CEMS associated with monitoring NO<sub>x</sub> (including the NO<sub>x</sub> monitor and necessary diluent and flow rate monitors) must be installed and operational upon May 12, 2016. All CEMS associated with monitoring SO<sub>2</sub> must be installed and operational no later than six months after May 12, 2016 (November 2016). Verification of the CEMS operational status shall, as a minimum, include completion of the manufacturer's written requirements or recommendations for installation, operation, and calibration of the devices.

(iii) The owner or operator must conduct a performance evaluation of each CEMS in accordance with 40 CFR part 60, appendix B, PS-2. The performance evaluations must be completed no later than 60 days after the respective CEMS installation (January 2017).

(iv) The owner or operator of each CEMS must conduct periodic Quality Assurance, Quality Control (QA/QC) checks of each CEMS in accordance with 40 CFR part 60, appendix F, Procedure 1. The first CEMS accuracy test will be a relative accuracy test audit (RATA) and must be completed no later than 60 days after the respective CEMS installation (March 2017).

(v) The owner or operator of each CEMS must furnish the Regional Administrator two, or upon request, more copies of a written report of the results of each performance evaluation and QA/QC check within 60 days of completion.

(vi) The owner or operator of each CEMS must check, record, and quantify the zero and span calibration drifts at least once daily (every 24 hours) in accordance with 40 CFR part 60, appendix F, Procedure 1, Section 4.

(vii) Except for CEMS breakdowns, repairs, calibration checks, and zero and span adjustments, all CEMS required by this section shall be in continuous operation during all periods of process operation of the indurating furnaces, including periods of process unit startup, shutdown, and malfunction.

(viii) All CEMS required by this section must meet the minimum data requirements at paragraphs (l)(4)(viii)(A) through (C) of this section.

(A) Complete a minimum of one cycle of operation (sampling, analyzing, and data recording) for each successive 15-minute quadrant of an hour.

(B) Sample, analyze, and record emissions data for all periods of process operation except as described in paragraph (1)(4)(viii)(C) of this section.

(C) When emission data from CEMS are not available due to continuous monitoring system breakdowns, repairs, calibration checks, or zero and span adjustments, emission data must be obtained using other monitoring systems or emission estimation methods approved by the EPA. The other monitoring systems or emission estimation methods to be used must be incorporated into the monitoring plan required by this section and provide information such that emissions data are available for a minimum of 18 hours in each 24-hour period and at least 22 out of 30 successive unit operating days.

(ix) Owners or operators of each CEMS required by this section must reduce all data to 1-hour averages. Hourly averages shall be computed using all valid data obtained within the hour but no less than one data point in each 15-minute quadrant of an hour. Notwithstanding this requirement, an hourly average may be computed from at least two data points separated by a minimum of 15 minutes (where the unit operates for more than one quadrant in an hour) if data are unavailable as a result of performance of calibration, quality assurance, preventive maintenance activities, or backups of data from data acquisition and handling systems and recertification events.

(x) The 30-day rolling average emission rate determined from data derived from the CEMS required by this section (in lbs/MMBTU or lbs/hr depending on the emission standard selected) must be calculated in accordance with paragraphs (1)(4)(x)(A) through (F) of this section.

(A) Sum the total pounds of the pollutant in question emitted from the unit during an operating day and the previous 29 operating days.

(B) Sum the total heat input to the unit (in MMBTU) or the total actual hours of operation (in hours) during an operating day and the previous 29 operating days.

(C) Divide the total number of pounds of the pollutant in question emitted during the 30 operating days by the total heat input (or actual hours of operation depending on the emission limit selected) during the 30 operating days.

(D) For purposes of this calculation, an operating day is any day during which fuel is combusted in the BART affected unit regardless of whether pellets are produced. Actual hours of operation are the total hours a unit is firing fuel regardless of whether a complete 24-hour operational cycle occurs (*i.e.*, if the furnace is firing fuel for only five hours during a 24-hour period, then the actual operating hours for that day are five. Similarly, total number of pounds of the pollutant in question for that day is determined only from the CEMS data for the five hours during which fuel is combusted.)

(E) If the owner or operator of the CEMS required by this section uses an alternative method to determine 30-day rolling averages, that method must be described in detail in the monitoring plan required by this section. The alternative method will only be applicable if the final monitoring plan and the alternative method are approved by EPA.

(F) A new 30-day rolling average emission rate must be calculated for the period ending each new operating day.

(xi) The 720-hour rolling average emission rate determined from data derived from the CEMS required by this section (in lbs/MMBTU) must be calculated in accordance with paragraphs (1)(4)(xi)(A) through (C) of this section.

(A) Sum the total pounds of NOX emitted from the unit every hour and the previous (not necessarily consecutive) 719 hours for which that type of fuel (either natural gas or mixed coal and natural gas) was used.

**(B)** Sum the total heat input to the unit (in MMBTU) every hour and the previous (not necessarily consecutive) 719 hours for which that type of fuel (either natural gas or mixed coal and natural gas) was used.

**(C)** Divide the total number of pounds of NOX emitted during the 720 hours, as defined above, by the total heat input during the same 720-hour period. This calculation must be done separately for each fuel type (either for natural gas or mixed coal and natural gas).

**(xii)** Data substitution must not be used for purposes of determining compliance under this regulation.

**(xiii)** All CEMS data shall be reduced and reported in units of the applicable standard.

**(xiv)** A Quality Control Program must be developed and implemented for all CEMS required by this section in accordance with 40 CFR part 60, appendix F, Procedure 1, Section 3. The program will include, at a minimum, written procedures and operations for calibration checks, calibration drift adjustments, preventative maintenance, data collection, recording and reporting, accuracy audits/procedures, periodic performance evaluations, and a corrective action program for malfunctioning CEMS.

**(m) Recordkeeping requirements.** (1)(i) Records required by this section must be kept in a form suitable and readily available for expeditious review.

**(ii)** Records required by this section must be kept for a minimum of five years following the date of creation.

**(iii)** Records must be kept on site for at least two years following the date of creation and may be kept offsite, but readily accessible, for the remaining three years.

**(2)** The owner or operator of the BART affected unit must maintain the records identified in paragraphs (m)(2)(i) through (xi) of this section.

**(i)** A copy of each notification and report developed for and submitted to comply with this section including all documentation supporting any initial notification or notification of compliance status submitted, according to the requirements of this section.

**(ii)** Records of the occurrence and duration of each startup, shutdown, and malfunction of the BART affected unit, air pollution control equipment, and CEMS required by this section.

**(iii)** Records of activities taken during each startup, shutdown, and malfunction of the BART affected unit, air pollution control equipment, and CEMS required by this section.

**(iv)** Records of the occurrence and duration of all major maintenance conducted on the BART affected unit, air pollution control equipment, and CEMS required by this section.

**(v)** Records of each excess emission report, including all documentation supporting the reports, dates and times when excess emissions occurred, investigations into the causes of excess emissions, actions taken to minimize or eliminate the excess emissions, and preventative measures to avoid the cause of excess emissions from occurring again.

**(vi)** Records of all CEMS data including, as a minimum, the date, location, and time of sampling or measurement, parameters sampled or measured, and results.

**(vii)** All records associated with quality assurance and quality control activities on each CEMS as well as other records required by 40 CFR part 60, appendix F, Procedure 1 including, but not limited to, the quality control program, audit results, and reports submitted as required by this section.

**(viii)** Records of the NOX emissions during all periods of BART affected unit operation, including startup, shutdown, and malfunction, in the units of the standard. The owner or operator shall convert the monitored data into the appropriate unit of the emission limitation using appropriate conversion factors and F-factors. F-factors used for purposes of this section shall be documented in the monitoring plan and developed in accordance with 40 CFR part 60, appendix A, Method 19. The owner or operator may use an alternate method to calculate the NOX emissions upon written approval from EPA.

(ix) Records of the SO<sub>2</sub> emissions or records of the removal efficiency (based on CEMS data), depending on the emission standard selected, during all periods of operation, including periods of startup, shutdown, and malfunction, in the units of the standard.

(x) Records associated with the CEMS unit including type of CEMS, CEMS model number, CEMS serial number, and initial certification of each CEMS conducted in accordance with 40 CFR part 60, appendix B, Performance Specification 2 must be kept for the life of the CEMS unit.

(xi) Records of all periods of fuel oil usage as required in paragraph (k)(4) of this section.

**(n) Reporting requirements.**

(1) All requests, reports, submittals, notifications, and other communications to the Regional Administrator required by this section shall be submitted, unless instructed otherwise, to the Air and Radiation Division, U.S. Environmental Protection Agency, Region 5 (A-18J) at 77 West Jackson Boulevard, Chicago, Illinois 60604. References in this section to the Regional Administrator shall mean the EPA Regional Administrator for Region 5.

(2) The owner or operator of each BART affected unit identified in this section and CEMS required by this section must provide to the Regional Administrator the written notifications, reports, and plans identified at paragraphs (n)(2)(i) through (viii) of this section. If acceptable to both the Regional Administrator and the owner or operator of each BART affected unit identified in this section and CEMS required by this section the owner or operator may provide electronic notifications, reports, and plans.

(i) A notification of the date construction of control devices and installation of burners required by this section commences postmarked no later than 30 days after the commencement date.

(ii) A notification of the date the installation of each CEMS required by this section commences postmarked no later than 30 days after the commencement date.

(iii) A notification of the date the construction of control devices and installation of burners required by this section is complete postmarked no later than 30 days after the completion date.

(iv) A notification of the date the installation of each CEMS required by this section is complete postmarked no later than 30 days after the completion date.

(v) A notification of the date control devices and burners installed by this section startup postmarked no later than 30 days after the startup date.

(vi) A notification of the date CEMS required by this section postmarked no later than 30 days after the startup date.

(vii) A notification of the date upon which the initial CEMS performance evaluations are planned. This notification must be submitted at least 60 days before the performance evaluation is scheduled to begin.

(viii) A notification of initial compliance signed by the responsible official, who shall certify its accuracy, attesting to whether the source has complied with the requirements of this section, including, but not limited to, applicable emission standards, control device and burner installations, and CEMS installation and certification. This notification must be submitted before the close of business on the 60th calendar day following the completion of the compliance demonstration and must include, at a minimum, the information in paragraphs (n)(2)(viii)(A) through (F) of this section.

(A) The methods used to determine compliance.

(B) The results of any CEMS performance evaluations and other monitoring procedures or methods that were conducted.

(C) The methods that will be used for determining continuing compliance, including a description of monitoring and reporting requirements and test methods.

(D) The type and quantity of air pollutants emitted by the source, reported in units of the standard.

(E) A description of the air pollution control equipment and burners installed as required by this section for each emission point.

(F) A statement by the owner or operator as to whether the source has complied with the relevant standards and other requirements.

(3) The owner or operator must develop and implement a written startup, shutdown, and malfunction plan for NOX and SO<sub>2</sub>. The plan must include, at a minimum, procedures for operating and maintaining the source during periods of startup, shutdown, and malfunction and a program of corrective action for a malfunctioning process and air pollution control and monitoring equipment used to comply with the relevant standard. The plan must ensure that, at all times, the owner or operator operates and maintains each affected source, including associated air pollution control and monitoring equipment, in a manner which satisfies the general duty to minimize or eliminate emissions using good air pollution control practices. The plan must ensure that owners or operators are prepared to correct malfunctions as soon as practicable after their occurrence.

(4) The written reports of the results of each performance evaluation and QA/QC check in accordance with and as required in paragraph (1)(4)(v) of this section.

(5) **Compliance reports.** The owner or operator of each BART affected unit must submit semiannual compliance reports. The semiannual compliance reports must be submitted in accordance with paragraphs (n)(5)(i) through (iv) of this section, unless the Regional Administrator has approved a different schedule.

(i) The first compliance report must cover the period beginning on the compliance date that is specified for the affected source through June 30 or December 31, whichever date comes first after the compliance date that is specified for the affected source.

(ii) The first compliance report must be postmarked no later than 30 calendar days after the reporting period covered by that report (July 30 or January 30), whichever comes first.

(iii) Each subsequent compliance report must cover the semiannual reporting period from January 1 through June 30 or the semiannual reporting period from July 1 through December 31.

(iv) Each subsequent compliance report must be postmarked no later than 30 calendar days after the reporting period covered by that report (July 30 or January 30).

(6) **Compliance report contents.** Each compliance report must include the information in paragraphs (n)(6)(i) through (vi) of this section.

(i) Company name and address.

(ii) Statement by a responsible official, with the official's name, title, and signature, certifying the truth, accuracy, and completeness of the content of the report.

(iii) Date of report and beginning and ending dates of the reporting period.

(iv) Identification of the process unit, control devices, and CEMS covered by the compliance report.

(v) A record of each period of a startup, shutdown, or malfunction during the reporting period and a description of the actions the owner or operator took to minimize or eliminate emissions arising as a result of the startup, shutdown, or malfunction and whether those actions were or were not consistent with the source's startup, shutdown, and malfunction plan.

(vi) A statement identifying whether there were or were not any deviations from the requirements of this section during the reporting period. If there were deviations from the requirements of this section during the reporting period, then the compliance report must describe in detail the deviations which occurred, the causes of the deviations, actions taken to address the deviations, and procedures put in place to avoid such deviations in the future. If there were no deviations from the requirements of this section during the reporting period, then the compliance report must include a statement that there were no deviations. For purposes of this section, deviations include, but are not limited to, emissions in excess of applicable emission standards established by this section, failure to continuously operate an air pollution control device in accordance with operating requirements designed to assure compliance with emission standards, failure to

continuously operate CEMS required by this section, and failure to maintain records or submit reports required by this section.

**(7)** Each owner or operator of a CEMS required by this section must submit quarterly excess emissions and monitoring system performance reports to the Regional Administrator for each pollutant monitored for each BART affected unit monitored. All reports must be postmarked by the 30th day following the end of each 3-month period of a calendar year (January-March, April-June, July-September, October-December) and must include, at a minimum, the requirements of paragraphs (n)(7)(i) through (xv) of this section.

**(i)** Company name and address.

**(ii)** Identification and description of the process unit being monitored.

**(iii)** The dates covered by the reporting period.

**(iv)** Total source operating hours for the reporting period.

**(v)** Monitor manufacturer, monitor model number, and monitor serial number.

**(vi)** Pollutant monitored.

**(vii)** Emission limitation for the monitored pollutant.

**(viii)** Date of latest CEMS certification or audit.

**(ix)** A description of any changes in continuous monitoring systems, processes, or controls since the last reporting period.

**(x)** A table summarizing the total duration of excess emissions, as defined in paragraphs (n)(7)(x)(A) through (B) of this section, for the reporting period broken down by the cause of those excess emissions (startup/shutdown, control equipment problems, process problems, other known causes, unknown causes), and the total percent of excess emissions (for all causes) for the reporting period calculated as described in paragraph (n)(7)(x)(C) of this section.

**(A)** For purposes of this section, an excess emission is defined as any 30-day or 720-hour rolling average period, including periods of startup, shutdown, and malfunction, during which the 30-day or 720-hour (as appropriate) rolling average emissions of either regulated pollutant (SO<sub>2</sub> and NO<sub>x</sub>), as measured by a CEMS, exceeds the applicable emission standards in this section.

**(B)(1)** For purposes of this section, if a facility calculates a 30-day rolling average emission rate in accordance with this section which exceeds the applicable emission standards of this section, then it will be considered 30 days of excess emissions. If the following 30-day rolling average emission rate is calculated and found to exceed the applicable emission standards of this section as well, then it will add one more day to the total days of excess emissions (*i.e.* 31 days). Similarly, if an excess emission is calculated for a 30-day rolling average period and no additional excess emissions are calculated until 15 days after the first, then that new excess emission will add 15 days to the total days of excess emissions (*i.e.* 30 + 15 = 45). For purposes of this section, if an excess emission is calculated for any period of time within a reporting period, there will be no fewer than 30 days of excess emissions but there should be no more than 121 days of excess emissions for a reporting period.

**(2)** For purposes of this section, if a facility calculates a 720-hour rolling average emission rate in accordance with this section which exceeds the applicable emission standards of this section, then it will be considered 30 days of excess emissions. If the 24th following 720-hour rolling average emission rate is calculated and found to exceed the applicable emission standards of the rule as well, then it will add one more day to the total days of excess emissions (*i.e.* 31 days). Similarly, if an excess emission is calculated for a 720-hour rolling average period and no additional excess emissions are calculated until 360 hours after the first, then that new excess emission will add 15 days to the total days of excess emissions (*i.e.* 30+15 = 45). For purposes of this section, if an excess emission is calculated for any period of time with a reporting period, there will be no fewer than 30 days of excess emissions but there should be no more than 121 days of excess emissions for a reporting period.

(C) For purposes of this section, the total percent of excess emissions will be determined by summing all periods of excess emissions (in days) for the reporting period, dividing that number by the total BART affected unit operating days for the reporting period, and then multiplying by 100 to get the total percent of excess emissions for the reporting period. An operating day, as defined previously, is any day during which fuel is fired in the BART affected unit for any period of time. Because of the possible overlap of 30-day rolling average excess emissions across quarters, there are some situations where the total percent of excess emissions could exceed 100 percent. This extreme situation would only result from serious excess emissions problems where excess emissions occur for nearly every day during a reporting period.

(xi) A table summarizing the total duration of monitor downtime, as defined in paragraph (n)(7)(xi)(A) of this section, for the reporting period broken down by the cause of the monitor downtime (monitor equipment malfunctions, non-monitor equipment malfunctions, quality assurance calibration, other known causes, unknown causes), and the total percent of monitor downtime (for all causes) for the reporting period calculated as described in paragraph (n)(7)(xi)(B) of this section.

(A) For purposes of this section, monitor downtime is defined as any period of time (in hours) during which the required monitoring system was not measuring emissions from the BART affected unit. This includes any period of CEMS QA/QC, daily zero and span checks, and similar activities.

(B) For purposes of this section, the total percent of monitor downtime will be determined by summing all periods of monitor downtime (in hours) for the reporting period, dividing that number by the total number of BART affected unit operating hours for the reporting period, and then multiplying by 100 to get the total percent of excess emissions for the reporting period.

(xii) A table which identifies each period of excess emissions for the reporting period and includes, at a minimum, the information in paragraphs (n)(7)(xii)(A) through (F) of this section.

(A) The date of each excess emission.

(B) The beginning and end time of each excess emission.

(C) The pollutant for which an excess emission occurred.

(D) The magnitude of the excess emission.

(E) The cause of the excess emission.

(F) The corrective action taken or preventative measures adopted to minimize or eliminate the excess emissions and prevent such excess emission from occurring again.

(xiii) A table which identifies each period of monitor downtime for the reporting period and includes, at a minimum, the information in paragraphs (n)(7)(xiii)(A) through (D) of this section.

(A) The date of each period of monitor downtime.

(B) The beginning and end time of each period of monitor downtime.

(C) The cause of the period of monitor downtime.

(D) The corrective action taken or preventative measures adopted for system repairs or adjustments to minimize or eliminate monitor downtime and prevent such downtime from occurring again.

(xiv) If there were no periods of excess emissions during the reporting period, then the excess emission report must include a statement which says there were no periods of excess emissions during this reporting period.

(xv) If there were no periods of monitor downtime, except for daily zero and span checks, during the reporting period, then the excess emission report must include a statement which says there were no periods of monitor downtime during this reporting period except for the daily zero and span checks.

(8) The owner or operator of each CEMS required by this section must develop and submit for review and approval by the Regional Administrator a site specific monitoring plan. The purpose of this monitoring plan is to establish procedures and practices which will be implemented by the owner or operator in its effort to comply

with the monitoring, recordkeeping, and reporting requirements of this section. The monitoring plan must include, at a minimum, the information in paragraphs (n)(8)(i) through (x) of this section.

**(i)** Site specific information including the company name, address, and contact information.

**(ii)** The objectives of the monitoring program implemented and information describing how those objectives will be met.

**(iii)** Information on any emission factors used in conjunction with the CEMS required by this section to calculate emission rates and a description of how those emission factors were determined.

**(iv)** A description of methods to be used to calculate emission rates when CEMS data are not available due to downtime associated with QA/QC events.

**(v)** A description of the QA/QC program to be implemented by the owner or operator of CEMS required by this section. This can be the QA/QC program developed in accordance with 40 CFR part 60, appendix F, Procedure 1, Section 3.

**(vi)** A list of spare parts for CEMS maintained on site for system maintenance and repairs.

**(vii)** A description of the procedures to be used to calculate 30-day rolling averages and 720-hour rolling averages and example calculations which show the algorithms used by the CEMS to calculate 30-day rolling averages and 720-hour rolling averages.

**(viii)** A sample of the document to be used for the quarterly excess emission reports required by this section.

**(ix)** A description of the procedures to be implemented to investigate root causes of excess emissions and monitor downtime and the proposed corrective actions to address potential root causes of excess emissions and monitor downtime.

**(x)** A description of the sampling and calculation methodology for determining the percent sulfur by weight as a monthly block average for coal used during that month.

**(o)** The requirements of section 169A of the Clean Air Act are not met because the regional haze plan submitted by the state on November 5, 2010, does not meet the requirements of 40 CFR 51.308(e) with respect to NOX and SO2 emissions from Tilden Mining Company L.C. of Ishpeming, Michigan. The requirements for this facility are satisfied by complying with § 52.1183(k-n)



**APPENDIX B - QA/QC FORMULAE**

## QA/QC Formulas

### *CALIBRATION DRIFT (CD)*

#### **Pollutant Concentration and Diluent Monitors:**

For each reference value (zero and high), calculate the percentage calibration error based upon instrument span for daily calibration error tests using the following equation:

$$CD = \frac{|R - A|}{S} \times 100 \quad (\text{Eq. 1})$$

where,

CD = Percentage Calibration error based upon span of the instrument.

R = Reference value of zero- or high-level calibration gas introduced into the monitoring system.

A = Actual monitoring system response to the calibration gas.

S = Span of the instrument.

Adjustments must be performed whenever the daily zero or high-level CD exceeds two times the limits of the applicable performance specifications defined in 40CFR60, Appendix B. If the CD exceeds two times the applicable limits for five, consecutive, daily periods, the CEMS is considered out-of-control. If the CD exceeds four times the applicable limits during any CD check, the CEMS is considered out-of-control.

### *CYLINDER GAS AUDITS (CGA)*

#### **Pollutant Concentration Monitors:**

For each audit point (Low – 20-30% of span, Mid – 50-60% of span), challenge the CEMS three times, and determine the average response using the following equation:

$$C_m = \frac{1}{3} \times \sum_{i=1}^3 m_i \quad (\text{Eq. 2})$$

where,

$C_m$  = Average of the three CGA responses

$\sum_{i=1}^3 m_i$  = Summation of responses of the CEMS during the CGA

Then, determine the CGA accuracy by determining the percentage of the difference between the measured average response of the CEMS and the certified reference value of the calibration gas used to test the CEMS using the following equation:

$$A = \frac{|C_m - C_a|}{C_a} \times 100 \quad (\text{Eq. 3})$$

where,

A = Accuracy of the CEMS determined by the CGA, percent (%)

$C_m$  = Average of the three CGA responses

$C_a$  = Certified reference value of the calibration gas

#### **Diluent Concentration Monitors:**

For each audit point (Low – 4-6% O<sub>2</sub>, Mid – 8-12% O<sub>2</sub>), challenge the CEMS three times, and determine the average response using the following equation:

$$C_m = \frac{1}{3} \times \sum_{i=1}^3 m_i \quad (\text{Eq. 4})$$

where,

$C_m$  = Average of the three CGA responses

$\sum_{i=1}^3 m_i$  = Summation of responses of the CEMS during the CGA

Then, determine the CGA accuracy by determining the percentage of the difference between the measured average response of the CEMS and the certified reference value of the calibration gas used to test the CEMS using the following equation:

$$A = \frac{|C_m - C_a|}{C_a} \times 100 \quad (\text{Eq. 5})$$

where,

A = Accuracy of the CEMS determined by the CGA, percent (%)

C<sub>m</sub> = Average of the three CGA responses

C<sub>a</sub> = Certified reference value of the calibration gas

$$[\text{Reserved}] \quad (\text{Eq. 6})$$

### **RELATIVE ACCURACY TEST AUDIT (RATA)**

#### **Arithmetic Mean of the differences:**

Calculate the arithmetic mean of the difference, *d* of the data set using the following equation:

$$d = \frac{1}{n} \sum_{i=1}^n d_i \quad (\text{Eq. 7})$$

where,

n = Number of data points.

Σ d<sub>i</sub> = Algebraic sum of the individual differences d<sub>i</sub>.

#### **Standard Deviation:**

Calculate the standard deviation, S<sub>d</sub>, of a data set as follows.

$$S_d = \sqrt{\frac{\sum_{i=1}^n d_i^2 - \frac{\left(\sum_{i=1}^n d_i\right)^2}{n}}{n-1}} \quad (\text{Eq. 8})$$

where,

n = Number of data points.

Σ d<sub>i</sub> = Algebraic sum of the individual differences d<sub>i</sub>.

#### **Confidence Coefficient:**

Calculate the confidence coefficient (one-tailed), *cc*, of a data set as follows.

$$cc = t_{0.025} \frac{S_d}{\sqrt{n}} \quad (\text{Eq. 9})$$

where,

t<sub>0.025</sub> = t value (See Table 1-3 in 40CFR60, Appendix B)

#### **Relative Accuracy:**

Calculate the relative accuracy of a data set using the following equation.

$$RA = \frac{|d| + |cc|}{RM} \times 100 \quad (\text{Eq. 10})$$

where,

RM = Arithmetic mean of the reference method values or applicable standard.

d = The absolute value of the mean difference between the reference method values and the corresponding continuous emission monitoring system values.

cc = The absolute value of the confidence coefficient.



March 11, 2002

Mr. Dennis Drake, Chief  
Air Quality Division  
Michigan Department of Environmental Quality  
P.O. Box 30260  
Lansing, MI 48909-7760

Dear Mr. Drake:

Subject: Oxides of Nitrogen (NOx) Control Plan  
Tilden Mining Company L.C.  
Revised February 2002

Tilden Mining Company's (Tilden) NOx Control Plan is attached in accordance with Rule 801(4)(g). Tilden has recently completed a comprehensive investigation of potential NOx control technologies for its grate-kiln systems and has determined that burning coal is the only known feasible technique to reduce NOx at this time.

Tilden Mine is operating in a very competitive industry and to be subject NOx control in Michigan, while our competitors in Minnesota and South America have no new NOx emissions limitations, puts Tilden at a significant economic disadvantage. Tilden Mine is one of the primary employers in Marquette County, employing approximately 810 people on a fulltime basis.

We will continue to look for additional ways to economically reduce NOx emissions from our operations. Please contact me with any questions about the attached plan.

Sincerely,

Leonard R. Parker  
Manager – Safety & Environmental

Copies:  
Brian Brady, AQD, Marquette

# TILDEN MINING COMPANY L.C.

## NO<sub>x</sub> CONTROL PLAN

(Amended February 2002)

Rule 801 (4)(g) requires that Tilden Mining Company L.C. (Tilden) submit a NO<sub>x</sub> Control Plan (Plan) for reducing NO<sub>x</sub> emissions during the ozone control period (May – September) to the Michigan Department of Environmental Quality. The Plan as outlined below is for the two grate-kiln-cooler machines that produce hematite fluxed pellets during the ozone control period. It should be noted that because Tilden is a large consumer of electric power, it will incur approximately \$1 million per year increased power costs due to NO<sub>x</sub> reduction efforts at Wisconsin Electric Power Company.

### Reasonably Available NO<sub>x</sub> Reduction Technologies

**Low-NO<sub>x</sub> burners** are used in some industries to lower the flame temperature to reduce the amount of NO<sub>x</sub> formed. Low-NO<sub>x</sub> burners to provide sufficient heat for the kilns would be much larger in physical size than the existing burners. A low-NO<sub>x</sub> burner for this application would have a diameter of approximately 40 feet and could not be physically accommodated at the existing facilities. The kiln is 160 feet long and 25 feet in diameter. To accommodate a Low-NO<sub>x</sub> burner the kiln would have to be raised in elevation, which would be cost prohibitive. Low-NO<sub>x</sub> burners also provide excess stoichiometric air, which is not desirable in an iron ore kiln. The increased primary air would increase fuel consumption and pressurize the kiln firing hood, causing the primary cooling fan to cut back on flow and adversely effecting pellet cooling. Therefore, the use of low-NO<sub>x</sub> burners is not an option.

**Oscillating combustion burner** technology uses oscillation of the fuel flow above and below the stoichiometric value to create fuel-rich and fuel-lean zones that improve heat transfer and reduce NO<sub>x</sub> by lowering peak flame temperatures. The amount of NO<sub>x</sub> reduction that can be expected at Tilden is speculative as the technology is experimental. The initial startup cost for replacing the existing burners on Tilden Units 1 and 2 with oscillating burners is estimated at \$1.1 million. In addition, an annual fee of up to \$100,000 must be paid to use this patented technology. At this time Tilden does not plan to investigate this experimental technology further.

**Water injection** into the flame of existing burners using an atomizing spray nozzle to reduce flame temperature has been considered. Preliminary testing of this technology resulted in increased fuel consumption without any reduction in NO<sub>x</sub> emissions. Research and testing may continue at Tilden to determine whether there are potential benefits to this technology.

**Coal burning** produces less NO<sub>x</sub> than natural gas burning. Plant testing at Tilden has shown that NO<sub>x</sub> emissions from natural gas baseline emissions could be reduced from about 5 lbs of NO<sub>x</sub> per long ton of pellets to 2 lbs of NO<sub>x</sub> per long ton of pellets by

burning 100% eastern coal. At this time, no additional direct fuel costs would be incurred to Tilden when burning coal because present natural gas prices are higher than coal. However, as gas prices decrease and coal prices increase, Tilden will eventually incur increased direct fuel costs when burning coal.

The operational cost penalty for burning coal is approximately \$0.82 per long ton of pellets produced. The penalty is incurred because of significant buildup of iron ore concentrate on the inside of the kiln when burning coal during hematite production. This means that if the cost of coal and natural gas are the same per Btu of heat input, coal burning during the ozone control period at Tilden would cause a cost penalty of \$2.7 million. The cost of this control is \$1385 per ton of NOx reduced.

Modeling has shown that installing turning vanes in the secondary air duct may improve the airflow distribution into the kiln. The airflow into the kiln would become more laminar, which should keep the coal flame in the center of the kiln and not licking the side of the kiln as it presently does when burning coal. It is hoped that this will help reduce kiln buildup. Tilden plans to install trial turning vanes in the Unit 2 secondary air duct soon in order to test this theory.

#### **Tilden Mine Selected Technology for NOx Reduction**

Although natural gas is the fuel of choice, Tilden proposes to burn coal during the ozone control period for a net NOx emissions reduction of about 25%. When possible, Tilden also plans to schedule repairs during the ozone control period to help reduce NOx emissions.

Tilden typically burns approximately 1/3 less fuel (coal and natural gas) when producing magnetite fluxed pellets than when producing hematite fluxed pellets, resulting in less NOx emissions with both fuels. Kiln buildup is also a problem when producing magnetite fluxed pellets when burning coal, but to a lesser extent

Although Tilden can produce hematite and magnetite pellets, the production of hematite pellets during the ozone control period is necessary for two reasons. First, the hematite process is sensitive to reuse water temperature and chemistry requiring that hematite pellets must be produced during the summer months. About 95% of the water used in the process is reuse water. Recovery of iron units from the finely ground ore is related to the water temperature and chemistry available during the warmer months of the year. The cost to heat the reuse water and maintain its chemistry during the winter months is prohibitive and technically infeasible. Tilden must produce hematite pellets during the warmer months of the year, which also coincides with the ozone control period. Second, and equally important, is that hematite pellets require more energy to produce. Typically, the market price for natural gas is lower in the warmer months than it is in the winter. This fluctuation in natural gas price makes it economically attractive to produce hematite pellets during the summer months.

Presently, Tilden only burns coal when it is economically necessary because of the operating problems associated with coal burning – rapid and extreme kiln and preheat furnace buildup of iron ore pellet dust and coal ash that occurs when coal is burned. This buildup, that doesn't occur when burning natural gas, lowers fired pellet production rates and damages the kiln and preheat furnace refractory. To remove the buildup, Tilden must burn natural gas or shut the unit down and manually remove the buildup. Tilden is presently working with chemical companies to find a chemical that can be sprayed into the kiln to reduce or prevent this buildup. To date, there has been very little success in finding a chemical to reduce buildup.

Kiln burner flame characteristics (shape, temperature, consistency, etc.) are important factors for an efficient operation and production of quality pellets. Gas and coal have very different flame characteristics, with the gas flame being superior. The poorer flame associated with burning coal likely contributes to the buildup. Primary air must be increased in order to convey coal to the burner. This excess air causes a bushier flame, which is easier pulled to the kiln lining by the uneven distribution of secondary air into the kiln. The installation of turning vanes in the secondary air duct may help alleviate this problem.

Burning coal also adds to potential delivery and logistics problems at Tilden. Coal delivery to the kilns can be curtailed for a number of reasons, including train, ship and trucking delays, freezing and conveying and milling problems at Tilden.

Tilden is presently investigating coke breeze as an additive to assist in providing heat in the process without causing excessive buildup in the grate-kiln system. Coke breeze may be mixed with the iron ore concentrate as an internal fuel before the pellets are formed or it may be injected directly into the kiln or pre-heat areas. An application for an air discharge permit to test this potentially beneficial process amendment is being developed and will be submitted to MDEQ-AQD in the first quarter of 2002.

### **Monitoring and Reporting**

The amount of coal and natural gas burned throughout the ozone control period will be measured and recorded for both pelletizing units. The quantity of pellets produced is also recorded. NOx emissions will be calculated by applying the following emission factors to the long tons of pellets produced on each unit during the ozone control period.

Baseline Natural Gas Firing	5 lbs NOx per long ton of pellets
Western Coal and Gas Firing	3 lbs NOx per long ton of pellets
Eastern Coal Firing	2 lbs NOx per long ton of pellets.

The percent NOx reduction is determined by:

$$\frac{\text{NOx from Gas} - \text{NOx actual}}{\text{NOx from Gas}} \times 100 = \% \text{ NOx reduction}$$



An annual summary report shall be submitted to MDEQ and shall include the following information:

- Quantity of each fuel burned during the ozone control period;
- Quantity of NO<sub>x</sub> emissions and emission rates while burning coal and natural gas;
- Quantity of NO<sub>x</sub> reduction during the ozone control period; and,
- Total operating time of the emissions units during the ozone control period.

*Operation and Maintenance (O&M) Plan*



**Tilden Mining Company L.C.**

*December 2021*

# Operation and Maintenance (O&M) Plan

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## 1. Purpose

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Cleveland Cliffs' Tilden Mining Company L.C., facility is subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Taconite Iron Ore Processing [40 Code of Federal Regulations (CFR) Part 63 Subpart RRRRR]. This regulation is commonly referred to as the Taconite MACT. The regulation requires the development and implementation of an Operation and Maintenance (O&M) Plan (40 CFR 63.9600(b)) which must be submitted to the Administrator for review and approval by October 30, 2006.

The O&M Plan is applicable to air pollution control equipment that is used to maintain compliance with the Taconite MACT. This includes the indurating furnace(s) and pollution control equipment used to control particulate emissions from the following sources:

- Ore Crushing and Handling Emission Units;
- Indurating Furnace(s); and
- Finished Pellet Handling Emission Units.

The general purpose of the O&M Plan is to document that the pollution control equipment at the facility is operated and maintained in a manner consistent with good air pollution control practice by minimizing emissions by documenting the operation and maintenance activities.

The O&M Plan must contain four general components:

1. Preventative maintenance for each control device;
2. Corrective action procedures for continuous parametric monitoring systems (PMS) for air pollution control devices; and
3. Good combustion practices for each indurating furnace.

In addition to the four general components required for the O&M Plan, this document also addresses roles and responsibilities, recordkeeping, reporting, and revisions.

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## 2. Responsibilities

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The following is a summary of the responsibilities for each position involved in the implementation of the O&M Plan.

### 2.1 Maintenance Personnel

- 2.1.1 Conducting maintenance activities, per the O&M Plan;

### 2.2 Maintenance Coordinators

- 2.2.1 Coordinating preventative maintenance activities, per the O&M Plan;
- 2.2.2 Coordinating maintenance activities, per the O&M Plan;
- 2.2.3 Coordinating critical spare parts specifications and inventories, per the O&M Plan; and
- 2.2.4 Maintaining equipment repair histories through the maintenance tracking system;

### 2.3 Area Manager Maintenance

- 2.3.1 Ensure that the Maintenance Personnel are completing their responsibilities;
- 2.3.2 Assist Maintenance Personnel and Maintenance Coordinators, as needed;
- 2.3.3 Assisting in the development and updating of the SSM and O&M procedures, the SSM Plan, and the O&M Plan;

### 2.4 Section Managers Maintenance

- 2.4.1 Ensure that the Maintenance Personnel are completing their responsibilities;
- 2.4.2 Ensure that the Maintenance Coordinators are completing their responsibilities; and
- 2.4.3 Assist Maintenance Personnel and Maintenance Coordinators, as needed;

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2.4.4 Assisting in the development and updating of the SSM and O&M procedures, the SSM Plan, and the O&M Plan;

2.4.5 Coordinating the root cause analysis and identification of the steps to prevent a reoccurrence;

## **2.5 Operators**

2.5.1 Operating the applicable air pollution control equipment and the indurating furnace(s) according to the Standard Operating Procedures (SOPs), the O&M Plan, and the SSM Plan;

2.5.2 Assisting in the development and updating of the SSM and O&M procedures, the SSM Plan, and the O&M Plan;

2.5.3 Following the SSM Plan malfunction procedures; and

2.5.4 Notifying the shift supervisor of all malfunctions, and problems with the monitoring systems for the scrubbers, the ESPs, and the GCP;

## **2.6 Shift Supervisor**

2.6.1 Ensuring that the operators are completing their responsibilities;

2.6.2 Assisting the operators in responding to malfunction events as necessary;

2.6.3 Notifying the Section Manager of all malfunctions, and problems with the monitoring systems for the scrubbers, the ESPs, and the GCP;

## **2.7 Section Manager Operations**

2.7.1 Ensuring that the operators and shift supervisor are completing their responsibilities;

2.7.2 Assisting the operators and shift supervisor in responding to malfunction events as necessary;

2.7.3 Assisting with root cause analysis and steps to prevent a reoccurrence;

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- 2.7.4 Ensuring that the steps to prevent a reoccurrence are completed in a timely manner;
- 2.7.5 Assisting in the development and updating of the SSM and O&M procedures, the SSM Plan, and the O&M Plan; and
- 2.7.6 Completing the Corrective Action Forms as required;
- 2.7.7 Coordinating initial training and refresher training of all affected operators and supervisors;

## **2.8 Environmental Engineers**

- 2.8.1 Developing and updating the SSM and O&M procedures, the SSM Plan, and the O&M Plan;
- 2.8.2 Creating reports. obtaining responsible official approval (sign-off) and submitting reports as required by the regulation; and
- 2.8.3 Facilitate resolution of inquiries and clarification of Taconite MACT rule as requested to assist personnel described herein in the completion of their responsibilities



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### 3. Definitions

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*Administrator* means the regulatory agency that is responsible for the administration of the Taconite MACT regulation; this could be EPA, or EGLE.

*Bypass* means to route gas around a control device.

*CMMS* means Cleveland Cliffs' Maintenance Management System

*CPMS* means continuous parametric monitoring system.

*CFR* means Code of Federal Regulations.

*DCS* means Distributed Control System.

*Dynamic Wet Scrubber* means an air emissions control device which utilizes a mechanically powered fan to cause contact between the process exhaust gas stream and the scrubbing liquid which are introduced concurrently into the fan inlet.

*EGLE* means State of Michigan Department of Environment, Great Lakes, and Energy

*EPA* means United States Environmental Protection Agency.

*ESP* means electrostatic precipitator.

*Finished Pellet Handling* means the transfer of fired taconite pellets from the indurating furnace to the finished pellet stockpiles at the plant. Finished pellet handling includes, but is not limited to:

- Furnace discharge;
- Finished pellet screening;
- Finished pellet transfer; and
- Finished pellet storage.

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The atmospheric pellet cooler vent stack and gravity conveyor gallery vents designed to remove heat and water vapor from the structure are not included as part of the finished pellet handling affected source.

*GCP* means the Good Combustion Practices.

*HAPS* means Hazardous Air Pollutants.

*Indurating* means the process whereby unfired taconite pellets, called green balls, are hardened at high temperature in an indurating furnace. Types of indurating furnaces include straight-grate indurating furnaces and grate-kiln indurating furnaces.

*IT* means Information Technology.

*MACT* means Maximum Achievable Control Technology.

*Malfunction* means any sudden, infrequent, and not reasonably preventable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner which causes, or has the potential to cause, the emission limitations in an applicable standard to be exceeded. Failures that are caused in part by poor maintenance or careless operation are not malfunctions. Malfunctions are specifically defined in the SSM Plan. Excursions of parametric limits are not necessarily malfunctions (i.e. 24 hour average opacity for indurating furnaces with dry ESPs and 24 hour average pressure drop and water flow for wet scrubbers)

*O&M Plan* means the Operation and Maintenance Plan.

*Ore Crushing and Handling Emission Units* means the process whereby dry taconite ore is crushed and screened. Ore crushing and handling includes, but is not limited to:

- Dry crushing operations (e.g. primary, secondary, and tertiary crushing);
- Dry ore conveyance and transfer points;
- Dry ore classification and screening;
- Dry ore storage and stockpiling;

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- Grate feed.

Ore crushing and handling specifically excludes any operations where the dry crushed ore is saturated with water, such as wet milling and wet magnetic separation.

*Shutdown* means the cessation of operation of an affected source or portion of an affected source for any purpose.

*SOP* means standard operating procedure.

*SSM Plan* means Startup, Shutdown, and Malfunction Plan.

*Startup* means the setting in operation of an affected source or portion of an affected source for any purpose.

*Wet Scrubber* means an air emissions control device which utilizes a mechanically powered fan to cause contact between the process exhaust gas stream and the scrubbing liquid which is introduced into the exhaust gas stream.

## 4. Pollution Control Equipment Covered by this Plan

The O&M Plan has been developed for three distinct categories of pollution control equipment.

### 4.1 Wet Scrubbers

The following is a list of wet scrubbers as particulate matter control equipment that are covered by this plan.

**Table 4.1 – Wet Scrubbers**

Air Permit ID Number	Control Equipment Description	Process Description
SVA0007880	EU-CONVEYOR4B-4C	Conveyors 4B & 4B1 to 4C
SVA0013480	EU-CONVEYOR4A-4A1	Conveyor 4A to 4A-1
SVA0007910	EU-CONVEYOR4C-4D	Conveyor 4C to 4D
SVA0011570	EU-PRIMARYCRUSHER	Primary Ore Crusher
SVA0010460	EU-CONVEYOR1	Conveyor 1 to 2
SVC0005037	EU-CONVEYOR12A-13	Conveyor 12A to 13
SVC0005042	EU-CONVEYOR12B-13	Conveyor 12B to 13
SVC0005047	EU-CONV13-17.1	Conveyor 13 to 17.1
SVC0005057	EU-CONV15-15.1	Conveyor 15 to 15.1
SVP0033820	EU-CONV15.8-15.9	Conveyor 15.8 to 15.9
SVP0033940	EU-CONV15.9-16.1	Conveyor 15.9 to 16.1
SVC0005062	EU-CONV16.1-17.1	Conveyor 16.1 to 17.1
SVP0016830	EU-CONV17.1-17.2	Conveyor 17.1 to 17.2
SVC0005052	EU-CONV14-15-16	Conveyor 14 to 15 to 16
SVC0005067	EU-CONV19&19A-17	Conveyor 19 & 19A to 17 & screen
SVC0005072	EU-SCREENSRECLAIM	Conveyor 19 to 19A to 19B & screen
SVP0016100	EU-FEEDMIXER1	T1 Bentonite feeders and blender
SVP0014430	EU-COOLER1	T1 Cooler Discharge & Conveyor
SVP0014160	EU-UNIT1LHF	T1 Low Head Feeder
SVP0016230	EU-FEEDMIXER2	T2 Bentonite feeders and blender
SVP0014490	EU-COOLER2	T2 Cooler Discharge & Conveyor
SVP0014290	EU-UNIT2LHF	T2 Low Head Feeder
SVE3100694	EU-PROD CONV2	Conveyors 31.4, 31.5, 31.6, & 31.7
SVP0016620	EU-TRANSFERTOWER1	Tilden Unit 1 Pellet Loadout
SVP0016690	EU-TRANSFERTOWER2	Tilden Unit 2 Pellet Loadout

## 4.2 Ore Concentrate Dryers with Dynamic Wet Scrubbers

The following table lists the ore concentrate dryers that utilize dynamic wet scrubbers as particulate matter control equipment that are covered by this plan.

**Table 4.2 – Ore Concentrate Dryers with Dynamic Wet Scrubbers**

Air Permit ID Number	Control Equipment Description	Process Description
SVP0082951	EU-OREDRYER1 - Dynamic Scrubber	Ore Concentrate Dryer #1
SVP0082851	EU-OREDRYER2 - Dynamic Scrubber	Ore Concentrate Dryer # 2 North Stack
SVP0082861	EU-OREDRYER2 - Dynamic Scrubber	Ore Concentrate Dryer # 2 South Stack

## 4.3 Indurating Furnaces with Dry ESPs

The following table lists the indurating furnaces that utilize dry ESPs as particulate matter control equipment that are covered by this plan.

**Table 4.3 – Indurating Furnaces with Dry ESPs**

Air Permit ID Number	Control Equipment Description	Process Description
SVP0051981	EU-KILN1 - Dry ESP 2C-1	Grate-Kiln Pelletizing Unit 1 North Stack
SVP0051711	EU-KILN1 - Dry ESPs 2A-1 & 2B-1	Grate-Kiln Pelletizing Unit 1 South Stack
SVP0052431	EU-KILN2 - Dry ESP 2C-2	Grate-Kiln Pelletizing Unit 2 North Stack
SVP0052131	EU-KILN2 - Dry ESPs 2A-2 & 2B-2	Grate-Kiln Pelletizing Unit 2 South Stack

## 4.4 Indurating Furnaces with Good Combustion Practices

The following table lists the indurating furnaces for the facility. The indurating furnaces are all required to follow Good Combustion Practices and, therefore, are covered by this plan.

**Table 4.4 – Indurating Furnaces with Good Combustion Practices**

Air Permit ID Number	Control Equipment Description	Process Description
SVP0051981	EU-KILN1 - Dry ESP 2C-1	Grate-Kiln Pelletizing Unit 1
SVP0051711	EU-KILN1 - Dry ESPs 2A-1 & 2B-1	
SVP0052431	EU-KILN2 - Dry ESP 2C-2	Grate-Kiln Pelletizing Unit 2
SVP0052131	EU-KILN2 - Dry ESPs 2A-2 & 2B-2	

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## 5. Preventative Maintenance for Control Devices

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The requirements presented in this section of the O&M Plan apply to all of the pollution control equipment which is presented in section 4 of this plan.

Per 40 CFR 63.9600(b)(1), the O&M Plan must address the following:

*Preventative maintenance for each control device, including a schedule that is consistent with the manufacturer's instructions for routine and long-term maintenance.*

In order to comply with this requirement, this facility periodically evaluates the routine inspection and preventative maintenance programs for the affected equipment. The evaluations are conducted to ensure that the routine inspection and preventative maintenance programs are consistent with the manufacturer's instructions and operating experiences. The established routine inspection and preventative maintenance programs ensure that the control equipment is maintained in a manner consistent with good air pollution control practices for minimizing emissions. This program is carried out per the framework set forth Cleveland Cliffs Maintenance Process Standards (MPS) and described below.

Each piece of control equipment is associated with a unique Maintenance Scheduling Task (MST) ID. The MST contains the frequency at which various standard jobs are to be performed. The MST serves as a "timer" and initiates work orders with the standard jobs attached. The work order is then scheduled and executed. Standard jobs can be associated with more than one MST.

In addition, routine inspections and preventative maintenance are also conducted through the completion of standard work performed during regular routes. Route work can be booked through an individual equipment ID but is typically booked to a building where control equipment is located. Route work for multiple pieces of similar control equipment is typically executed under one work order to maximize efficiency of the work order system.

Routine inspections and preventative maintenance work orders are generated using Cleveland Cliffs' CMMS (Ellipse). Work details are contained in the standard job and may include but are not limited to control equipment description, PM responsibility, equipment description, PM description and PM frequency are provided on the work orders. Upon the execution of these work orders, if additional

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tasks are identified, “ad hoc” work orders are created, planned and executed. Closed work orders are the primary method used for verification that work has been completed.

Materials management/critical parts inventory management - current material stocking levels are managed and monitored to include item storage location, stock code ID and number of spares on hand. Materials stocking levels are periodically reviewed by inventory control with input from the maintenance department. Inventory Control suggests stocking levels based on usages and lead times. Adjustments are made with approval from the maintenance department taking into account critical parts inventory management.

The routine inspection and preventative maintenance general schedules and framework for the equipment affected by this plan are presented in Appendix A of this document. The general framework provided herein addresses routine inspection and preventative maintenance as well as activities performed during the major repairs.

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## **6. Corrective Action Procedures for Continuous Parameter Monitoring Systems**

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The requirements presented in this section of the O&M Plan apply to the MACT regulated systems at this facility that utilize continuous parametric monitoring systems (CPMS), which consists of the following:

- Wet scrubbers, as presented in section 4.1 and table 4.1;
- Dynamic wet scrubbers, as presented in section 4.2 and table 4.2;
- Indurating furnaces with dry ESPs as presented in section 4.3 and table 4.3; and

Monitoring requirements as required by 40 CFR 63.9631 include:

- Wet Scrubbers:
  - Daily average pressure drop; and
  - Daily average scrubber water flow rate.
- Dynamic wet scrubbers:
  - Daily average fan amperage or daily average pressure drop; and
  - Daily average scrubber water flow rate.
- Dry ESPs:
  - 6-minute average opacity;

If the daily average operating parameter value for an emission unit does not meet the corresponding established operating limit, that does not necessarily mean that the substantive emission limitation was exceeded.



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- Engineering calculations and information from other process parameters may be used to evaluate whether emission exceedances occurred.
- If credible evidence indicate that the aberrant operating condition did not result in excess emissions and does not represent operation outside the expected or normal range, then the appropriate corrective action may include no action.

Per 40 CFR 63.9600(b)(3), the O&M Plan must address the following:

*Corrective action procedures for continuous parametric monitoring systems (CPMS) for all air pollution control devices.*

The regulation states:

*In the event you exceed an established operating limit for an air pollution control device except for a baghouse, you must initiate corrective action to determine the cause of the operating limit exceedance and complete the corrective action within 10 calendar days. The corrective action procedures you take must be consistent with the installation, operation, and maintenance procedure listed in your site-specific CPMS monitoring plan in accordance with 63.6932(b).*

Compliance with this requirement is achieved as follows:

- The monitoring requirements of 63.9632(b) are addressed in the *Site-Specific Monitoring Plan for Continuous Parametric Monitoring Systems* for this facility.
- The corrective action procedures as required by 63.9600(b)(3) were addressed in “Malfunction Procedures” and “Corrective Action Requirements” sections of the *Startup, Shutdown, and Malfunction (SSM) Plan* for this facility. The Corrective Action Forms address the corrective action procedures and corresponding documentation. Examples of the Corrective Action Forms are available in the SSM Plan.
- Excursions of parametric limits are not malfunctions (i.e. 24 hour average opacity for indurating furnaces with dry ESPs and 24 hour average pressure drop and water flow for wet scrubbers)

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- The malfunction forms provided in the SSM Plan will be utilized when the daily average operating parameter value for an emission unit does not meet the corresponding established operating limit for a 10 day consecutive period. A separate form will be completed for each 10 day consecutive period.

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## 7. Good Combustion Practices for Indurating Furnaces

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The requirements presented in this section of the O&M Plan apply to the Indurating Furnaces, as presented in section 4.6 and table 4.6 of this plan.

Per 40 CFR 63.9600(b)(4), the O&M Plan must address the following:

*Good combustion practices (GCP) for Indurating Furnaces.*

The regulation states that the following:

*You must identify and implement a set of site specific GCP for each type of indurating furnace at your plant. These GCP should correspond to your standard operating procedures for maintaining the proper and efficient combustion within each indurating furnace.*

The required elements of the GCP, including the facility's strategy for compliance, justification the strategy, and the documentation plan, are provided below.

- (i) *Required Element:* Proper operating conditions for each indurating furnace (e.g. minimum combustion temperature, maximum carbon monoxide concentration in the furnace exhaust gases, burner alignment, or proper fuel-air distribution/mixing).

*Facility Compliance Strategy:*

- Operate according to established startup, shutdown, and malfunction procedures;
- Maintain adequate primary air by monitoring primary air fan flow or damper setting;
- Monitor and maintain kiln off gas temperature above 1500 °F;
- Operate coal mill exhauster with adequate air discharge by monitoring pressure or damper setting;
- Operate the coal mill outlet within the proper temperature range;
- Maintain negative pressure in preheat windbox; and
- Monitor flame.

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*Justification for the Strategy:* The induration process operates in excess of 1500 °F which is well beyond the auto-ignition temperature of natural gas or coal. The large quantities of fuel consumed in the induration process represents a significant portion of the product cost, it is in Tilden’s best interest to ensure complete combustion of all fuel.

*Facility Documentation Plan:* The monitored parameters associated with GCP are documented in a computer historian. Corporate IT ensures the documented records are kept in the computer historian for a minimum of 5 years.

- (ii) *Required Element:* Routine inspection and preventative maintenance and corresponding schedules of each indurating furnace.

*Facility Compliance Strategy:* The routine inspection and preventative maintenance program was addressed in section 5 of this document.

*Justification for the Strategy:* The routine inspection and preventative maintenance schedules have been arrived at through manufacturer instructions, operational experience and process analysis.

*Facility Documentation Plan:* The facility documentation program for routine inspections and preventative maintenance was presented in section 5 of this document.

- (iii) *Required Element:* Performance analysis of each indurating furnace.

*Facility Compliance Strategy:* Numerous aspects of the induration process are continually monitored and controlled by a Distributed Control System (DCS) which ensures the proper operating parameters are maintained. The parameter ranges have been arrived at through manufacturer instructions, operational experience and process analysis.

*Justification for the Strategy:* DCS is the state of the art technology for process control and monitoring.

*Facility Documentation Plan:* The monitored parameters associated with GCP are documented in a computer historian. Corporate IT ensures that the documented records are kept in the computer historian for a minimum of 5 years.

- (iv) *Required Element:* Keeping applicable operator logs.

*Facility Compliance Strategy:* The parameters associated with GCP are continuously monitored by the DCS.

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*Justification for the Strategy:* DCS is the state of the art technology for process control and monitoring.

*Facility Documentation Plan:* The monitored parameters associated with GCP are documented in a computer historian. Corporate IT ensures that the documented records are kept in the computer historian for a minimum of 5 years.

- (v) *Required Element:* Keeping applicable records to document compliance with each element.

*Facility Compliance Strategy:* The compliance strategy for recordkeeping is presented with each of the required elements.

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## 8. Recordkeeping Requirements

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The purpose of the recordkeeping program is to maintain records that demonstrate conformance with the O&M Plan. The following general recordkeeping requirements apply as required by 40 CFR 63.9642 and 63.9643:

- All records will be maintained for a minimum of 5 years.
- Records will be maintained in a manner that can be readily accessed.
- Records can be maintained as a hard copy or a computer-readable form.
- The most recent 2 years of records will be maintained on-site. The remaining 3 years of records may be retained off-site.
- Copies of reports that have been submitted to the applicable EPA Regional office are not required to be maintained.

The following records will be maintained:

- Routine inspection and preventative maintenance records, as described in section 5;
- Completed Malfunction Forms as described in section 6; and
- GCP records, as described in section 7.

In addition, the Environmental Department will maintain a current copy of the O&M Plan. The plan will be maintained for the life of the affected source or until the affect source is no longer subject to the requirements of this regulation.

## 9. Reporting Requirements

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The following is a summary of the reports required per the Taconite MACT regulations. All report preparation and submittal to outside agencies is the responsibility of the Environmental Department.

### 9.1 Semiannual Reports

The MACT regulations require submittal of semiannual reports. The reporting requirements are detailed in 40 CFR 63.9641. It is important to note that one semiannual report is submitted for compliance with all of the Taconite MACT requirements.

The reporting due dates are:

Reporting Period	Dates	Report Due Date
1 <sup>st</sup> Semiannual Period	January 1 – June 30	September 15
2 <sup>nd</sup> Semiannual Period	June 30 – December 31	March 15

The report must include:

1. Company name and address;
2. Statement by responsible official, with the official's name, title, and signature, certifying the truth, accuracy, and completeness of the content of the report.
3. Dates of report and beginning and ending dates of the reporting period.
4. If there was a Startup, Shutdown, or Malfunction during the reporting period and actions were consistent with the SSM Plan, the compliance report will include the information presented in 40 CFR 63.10(d)(5)(i), which is detailed in the SSM report.
5. If there were no deviations from the continuous compliance requirements in 40 CFR 63.9634 through 63.6936, then a statement will be provided that states that there were no deviations from the emission limitations, work practice standards, or operation and maintenance requirements during the operating period.

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6. If there were no periods during which a continuous monitoring system (CPMS or COMS) was out-of-control as specified in 40 CFR 63.8(c)(7), then a statement will be provided that states that there were no periods during which a continuous monitoring system was out-of-control during the reporting period.
  
7. For each deviation from a MACT emission limitation where you are not using a continuous monitoring system (including CPMS or COMS) to comply with an emission limitation for the Taconite MACT, the compliance report must contain the following information (including for periods of startup, shutdown, and malfunction):
  - (i) The total operating time of each affected source during the reporting period; and
  - (ii) Information on the number, duration, and cause of deviations (including unknown causes) as applicable, and the corrective action taken.
  
8. For each deviation from a MACT emission limitation where you are using a continuous monitoring system (including CPMS or COMS) to comply with an emission limitation for the Taconite MACT, the compliance report must contain the following information (including for periods of startup, shutdown, and malfunction):
  - (i) The date and time that each malfunction started and stopped;
  - (ii) The date and time that each CPMS and/or COMS was inoperative, except for zero (low-level) and high-level checks;
  - (iii) The date, time and duration that each CPMS and/or COMS was out-of-control, including the information in 40 CFR 63(c)(8);
  - (iv) The date and time that each deviation started and stopped, and whether each deviation occurred during a period of startup, shutdown, or malfunction or during another period;
  - (v) A summary of the total duration of the deviations during the reporting period and the total duration as a percent of the total source operating time during the reporting period;



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- (vi) A breakdown of the total duration of the deviations during the reporting period, including those due to startup, shutdown, control equipment problems, process problems, other known causes, and unknown causes;
- (vii) A summary of the total duration of continuous monitoring system downtime during the reporting period and the total duration of continuous monitoring system downtime as a percent of the total source operating time during the reporting period;
- (viii) A brief description of the process units;
- (ix) A brief description of the continuous monitoring system;
- (x) The date of the latest continuous monitoring system certification or audit;  
and
- (xi) A description of any changes in continuous monitoring systems, processes, or controls since the last reporting system.

Reports required by other regulations, can be submitted in place of or as part of the semiannual report.

This facility will comply with the reporting requirements as follows:

- The Taconite MACT Reporting requirements are submitted in combination with the Title V (ROP) semi-annual report.

## **9.2 Immediate Corrective Action Reports**

As discussed in the SSM Plan, after three unsuccessful attempts at applying corrective actions to an emission unit or emission groups, an immediate corrective action report must be submitted as required by 40 CFR 63.6934(j):

- The report must be submitted to the Administrator within 5 calendar days of the third unsuccessful attempt at corrective action;
- This written report must state that a deviation has occurred and must document the types of corrective measures that have been taken to address the problem.

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### **9.3 Reports for Actions Not Consistent with SSM Plan**

As discussed in the SSM Plan, if an SSM event occurred that was not consistent with the SSM plan, you must submit a immediate notification and a written report, as required by 40 CFR 63.6(e)(3)(iv) and 63.10(d)(5)(ii):

- An immediate notification, which consists of a phone call or email, to the Administrator within 2 working days after commencing action that is inconsistent with the SSM Plan.
- A written report to the Administrator within 7 working days after the end of the event. The report shall include:
  - Certification of truth, accuracy, and completeness of report by a responsible official;
  - Explanation of circumstances of the event;
  - Reasons for not following the SSM Plan; and
  - Description of all excess emissions and/or CPMS monitoring exceedences which are believed to have occurred.

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## 10. Revisions of the O&M Plan

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### 10.1 Revisions Required by the Administrator

As stated in 40 CFR 63.9600(b), the facility must submit the O&M Plan to the Administrator for review and approval by October 30, 2006. As stated in the regulation:

- The Administrator will review the adequacy of the site-specific practices, the objectives, and the records the facility will keep to demonstrate compliance with the O&M Plan.
- If the Administrator determines that any portion of the O&M Plan is not adequate, the Administrator can reject those portions of the plan, and request that the facility provide additional information addressing the relevant issues.
- In the interim of the approval of the revised portions of the plan, the facility will continue to follow the current O&M Plan as submitted, until the revisions are accepted as adequate by the Administrator.

### 10.2 Revisions Initiated by the Tilden Mine

The Tilden Mine may periodically revise the O&M Plan, as necessary, to satisfy the requirements of the regulation or to reflect changes in equipment or procedures at the affected source. In order to make these change, the facility will use the following procedure:

- The facility will submit the proposed revisions to the Administrator for approval;
- In the interim of the approval of the revised portions of the plan, the facility will continue to follow the current O&M Plan as submitted, until the revisions are accepted as adequate by the Administrator.

## *Appendix A*

### *Routine Inspection and Preventative Maintenance Schedules*

## Wet Scrubbers & Dynamic Wet Scrubbers Routine Inspection and Preventative Maintenance Work Orders

The PMs below are provided to give a brief overview of the scope of work managed by the CMMS (Ellipse). The nature and frequency of the PMs are subject to change. Frequency and nature of the PMs can change based on feedback from the work performed.

Plant Number	Item Name	JOB_NUMBER	STD_JOB_DESCRIPTION
MTDCCCVDC12A	COLLECTOR, DUST, 12A CONVEYOR 12A to 13	000883	(2M) DC FILTER CONV AREA GREASE & INSP
		013349	[Y] MACT D/P XMITTER CAL - CONCENTRATOR
		019259	(2Y) Conc Dust Collector Air flow survey
		TFQ3V	TILDEN CONC QUARTERLY MJSD VIB ROUTE
MTDCCCVDC12B	COLLECTOR, DUST, 12B CONVEYOR 12B to 13	000883	(2M) DC FILTER CONV AREA GREASE & INSP
		013349	[Y] MACT D/P XMITTER CAL - CONCENTRATOR
		TFQ3V	TILDEN CONC QUARTERLY MJSD VIB ROUTE
MTDCCCVDC13	COLLECTOR, DUST, 13 CONVEYOR 13 to 17.1	000883	(2M) DC FILTER CONV AREA GREASE & INSP
		013349	[Y] MACT D/P XMITTER CAL - CONCENTRATOR
		TFQ3V	TILDEN CONC QUARTERLY MJSD VIB ROUTE
MTDCCCVDC15N	COLLECTOR, DUST, N. END CV15 14 to 15 to 16	000883	(2M) DC FILTER CONV AREA GREASE & INSP
		TFQ3V	TILDEN CONC QUARTERLY MJSD VIB ROUTE
		013349	[Y] MACT D/P XMITTER CAL - CONCENTRATOR
MTDCCCVDC15S	COLLECTOR, DUST, CV15 HEAD END 15 to 15.1	000883	(2M) DC FILTER CONV AREA GREASE & INSP
		013349	[Y] MACT D/P XMITTER CAL - CONCENTRATOR
		TFQ3V	TILDEN CONC QUARTERLY MJSD VIB ROUTE
MTDCCCVDC17	COLLECTOR, DUST, 17 CONVEYOR 16.1 to 17.1	004099	[Y] T-1 PP DUST COLL COUPLING GREASING
		013349	[Y] MACT D/P XMITTER CAL - CONCENTRATOR
		008297	[M] ALL PP DUST COLL MECH SERVICE
MTDCCCVDC19N	COLLECTOR, DUST, 19 CONV. NORTH SIDE 19 & 19A to 17	000883	(2M) DC FILTER CONV AREA GREASE & INSP
		013356	[Y] MACT D/P XMITTER CAL - DRYER

		TFQ3V	TILDEN CONC QUARTERLY MJSD VIB ROUTE
MTDCASCDC1	COLLECTOR, DUST, 4B & C CONVEYOR. 4B to 4C	001488	(2M) SEC.CRUSHER DC GREASE & INSPECT
		010724	[Y] 4B/4C CONV DUST COLLECTOR INST PM
		001597	TRANS HOUSE DUST COLLECTOR
		013352	[Y] MACT D/P XMITTER CAL - SEC. CRUSHER
		TFQ3V	TILDEN CONC QUARTERLY MJSD VIB ROUTE
MTDCASCDC2	COLLECTOR,DUST, SECONDARY 4C to 4D	001488	(2M) SEC.CRUSHER DC GREASE & INSPECT
		TFQ3V	TILDEN CONC QUARTERLY MJSD VIB ROUTE
		001597	TRANS HOUSE DUST COLLECTOR
		013352	[Y] MACT D/P XMITTER CAL - SEC. CRUSHER
MTDCASCDC3	COLLECTOR, DUST, 4A & 4A1 CONV 4A to 4A1	001488	(2M) SEC.CRUSHER DC GREASE & INSPECT
		008274	INSP DUST COLLECTRS SECONDAY CRUSHER
		TFQ3V	TILDEN CONC QUARTERLY MJSD VIB ROUTE
		001597	TRANS HOUSE DUST COLLECTOR
		013352	[Y] MACT D/P XMITTER CAL - SEC. CRUSHER
MTDCPK1	COLLECTOR,SCRUBBER,DUST,BLENDER/MIXER U1 Unit 1 Feed Mixer	004099	[Y] T-1 PP DUST COLL COUPLING GREASING
		003848	[M] DUST COLLECTOR STATIC OPERATOR INSP (9W) T1 PP DUST COLLECTOR BEARING GREASE
		004064	GREASE
		TPB1V	TILDEN INDUR BIMONTHLY JMMJSN VIB ROUTE
		014420	[D] T1 PP DUST COLLECTOR INSP
		008297	[M] ALL PP DUST COLL MECH SERVICE
		013357	[Y] MACT D/P XMITTER CAL - PELLET PLT #1
		3949AA	[Y] T1 BALLING MOTOR GREASING
		019983	[Y] T1 BENTONITE PIPEWORK CLEANING
MTDCPK2	COLLECTOR,SCRUBBER,DUST,BLENDER/MIXER U2 Unit 2 Feed Mixer	003633	[1Y] T-2 PP DUST COLL CPLG LUBE (9W) T2 PP DUST COLLECTOR BEARING GREASE
		004065	GREASE
		013361	[Y] MACT D/P XMITTER CAL - PELLET PLT #2
		3949AB	[Y] T2 BALLING MOTOR GREASING
		TPB1V	TILDEN INDUR BIMONTHLY JMMJSN VIB ROUTE

		014552	[D] T2 PP DUST COLLECTOR INSP
		003848	[M] DUST COLLECTOR STATIC OPERATOR INSP
		008297	[M] ALL PP DUST COLL MECH SERVICE
		019982	[Y] T2 BENTONITE PIPEWORK CLEANING
MTDCCV17	COLLECTOR, DUST, CONVEYOR 17/17-2 17.1 to 17.2	004099	[Y] T-1 PP DUST COLL COUPLING GREASING (9W) T1 PP DUST COLLECTOR BEARING GREASE
		TPB1V	TILDEN INDUR BIMONTHLY JMMJSN VIB ROUTE
		014420	[D] T1 PP DUST COLLECTOR INSP
		003848	[M] DUST COLLECTOR STATIC OPERATOR INSP
		013357	[Y] MACT D/P XMITTER CAL - PELLET PLT #1
MTDCDRYER1	COLLECTOR, DUST, #1 DRYER	003937	(6M) #1 DRYER, DUCON &16D CONV GREASING
		014553	[D] DRYER DUST COLLECTOR OP INSP
		013356	[Y] MACT D/P XMITTER CAL - DRYER
MTDCDRYER2	COLLECTOR, DUST, #2 DRYER	008676	[D] CREW 1 DRYER OPERATOR DAILY INSP
		008687	T1/T2 DRYER DUCON FN VIBRATION PICKUP PM
		3949H	(5K) DRYER 2 AREA MTR GREASE W/ UE CADDY
		3949AG	[Y] DRYER AREA MOTORS GREASE
		014553	[D] DRYER DUST COLLECTOR OP INSP
		019521	[D] CREW 3 DRYER OPERATOR DAILY INSP
		019522	[D] CREW 4 DRYER OPERATOR DAILY INSP
		019506	[D] CREW 2 DRYER OPERATOR DAILY INSP
		004059	[1.4K] #2 DRYER DUCON FANS LUBRICATION
		013356	[Y] MACT D/P XMITTER CAL - DRYER
MTDCCV158	COLLECTOR, DUST, 15-8 CONVEYOR HEAD END 15.8 to 15.9	003634	[6M] 15-8/15-9 DUST COLL COUPLING GREASE
		TPB1V	TILDEN INDUR BIMONTHLY JMMJSN VIB ROUTE
		004056	(2M) 15-8/15-9 DUST COLL. GREASE & INSP
		014553	[D] DRYER DUST COLLECTOR OP INSP
		003848	[M] DUST COLLECTOR STATIC OPERATOR INSP
		008297	[M] ALL PP DUST COLL MECH SERVICE
		010734	[Y] 15.8 CONV DUST COLLECTOR INST PM
		013356	[Y] MACT D/P XMITTER CAL - DRYER

MTDCCV159	COLLECTOR, DUST, 15-9 CONVEYOR HEAD END 15.9 to 16.1	003634	[6M] 15-8/15-9 DUST COLL COUPLING GREASE
		TPB1V	TILDEN INDUR BIMONTHLY JMMJSN VIB ROUTE
		004056	(2M) 15-8/15-9 DUST COLL. GREASE & INSP
		014553	[D] DRYER DUST COLLECTOR OP INSP
		003848	[M] DUST COLLECTOR STATIC OPERATOR INSP
		008297	[M] ALL PP DUST COLL MECH SERVICE
		013356	[Y] MACT D/P XMITTER CAL - DRYER
MTDCCLRT1	COLLECTOR, DUST COOLER DISCHARGE UNIT 1 Unit 1 Cooler	004064	(9W) T1 PP DUST COLLECTOR BEARING GREASE
		004099	[Y] T-1 PP DUST COLL COUPLING GREASING
		TPB1V	TILDEN INDUR BIMONTHLY JMMJSN VIB ROUTE
		014420	[D] T1 PP DUST COLLECTOR INSP
		003848	[M] DUST COLLECTOR STATIC OPERATOR INSP
		008297	[M] ALL PP DUST COLL MECH SERVICE
		013357	[Y] MACT D/P XMITTER CAL - PELLET PLT #1
MTDC2A1T1	PRECIPITATOR,2A-1 UPDRAFT DRYING EXHAUST	016039	[6M] REPLACE PRECIP XFMR CONT FILTER
		014407	[W] T1/T2 DAILY PRECIPITATOR INSPECTION
		015685	ZERO CALIBRATE OPACITY SENSOR
		009440	2A PRECIPITATOR BIN PROBE INSPECTION
		010712	[PW] CLN/RPLC OPACITY MONITOR PRE-FILTER
		003286	[6M] T1 PRECIPITATOR RAPPER INSP
		006392	2A PRECIP TRANSFORMER PM INSPECTION
		006395	MAJOR-2A PRECIPITATOR PM INSPECTION
		008860	[M] P.P. OPACITY MONITORING PM
		003289	[9W] PRECIP PRESS' FAN FILTER CHNG
MTDC2B1T1	PRECIPITATOR,2B-1 DOWNDRAFT DRYING EXHST	016039	[6M] REPLACE PRECIP XFMR CONT FILTER
		014407	[W] T1/T2 DAILY PRECIPITATOR INSPECTION
		003286	[6M] T1 PRECIPITATOR RAPPER INSP
		006393	2B PRECIP TRANSFORMER PM INSPECTION
		006396	MAJOR-2B PRECIPITATOR PM INSPECTION
		009441	2B PRECIPITATOR BIN PROBE INSPECTION
		003289	[9W] PRECIP PRESS' FAN FILTER CHNG



MTDC2C1T1	PRECIPITATOR,2C-1 DOWNDRAFT DRYING EXHST	016039	[6M] REPLACE PRECIP XFMR CONT FILTER
		014407	[W] T1/T2 DAILY PRECIPITATOR INSPECTION
		016583	ZERO CALIBRATE OPACITY SENSOR
		009442	2C PRECIPITATOR BIN PROBE INSPECTION
		010706	[PW] CLN/RPLC OPACITY MONITOR PRE-FILTER
		003286	[6M] T1 PRECIPITATOR RAPPER INSP
		006394	2C PRECIP TRANSFORMER PM INSPECTION
		006397	MAJOR-2C PRECIPITATOR PM INSPECTION
		008860	[M] P.P. OPACITY MONITORING PM
		003289	[9W] PRECIP PRESS' FAN FILTER CHNG
MTDCCLRT2	COLLECTOR, DUST COOLER DISCHARGE UNIT 2  Unit 2 Cooler	003633	[1Y] T-2 PP DUST COLL CPLG LUBE
		004065	(9W) T2 PP DUST COLLECTOR BEARING GREASE
		TPB1V	TILDEN INDUR BIMONTHLY JMMJSN VIB ROUTE
		013361	[Y] MACT D/P XMITTER CAL - PELLET PLT #2
		014552	[D] T2 PP DUST COLLECTOR INSP
		003848	[M] DUST COLLECTOR STATIC OPERATOR INSP
		008297	[M] ALL PP DUST COLL MECH SERVICE
		MTDC2A2T2	PRECIPITATOR,2A-2 UPDRAFT DRYING EXHAUST
014407	[W] T1/T2 DAILY PRECIPITATOR INSPECTION		
015685	ZERO CALIBRATE OPACITY SENSOR		
009440	2A PRECIPITATOR BIN PROBE INSPECTION		
010716	[PW] CLN/RPLC OPACITY MONITOR PRE-FILTER		
003287	[6M] T2 PRECIPITATOR RAPPER INSP		
003290	[9W] PRECIP PRESS' FAN FILTER CHNG		
006392	2A PRECIP TRANSFORMER PM INSPECTION		
006395	MAJOR-2A PRECIPITATOR PM INSPECTION		
008860	[M] P.P. OPACITY MONITORING PM		
MTDC2B2T2	PRECIPITATOR,2B-2 DOWNDRAFT DRYING EXHST	016039	[6M] REPLACE PRECIP XFMR CONT FILTER
		014407	[W] T1/T2 DAILY PRECIPITATOR INSPECTION
		009441	2B PRECIPITATOR BIN PROBE INSPECTION

		003287	[6M] T2 PRECIPITATOR RAPPER INSP
		003290	[9W] PRECIP PRESS' FAN FILTER CHNG
		006393	2B PRECIP TRANSFORMER PM INSPECTION
		006396	MAJOR-2B PRECIPITATOR PM INSPECTION
MTDC2C2T2	PRECIPITATOR,2C-2 DOWNDRAFT DRYING EXHST	016039	[6M] REPLACE PRECIP XFMR CONT FILTER
		014407	[W] T1/T2 DAILY PRECIPITATOR INSPECTION
		016583	ZERO CALIBRATE OPACITY SENSOR
		009442	2C PRECIPITATOR BIN PROBE INSPECTION
		010721	[PW] CLN/RPLC OPACITY MONITOR PRE-FILTER
		003287	[6M] T2 PRECIPITATOR RAPPER INSP
		003290	[9W] PRECIP PRESS' FAN FILTER CHNG
		006394	2C PRECIP TRANSFORMER PM INSPECTION
		006397	MAJOR-2C PRECIPITATOR PM INSPECTION
		008860	[M] P.P. OPACITY MONITORING PM
		008860	[M] P.P. OPACITY MONITORING PM
MTDCDCSCRUBT2	COLLECTOR, DUST UNIT 2 PRODUCT CONVEYORS  Unit 2 Product Conveyor	003633	[1Y] T-2 PP DUST COLL CPLG LUBE
		004065	(9W) T2 PP DUST COLLECTOR BEARING GREASE
		013361	[Y] MACT D/P XMITTER CAL - PELLET PLT #2
		TPB1V	TILDEN INDUR BIMONTHLY JMMJSN VIB ROUTE
		014552	[D] T2 PP DUST COLLECTOR INSP
		003848	[M] DUST COLLECTOR STATIC OPERATOR INSP
		008297	[M] ALL PP DUST COLL MECH SERVICE
MTDCLOWHDFD1	COLLECTOR, DUST UNIT 1 LOWHEAD FEEDER Unit 1 Low Head Feeder	004064	(9W) T1 PP DUST COLLECTOR BEARING GREASE
		004099	[Y] T-1 PP DUST COLL COUPLING GREASING
		TPB1V	TILDEN INDUR BIMONTHLY JMMJSN VIB ROUTE
		014420	[D] T1 PP DUST COLLECTOR INSP
		003848	[M] DUST COLLECTOR STATIC OPERATOR INSP
		008297	[M] ALL PP DUST COLL MECH SERVICE
		013357	[Y] MACT D/P XMITTER CAL - PELLET PLT #1
MTDCLOWHDFD2	COLLECTOR, DUST UNIT 2 LOWHEAD FEEDER	003633	[1Y] T-2 PP DUST COLL CPLG LUBE

	Unit 2 Low Head Feeder	004065	(9W) T2 PP DUST COLLECTOR BEARING GREASE
		013361	[Y] MACT D/P XMITTER CAL - PELLET PLT #2
		TPB1V	TILDEN INDUR BIMONTHLY JMMJSN VIB ROUTE
		014552	[D] T2 PP DUST COLLECTOR INSP
		003848	[M] DUST COLLECTOR STATIC OPERATOR INSP
		008297	[M] ALL PP DUST COLL MECH SERVICE
MTDCTRANTWR1	COLLECTOR, DUST UNIT 1, TRANSFER TOWER 1 Unit 1 Transfer Tower	004064	(9W) T1 PP DUST COLLECTOR BEARING GREASE
		004099	[Y] T-1 PP DUST COLL COUPLING GREASING
		TPB1V	TILDEN INDUR BIMONTHLY JMMJSN VIB ROUTE
		014420	[D] T1 PP DUST COLLECTOR INSP
		003848	[M] DUST COLLECTOR STATIC OPERATOR INSP
		008297	[M] ALL PP DUST COLL MECH SERVICE
		013357	[Y] MACT D/P XMITTER CAL - PELLET PLT #1
MTDCTRANTWR2	COLLECTOR, DUST UNIT 2, TRANSFER TOWER 2 Unit 2 Transfer Tower	003633	[1Y] T-2 PP DUST COLL CPLG LUBE
		004065	(9W) T2 PP DUST COLLECTOR BEARING GREASE
		013361	[Y] MACT D/P XMITTER CAL - PELLET PLT #2
		TPB1V	TILDEN INDUR BIMONTHLY JMMJSN VIB ROUTE
		014552	[D] T2 PP DUST COLLECTOR INSP
		003848	[M] DUST COLLECTOR STATIC OPERATOR INSP
		008297	[M] ALL PP DUST COLL MECH SERVICE
MMDCACRDC	COLLECTOR, DUST, PRIMARY CRUSHER	001625	[T1DY] TILDEN PRIMARY CRUSH DYN MECH PM
		012540	[T1DY] TIL PRI CRUSHER DUST COLL. INSP
		010705	[Y] PRI CRUSHER DUST COLLECTOR INST PM
		013338	MACT D/P XMITTER CAL - PRIMARY CRUSHER
		001448	(M) TILDEN PRIMARY CRUSHER GREASING
		001596	(2W) TIL PRI CRUSHER DUST COLLECTOR INSP
		001521	(Y) TILDEN PRI CRUSHER COUPLING GREASING
		TOM1V	TILDEN OUTSIDE MONTHLY VIB ROUTE
MMDCACVDC	COLLECTOR,DUST,#1CONVEYOR DRIVEHOUSE	001515	(M) TILDEN DRV TWR DUST COLLECTOR GREASE
		001512	(Y) TIL 1 CV DRIVE TWR COUPLING GREASING

014040	TILDEN DRIVE TOWER DUST COLLCTR INSPECT
013338	MACT D/P XMITTER CAL - PRIMARY CRUSHER
001514	(Y) TIL 1CV DUST COLLECTOR COUPLING GRSE
TOM1V	TILDEN OUTSIDE MONTHLY VIB ROUTE
001598	[T2DY] TIL DRIVE TOWER DUST COLLEC INSP

### Wet Scrubbers & Dynamic Wet Scrubbers Routine Inspection and Preventative Maintenance Summary

Control Equipment Description	Process Description	Equipment Description	PM Description	PM Frequency	PM Responsibility
Wet Scrubber Or Dynamic Wet Scrubber	Ore Crushing and handling, finished pellet handling, Ore Drying	Motor and Fan	General Check (Check for vibrations or unusual noise, check belts, check sheaves, check bearings)	Varies - Refer to Routine Inspection and Preventative Maintenance Schedules as carried out per the framework set forth Cleveland Cliffs Maintenance Process Standards (MPS) and described in Section 5 of this document	Maintenance & Operating
		Scrubber Housing	Visual Inspection (Check housing, holes and ductwork)		Maintenance & Operating
			Check drain for plugging		Maintenance & Operating

## Indurating Furnaces with Dry ESPs Routine Inspection and Preventative Maintenance Work Orders

Standard Job	Description	Equipment	Inspection Frequency	Scheduled Frequency
14407	[D] T1/T2 DAILY PRECIPITATOR INSPECTION	ESPPrecipitators	Daily	Weekly
10712	[PW] CLN/RPLC OPACITY MONITOR PRE-FILTER	ESPPrecipitators	Weekly	Weekly
8860	[M] P.P. OPACITY MONITORING PM	ESPPrecipitators	Monthly	Monthly
3289	[9W] PRECIP PRESS' FAN FILTER CHNG	ESPPrecipitators	9 Weeks	9 Weeks
3286	[6M] T1 PRECIPITATOR RAPPER INSP	ESPPrecipitators	6 Months	6 Months
3287	[6M] T2 PRECIPITATOR RAPPER INSP	ESPPrecipitators	6 Months	6 Months
16039	[6M] REPLACE PRECIP XFMR CONT FILTER	ESPPrecipitators	6 Months	6 Months
19393	Clean TR buss bushings*	ESPPrecipitators	Annually/Major repair	Annually/Major repair
9440	2A PRECIPITATOR BIN PROBE INSPECTION	ESPPrecipitators	Annually/Major repair	Annually/Major repair
9441	2B PRECIPITATOR BIN PROBE INSPECTION	ESPPrecipitators	Annually/Major repair	Annually/Major repair
9442	2C PRECIPITATOR BIN PROBE INSPECTION	ESPPrecipitators	Annually/Major repair	Annually/Major repair
15685	ZERO CALIBRATE OPACITY SENSOR	ESPPrecipitators	Annually/Major repair	Annually/Major repair
6392	2A PRECIP TRANSFORMER PM INSPECTION	ESPPrecipitators	Annually/Major repair	Annually/Major repair
6393	2B PRECIP TRANSFORMER PM INSPECTION	ESPPrecipitators	Annually/Major repair	Annually/Major repair
6394	2C PRECIP TRANSFORMER PM INSPECTION	ESPPrecipitators	Annually/Major repair	Annually/Major repair
6395	MAJOR-2A PRECIPITATOR PM INSPECTION	ESPPrecipitators	Annually/Major repair	Annually/Major repair
6396	MAJOR-2B PRECIPITATOR PM INSPECTION	ESPPrecipitators	Annually/Major repair	Annually/Major repair
6397	MAJOR-2C PRECIPITATOR PM INSPECTION	ESPPrecipitators	Annually/Major repair	Annually/Major repair
13352	[Y] MACT D/P XMITTER CAL - SEC. CRUSHER	Wet Dust Collectors	Annually	Annually
13356	[Y] MACT D/P XMITTER CAL - DRYER	Wet Dust Collectors	Annually	Annually
13357	[Y] MACT D/P XMITTER CAL - PELLET PLT #1	Wet Dust Collectors	Annually	Annually
13361	[Y] MACT D/P XMITTER CAL - PELLET PLT #2	Wet Dust Collectors	Annually	Annually
10724	[Y] 4B/4C CONV DUST COLLECTOR INST PM	Wet Dust Collectors	Annually	Annually
10734	[Y] 15.8 CONV DUST COLLECTOR INST PM	Wet Dust Collectors	Annually	Annually
10735	[Y] 15.9 CONV DUST COLLECTOR INST PM	Wet Dust Collectors	Annually	Annually

## Indurating Furnaces – Equipment for Good Combustion Practices Routine Inspection and Preventative Maintenance Summary

Process Description	Equipment Description	PM Description	PM Frequency	PM Responsibility
Indurating Furnace	GCP Instrumentation (flame monitoring, primary air flow and coal mill exhaust pressure, primary air fan damper, grate windbox pressure, coal mill outlet temperature, kiln off gas temperature)	Instrumentation Inspection	Scheduled with major repairs (approx. 12 months)	Electrical



# **Predictive Emissions Monitoring System Quality Assurance Manual**

Prepared for:

**Cleveland-Cliffs, Inc.**  
**Tilden Mining Company, L.C.**  
**Ishpeming, Michigan**

Tilden Mine  
National Mine, Michigan

Date: November 2021

Prepared by:  
Wunderlich-Malec Engineering  
Environmental Information Systems  
600 Corporate Circle Suite L  
Golden, CO 80401



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## REFERENCED DOCUMENTS

RENEWABLE OPERATING PERMIT (ROP NO: MI-ROP-B4885-2017b)

U.S. EPA 40 CFR PART 60, APPENDIX F

U.S. EPA 40 CFR PART 60, APPENDIX B, PERFORMANCE SPECIFICATION 16 - SPECIFICATIONS AND TEST PROCEDURES FOR PREDICTIVE EMISSION MONITORING SYSTEMS IN STATIONARY SOURCES

U.S. EPA 40 CFR PART 60, SUBPART DB - STANDARDS OF PERFORMANCE FOR INDUSTRIAL-COMMERCIAL-INSTITUTIONAL STEAM GENERATING UNITS

## **1.0 INTRODUCTION**

Cleveland-Cliffs owns and operates Boiler 4 (EU-BOILER4) at the Tilden Mine, rated at 300 million BTU per hour (mmBTU/hr) heat input capacity and fired with natural gas only. Boiler 4 is equipped with low NOx burners for control of NOx emissions. The boiler combusts pipeline natural gas (NG). This unit is subject to 40 CFR Part 60 and Subpart Db regulations.

Tilden is required to monitor and record NOx and O2 emissions from Boiler 4 on a continuous basis. The emissions are monitored using a non-linear polynomial regression-based predictive emissions monitoring system (PEMS) approved by the Michigan Department of Environment, Great Lakes & Energy (EGLE), Air Quality Division ROP No. MI-ROP-B4885-2017b.

A Data Acquisition and Handling System (DAHS) named CirrusDAHS provides the continuous compliance and reporting functionality. The installed DAHS and PEMS software components are provided and maintained by Wunderlich-Malec Environmental Information Systems (EIS). The Boiler 4 PEMS DAHS configuration was added to the existing DAHS configuration in earlier 2019. The initial certification was complete before any PEMS data was reported as quality-assured.

## **2.0 QA/QC OVERVIEW**

### **2.1 QUALITY CONTROL AND QUALITY ASSURANCE**

Quality control (QC) encompasses the procedures, policies, and corrective actions that are in place to provide a consistent, quality product. Quality assurance (QA) are the series of checks performed to ensure that the QC procedures are functioning properly and are necessary to ensure reliability of the PEMS data.

The minimum QA/QC requirements for all continuous emission monitoring systems are detailed in 40 CFR 60, Appendix F. Additional specifications, test procedures, and QA/QC requirements for PEMS are contained in 40 CFR Part 60, Appendix B, Performance Specification 16 (PS-16). The QA/QC procedures specified in PS-16 are to be used for the initial certification of PEMS after installation and periodically thereafter to ensure the PEMS is working properly.

### **2.2 STACK TESTING**

Network Environmental, Inc. was contracted by Tilden to perform all required stack testing for the Boiler 4 PEMS. In May 2019, model training emission stack data was collected with a certified mobile continuous emission monitoring system (CEMS) and paired with the collected plant sensor data. After the model development was complete, the PEMS models were installed, deployed, and successfully certified with the initial Relative Accuracy Test Audit (RATA) completed by Network. The RATA was conducted in accordance with PS-16. Appendix A contains a reference of the official RATA document submitted by Network.

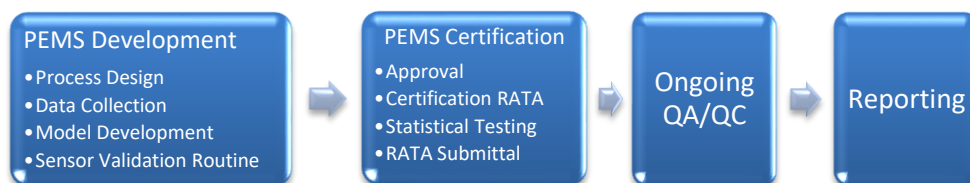
### **2.3 USING THE QA/QC MANUAL**

This Quality Assurance Plan (QAP) has been created to outline the QC procedures and QA checks which need to be adhered to during PEMS operations, assist plant staff in the assessment of the PEMS data quality, and specify corrective actions if needed. The continuing accuracy of the PEMS and compliance with the regulations is dependent on the operating personnel and this QA program.

This QAP contains the minimum expected standards for maintaining a PEMS and relies on a performance-based approach for initial and ongoing PEMS performance verification to demonstrate that the PEMS can predict emissions at least as accurately as a CEMS. This QAP must be kept on-site, reviewed periodically to address any performance issues, and updated as needed with the continued operation of Boiler 4.

## 2.4 PEMS OPERATION STAGES

Figure 1 displays the main PEMS operating stages for developing, certifying, and operating a PEMS in accordance with this QAP.



**Figure 1 - PEMS Operation Stages**

The PEMS Development stage includes the CEMS stack testing to collect steady-state operational CEMS emission data that encompasses the full boiler operating range and combustion conditions, which is paired with the collected process data for the model development. After the models and sensor validation routines are built, the initial PEMS certification RATA is produced with the real-time PEMS model outputs and a certified CEMS. The required statistical tests are generated following the certification RATA and the results are submitted in the final RATA report. Ongoing quarterly, semi-annually, or annually QA/QC are required following the initial PEMS certification. Refer to Table 2 for the ongoing QA test requirements.

## 2.5 PEMS SITE RESPONSIBILITIES

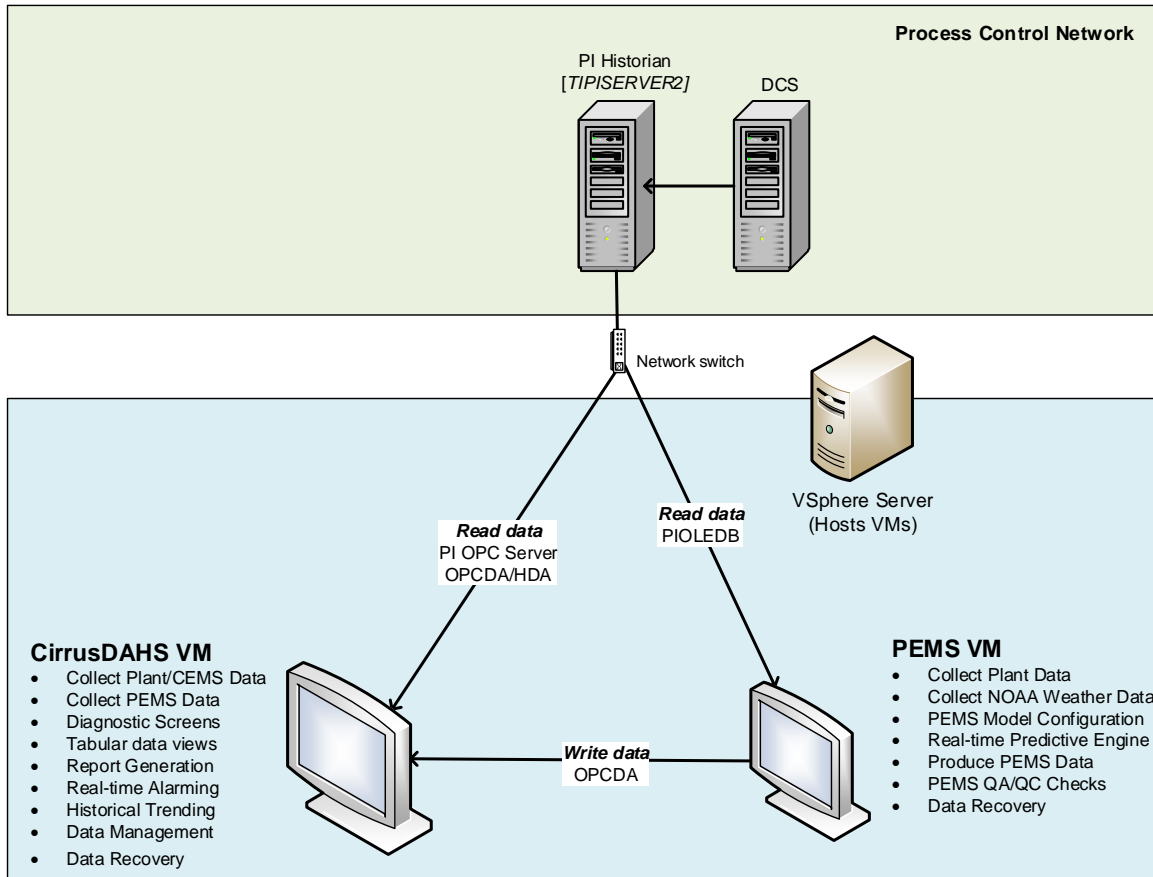
Table 1 summarizes the contact information for the primary DAHS/PEMS vendor contacts and Tilden’s operations/maintenance staff as it relates to the operation of the PEMS and DAHS.

**Table 1 - Organization Chart and Phone Numbers**

DESCRIPTION	NAME	EMAIL	TELEPHONE
Area Manager, Environmental	Brent Ketzenberger	brent.ketzenberger@clevelandcliffs.com	906 475 3792
Environmental Engineer	Thomas O’Brien	thomas.obrien@clevelandcliffs.com	906 475 3306
Boiler Operations Supervisor	Jonah Kuhlman	jonah.kuhlman@clevelandcliffs.com	906 475 3635
DAHS/PEMS Support Manager	Richard Hansen (Wunderlich-Malec EIS)	eis.support@wmeng.com	855 928 8100
DAHS/PEMS Software Specialist	Emily Zeker (Wunderlich-Malec EIS)	emily.zeker@wmeng.com	303 590 9390

## 2.6 PEMS FUNCTIONAL SITE DIAGRAM

The PEMS and DAHS system are installed, certified, and operated on site as depicted in Figure 2 below.



**Figure 2- Tilden PEMS DAHS Architecture**

Tilden maintains a VMWare VSphere server on-site that hosts virtual machines (VMs) for compliance management and other purposes. The PEMS VM contains the PEMS software, PEMS data, model configuration, and predictive run-time engine. The distributed control system (DCS) data is forwarded to the OSIsoft PI enterprise-level plant historian. The process data is read into the PEMS VM via a direct PI database (PIOLEDB) connection and the data is fed through the PEMS model engine at a one-minute frequency. The PEMS VM logs the PEMS data as a backup method to the CirrusDAHS VM.

The final quality-assured PEMS data and statuses are written to the CirrusDAHS VM via an OPC connection. The CirrusDAHS VM is the core Continuous Parametric and Opacity Monitoring Systems (CPMS, COMS) and PEMS combined DAHS for Tilden's reporting and compliance that logs environmental data, displays screens, produces alarms, generates reports, and administers historical data recovery from PI directly or the PEMS VM. The CirrusDAHS contains the alarming, diagnostic views, and reporting for all the CPMS, COMS, and PEMS. For CPMS and COMS compliance, the CirrusDAHS reads in data from PI directly via an OPC connection from a local PI OPC Server. Beginning summer 2019, both VMs will run on Server 2016 operating systems on the latest software platforms.

Both the PEMS and CirrusDAHS VMs start all necessary software and services upon boot up and the systems are highly monitored and maintained. If the CirrusDAHS VM loses communication to the PEMS

VM, an alarm will show on the CirrusDAHS. Any abnormal system-level or unit-level connection will generate an alarm.

### 3.0 PEMS QUALITY CONTROL PROCEDURES

#### 3.1 OVERVIEW

The following QC procedures must be followed on a regular preventative basis to maintain the PEMS plant equipment and software for the recurring QA tests outlined in the following section, in effort to comply with regulations and demonstrate that the PEMS is working properly.

#### 3.2 PEMS SENSOR OPERATING ENVELOPES

Table 2 summarizes the optimal plant sensors chosen for use in the main emission models and sensor validation models, with tag names, units, minimum ranges, and maximum ranges.

**Table 2 - Boiler 4 PEMS Model Input Parameter Specifications**

MODEL LEVEL	INPUT PARAMETER	PI HISTORIAN TAG NAME	UNITS	MIN	MAX
1	GAS FLOW	\\TIPISERVER2\BOILER_2:GAS_PID.MEAS	KSCF/HR	25	269
1	FLUE GAS RECIRCULATION (FGR) DAMPER	\\TIPISERVER2\BLR2_CTRL:FGRDAMP.MEAS	%	10	73
1	FRESH AIR DAMPER	\\TIPISERVER2\BLR2_CTRL:FRSHAIRDAMP.MEAS	%	72	80
1	ABSOLUTE HUMIDITY	CALCULATED FROM LIVE NOAA RELATIVE HUMIDITY AND AMBIENT TEMPERATURE DATA	GRAINS/LB	0	250
1/2	FLUE GAS O2	\\TIPISERVER2\BOILER_2:O2_PID.MEAS	%	1.6	10.5
1/2	FD FAN OUTLET DAMPER FEEDBACK	\\TIPISERVER2\BLR2_CTRL:FDOUTLETDAMP.MEAS	%	0	100
2	COMBUSTION AIR FLOW	\\TIPISERVER2\BLR2_CTRL:CTRLCALC.R004	KSCF/MIN	6.6	67
2	STEAM FLOW	\\TIPISERVER2\BOILER_2:STEAM_FLOW.PNT	KLB/HR	21	226
2	GAS CONTROL VALVE POSITION	\\TIPISERVER2\BLR2_CTRL:GASFCVPOS.MEAS	%	22	81
2	FLUE GAS RECIRCULATION (FGR) FLUE GAS FLOW	BLR2_CTRL:AUTMANCALC.R001	KSCF/MIN	0	58
2	FD FAN VFD SPEED FEEDBACK	\\TIPISERVER2\BLR2_CTRL:FDVFDSPD.MEAS	%	32	100
2	BOILER FEEDWATER PRESSURE	\\TIPISERVER2\BLR2_CTRL:FEEDH2OPRESS.MEAS	PSIG	290	384

Denoted in Table 2, Model Level 1 represents primary model inputs used in the main emission models and Model Level 2 represents secondary model inputs used in the sensor validation sub-models. The minimum and maximum values determine the range of the quality-assured operating envelope for each sensor (i.e. set points). These bounds values were chosen based on the knowledge of the process instrumentation and the historical model training dataset that captured the full boiler operating range.

The operating envelopes for the PEMS are part of the hardcopy monitoring in the QAP that must be updated if any adjustments are made. When the real-time sensor values go outside of the bounds collected in the historical training dataset, the data is flagged as invalid and sensor validation sub-model routines are applied wherever applicable. If the secondary models fail, the data is marked as invalid and faulted (i.e. downtime).

### 3.3 PEMS SENSOR MAINTENANCE

Each of the devices providing inputs utilized by the PEMS models are included in the plant's process control system quality assurance program. Per PS-16, all plant sensors must be calibrated as often as needed, but at least as often as recommended by the manufactures. Replacement parts for plant equipment will be obtained directly from the manufacturer on an as needed basis.

A RATA is not necessary if the replacement of a non-critical sensor does not affect the PEMS' accuracy. A RATA is necessary after replacing a critical sensor that changes the data scaling, output, or historical training dataset. Additional quality control activities are scheduled when the plant sensors appear to be inconsistent or fault by plant operations or maintenance staff. The QA activities are to be recorded as part of existing plant operations.

### 3.4 SOFTWARE MAINTENANCE ACTIVITIES

Summarized in Table 3, periodic system maintenance, database maintenance, and data backup procedures have been instituted on site and are conducted by Wunderlich-Malec EIS on Tilden's PEMS and DAHS.

**Table 3 - DAHS and PEMS Maintenance Activities**

DESCRIPTION	INTERVAL
Perform DAHS/PEMS application backup	Quarterly
Perform incremental database backup	Quarterly
Transfer backups to network client folder	Quarterly
Perform database performance tuning	Quarterly
Maintain DAHS software to latest revision	Quarterly
Review data for abnormalities	Quarterly
Review system performance and file storage	Quarterly
Perform full database backup	Annually

## 4.0 PEMS QUALITY ASSURANCE PROCEDURES

### 4.1 OVERVIEW

The quality assurance and quality control procedures specified in PS-16 are to be used for the initial certification of PEMS after installation and periodically during the QA/QC activities thereafter to ensure the PEMS is working properly. Table 4 summarizes the regular QA objectives that are to be conducted.

**Table 4 - PS-16 Quality Assurance Objectives**

OBJECTIVE	Performance Specification	Frequency
QAP	Update QAP manual as needed	Annually at a minimum
Parameter Operating Envelopes	PS-16 Section 6.1.2	Detection, Status Flagging, and Alarming Notification 1x/minute (PEMS/DAHS)
Daily Validation Test	PS-16 Section 9.2	Automatic Daily Calibration Check (PEMS Software)
Sensor Evaluation System	PS-16 Section 3.14	Automatic check once per minute with sensor validation sub-models (PEMS Software)
Relative Accuracy Test Audit (RATA)	PS-16 Section 13.1	Initial: $\geq 27$ test runs each at three loads Annual: $\geq 9$ test runs at normal operating level
3-Run Relative Accuracy Audit (RAA)	The same performance specifications from the RATA (PS-16 Section 13.1)	Quarterly <sup>1</sup> Three 30-minute tests averages at normal operating level
Recertification RATA	To be conducted when a quarterly RAA or a year RATA fails, or when operating conditions change.	$\geq 9$ test runs are required at each of 3 operating levels. Resume quarterly RAAs following failure.
Bias Correction	If $d_{avg} \leq  cc $ , Bias test is passed (PS-16 Section 13.2)	After each RATA. Perform at the mid operating level.
PEMS Training (Linear correlation and F-test)	$F_{critical} \geq F$ and $r \geq 0.8$ (PS-16 Section 13.3, 13.4)	Optional after initial and subsequent RATAs.
PEMS Statistical Tests	PS-16 Section 12.3	Only required for initial RATA and recertification RATAs

<sup>1</sup> A relative accuracy audit (RAA) will be performed in every calendar quarter, except for the quarter in which a full 9-run RATA or PEMS recertification is performed in the first year. If the PEMS passes all quarterly RAAs in the first year and passes the subsequent yearly RATA in the second year, a single mid-year RAA in the second year may be satisfactory in place of the quarterly RAAs, *if permitted by Michigan Department of EGLE* (per PS-16 Section 9.3).



## **4.2 PARAMETER OPERATING ENVELOPES**

Emission data calculated outside of the operating envelope ranges will not be considered quality-assured and must become invalid and faulted, if the sensor validation sub-models in place per PS-16 cannot produce quality-assured reconstructed values for the primary sensors. The PEMS software and DAHS together contain automatic measures to determine when this happens and automatically invalidate the data with visible status and fault flags until the data becomes quality-assured. Alarms are displayed on the DAS Alarm Screen when any abnormal status within the emission or sensor validation models occurs at a one-minute frequency.

The corrective action for a sensor regularly going out of bounds is to discuss the sensor range with operations and determine the cause the abnormality (e.g. the operation of the boiler could have changed, or the historical training dataset does not include the current operating condition, resulting in temporary downtime). Plant discretion is needed to determine the next course of action depending on magnitude. These QA/QC checks built into the PEMS software assist in generating quality-assured, accurate data.

## **4.3 DAILY VALIDATION TEST**

Each day, the PEMS is subjected to an automatic daily calibration test. Every time the calculation sequencing crosses a midnight boundary, a self-test of the emissions model is performed by injecting a specified input pattern into the model and comparing the result to the specified output pattern. The calibration results are verified to match the model predictions based on an absolute error tolerance. If the comparison fails, an error code is generated and the daily validation status is updated. If any corruption occurs that affects the predictive model engine, the daily calibration values will not output correctly. This error status will be read by the DAHS, an alarm will be generated, and real-time PEMS data will be faulted. The corrective action for a failed daily validation test is to contact Wunderlich-Malec EIS Support for review of the PEMS VM.

## **4.4 SENSOR EVALUATION SYSTEM**

The PEMS must assess the quality of sensor input data on at least a daily basis as required in PS-16. The PEMS sensor evaluation system validates each sensor every minute, during the data processing step prior to the generation of each output value and validity status that get written to the DAHS. The corrective action for a defective sensor is calibration or replacement of sensor.

## **4.5 AMBIENT CONDITIONS**

Ambient outside air does not feed directly into the boiler's combustion chamber as it is internally fed and controlled, but the site location in the upper peninsula of Michigan has dramatic weather swings. The model testing confirmed that ambient conditions were not negligible (i.e. correlated to the emission outputs) so they had to be considered per PS-16 Section 6.1.4. Absolute humidity was found to have the greatest effect on the accuracy of pollutant concentrations and therefore was chosen as a primary model input into the emission models with extrapolation enabled. PS-16 allows extrapolation on ambient conditions only, in order to include future anticipated conditions during seasonal changes. Every minute, ambient air temperature and relative humidity values are retrieved from NOAA in real-time in the PEMS software and are used towards the final absolute humidity calculation in grains per pound fed as a primary input into the emission models.

**APPENDIX A**

**PEMS RELATIVE ACCURACY TEST AUDIT (RATA) REPORT**

REFER TO THE OFFICIAL:

PEMS RATA REPORT FOR BOILER 4 (EU-BOILER4)

GENERATED BY NETWORK ENVIRONMENTAL, INC.

June 2020