STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF THE DIRECTOR

In the matter of administrative proceedings against **DETROIT RENEWABLE POWER**, a corporation organized under the laws of the State of Michigan and doing business at 5700 Russell Street in the City of Detroit, County of Wayne, State of Michigan	AQD No. 6-2017 SRN: M4148

STIPULATION FOR ENTRY OF FINAL ORDER
BY CONSENT

This proceeding resulted from allegations by the Michigan Department of Environmental Quality (MDEQ), Air Quality Division (AQD) against Detroit Renewable Power (Company), a Michigan corporation located at 5700 Russell Street in the City of Detroit, County of Wayne, State of Michigan, with State Registration Number (SRN) M4148. The MDEQ alleges that the Company is in violation of 40 Code of Federal Regulations (CFR) Part 52, Subpart A; 40 CFR Part 60, Subpart Cb, Db & Eb; 40 CFR Part 62 Subpart FFF; and its Renewable Operating Permit (ROP) MI-ROP-M4148-2011a, Table FGBOILERS011-13, Special Conditions 1.1, 1.9 & I.11. Specifically, the MDEQ alleges that the Company has violated air emission limitations for sulfur dioxide, carbon monoxide, and particulate emissions from the Refuse Derived Fuel Fired Boilers No. 11 and No. 12 as cited herein and in Violation Notices dated June 29, 2015, November 9, 2015, December 16, 2015, February 12, 2016, March 4, 2016, March 23, 2016, May 19, 2016, and June 9, 2016. The MDEQ also alleges that the Company failed to properly perform a cylinder gas audit for Refuse Derived Fuel Fired Boilers No. 11, No. 12, and No. 13 and reported a high percentage of continuous emissions monitor downtime during the first and second quarters of 2016 as cited herein and in Violation Notices dated June 9, 2016, September 2, 2016, and October 21, 2016. The Company and MDEQ stipulate to the termination of this proceeding by entry of this Stipulation for Entry of a Final Order by Consent (Consent Order).

The Company and MDEQ stipulate as follows:

1. The Natural Resources and Environmental Protection Act, 1994 PA 451 (Act 451), MCL 324.101 *et seq.* is an act that controls pollution to protect the environment and natural resources in this State.

2. Article II, Pollution Control, Part 55 of Act 451 (Part 55), MCL 324.5501 *et seq.* provides for air pollution control regulations in this State.

3. The MDEQ was created as a principal department within the Executive Branch of the State of Michigan pursuant to Executive Order 2011-1 and has all statutory authority, powers, duties, functions and responsibilities to administer and enforce all provisions of Part 55.

4. The Director of the Michigan Department of Environmental Quality has delegated authority to the Director of the AQD (AQD Director) to enter into this Consent Order.

5. The termination of this matter by a Consent Order pursuant to Section 5528 of Part 55 is proper and acceptable.

6. The Company and the MDEQ agree that the signing of this Consent Order is for settlement purposes only and does not constitute an admission by the Company of any fact or that the law has been violated.

7. This Consent Order becomes effective on the date of execution (effective date of this Consent Order) by the AQD Director.

8. The Company shall achieve compliance with the aforementioned regulations in accordance with the requirements contained in this Consent Order.

COMPLIANCE PROGRAM AND IMPLEMENTATION SCHEDULE

9.A. Flexible Group FGBOILERS011-013 Requirements

1. On and after the effective date of this Consent Order, the Company shall comply with all particulate emission limitations specified in ROP MI-ROP-M4148-2011a, Flexible Group FGBOILERS011-13, or any subsequent permit revision/federal regulation change applicable to this flexible group during the term of this Consent Order.

2. On and after the effective date of this Consent Order, the Company shall comply with the 24-hour carbon monoxide emission limitation specified in ROP MI-ROP-M4148-2011a, Flexible Group FGBOILERS011-13, Emission Limit(s) table 11.a, or any subsequent permit revision/federal regulation change applicable to this flexible group during the term of this Consent Order.

3. On and after the effective date of this Consent Order, the Company shall comply with the 24-hour sulfur dioxide emission limitation specified in ROP MI-ROP-M4148-2011a, Flexible Group FGBOILERS011-13, Emission Limit(s) table 9.a, or any subsequent permit revision/federal regulation change applicable to this flexible group during the term of this Consent Order.

4. On and after the effective date of this Consent Order, the Company shall comply with the 1-hour carbon monoxide emission limitation specified in ROP MI-ROP-M4148-2011a, Flexible Group FGBOILERS011-13, Emission Limit(s) table 11.b, or any subsequent permit revision/federal regulation change applicable to this flexible group during the term of this Consent Order.

9.B. Abnormal Condition Startup/Shutdown Malfunction Abatement Plan

1. On and after the effective date of this Consent Order, the Company shall fully comply with the approved Startup, Shutdown and Malfunction Plan (SSM), dated November 4, 2016 and revisions thereto attached as Exhibit A, incorporated by reference and made an enforceable part of this Consent Order.

2. On and after the effective date of this Consent Order, any acceptable changes or updates to the SSM, as reasonably requested by the Company, shall be promptly submitted to the AQD Detroit Office District Supervisor. The revised SSM shall be attached and become an enforceable part of this Consent Order.

3. On and after the effective date of this Consent Order, the Company shall submit a revised SSM plan if new equipment is installed that requires SSM Plan revision or upon the request from the AQD Detroit Office District Supervisor if AQD has determined that the current version of the SSM plan is not adequate for its stated purposes within 30 days of the installation or request. The revised SSM plan shall take effect upon written notice from the AQD Detroit Office District Supervisor or 60 days after submittal, whichever is earlier.

9.C. Cylinder Gas Audit Requirements

1. On and after the effective date of this Consent Order, the Company shall comply with 40 CFR Part 60 Appendix F.

2. On and after the effective date of this Consent Order, the Company shall maintain cylinder gas certification records onsite and make them available to the AQD upon request.

GENERAL PROVISIONS

10. This Consent Order in no way affects the Company's responsibility to comply with any other applicable state and federal, or local laws or regulations, including without limitation, any amendments to the federal Clean Air Act, 42 USC 7401 *et seq.*, Act 451, Part 55 or their rules and regulations, or to the State Implementation Plan.

11. This Consent Order constitutes a civil settlement and satisfaction as to the resolution of the violations specifically addressed herein; however, it does not resolve any criminal action that may result from these same violations.

12. Within thirty (30) days after the effective date of this Consent Order, the Company shall pay to the General Fund of the State of Michigan, in the form of a check made payable to the "State of Michigan" and mailed to the Michigan Department of Environmental Quality, Accounting Services Division, Cashier's Office, P.O. Box 30657, Lansing, Michigan 48909-8157, a settlement amount of $149,000.00, which includes AQD costs for investigation and enforcement. The total sum of $149,000.00 shall be made in two (2) payments as follows: a payment of $74,500.00 shall be paid within thirty (30) days of the effective date of this Consent Order; a final payment of $74,500.00 shall be made on or before August 1, 2017. To ensure proper credit, all payments made pursuant to this Consent Order shall include the "Payment Identification Number AQD40165" on the front of the check and/or in the cover letter with the payment.

13. On and after the effective date of this Consent Order, if the Company fails to comply with paragraph 9.A.1 of this consent Order, the Company is subject to a stipulated fine of up to $5,000.00 per violation per day, limited to a maximum of $40,000.00 per stack testing event. On and after the effective date of this Consent Order, if the Company fails to comply with paragraph 9.A.2 or 9.A.3 of this consent Order, the Company is subject to a stipulated fine as follows:

Fine Per Violation	Total Number of violation notice(s) issued
$1,000.00	1st through 5th
$2,000.00	6th through 10th
$5,000.00	11th and beyond

On and after the effective date of this Consent Order, if the Company fails to comply with paragraph 9.A.4 of this Consent Order for a period of longer than three (3) hours in a single day, the Company is subject to a stipulated fine of up to $1,000.00 per violation per day. On and after the effective date of this Consent Order, if the Company fails to comply with paragraph 9.B.1, 9.B.2, 9.B.3, 9.B.4, 9.C.1, or 9.C.2 of this Consent Order, the Company is subject to a stipulated fine of up to $1,000.00 per violation. On and after the effective date of this Consent Order, if the Company fails to comply with any other provision of this Consent Order, the Company is subject to a stipulated fine of up

to $500.00 per violation. The amount of the stipulated fines imposed pursuant to this paragraph shall be within the discretion of the MDEQ. Stipulated fines submitted under this Consent Order shall be by check, payable to the "State of Michigan" within thirty (30) days of written demand and shall be mailed to the Michigan Department of Environmental Quality, Accounting Services Division, Cashier's Office, P.O. Box 30657, Lansing, Michigan 48909-8157. To ensure proper credit, all payments made pursuant to this Consent Order shall include the "Payment Identification Number AQD40165-S" on the front of the check and/or in the cover letter with the payment. Payment of stipulated fines shall not alter or modify in any way the Company's obligation to comply with the terms and conditions of this Consent Order.

14. The AQD, at its discretion, may seek stipulated fines or statutory fines for any violation of this Consent Order which is also a violation of any provision of applicable federal and state law, rule, regulation, permit, or MDEQ administrative order. However, the AQD is precluded from seeking both a stipulated fine under this Consent Order and a statutory fine for the same violation.

15. To ensure timely payment of the settlement amount assessed in paragraph 12 and any stipulated fines assessed pursuant to paragraph 13 of this Consent Order, the Company shall pay an interest penalty to the State of Michigan each time it fails to make a complete or timely payment under this Consent Order. The interest penalty shall be determined at a rate of interest that is equal to one percent (1%) plus the average interest rate paid at auctions of 5-year United States treasury notes during the six months immediately preceding July 1 and January 1, as certified by the state treasurer, compounded annually, using the full increment of amount due as principal, calculated from the due date specified in this Consent Order until the date that delinquent payment is finally paid in full. Payment of an interest penalty by the Company shall be made to the State of Michigan in accordance with paragraph 13 of this Consent Order. Interest payments shall be applied first towards the most overdue amount or outstanding interest penalty owed by the Company before any remaining balance is applied to subsequent payment amount or interest penalty.

16. The Company agrees not to contest the legal basis for the settlement amount assessed pursuant to paragraph 12. The Company also agrees not to contest the legal basis for any stipulated fines assessed pursuant to paragraph 13 of this Consent Order, but reserves the right to dispute in a court of competent jurisdiction the factual basis upon which a demand by MDEQ of stipulated fines is made. In addition, the Company agrees that said fines have not been assessed by the MDEQ pursuant to Section 5529 of Part 55 and therefore are not reviewable under Section 5529 of Part 55.

17. This compliance program is not a variance subject to the 12 month limitation specified in Section 5538 of Part 55.

18. This Consent Order shall remain in full force and effect for a period of at least two (2) years. Thereafter, the Consent Order shall terminate only upon written notice of termination issued by the AQD Director. Prior to issuance of a written notice of termination, the Company shall submit a request, to the AQD Director at the Michigan Department of Environmental Quality, Air Quality Division, P.O. Box 30260, Lansing, Michigan 48909-7760, consisting of a written certification that the Company has fully complied with all the requirements of this Consent Order and has made all payments including all stipulated fines required by this Consent Order. Specifically, this certification shall include: (i) the date of compliance with each provision of the compliance program and the date any payments or stipulated fines were paid; (ii) a statement that all required information has been reported to the AQD Detroit Office District Supervisor; (iii) confirmation that all records required to be maintained pursuant to this Consent Order are being maintained at the facility; and, (iv) such information as may be requested by the AQD Director.

19. In the event Detroit Renewable Power sells or transfers the facility, with SRN M4148, it shall advise any purchaser or transferee of the existence of this Consent Order in connection with such sale or transfer. Within thirty (30) calendar days, the Company shall also notify the AQD Detroit Office Supervisor, in writing, of such sale or transfer, the identity and address of any purchaser or transferee, and confirm the fact that notice of this Consent Order has been given to the purchaser and/or transferee. As a condition of the sale, Detroit Renewable Power must obtain the consent of the purchaser and/or transferee, in writing, to assume all of the obligations of this Consent Order. A copy of that agreement shall be forwarded to the AQD Detroit Office Supervisor within thirty (30) days of assuming the obligations of this Consent Order.

20. Prior to the effective date of this Consent Order and pursuant to the requirements of Sections 5511 and 5528(3) of Part 55, the public was notified of a 30-day public comment period and was provided the opportunity for a public hearing.

21. Section 5530 of Part 55 may serve as a source of authority but not a limitation under which the Consent Order may be enforced. Further, Part 17 of Act 451 and all other applicable laws and any other legal basis or applicable statute may be used to enforce this Consent Order.

22. The Company hereby stipulates that entry of this Consent Order is a result of an action by MDEQ to resolve alleged violations of its facility located at 5700 Russell Street in Detroit, Michigan. The Company further stipulates that it will take all lawful actions necessary to fully comply with this Consent Order, even if the Company files for bankruptcy in the future. The Company will not seek discharge of the settlement amount and any stipulated fines imposed hereunder in any future bankruptcy proceedings, and the Company will take necessary steps to ensure that the settlement amount and any future stipulated fines are not discharged. The Company, during and after any future bankruptcy proceedings, will ensure that the settlement amount and any future stipulated fines remain an obligation to be paid in full by the Company to the extent allowed by applicable bankruptcy law.

The undersigned certifies that he/she is fully authorized by the Company to enter into this Consent Order and to execute and legally bind the Company to it.

DETROIT RENEWABLE POWER

Linwood Buber JR
Print Name and Title

Signature Date: 6-1-17

The above signatory subscribed and sworn to before me this 1 day of June, 2017

Notary Public Signature

EMILY BERGER
Notary Public - Michigan
Macomb County
My Commission Expires Jun 28, 2021
Acting in the County of Macomb

Approved as to Content:

Lynn Fiedler, Division Director
AIR QUALITY DIVISION
DEPARTMENT OF
ENVIRONMENTAL QUALITY

Dated: 6/19/17

Approved as to Form:

Neil D. Gordon, Section Head
ENVIRONMENTAL REGULATION SECTION
ENVIRONMENT, NATURAL RESOURCES,
AND AGRICULTURE DIVISION
DEPARTMENT OF ATTORNEY GENERAL

Dated: June 7, 2017

FINAL ORDER

The Director of the Air Quality Division having had opportunity to review the Consent Order and having been delegated authority to enter into Consent Orders by the Director of the Michigan Department of Environmental Quality pursuant to the provisions of Part 55 of Act 451 and otherwise being fully advised on the premises,

HAS HEREBY ORDERED that the Consent Order is approved and shall be entered in the record of the MDEQ as a Final Order.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Lynn Fiedler, Division Director
Air Quality Division

Effective Date: 6/19/17

EXHIBIT A

Abnormal Condition Startup/Shutdown Malfunction Abatement Plan

Detroit Renewable Power

Startup, Shutdown, Malfunction Plan Table of Documents

Last Rev. 11/04/16

Document	Document Number	Last Revised
SSM Plan	AIR-001	10/31/16
Documents below included for reference		
Boiler Start-up	SOP-1018	10/31/16
Boiler Shutdown	SOP 1022	11/04/16
Loss of Station Power	SOP 0110	11/04/16
SDA Malfunctions	SOP 0120	10/31/16
Boiler Feed Chute	SOP 0130	10/31/16
Boiler Grate Malfunction	SOP 0140	10/31/16
CO Excursion	SOP 0150	10/31/16
High SO2	SOP 0160	10/31/16
High NOx	SOP 0170	10/31/16
High Opacity	SOP 0180	10/31/16
Preventive Maintenance Schedule	Schedule 0001 SSM-Form-014 SSM-Form-015 SSM-Form-016 SSM-Form-017 SSM-Form-018	10/31/16 11/04/16 11/04/16 11/04/16 11/04/16 11/04/16
Boiler Critical Spare Parts List		11/04/16
AAO Slaker Logs 1-4		11/04/16
AO Grate Logs 1-2		11/04/16
Control Room Log (2 pages)		11/04/16

Detroit Renewable Energy			
Startup, Shutdown, and Malfunction Plan	Document No.: AIR-001	Approval Date: 10/31/2016	Page 1 of 5
	Revision No.: 04	Next Revision Date: 10/25/2017	
	Document Custodian: Environmental, Health & Safety		

1.0 PURPOSE

This guideline summarizes the Detroit Renewable Energy's (DRE's) SSM Plan for their facility located at 5700 Russell St. Detroit as required by the conditions of Renewable Operating Permit (ROP) MI-ROP-M4148-2011a. The purpose of this plan is to ensure:

- Units are operated and maintained in a manner consistent with good air pollution control practices and which satisfies the general duty to minimize emissions.
- DRE is prepared to correct malfunctions as soon as practicable to minimize excess emissions of Hazardous Air Pollutants (HAPs).
- Preventative actions are taken to minimize the occurrences of incidents
- Predictive and preventative maintenance operations are conducted

Detroit Renewable Energy (DRE) operates its facility to reduce the frequency of excess emissions. The operating philosophy at DRE is to operate the plant within the permit limits required by the Renewable Operating Permit (ROP). To achieve these goals, the boilers will be operated in the most efficient manner possible, which in turn, will conserve fuel and provide for complete combustion. However, DRE recognizes that exceedances of permit limits may occur which are unavoidable under certain malfunction situations, as well as startup and shutdown of the boilers and associated control equipment. Therefore, the equipment will be operated and maintained in such a manner to minimize the duration and magnitude of these incidents. The operation of the plant will be performed utilizing properly trained and experienced operators.

The primary cause of excess emissions is due to the inherently inconsistent fuel. Municipal solid waste (MSW) is received in all shapes, sizes, and consistencies which can cause equipment wear, breakdown, and pile up of MSW feed in the boilers. DRE works to remedy this potential cause of permit limit exceedances by sorting, shredding and screening the MSW to create a more cohesive fuel, also known as Refuse Derived Fuel (RDF). DRE conducts routine inspections and maintenance of equipment to reduce breakdowns and in the event the feed does pile up, alarms are in place to notify the operators. In addition to proper operation, it is equally important to establish inspection and maintenance procedures that will allow the plant to continue running in an optimum operating condition. These procedures will include regularly scheduled inspections. The quantity and type of spare parts selected for inventory will be based on plant operating experience. Properly trained and experienced plant operators and maintenance personnel will perform the inspections.

Events that occur during Abnormal Condition, Startup, Shutdown, or Malfunction (SSM) have the potential to exceed permit limits. The purpose of this document is to provide a prescribed plan of action to be taken to minimize emissions if one of the events occurs. As long as the steps contained within this Plan and the applicable Standard Operating Procedures (SOPs) are followed, then the excess emissions are not a violation of the standard. Documentation is required for each event to show that the facility did or did not follow the prescribed steps for the event. Note that this document referenced the SOPs for specific actions to excess emission events and startup and shutdown of the boilers. Specific reference to the SOPs is intended to ensure operations personnel are referencing the most accurate and up-to-date SOP. In addition, the SSM plan includes very specific requirements in the event of an SSM event. These steps will be completed in addition to the SOP. These formal steps are listed in the form on page 5 of this document. This form must be filled out for each SSM event that occurs at the facility and maintained for five years. If the steps on page 5 and/or the SOP are not followed then an investigation must be completed to determine why the steps were not followed and measures must be taken to ensure conformance in the future.

2.0 DEFINITIONS

Start-up, shutdown, malfunction, and plan of action are generally defined in Table 1.

Table 1

Term	Definition
Start-up	The setting in operation of the affected facility for any purpose. **"Start-up" includes starting up from a shutdown caused by a malfunction.** The startup period commences when the affected facility begins the continuous burning of municipal solid waste and does not include any warmup period when the affected facility is combusting fossil fuel or other non-municipal solid waste fuel, and no municipal solid waste is being fed to the combustor.
Shutdown	The cessation of operation of an affected facility for any purpose. The shutdown period commences at the time MSW is no longer being continuously fed to the unit. The shutdown period ends and the affected facility is "off line" when the oxygen concentration in the flue gas is sustained at a value greater than or equal to 16%. Note, however, for SO2 and NOx, 40 CFR 60.58b(b)(8) allows a diluent cap of 14%. This option is available for definition of shutdown periods for these limits. When a facility is "off line" it shall not be considered to be operating.
Malfunction	A sudden, infrequent, or not reasonably preventable failure of air pollution control equipment, process equipment, or a process to operate in a normal, or usual manner which causes excess emissions. Failures that are caused in part by poor maintenance or careless operation are not malfunctions. The malfunction period ends at the time in which the unit is back to normal steady state operation, or when the unit has been shut down in response to the malfunction. Potential malfunctions may include, but not limited to, stoker grate failure, fuel feed chute failure, or auger issues.
Plan of Action	Each Startup, Shutdown and Malfunction event has a prescribed list of actions that must be taken when they occur. The actions are consistent with the units' SOPs, although the SOPs are not incorporated into this document. Follow SOPs **IMMEDIATELY upon SSM event.** SOPs will specifically address the corrective actions to be taken when issues such as stoker grate failure, fuel feed chute failure, auger issues, and other malfunctions that may occur. These procedures are intentionally left out of this Plan to ensure the most current version of the SOP is being used by operations personnel.

3.0 SCOPE

This guideline has been written to satisfy permit requirements for Boiler #11, #12, and #13 during periods of start-up, shutdown, and malfunction.

Table 2

Area	Control Device	Continuous Monitoring System
Boilers #11, #12, and #13	Combustion Controls	CO and/or O2 CEMS
	Scrubber	SO2 CEMS

4.0 PROCEDURE

Table 3 outlines some basic responses to SSM events however the SOP should be followed for specific instructions. The Operator, Supervisor, or other designee must complete the SSM Form at the end of this procedure for each incident. The **completed checklist** must be filled out **completely** and returned to the Environmental Manager **by the next business day**. SSM events will be investigated to determine what, if any, preventative measures can be put in place to minimize the occurrences. Note the current SOPs are written to minimize the occurrences of SSM events.

Table 3 - Plan of Action

SSM Scenario	Response Action(s)
Boiler Start-up SOP-1018 (Replaces SOP-0101-01.01	To the extent possible, maintain good combustion characteristics while the boiler is being brought on-line. Verify the following: - Oil fire in boiler - Lime addition available/started - Baghouse in service - Water wall temperature above 200°F - Baghouse inlet above 250°F - Boiler bank inlet temperature above 850°F - Boiler furnace temperature 1800°F, 1 second above the grate level
Boiler Shutdown SOP-1022 (Replaces SOP-0101-01.01)	To the extent possible, maintain good combustion characteristics while the boiler is being brought down. Verify the following: - Operation of all soot blowers prior to reduction of steam flow - Reduction of RDF firing rate - Ignitors and oil guns in service at 250k lb/hr - Maintain 1800°F furnace temperature as load is being lowered
Boiler Upset or Malfunction SOPs 0110, 0120, 0130, 0131, 0140, 0150, 0160, 0170, 0180)	To the extent possible, maintain good combustion characteristics while the boiler is being brought on-line. Potential actions to be taken depending on the issue: - Adjust undergrate air dampers to maintain proper combustion temperature, utilize ignitors and oil guns as needed - Identify plugged chute and clear it - Adjust TOFA - Adjust the grate speed and/or auger bias - Maintain even combustion bed thickness - Manually adjust dampers - Secure RDF feed and allow fuel on grates to completely combust - Ensure proper lime slurry flow - Reduce exit flue gas air temperature

5.0 CONTINUOUS EMISSION MONITORING SYSTEMS (CEMS)

Procedures to address failures of the CEMS are not included in this document.

6.0 RECORDKEEPING AND REPORTING

Specific recordkeeping and reporting is required to comply with the ROP and federal regulations during an SSM event.

a. **Recordkeeping**

Complete a Start-up Shutdown Malfunction Checklist (found on page 5 of this document) for each SSM event. Additional records, such as CEMS data, may be included as required. When the actions taken during an SSM event are consistent with the SSM plan, records will be kept that demonstrate that the procedures in the plan were followed.

The emission guideline standards do not apply during periods of startup and shutdown. The duration of the startup/shutdown period is limited to 3 hours per occurrence 40 CFR 60.58b(a)(1). During periods of startup, shutdown, or malfunction, monitoring data shall be dismissed or excluded from compliance calculations, but shall be recorded and reported.

Additionally, if a loss of boiler water level control (e.g., boiler waterwall tube failure) or loss of combustion air control (e.g., loss of combustion fan, induced draft fan, combustion grate bar failure) is determined to be a malfunction, the duration of the malfunction period is limited to 15 hours per occurrence for Carbon Monoxide (40 CFR 60.58b(a)(1)(iii)). During such periods of malfunction,

monitoring data shall be dismissed or excluded from compliance calculations, but shall be recorded and reported.

A signed confirmation that the procedures in this SSM plan were followed will be included in the semi-annual ROP certification report. If actions taken during an SSM are not consistent with the plan, the actions taken for that event will be reported in the semi-annual ROP certification report. If this SSM plan fails to address or inadequately addresses an event that meets the characteristics of a malfunction, the plan will be revised within 45 days after the event.

This SSM plan will be maintained for the operating life of the units listed in this document, unless the units are no longer subject to SSM plan requirements. If the plan is revised, the previous (superseded) version will be retained for five years. Any updates to the facility's SSM plan will be submitted to MDEQ for approval. If submitted changes have not been rejected within ninety (90) days, they shall be deemed approved per the ROP.

b. **Reporting**

The ROP section A. General Conditions number 25 requires notice of 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 electronic or telephonic notice shall be provided no later than two business days after the start-up, shutdown, or discovery of the abnormal conditions or malfunction. 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.

7.0 DEFINITIONS

7.1 AQD – Air Quality Division
7.2 CEMS – Continuous Emission Monitoring System
7.3 HAP – Hazardous Air Pollutant
7.4 SSM – Start-up, Shutdown, Malfunction

8.0 REFERENCES

8.1 40 CFR Part 60, Subpart Eb (§60.58b)

9.0 ATTACHMENTS

9.1 Start-up, Shutdown, Malfunction Checklist (Page 5 of this document)

10.0 Revision History

Revision number	Description of change	Written by	Checked by	Effective date
01	Original procedure	TLP	DD	05/06/2016
02	Original procedure – changes per MDEQ	TLP	DD	09/01/2016
03	Original procedure – minor wording changes	TLP	DD	10/25/2016
04	Added references to SOPs	DGD	RS	10/31/2016

Start-up, Shutdown, Malfunction Checklist (SSM Checklist)
Detroit Renewable Power (DRP)

When a start-up, shutdown, or malfunction event occurs, the Supervisor must complete this checklist and submit it to the Environmental Manager by the next business day.

Part I – General information

a. Event type:

☐ Malfunction (unplanned)	☐ Start-up	☐ Shutdown

b. Equipment affected:

☐ Boiler #11	☐ Boiler #12	☐ Boiler #13

c. Event Date/Time:

Malfunction Start date:		Malfunction Start time:	
Malfunction End date:		Malfunction End time:	
Start-up Start date:		Start-up Start time:	
Start-up End date:		Start-up End time:	
Shutdown Start date:		Shutdown Start time:	
Shutdown End date:		Shutdown End time:	

d. Reason for Shutdown or Malfunction:

Part II – Specific questions on incident

a. Boiler (must answer all):

Did we achieve/maintain good combustion characteristics as soon/long as possible?	☐ Yes	☐ No	☐ N/A
Did we verify that there is oil ignited in the boiler?	☐ Yes	☐ No	☐ N/A
Did we verify the lime addition system is operating correctly?	☐ Yes	☐ No	☐ N/A
Did we verify the baghouse is operating correctly?	☐ Yes	☐ No	☐ N/A
Did we ensure the water wall temperature is above 200°F?	☐ Yes	☐ No	☐ N/A
Did we ensure the baghouse inlet temperature is above 250°F?	☐ Yes	☐ No	☐ N/A
Did we ensure the boiler bank inlet temperature is above 850°F?	☐ Yes	☐ No	☐ N/A
Did we ensure the boiler furnace temperature is 1800°F?	☐ Yes	☐ No	☐ N/A
Did we operate all soot blowers prior to reduction of steam flow (for shutdown/malfunction only)?	☐ Yes	☐ No	☐ N/A
Did we reduce the RDF firing rate (for shutdown/malfunction only)?	☐ Yes	☐ No	☐ N/A
Did we introduce the ignitors and oil guns to service at 250k lb/hr (for shutdown/malfunction only)?	☐ Yes	☐ No	☐ N/A
Did we maintain 1800°F furnace temperature as load was being lowered?	☐ Yes	☐ No	☐ N/A
Did we follow the appropriate Standard Operating Procedures (SOPs)? (list them below)	☐ Yes	☐ No	☐ N/A
SOP(s) followed:			

Part III – Details

a. Provide details for the questions above and a description of any corrective actions planned/taken (continue on back if there is not enough space):

Was incident on-going at the time this report was submitted?	☐ Yes	☐ No	
Were all actions taken to correct the malfunction in conformance with the SSM plan?	☐ Yes	☐ No	☐ N/A

Print name below:	Sign name below:	Date:

Boiler Startup
Standard Operating Procedure
SOP-1018

1.0 Purpose:

To bring Steam boiler from a cold or hot start to full load operation in conjunction with other Steam Generators or Turbine/Generator.

2.0 Scope:

Detroit Renewable Power – Power Block.

3.0 Responsibilities:

Department Manager or designee is responsible for implementing and maintaining this procedure.

Department Supervisor(s) and Control Room operators (CRO) are responsible for adhering to this procedure.

3.1 Power Block Supervisor gives CRO permission to distribute pre-operational check sheets

Appendix 1 Turbine Operator Start Up Check List
Appendix 2 Grate Operator Start Up Check List
Appendix 3 Ash Operator Start Up Check List
Appendix 4 Slaker Operator Start Up Check List
Appendix 5 Auger Operator Start Up Check List
Appendix 6 Maintenance Start Up Check List
Appendix 7 E & I Start Up Check List
Appendix 8 CEMS Start Up Check List

4.0 Deleted

5.0 Standard Operating Procedure Steps:

5.1 PREREQUISITES:

5.2 Cooling Tower Valve alignment as required by seasonal conditions of ambient air temperature.

5.2.1 Wet Mode
5.2.2 Wet I Dry Mode
5.2.3 Dry Mode

5.3 Circulating Water System in service.

5.4 Closed Cooling Water System in service.

5.5 Service Air System in Service supplying 80-100 psi.

5.6 Instrument Air System in Service supplying 80-100 psi.

5.7 Service Water System in Service supplying 80-100 psi.

5.8 Availability of demineralized water and make up storage water supply (fifteen feet in both the demineralized water and condensate storage tanks).

5.9 Availability of #2 Fuel Oil and RDF.

5.10 Availability of Pebble Lime for Slaker operation.

5.11 Check Clearance Log for Active Tag Outs.

5.12 Condensate System in service.

5.12.1. Condensate Hot well at normal operating level.
5.12.2. Deaerator at normal operating level.

5.13 PREPARING STEAM GENERATOR FOR LIGHT-OFF:

5.14 Establish communications with Boiler Operator to prepare boiler for startup.

5.15 Verify all boiler vents and drains are in their start-up alignment positions.

5.15.1 Secondary super heater outlet vents open.
5.15.2 Primary super heater outlet vents open.
5.15.3 Intermediate Crossover vents open.
5.15.4 Align main and non-return valves into open position.

5.16 Verify bag house compartment dampers are operational and aligned for startup.

5.16.1 Compartments A, B, F & G "on line".
5.16.2 Compartments H, J, K, C, D, E "isolated".
5.16.3 The compartment inlet and outlet dampers should fail "open" on loss of power or air.
5.16.4 Bypass dampers "closed".
5.16.5 The bypass dampers are "welded" and blocked closed.
5.16.6 All interlocks which could result in automatic operation of the bypass damper have been eliminated.

5.17 Verify drum level is at a -2" below normal.

5.18 Start ID fan.

5.18.1 Perform prestart inspections.
5.18.2 Perform running inspections.
5.18.3 Decrease furnace pressure to -0.05 by opening ID fan damper. Place damper in Auto.

5.19 Start FD fan.

5.19.1 Perform prestart inspections.
5.19.2 Perform running inspections.
5.19.3 Increase air heater outlet pressure to 4-7" w.g. and place damper in Auto

5.20 Purge boiler.

5.20.1 Place wind box dampers at or above 93% open.
5.20.2 Ensure O.F.A. damper are closed.
5.20.3 Start purge, air flow >30%.
5.20.4 When purge is complete reset MFR.

5.21 Boiler Light Off:

5.21.1 Ensure an operator is on station to observe light off and check for fuel leaks at the ignitors.

5.21.2Initiate ignitor light off and record time in log.

5.22 If desired, place oil guns in service:

5.22.1 Ensure an operator is on station to observe light off and check for fuel leaks at the Oil Guns
5.22.2 Adjust wind box dampers to 8% open.
5.22.3 Initiate oil gun light off

5.23 Perform Oil Gun/ Ignitor Interlock Test

5.24 Adjust firing rate to ensure that warm-up rates are not exceeded.

5.24.1 Gas exit temperatures not to exceed 900° F.
5.24.2 Saturated steam temperature rise not to exceed 100° F.

5.25 As pressure increases throttle vents and drains. Do not close secondary super heater outlet vent until Electromatic Relief Valve (ERV) is open to ensure adequate flow through Super heater.

5.26 At 25 psi perform the following
5.26.1 Close drum Vent
5.26.2 Close Intermediate Crossover vents
5.26.3 Open Electromatic Relief Valve (ERV)
5.26.4 Close Secondary super heater outlet vents.

5.27 Install SDA Spray Machine IAW SOP 1029

5.28 When drum pressure reaches 200 psi, blow down the:

5.28.1 Gage glasses
5.28.2 Water columns
5.28.3 Remote level indicators

5.29 When Water level no longer increases due to swelling align feedwater start-up Valve for use up to 148,000 lbs/hour

5.30 Roll turbine generator as soon as minimum steam temperature and pressure are reached.

5.31.1 Consult turbine start up chart.
5.31.2 Omit this step if process steam line is to be placed into service first.

5.31 Turbine Start-up valve alignment. Go to step 5.69 if Turbine is in service.

5.32 Steam generator outlet free blows.

5.33 Main stream line drains to blow down tank.

5.34.1 Verify drains alignment to blow down tank.
5.34.2 Open SGG-BV-23 and SGG-BV-24.

5.34 Open turbine isolation valve SGG-BV-25.

5.35 Open steam seal isolation valves.

5.36 Verify EHC system is in service.

5.36.1 Check auto starts on pumps.

5.37 Verify turbine lube oil system is in service.

5.37.1 Check auto starts on pumps.

5.38 Reset turbine stop valves by.

5.39.1 Test turbine stop valves by tripping and resetting several times.
5.39.2 Allow turbine chest to warm up.

5.39 Place turbine on turning gear.

5.40.1 Four hour minimum when taking off turning gear before turbine can be rolled.

5.40 Startup turbine generator following General Electric instructions.

5.41.1 GEL-81479 and GEK-96801.

5.41 <u>Process Steam Line Warm-up and Operation:</u>

5.42 Notify Detroit Edison Beacon Heating Plant by phone that the process steam line is being warmed up. Beacon control room- 963-3707. Shift supervisor's office- 963-3287.

Make sure that we call the following entities when the turbine generator is coming online.

Michigan Electric Coordinated Systems
Balancing Authority: Call this number first > (248) 380-2932 or (248) 380-2931

Midwest Independent Transmission System Operator
Reliability Coordinator: (317) 249-5030

ITC Transmission
Transmission Operators Control Room: (248) 380-2903

5.43 Valve TEG-BV-14 and bypass BV-3007 closed.

5.44 Check level switches LS-40, and LS-26 is valved in and operational.

5.45 Check flow transmitters PT-29, PT-7, PT-8, and PT-10 are valved in and operational.

5.46 Check flow transmitters FT-82, FT-87, and FT-81 are valved and operational.

5.47 Check extraction traps and drains 1-603, 5-603, 7-603, 9-603, 10-603, and 4-603 are valved and operational.

5.48 Open steam line drain in metering pit.

5.49 Open isolation valves TEG-BV-10 and TEG-BV-20.

5.49.1 Stroke ACV-6 prior to opening BV-1 0.

5.50 Open desuperheater spray isolation valves.

5.51 Open turbine bypass isolation valves.

5.51.1 Stroke SGG-ACV-18 prior to opening valves.
5.51.2 SGG-BV-16.
5.51.3 SGG-BV-17.
5.51.4 SGG-BV-19.

5.52 Open TEG-MBV-13 process steam line isolation valve (this valve closes automatically under the following conditions):

5.52.1 Outlet temperature 520° F for 30 seconds.
5.52.2 Outlet temperature of 550° F instantly.
5.52.3 Outlet drains pot level high.

5.53 Crack open SGG-ACV-18 until flow is established (Manual operation at this time is 3% - 5% open)

5.54.1 Automatically closes when TEG-MBV-13 trips closed.

5.54 Verify process steam dump valve TEG-ACV-6 to the condenser is operational and in manual control at 20% open.

5.54.1 Automatically opens to 20% when steam flow is below 60 klbh.

5.55 Allow the line to warm slowly, making checks on all drains often.

5.56 Raise steam pressure and temperature as drain become free of condensate.

5.57 As the steam temperature reaches 400 F places the attemperator in service using ACV-32.

5.58 When temperature is stable place in automatic and slowly raises set point to 460 f.

5.59 Raise steam pressure to 200 PSI.

5.60 Check steam line drains for condensate.

5.61 Once drains are dry DECO is to be notified to witness steam quality.

5.62 When contacted by DECO that steam quality has been accepted, note time and contact person in the Shift Supervisor log.

5.62.1 Ensure that Beacon Heating supervisor has been notified.

5.63 Start opening TEG-BV-14 bypass BV-3007 valve.

5.63.1 Equalize line pressure acrossBV-14 before opening valve.
5.63.2 Drain valve in metering pit can be closed at this time.

5.64 Slowly open BV-14.

5.65 Continue to open ACV-18 until export steam flow is above 80 klbh and flow is stable.

5.66 Slowly start closing ACV-6 and place into automatic when fully closed.

5.66.1 Manual closing operation is over ridden if export flow is below 60 klbh m1mmum.

5.67 ACV-18 can now be place into automatic.

5.68 Turbine generator can ' now be started or placed into turbine extraction flow if already service.

5.69 <u>RDF Firing Pre-requisitions for Start-up:</u>

5.70.1 Oil Fires is boiler.
5.70.2 Lime addition available.
5.70.3 Bag house in service.
5.70.4 Water wall temperature above 200 F.

5.70.5 Bag house inlet above 250 F.
5.70.6 Boiler bank inlet temperature above 850 F.
5.70.7 Boiler furnace temperature 1800 F, 1 second above the grate level.

5.71 Start fabric filter reverse air fan when the fabric filter outlet temperature reaches 230 F.

5.71.1. Reverse air for cleaning bag house compartments.

5.72 Place atomizer feed control in auto and adjusts until an outlet temperatureof 280 F is obtained.
5.72.1 Lime slurry feed for S02.
5.72.2 Dilution water feed for temperature control

5.73 Continue firing the boiler on fuel oil until an SDA inlet temperature of 280 F is obtained.

5.74 Initiate solid fuel firing and place remaining bag house compartments used during Start up.

5.74.1 First 4 compartments are sacrificial compartments used during start-up.
5.74.2 Furnace temperature above 1800 F.
5.74.3 Start RDF feed to metering bin.
5.74.5 Start PDA fan.
5.74.6 Start augers.

5.75 Remove oil fires when the following conditions are met:

5.76.1 Steam flow above 150 klbh for over five minutes.
5.76.2 Auger speed above 15%.
5.76.3 Furnace temperature above 1800 F.

5.77 Place combustion control loops in auto:

5.77.1 Under grate air in local/auto.
5.77.2 Auger control in auto.
5.77.3 Steam flow master at 0% output place in auto.
5.77.4 Under grate air in remote/auto.
5.77.5 Feed water in 3-element control above 100 klbh.
5.77.6 Adjust fuel to air ratio by placing bias in under grate and or auger master.
5.77.7 Put desuperheaters in Auto.

5.78 Completed Start Up check sheets appendix 1-9 turned attached to completed Start Up procedure and returned to Shift Supervisor.

5.79 Shift Supervisor retains Start Up check sheets appendix 1-9 along with completed Start Up procedure to review according to continuous improvement policies.

RDF Boiler Start-Up
Appendix 1
Turbine Operator Start Up Check List

	Operator Initials
Building Roof	
Verify vent is closed on Steam Supply to Spray Water Condenser expansion loop	_____
8th Floor	
Boiler Roof	
Verify the following:	
Check Drum Pressure sensor supply root valve open (at drum vent)	_____
Check Soot Blowing Steam Supply valve closed	_____
Verify air supply to Sootblowing Steam Supply valve ACV open	_____
Open High Point valves (guarding and blowing)	_____
Open Superheater intermediate vent valves (guarding and blowing)	_____
Check ERV isolation valve open	_____
Check ERV air supply aligned	_____
Check Superheater outlet safety valve gag is removed	_____
Check free blow drain closed (Between Main Steam Stop and Main Steam Automatic Non-return)	_____
Open Main Steam Stop valve	_____
Open Main Steam Automatic Non-return valve	_____
North side of Boiler	
Verify the following:	
Check the Economizer vent valves closed (guarding and blowing)	_____
Check Chemical Feed supply valves open (2 block valves)	_____
Check Chemical Feed to Steam Drum valves open (2 block valves)	_____
Check FWA PT supply valves open (2 block valves)	_____
Check feedwater line drains are closed	_____

(From the Economizer outlet to the Feedwater ACVs) _____

Check the Spray Water Condenser drains closed
(2 valves on each drain) _____

Feedwater Start up ACV
Outlet valve open _____

Air supply aligned _____

North side of Steam Drum

Check Drum Level Transmitter Upper and Lower root valves open
(From Steam Drum) _____

Check Continues Blow Down Root valve closed _____

Check CBD valve closed _____

Check Water Column upper and lower isolation valves open _____

Check Gauge Glass upper and lower isolation valves open _____

Check Water Column drain root valve open _____

Check Gauge Glass drain root valve open _____

Open Primary Superheater drain (2 valves) _____

Open Secondary Superheater drain (2 valves) _____

Verify Steam Drum door is secure _____

Verify the Steam Drum safety valve gag has been removed _____

West side of Boiler

Check Main Stream Flow Transmitter root valve is open (on Main Steam Line) _____

Verify Penthouse door is in place _____

South side of Steam Drum

Verify the follow on the Desuperheater ACV station:

Inlet valve open _____

Outlet valve open _____

Air supply _____

Vent/drain closed _____

Verify the Steam Drum south door in place _____

Verify the Steam Drum Safety Valve gags have been remove (2 safety valves) _____

Check Water Column upper and lower isolation valves open _____

Check Gauge Glass upper and lower isolation valves open _____

Check Water Column drain root valve open _____

Check Gauge Glass drain root valve open _____

Check Eye High upper and lower isolation valves open _____

Check Eye High drain root valve open _____

Check the Sootblowing Wizard pressure sensing line root valve line is open _____

Verify the air supply to the Sootblowing Wizard _____

8th floor East side of Boiler at TAH

Verify the Upper TAH door is on (Gas side) _____

7 ½ Floor North side of Boiler

Check Continuous Blow Down to Flash Tank isolation valve closed _____

7th floor North

Check IR camera in place (mounted in SH Door) _____

Verify Air supply to IR camera _____

Verify Superheater access doors in place (3 doors) _____

Verify Gen Bank "crotch" access door in place _____

7th floor East side of Boiler

Verify TAH doors in place (5 doors) _____

6th floor North side of Boiler

Verify Economizer inlet door in place _____

Verify North Mud Drum door in secure _____

Verify Dance Floor access door in place _____
(Note: this door is on the South side for unit 12 and Unit 13)

6th Floor West side of Boiler

Verify inspection port doors closed (4 doors) _____

At the furnace camera station verify the following:

Purge Air supply valve open _____

Cooling air supply aligned and air present _____

Check insertion control air supply aligned and air present _____

Check IR camera air supply root valve open _____

6th Floor South of Boiler

Verify South Mud drum door secure _____

5th Floor North side of Boiler

Check Economizer drain closed (2 valves) _____

Check Sparging Steam to Economizer inlet isolated (2 valves) _____

Check North Mud Drum Blowdown valves closed (2 valves) _____

Verify dance floor beams retracted (7 beams) _____

Verify beam penetration doors closed (7 doors) _____

5th Floor West of Boiler

Verify inspection doors closed (7 doors) _____

5th Floor East of Boiler

Verify Economizer doors in place (4 doors) _____

Verify TAH doors in place (4 doors) _____

4th Floor North of Boiler

Verify Economizer Hopper inspection door in place _____

4th Floor South of Boiler

Verify Econ/TAH cross over door in place _____
(Note: this door is on the North side on Unit 12 and Unit 13)

Ground Floor 4160v Room

Check closed FD high and low speed breaks closed _____

Check Closed ID fan breaker _____

Appendix 2
Unit Start Up
Grate Operator Walk Down

Operator's Initials

Verify the following at each:

Ring wall drains closed	_____
Sparging Steam closed	_____
Igniter air aligned	_____
Drum pressure gage aligned	_____
Condensate fill closed	_____

Verify the following at each:

Start SSC	_____
Check hyd unit gages	_____
No leaks on Hyd. Unit	_____
Check for bad flights	_____
Check clinker switch	_____
Check vibrator underneath SSC (underneath SSC incline)	_____

Verify the following at each:

Grate doors closed, (use steel wool to seal gaps if possible)	_____
Grate glass cleaned or replace	_____
Start Grates	_____
Check oil level	_____
Check speed	_____
Check limit torque setting	_____
Check Back stops	_____
Check Sifting hopper from grate level	_____
Inspect grate bars as they rotate around	_____
Check SSC from grate level hoppers	_____

Verify the following at each:

Start all Sifting Screws	_____
Check trough and Flights on screw	_____
Check bearing, Chain and Chain guard (grease if needed)	_____
Open & closed then set dampers, proof of operation	_____

Verify the following at each:

SSC seal and service water aligned	_____
Seal trough filled	_____

Verify the following at each:

Start Sifting hopper screw	_____
Check shaft for rotation	_____

Verify the following at each:

OFA operation, stroke damper	_____
UFA operation, Stroke damper	_____
North UGD, Stroke damper	_____
South UGD, Stroke damper	_____

Appendix 3
Unit Start Up **Operator's Initials**

Ash Operator Walk Down
Baghouse Penthouse

Verify the following at each Baghouse Compart damper set:

Air supply to Outlet damper open _____
Air supply to Reverse Air damper open _____
Air supply to Sonic Air Horn open _____
Inline lubricator oil level ½-3/4 _____
Inline moisture separator drained _____

Verify the following at the RA Recirc damper (near F compartment):

Air supply to RA Recirc. damper open _____
Inline lubricator oil level _____
Inline moisture separator drained _____
Baghouse upper catwalk

Verify the following at each of the Baghouse compartments:

Both upper doors are closed tight _____

Verify the air supply to the Reverse Air Fan inlet damper:

Baghouse lower catwalk _____

Verify the following at each of the Baghouse compartments:

Both lower doors are closed tight _____
Inside Baghouse Hopper area _____
On catwalk _____

Verify the following at each of the Baghouse hopper:

Air supply to Inlet damper _____
Inline lubricator oil level _____
Inline moisture separator drained _____
On ground floor _____

Verify the following at each of the Baghouse hopper:

D Door is closed tight _____
Poke hole cap in place _____
Plate covers in place (upper and lower) _____

Air supply to double dumps open (upper and lower) _____
ID fan _____

Verify the follow at the fan OB bearing:

Oil level _____
ECB inlet valve open _____
ECB outlet valve open _____

Verify the follow at the fan IB bearing:

Oil level _____
ECB inlet valve open _____
ECB outlet valve open _____

Verify the ID Fan inspection door is in place _____

ID fan controller:
Verify the damper controller air supply is aligned and >75psi _____
Verify the damper controller is in automatic with the air cylinder needle valve closed. _____

If the damper is not in automatic, contact the Control Room to coordinate placing the ID fan into automatic.

FD fan
Verify the follow at the fan OB bearing:

Oil level _____
ECB inlet valve open _____
ECB outlet valve open _____

Verify the follow at the fan IB bearing:

Oil level _____
ECB inlet valve open _____
ECB outlet valve open _____
Verify the FD Fan inspection door is in place _____

FD fan controller:

Verify the damper controller air supply is aligned and >75psi _____
Verify the damper controller is in automatic with air cylinder needle valve closed. _____

If the damper is not in automatic, contact the Control Room to coordinate placing the FD fan into automatic.

Pugmill MCC building

Verify the following for each of the Baghouse hoppers:

Hopper heater breaker is closed _____
Hopper vibrator breaker is closed _____

TAH hopper room

Verify the following at the TAH hopper:

D Door is closed tight _____
Poke hole cap in place _____
Platco covers in place (upper and lower) _____
Air supply to double dumps open (upper and lower) _____

Appendix 4
Unit Start Up **Operator's Initials**

Slaker Operator Walk Down List
8Th Floor SDA Penthouse

Verify a clean Spray Machine is available for service	_____
Spray Machine lube oil reservoir: Verify oil temp>80 deg deg F. If low- turn on/up lube oil heater	_____
Verify Lube oil tank level is sufficient	_____
Verify Slurry strainer is clean	_____
Verify Dilution Water head tank is overflowing	_____
Verify Dilution Water control valve is in neutral position	_____
Verify isolation valve between the Dilution Water head tank and control valve is closed	_____
Verify Slurry head tank is overflowing	_____
Verify Slurry control valve is in neutral position	_____
Verify isolation valve between Slurry head tank and control valve is closed	_____
Verify the SDA inlet door is in place (under SDA floor)	_____
Verify the SDA midlevel door is in place	_____
Verify the SDA outlet door is in place	_____

Ground floor Pugmill MCC

Verify the Spray Machine breaker is closed	_____
Verify the Spray Machine lube oil break is closed	_____

Appendix 5
Unit Start Up **Operator's Initials**

Auger Operator Walk Down

Verify the following at each:

6th

Visually inspect I-bolt to distribution spout _____
Check bearing for distribution spout _____

5th

Check Hydraulic lines to distribution spout _____
Check Hydraulic motor and gages _____
Check camera and housing _____

4th

Check distribution spout travel _____
Check Auger flights _____
Check Auger pull cord _____
Check auger drives and idler, valves open _____
Check auger discharge ….bearing, speed sensor, E- Stop _____
Check motor, gages and oil reservoir and cooling water _____
Check auto/ hand switch and control power _____

3rd

Check economizer double dumps and put I/S _____
Stroke OFA dampers upper, lowers and modulating _____
Oil tilts @ zero _____
3&4 and 7&8 windbox ask CRO _____
Insure igniter fan I/S _____
Insure oil and air line for igniters _____

Insure oil and air for oil guns are aligned _____
Make sure limits are made on oil train _____
Clean igniter and oil guns put in remote _____
Discharger roller I/S _____
Check plug chute detectors _____

Appendix 6
Unit Start Up **Operator's Initials**

Operator Walk Down List DOORS
8th

Floor Boiler Penthouse 2 doors _____
Steam drums north & south _____

7th
4 doors north side, Superheat and Gen. bank _____

6th
Mud Drum, north and south side _____
Economizer lanes door _____
Dance floor door _____
6 View port doors _____
Diverter gate _____

6th
Outside 2 door on FD outlet ductwork _____

5th
6 View port doors, exterior _____
6 View port doors, interior _____
4 Doors Economizer lanes _____
Distribution spouts cover and doors _____

4th
Auger discharge doors _____
Metering bin doors _____
Crossover door _____
Economizer hopper door _____

3rd
Plug chute small and large access doors _____
Igniter inspection door _____
Economizer Platco's _____

2nd
Grate doors _____
Grate inspection doors _____
Grate inspection view port _____

Basement
SSC doors (2) _____
FD ductwork doors (2) _____
Shifting hopper covers _____

TAH
10 doors _____
"D "door on TAH hopper in TAH room _____

SDA & Baghouse
Inlet door, (underneath SDA room) _____
Midway door _____
Outlet door _____
Thimble sheet and Outlet damper … 40 doors _____
Baghouse "D" door on all compartments _____
Baghouse Platco covers's _____

Appendix 6 Maintenance Checklist

Action	Complete?	Initials
Remove grate level 3 front doors		
Remove 6 and 7th floor doors		
Ops run grates off		
Install 2nd floor picks and boards		
Install danger tape over opening		
Install dance floor beams		
Install dance floor ops to sniff 6th floor door		
Throw first half of boards in		
Entry guy wears harness		
Hole watch at door		
Entry lines up boards		
Hole watch hands entry remaining boards		
Deklincker boiler Maint. Supervisor		
Must have hole watch on grate level		
Wash down entire boiler from grate level		
Do a internal and external grate inspection		
Internal remove bars and enter belly of grates from rear		
Hole watch and grates locked out		
Inspect back stops and repairs		
Trajectory chutes 2 guys' inspection and set gaps 3/8		
One guy in boiler on 6 ft. ladder second outside doing adjustments		
Remove under grate doors n/s		
Board out over dampers and install board to reach zone dampers		
Hole watch and a guy stroking zone dampers from outside		
Remove zone dampers if coffins are plugged		
Inspect over fire and under fire dampers		
Inspect SSC- bearings, chain, tail drum, head drum, flights and tension		
Metering bin-inspect couplings, bearings, augers and pumps		
Board out top if entering bin, hole watch		
Make sure bin is run out		
Inspect and clean all spray machines as needed		
Run and inspect all ash conveyors-check for ash leaking out		
Cycle all double dumps-bag house		
Inspect all iks and g9b-repair as needed		
Install picks and boards in super heats do repairs as needed		
Hole watch stationed outside 7th floor		
Work orders required for all jobs		

Appendix 7 E&I

E&I Check List for Boiler 11 Startup

TRANSMITTERS

Tag Number	Description	Cal Range	Location	Checked By: (initials print)
PI1040	FF Outlet Press	(-30" to 0" H2O)	Inside upper level of bag house	
PI1001	SDA Outlet Press	(-30" to 0" H2O)	SDA Platform	
11SGA-PT2006	TAH Gas outlet press	(-15" to 0" H2O)	SDA Platform	
11FWA-FT0028	Econ Feedwater Inlet flow	(0" to 71" H2O)	8th FL NE corner Blr	
11FWA-PT0076	Econ Feedwater Inlet Press	(0-1400 PSI)	8th FL NE corner Blr	
11SGG-PT0002	Main Stm Press	(0 - 1000 PSI	8th FL W side Blr	
11SGG-FT0002	Main Stm Flow	(0" to 424" H2O)	8th FL W side Blr	
11SGA-PT0063	Boiler Gas Outlet Press	(-15" to +5" H2O)	7.5 FL E. side Blr	
11SGF-LT00026	Drum Level	(-36" to -16" H2O)	7.5 FL N side Blr	
11SGA-PT0036	Furnace Press	(-5" to +5" H2O)	7 FL S side Blr	
11SGA-PT0039	Furnace Press	(-5" to +5" H2O)	7 FL N side Blr	
1SGB-PT2004	TAH AIR OUTLET PRESS	(0" to 30" H2O)	1ST FL SE Corner Blr 12 ductwork	
1SGB-PT0049	TOTAL AIR FLOW	(0" to 5" H2O)	1ST FL SE Corner Blr 12 ductwork	

CONTROL VALVES

Tag Number	Description	Cal Range	Location	Checked By: (initials print)
1CCC-ACV2008	SDA DILUTION WATER VLV	0-100%	SDA PLATFORM	
1CCC-ACV2028	SDA SLURRY VLV	0-100%	SDA PLATFORM	
11FWA-ACV0095	MAIN FEEDWATER VLV	0-100%	8th FL N Side Blr 12	
11FWA-ACV157	START-UP FEEDWATER VLV	0-100%	8th FL N Side Blr 12	
1SGF-ACV0032	DESUPERHEATER SUPPLY VLV	0-100%	8th FL N Side Blr 12	
1SG1-ACV0002	SOOT BLWR STM SUPPLY VLV	0-100%	Top of Blr 12	
1FOB-ACV0092	FUEL OIL SUPPLY VLV	0-100%	3rd Fl N side Blr 12	

BOILER I/P CONVERTERS

1SGB-SGC0003	WINDBOX CTRL - F	4-20ma = 0-100%	3rd FL S Side Blr 12	
1SGB-SGC0004	WINDBOX CTRL - R	4-20ma = 0-100%	3rd FL S Side Blr 12	

E&I Check List for Boiler 12 Startup

TRANSMITTERS

Tag Number	Description	Cal Range	Location	Checked By: (initials print)
PI2040	FF Outlet Press	(-30" to 0" H2O)	Inside upper level of bag house	
PI2001	SDA Outlet Press	(-30" to 0" H2O)	SDA Platform	
12SGA-PT2006	TAH Gas outlet press	(-15" to 0" H2O)	SDA Platform	
12FWA-FT0028	Econ Feedwater Inlet flow	(0" to 71" H2O)	8th FL NE corner Blr	
12FWA-PT0076	Econ Feedwater Inlet Press	(0 -1400 PSI)	8th FL NE corner Blr	
12SGG-PT0002	Main Stm Press	(0 - 1000 PSI	8th FL W side Blr	
12SGG-FT0002	Main Stm Flow	(0" to 424" H2O)	8th FL W side Blr	
12SGA-PT0063	Boiler Gas Outlet Press	(-15" to +5" H2O)	7.5 FL E. side Blr	
12SGF-LT00026	Drum Level	(-36" to -16" H2O)	7.5 FL N side Blr	
12SGA-PT0036	Furnace Press	(-5" to +5" H2O)	7 FL S side Blr	
12SGA-PT0039	Furnace Press	(-5" to +5: H2O)	7 FL N side Blr	
2SGB-PT2004	TAH AIR OUTLET PRESS	(0" to 30" H2O)	1ST FL SE Corner Blr 12 ductwork	
2SGB-PT0049	TOTAL AIR FLOW	(0" to 5" H2O)	1ST FL SE Corner Blr 12 ductwork	

CONTROL VALVES

Tag Number	Description	Cal Range	Location	Checked By: (initials print)
2CCC-ACV2008	SDA DILUTION WATER VLV	0-100%	SDA PLATFORM	
2CCC-ACV2028	SDA SLURRY VLV	0-100%	SDA PLATFORM	
12FWA-ACV0095	MAIN FEEDWATER VLV	0-100%	8th FL N Side Blr 12	
12FWA-ACV157	START-UP FEEDWATER VLV	0-100%	8th FL N Side Blr 12	
1SGF-ACV0032	DESUPERHEATER SUPPLY VLV	0-100%	8th FL N Side Blr 12	
2SG1-ACV0002	SOOT BLWR STM SUPPLY VLV	0-100%	Top of Blr 12	
2FOB-ACV0092	FUEL OIL SUPPLY VLV	0-100%	3rd Fl N side Blr 12	

BOILER I/P CONVERTERS

1SGB-SGC0003	WINDBOX CTRL - F	4-20ma = 0-100%	3rd FL S Side Blr 12	
1SGB-SGC0004	WINDBOX CTRL - R	4-20ma = 0-100%	3rd FL S Side Blr 12	

E&I Check List for Boiler 13 Startup

TRANSMITTERS

Tag Number	Description	Cal Range	Location	Checked By: (initials print)
FIT2001	FF OUTLET PRESS	-30 TO 0 H2O	[illegible]	
FIT2002	SDA OUTLET PRESS	-30 TO 0 H2O	SDA PLATFORM	
12SGA-PT2006	TAH GAS OUTLET PRESS	-15 TO 0 H2O	SDA PLATFORM	
12FWA-FT2025	ECO FEEDWATER FLOW	0 TO 71 H2O	BTH FLR ELEVATOR B	
12FWA-PT2075	ECO FEEDWATER INLET PRESS	0-1400 PSI	BTH FLR ELEVATOR B	
12SGG-PT2002	MAIN STEAM PRESS	0-1000 PSI	BTH FLR WEST SIDE B	
12SGG-FT2002	MAIN STEAM FLOW	0 TO 424 H2O	BTH FLR WEST SIDE B	
12SGA-PT2048	BOILER GAS OUTLET PRESS	-15 TO -5 H2O	7TH FLR EAST SIDE B	
12SGF-LT2025	DRUM LEVEL	-36 TO +15 H2O	7TH FLR WEST SIDE B	
12SGA-PT2036	FURNACE PRESS	-5 TO +5 H2O	7TH FLR SOUTH SIDE B	
12SGA-PT2037	FURNACE PRESS	-5 TO +5 H2O	7TH FLR WEST SIDE B	
2SGB-PT2004	TAH AIR OUTLET PRESS	0 TO 30 H2O	1ST FLR SE CORNER B 12 [illegible]	
2SGB-FT2048	TOTAL AIR FLOW	0 TO 5 H2O	1ST FLR SE CORNER B 12 [illegible]	

CONTROL VALVES

Tag Number	Description	Cal Range	Location	Checked By: (initials print)
2CCC-ACV2008	SDA DILUTION WATER VLV	0-100%	SDA PLATFORM	
2CCC-ACV2023	SDA SLURRY VLV	0-100%	SDA PLATFORM	
12FWA-ACV0098	MAIN FEEDWATER VLV	0-100%	BTH FLR WEST SIDE B 12	
12FWA-ACV0187	START-UP FEEDWATER VLV	0-100%	BTH FLR WEST SIDE B 12	
1SGR-ACV0082	DEAERATOR HEATER SUPPLY VLV	0-100%	BTH FLR WEST SIDE B 12	
2SG1-ACV0002	SOOT BLWR STM SUPPLY VLV	0-100%	TOP OF B 12	
2FO6-ACV0092	FUEL OIL SUPPLY VLV	0-100%	BTH FLR WEST SIDE B 12	

BOILER I/P CONVERTERS

1SGB-SGC0003	WINDBOX CTRL - F	4-20ma = 0-100%	BTH FLR SOUTH SIDE B 12	
1SGB-SGC0004	WINDBOX CTRL - R	4-20ma = 0-100%	BTH FLR SOUTH SIDE B 12	

Appendix 8
CEMS Checklist

DETROIT RENEWABLE POWER
CEMS BOILER START-UP CHECK FORM

	MON	TUES	WED	THURS	FRI
Check Gas Bottles					
Check System pressures and vacuums					
Check Sample Gas Flows					
Check Analyzer Alarms					
Check Computer Is on Line					
Check Daily Cal Drifts of OOC Conditions					
INITIALS					

DATE: / /

Cal Gas Press.	MON	TUE	WED	THUR	FRI	CAL
1)N2/O2						
2) SO2/NO/CO						
3) O2/CO/CO2						
4) N2						
5) SO2						
6) O2						

	OUTLET			INLET		
GAS ANALYZERS	11	12	13	11	12	13
CHECK CAL GAS FLOW (STEADY FLOW FLOW RATE)						
CHECK SYSTEM PARAMETERS (PRESSURE VACCUM)						
CHECK SO2 MONITOR LAMP VOLTAGE (<165 VDC,STABLE)						
OPACITY	11	12	13			
CHECK FOR FAULT LAMPS AND ALARMS						

INLET				
UNITS		11	12	13
SO2 LAMP VOLTAGE				

OUTLET				
UNITS		11	12	13
SO2 LAMP VOLTAGE				

COMMENTS:

Boiler Shutdown
Standard Operating Procedures

SOP-1022

1.0 Purpose:

To provide a procedure to ensure proper shutdown of the boiler. Each boiler is shutdown at least every 42 days but, in general, it is done on a more frequent basis.

2.0 Scope:

Detroit Renewable Power – Power Block

3.0 Responsibilities:

Department Manager or designee is responsible for implementing and maintaining this procedure.

Department Supervisor(s) and Control Room operators (CRO) are responsible for adhering to this procedure.

4.0 Definitions: None

5.0 Safety and Environmental Information:

You must wear proper Personal Protective Equipment, which consists of:

5.1 Approved hard hat that meets all ANSI/ISEA Z89. 1 Type 1 standard and Class E certification standard are located inside employee's hard hat.

5.2 Safety Glasses/Face shield Approved by ANSI with the designation stamped or molded on the glasses saying Z-87 which have been tested and have been approved to wear in industry.

5.3 The following specifications are the minimum requirements for protective work boot.

- 5.3.1 Leather upper material
- 5.3.2 Minimum 6" boot height
- 5.3.3 No deep cleats in the sole
- 5.3.4 Semi-lug sole for traction
- 5.3.5 High density sole
- 5.3.6 Composite or steel toe

5.4 Long sleeved shirt and long pants to keep ash off of your body.

5.5 Hearing protection may be necessary but not required.

5.6 Leather gloves may be required. Use our standard leather glove (grey with cuff) should be available.

5.7 Before starting, or shutting down follow Safety Procedure # 15 Lockout Tagout which can be viewed in the Safety Manager's office or on the S drive.

6.0 Standard Operating Procedures Steps:

6.1 Notify Beacon Control to coordinate boiler shut down vs. steam demand.

6.1.1 Make sure that we call the following entities when the turbine generator is coming offline.

6.1.2 Michigan Electric Coordinated Systems
Balancing Authority: Call this number first > (248) 380-2932 or (248) 380-2931

6.1.3 Midwest Independent Transmission System Operator
Reliability Coordinator: (317) 249-5030

6.1.4 ITC Transmission
Transmission Operators Control Room: (248) 380-2903

6.2 Reduce Boiler Main Steam set point to approximately 250klb/hr.
6.3 Stop feeding Metering bin to allow to run empty.
6.4 Start igniters and oil guns.
6.5 As metering bin runs low, place Combustion Control loop in manual from auto.
6.6 Adjust oil firing rate to maintain stable boiler conditions while metering bin runs completely empty.
6.7 When metering bin is empty:
a. Stop Augers.
i. Toggle CEMS input to off line.
ii. Record auger stop time as "RDF Out".
b. Open Superheater drains by turning two (2) rotations.
c. Isolated slurry to Spray Machine.
d. Stop PDA fan.
e. Isolate all make up water to SSC.
6.8 Reduce oil firing rate.
6.9 Align the Start Up Feedwater ACV and place in service (recommended below100Klb/hr.).
6.10 Isolate Main Feedwater ACV.
6.11 Stop oil guns and allow to purge.
6.12 Stop igniters (Boiler will trip. First Out: loss of all fuel).
6.13 Record MFT time as "Oil Out".
6.14 Clean Baghouse (two [2] times).
6.15 Continue to run the bottom ash screws and Grates until the boiler is cool.
6.16 Stop and remove Spray Machine when SDA outlet temp is below approximately 300 degrees.

6.17 Continue to run the DF fan for cooling as needed until the Baghouse outlet temperature is 150 degrees.

a. After stopping the FD fan, leave the 4 sacrificial baghouse compartments in service while isolating the remaining 6 compartments. (A, B, F, G in) (C, D, H, J, K isolated).
b. Stop the reverse Air Fan.
c. Turn Off the sonic air horns.
d. Place the cleaning cycle from Auto to Manual.

6.18 Perform the list of required checks on the "Supervisor Boiler Inspection / Shutdown Checklist"

SUPERVISOR

BOILER INSPECTION / SHUTDOWN CHECKLIST

(each boiler is shut down every 42 days, but in general it is more frequent)

Date: _____ **Boiler #_____**

	Initials
1. LO/TO Boiler	_____
2. Have doors removed per door list	_____
3. Remove Spray Machine	_____
a. Drain/ Flush Slurry Line	_____
b. Spray Machine Cleaned (Maintenance)	_____
4. Confined Space Sheets	_____
5. Gas Path/ Furnace Inspection	_____
a. TAH Gas Path	_____
b. Economizer Gas Path	_____
c. Gen Bank Gas Path	_____
d. Furnace Wall Inspection	_____
e. Wind box/TOFA Nozzles	_____
f. UGA Zone Plenums	_____
g. UFA Duct PDA Fan Suction	_____
h. Inspect S.D.A Inlet, Vessel & Outlet	_____
6. Bag House Hoppers Clear	_____
7. Economizer Hoppers Clear	_____
8. T.A.H Hopper Clear	_____
9. Oil Guns Clean	_____
10. Auger Wraps Cleared	_____
11. Fuel Chute Inspection	_____
12. Clean Auger Couplings	_____
13. Auger Inspection (Maintenance)	_____

14. P.D.A Inspection
- **a. Internal** _____
- **b. External** _____

15. Sifting Screw Inspection _____

16. Sifting Hopper Inspection _____

17. Inspect Boiler for Tube Leaks _____

18. Grate Inspection (Maintenance)
- **a. External (each Shut Down)** _____
- **b. Internal (Per schedule)** _____

19. SSC Inspection (Maintenance) _____

20. Verify Damper Operation _____
- **a. UFA Damper** _____
- **b. N. UGA Damper** _____
- **c. S. UGA Damper** _____
- **d. OFA Damper** _____
- **e. Wind box Dampers (1-8)** _____
- **f. Upper TOFA (1-8)** _____
- **g. Lower TOFA (1-8)** _____

Supervisors are responsible for the performance or directing of performance of all checks

DETROIT RENEWABLE POWER

SOP-0110
Procedure Title:

LOSS of STATION POWER

Following a total loss of station power, the immediate priority is to ensure a safe shutdown of all equipment and to ensure the safety of the Facility personnel.

A. The following actions will be taken:

1. Immediately check all relays both in the control room and the switchyard
2. Immediately ensure that the DC turbine lube oil pump has started and is maintaining pressure
3. Immediately ensure that the generator breaker is open and open I main and reserve breakers.
4. Immediately check for fire in all fuel-feed systems that were in service and station operator at the diesel fire pump
5. Contact the DTE dispatcher for any information on the cause of the power loss
6. Notify the FAA (1-800-332-5694) that the chimney strobe lights are not operating. Report the stack location as:

   Latitude 42° 22 minutes 04 seconds

   Longitude 83° 03 minutes 05 seconds
7. Notify the MDEQ - AQD
8. If the cause of the outage has been identified and corrected, re-energize immediately
9. If the cause cannot be identified within a short time, contact the appropriate technical support personnel for assistance
10. If the power is not restored, isolate all deluge systems and post a fire watch
11. Ensure that there is a natural draft through the boilers tripped off line
12. If power is not restored within one hour, begin degassing and purging the turbine generator with carbon dioxide.
13. If temperature is below freezing, drain any fire protection systems that may have tripped

14. Isolate any air operated control valves that are allowing operating parameters to reach abnormal values

B. When power is restored:

Once power is restored, place in service the air compressor

1. Reset all fire systems
2. Refill boilers as per manufacturer's recommendation
3. Minimum air flows will be used to purge boilers of gases and particulate to minimize impact on opacity.
4. Restart gas generator, as per power manufacturer's recommendations
5. Run all ash out of all conveyors systems
6. Once all auxiliary systems have been restarted and operating conditions are stabilized, re-initiate fires in the boilers
7. Proceed with restart procedure

SOP-0120

Procedure Title:

SDA MALFUNCTIONS

The Shift Supervisor will be responsible to determine the cause of the problem, rectify the problem and place all systems back in service as soon as possible. The operating SOP is as follows:

1. Attempt to re-establish proper SO2 control. If unsuccessful, place the oil guns in service and secure RDF feed to the boiler as quickly as possible
2. Secure the RDF feed to the boiler and allow the fuel remaining on the grate to completely burnout.
3. If the SO2 is within the air permit limit value, leave the boiler in-service on oil-firing.
4. Re-establish RDF fires once proper SO2 control is restored.

DETROIT RENEWABLE POWER

SOP-0130

Procedure Title:

BOILER FEED CHUTE PLUG

Feed chute plug may cause excessive transient CO emissions. In order to compensate for these conditions, the following procedure will be observed:

1. If steam flow is affected reduce load.
2. Evaluate grate conditions for barren spots or lightly-covered areas.
3. Adjust undergrate air dampers to maintain grate temperature.
4. Identify the plugged chute and clear it.
5. If necessary, adjust TOFA to keep CO within the air permit limit value.
6. Adjust grate speed.
7. Once grate conditions are stable, adjust the grate speed to maintain proper burnout.
8. After fuel-feed is re-established, adjust all parameters to the normal operational settings while maintaining emissions within limits.
9. Check the CEM system for possible CO exceedance.

DETROIT RENEWABLE POWER

SOP-0140

Procedure Title:

RDF Boiler Grate Malfunction

Boiler grate malfunctions may include drive failure, chain breakage, binding or damage due to high temperatures. The following SOP should be used if the grate malfunctions:

1. If steam flow is affected reduce load.
2. Immediately shutdown the Auger screws feeding the affected half-of-grate.
3. Bias up undergrate air
4. If necessary, evenly distribute piled RDF on the grate with appropriate tools.
5. Maintain undergrate air flow to keep grate temperatures less than SOOT.
6. Concurrent with emergency actions, identify causes for the malfunction.
7. Monitor and maintain CO and excess O_2 within normal operating limits.
8. Re-establish fuel feed and carefully monitor grate conditions, once the malfunction is corrected.
9. If the boiler must be shutdown, follow procedures for RDF BOILER STARTUP/SHUTDOWN.

DETROIT RENEWABLE POWER

SOP-0150

Procedure Title

RESPONSE TO CARBON MONOXIDE (CO) EXCURSION

Anytime CO emissions are above the permit limit, immediate action must be taken to reduce them to normal levels. If CO levels cannot be reduced to permitted levels in one hour, the Operations Supervisor must be notified. Unit load must be reduced or the unit removed from service, as necessary to prevent exceeding the hourly or the 24 hour average permit limit for CO emissions.

In the event that the CEM CO monitor indicates an increasing trend or an alarm condition is reached:

1. Verify whether a substantial increase in fuel moisture content is occurring as indicated by:
   - Auger Speed is increasing.
   - Verbal communication with the Waste Processing Loader Operator.
   - Visual inspection of the refuse fire. (Unburned fuel at grate discharge, fuel not reaching back of grate.)

   If wet refuse is causing the increase in CO, take action to:
   - Immediately reduce load.
   - Instruct the loader operator to mix a more homogeneous blend of wet and dry fuel.
   - Increase the pneumatic distribution air by opening each of the seven manually controlled dampers, ensuring that the fuel is being delivered to the charging zone of the grate
   - Reduce bed thickness by increasing the speed of the grates 10 - 15%.
   - Place burner tilts at 30 ° down to increase fuel bed agitation,
   - Adjust fuel/air ratio by decreasing the auger bias,
   - Increase overfire air by raising the air heater outlet duct pressure set point.

2. In addition to items listed in #1 above, verify whether a fuel overfeed situation exists as indicated by:
   - Furnace O_2 continues dropping below the normal operating range of 5 to 7%.

   If a fuel overfeed situation exists, take action to:
   - Decrease the Auger bias.
   - Increase the grate speeds 10-15%.
   - Maintain these settings until fuel feed and combustion return to acceptable levels.
   - Adjust settings to insure complete combustion.
   - Adjust grate speed to maintain a 4 to 6 inch bed depth.
   - Adjust pneumatic distribution air to maintain fuel delivery to the grate charging zone.
   - Adjust auger bias to maintain an O_2 range of 5 to 7%.

3. Verify whether a severe fuel overfeed situation exists as indicated by (in addition to items listed in #1 and #2 above):
   - Furnace flue gas temperature decreasing below 1810°F, approaching the permit limit of 1800°F; requiring that oil burners be placed in service,
   - Annunciation on the Taylor DCS alarm screen occurring as process O_2 falls below 5% or raises above 7%.

   Actions to correct a severe refuse overfeed are as follows:

- Place the underfire air dampers in local/auto control and increase the amount of undergrate air by 5 %.
- Decrease auger bias by 10 to 15%.
- Increase the grate speeds by 10 to 15% to thin out fuel bed.
- Place the oil burners in service as necessary to maintain a minimum of 1800°F flue gas temperature leaving the furnace.
- As the fuel bed returns to normal, place the undergrate air control back to remote auto
- Take oil burners out of service as temperatures are stabilized at or above 1810°F.

4. Verify that no ingress of fugitive air is occurring at the ash discharger(s) or any other furnace opening upstream of the O_2 probe as would be indicated by:
   - ID Fan amps increasing and furnace draft becoming unsteady, sporadically going on positive pressure,
   - ID fan damper at 100% or above normal.

   If loss of atmospheric seal occurs, take the following action:
   - Identify and begin restoring the atmospheric seal, reduce load as necessary to stabilize boiler draft.
   - Determine the degree of overfeed which has caused the CO to increase and follow the appropriate corrective action as indicated in item 1.

5. Verify that the soot blowers are not in operation and that a soot blower poppet valve has not stuck open. These may cause the following:
   - May cause a CO spike or repeated spiking.
   - Soot blowing increases loading on the ID fan. It is possible for this loading to cause the boiler draft to become unsteady causing sporadically positive pressures in the furnace.
   - ID fan damper near 100% open (or above normal damper opening) during soot blowing operation.

   If malfunctioning soot blowers or sporadically positive pressures in the furnace are the cause of the CO problem, take the following action:
   - Isolate soot blowing steam block valve to ensure no steam is entering boiler through the soot blowers.
   - Reduce load on the boiler until the ID fan damper can control the boiler draft,
   - Insure that the air preheater is clean, soot blow if needed.

6. Verify that the CO reading on the CEM monitor is correct as indicated by:
   - Comparing current CO readings with visual observations of the refuse fire on the stoker.
   - Access the group trend for emissions on the Taylor MOD-300 and review these trends.
   - Reviewing the Daily Calibration Report printout status. Report is recorded every day on the senior operators log at 0800.
   - If the continuous emission monitor is suspected or found to be faulty, immediately notify E&I department so that repairs can be made.

DETROIT RENEWABLE POWER
SOP-0160

Procedure Title

SOP for High SO_2

This procedure covers the actions to be taken to respond to a high SO_2 condition and prevent an excursion. The SO_2 (stack) rate (ppm) should be closely monitored. If the SO_2 (stack) exceeds the normal operating range, the shift supervisor must be immediately notified. The boiler load must be reduced and if necessary, taken off line to prevent the unit from exceeding the SO2 permit limit.

In the event that the SO_2 (stack) monitor indicates an increasing trend or an alarm condition is reached:

1. Verify that the atomizer is running. Restart the machine if necessary.
2. Verify proper lime slurry flow is being supplied to the Spray Dryer Atomizer (SDA) via Lime Slurry head tank.

   - Normal slurry flow is indicated on the Control Room CRT, varying between 3 and 30 gallons per minute (gpm),
   - SDA outlet temperature is being maintained at setpoint (285°F) and "Spray Dryer Absorber Temp High" alarm has not activated.

   If no slurry flow or poor flow is being supplied to the Spray Dryer Atomizer head tank, take action to:

   - Verify that the Additive feed pump is operating properly. Restart pump or switch over to standby pump if necessary.
   - Verify proper Additive feed pump flow by checking the recirculation flow back to the tank. If necessary, flush the loop or start a second pump.
   - Verify that the atomizer slurry inlet strainer is clear of all material. Clean the strainer if necessary.
   - Verify that Additive Feed Isolation Block Valve is open. Reopen if necessary.
   - Verify that the Additive Flow Control Valve's actual position matches temperature controller's indication. Stroke valve through its range. Verify that valve is opening properly.
   - Verify that the atomizer wheel nozzles are clear. Clean nozzles if necessary. High vibration may indicate plugged nozzles.

   If control over SDA SO_2 emissions cannot be regained within one hour, the boiler load must be reduced, and if necessary, taken off line to prevent the unit from exceeding the SO_2 permit limit.

3. Verify whether the slurry supply to the SDA has low lime density as indicated by:
   - Proper temperature control but poor SO_2 reduction.
   - Both online boilers indicating high SO2 outlet problems. Take manual samples of slurry from additive feed sample port. Check the specific gravity of the sample.
   - Normal slurry from the storage tank will contain around 22% solids. Normal slurry supplied to the SDA will vary from 11% to 22% solids.

4. If low slurry density is found on the additive feed pump discharge, take the following action:
   - Verify that the additive transfer pump is in operation. Restart pump or switch over to the standby pump if necessary.
   - Verify proper additive transfer pump flow. If necessary, flush the loop or start a second pump.
   - Verify that the SO_2 Control Valve's actual position matches controller's indication. Stroke valve through its range. Verify that valve is opening properly.

5. If one additive transfer pump cannot provide proper flow; determine cause of problem and correct or notify maintenance of the necessary repair. Acid clean the additive transfer pump if necessary.

   If a low slurry density is found in the additive storage tank, take the following action:
   - Verify that the additive storage tank mixer is operating properly. If the mixer is not running, the slurry will concentrate at the bottom of the tank. Once the high solids slurry is used up, only low density slurry will remain in the tank.
   - Restart or repair the mixer as necessary. If the mixer cannot be quickly repaired, ensure proper agitation with compressed air.

6. Start the slaker. Verify proper slaking temperature 170°F. Test slaker outlet density. If density is low, adjust slaker settings as required.
   - If problems are found with the lime slurry, check quality of the lime for proper CaO content.
   - If control over slurry density cannot be regained within one hour, the boiler load must be reduced, and if necessary, taken off line to maintain proper SO_2 limit.

7. Verify that the waste processing tipping floor operator is locating and removing items known to produce excessive amounts of SO_2 during combustion, e.g. sheetrock

8. Ensure that the waste processing is feeding a homogeneous blend of RDF onto the boiler feed conveyor belt.

9. Verify that flue gas inlet conditions are suitable for optimum SO_2 absorption in the reactor. SDA inlet temperature should be maintained between 400 and 450°F.
   - If the inlet temperature is too high, SO_2 will not be absorbed because the particles dry too quickly. Maximum temperature allowed is ***520°F***. Blow soot and if necessary reduce load until temperature is brought back into design.
   - If the inlet temperature is too low, lime particles will not react properly with the SO_2. Minimum inlet temperature allowed is ***350°F***. Increase load and/or place auxiliary burners in service to bring the inlet temperature back up to design.
   - Check for abnormally high SO_2 inlet conditions.

10. Verify that the SO_2 reading on the CEM monitor is correct as indicated by:
    - Comparing current SO_2 readings with visual observations of the refuse fire on the stoker.
    - Access the group trend for emissions on the Taylor MOD-300 and review these trends.
    - Reviewing the Daily Calibration Report printout status. Report is recorded every day on the senior operators log at 0700.
    - Review the Daily Report by accessing the HOURLY OUTLET DATA on the Trace Data Explorer generation by the DAU number for the boiler experiencing the SO_2 excursions and reviewing the hourly SO_2 readings as an indication as to whether the monitor has been tracking SO_2 emissions in a steady or very erratic manner.

11. If the continuous emission monitor is suspected or found to be faulty, immediately notify CEM coordinator E&I so that repairs can be made.

DETROIT RENEWABLE POWER

SOP-0170

Procedure Title

SOP for High NO_X

Anytime NOX emissions are above the permit limit, immediate action must be taken to reduce them to normal levels. If NOX levels cannot be reduced to permitted levels in one hour, the Operations Supervisor must be notified. Unit load must be reduced or the unit removed from service, as necessary to prevent exceeding the 2nd 1 hour average permit limit for NOX emissions.

In the event that the CEM NOX monitor indicates an increasing trend or an alarm condition is reached:

1. Verify whether an oversupply of excess air is present in the furnace, as indicated by:
   - A substantial increase in the opening of underfire and/or overfire air dampers,
   - Increased pressure drops throughout the furnace flue gas path.
   - The ID fan damper position continuously running at or near the end of its effective operating range, o
   - Furnace draft becoming unstable due to an imbalance of combustion air or loss of atmospheric seal on the furnace.

   If too much excess air is causing the increase in NOX, take action to:
   - Reduce the combustion air temperature if fuel is dryer than normal and high in BTU.
   - Reduce the underfire and/or overfire air by increasing auger bias 2-10%. This should ensure good combustion and reduce NOX levels,
   - Identify and reestablish furnace atmospheric seal and/or determine and correct the deficiency causing the ID fan dampers to run at the end of their effective range,
   - Reduce load if overall fuel moisture is too high to ensure complete combustion while running unit at full load.
2. Verify whether a substantial increase in organic/vegetable matter such as brush, undergrowth, grass clippings, leaves and/or food waste is being fed to the furnace, as indicated by:
   - Auger increasing dramatically above the proportion run time setting as a result of the sudden increase in refuse moisture
   - Furnace flue gas temperature decreasing
   - Boiler steam flow rate steadily decreasing

- Verbal communication with the Waste Processing Loader Operator
- Visual inspection of the fire.

If an increase in organic/vegetable matter is found to be causing the increase in NO_x, take action to notify the Waste Processing Loader Operator to mix a more homogenous blend of wet and dry refuse and maximize the combustion air temperature.

3. Verify that the stoker refuse bed condition is not contributing to the formation of NO_x as indicated by:

- The grate fuel bed being a uniform and correct thickness across the width of each undergrate air zone
- There being no thick patches of partially burning fuel where unconsumed oxygen can react with nitrogen to form nitrogen oxides (NO_x).

If the refuse bed condition is causing the increase in NO_x, take action to:

- Notify the Waste Processing Loader Operator to mix a more homogenous blend of wet and dry fuel.
- Maximize the combustion air temperature.
- Reduce load as necessary to ensure complete combustion and minimize the formation of NO_x.

If the continuous emission monitor is suspected or found to be faulty, immediately notify CEM coordinator or E&I department so that repairs can be made.

DETROIT RENEWABLE POWER

SOP-0180

Procedure Title

SOP for High Opacity

(Fabric Filter)

Anytime Opacity emissions are above the permit limit, immediate action must be taken to reduce them to normal levels. If Opacity emissions exceed 10.0% unit load must be reduced or the unit removed from service, as necessary to prevent exceeding the 6 minute average permit limit for Opacity Emissions.

1. Immediately notify the shift supervisor and begin taking steps to identify and correct the cause of the opacity excursion.

   Note: Most often a gradual increase in opacity will be observed if the cause is a small leak(s) in one or two filter bags or a gradual dirtying of the optics on the opacity monitor itself. Likewise, a small momentary spike in opacity between 8 and 26%, immediately after cleaning of a compartment(s) is generally an indication of a leaking bag in that compartment. A quick increase in opacity could be an indication that the bypass damper has opened or a bag has come unseated. A large sustained increase in opacity may be an indication of a malfunction occurring in the opacity monitor itself. A visual inspection of the gas plume exiting the stack together with additional instrument indications may signify that a multiple bag or catastrophic failure such as a fire is occurring. All of these conditions require immediate action in order to prevent, or minimize, a reportable opacity excursion from occurring and to prevent, or minimize, damage to equipment and danger to personnel.

2. Verify which (if any) compartments) have leaking bag(s) by performing the following:

   - Call-up on the Taylor DCS process control screen "Baghouse Overview "(compartments 1-10) of the unit experiencing the opacity excursion, If the baghouse is being cleaned using off-line cleaning, close the outlet damper on the compartment which had last finished cleaning prior to the increase in opacity, by issuing an ISOLATE command,
   - Access the group trend for emissions on the Taylor MOD-300 and review these trends (has real time opacity indication and updates every 10 seconds).
   - Check to see if a noticeable decrease in opacity occurs. Reopen the compartment outlet damper. If the leaking bag(s) is located in the compartment opacity will again increase as seen on the CEM monitor.

   Note: It is possible that two or more compartments have leaking bag(s), causing the high opacity. If opacity does not return to its pre-aiann level when a compartment containing a

leaking bag is located and isolated, a second check of all remaining compartments should be made.

3. Once the leaking compartment(s) is located, it should be:

   - Injected with leak detection powder.
   - Tagged and locked out.
   - The cover removed and the damaged/unseated bag(s) identified and replaced.
   - The tube sheet vacuumed and all bags inspected for fly ash buildup in them. Any fly ash in the bags must be vacuumed out to prevent damaging the fabric.

   Note: If the leaks at this point are minor i.e. < 5% and the compartmest(s) can be isolated without the need to reduce load on the unit, it is advisable to postpone the inspection until after dark. The leak detection powder is most visible in ultraviolet light, with little or no sunlight interference.

   - When the bag(s) have been replaced a bag replacement form must be completed. This form details the cause of the failure/unseating, together with the action which should be taken to make corrections and to prevent any further recurrence.

4. Verify that the following parameters are within a normal operating range and are not indirectly causing high opacity:

   - Furnace draft is stable at approximately -0.005"WG. Large pressure fluctuations in the furnace and baghouse may cause fly ash to "bleed" through the filter bag fabric or cause the fabric to tear
   - Baghouse inlet temperature is below 350°F. High inlet temperatures (above 400°F) may damage or cause bags to fail
   - Furnace O_2 is between 8-9%. Large amounts of excess air may cause fly ash to "bleed" through the filter bag fabric or cause the fabric to tear,
   - Differential pressure across the baghouse is running between 5 and 7"WG.
   - Excessive cleaning can clean off the buildup of filter cake on the filter bag allowing fly ash to "bleed" through the filter bag.
   - Insufficient cleaning allows the filter cake to become excessively thick and creates a much greater
   - Restriction to gas flow which can cause the filter bag fabric to tear. (High compartment differential pressure and no High Hopper Level alarms indicate plugged or blinded filter bags.)
   - Differential pressures on each baghouse compartment are running between 5 and 7"inches WC. Large differences in pressure between compartments indicate problems which left uncorrected can or may cause overloading of compartments a with lower differential pressure. (Use sonic horns to clear the compartments of the high differences in pressure.)
   - All fly ash hoppers are empty or flowing. Plugged fly ash hoppers increase flue gas velocities and particulate carryover which increase the particulate loading in the baghouse.

- No casing air leaks or other routes of fugitive air ingress i.e. loose or missing screw conveyor covers, hopper inspection pipe caps, which can overload the baghouse.

5. If no leaks can be identified, verify that the Opacity reading on the CEM monitor is correct as indicated by:

   - Having an EPA Method 9 certified smoke reader, if available and weather permits, determine what actual stack opacity emissions are for the unit in question.

   - Reviewing the Daily Calibration Report printout status. Report is recorded every day on the senior operators log at 1900,

   - Review the Daily Report by accessing the HOURLY OUTLET DATA on the Trace Date Explorer generation by the DAU number for the boiler experiencing the opacity excursions and reviewing the hourly opacity readings as an indication as to whether the monitor has been tracking opacity emissions in a steady or very erratic manner.

   - If the continuous emission monitor is suspected or found to be faulty, immediately notify E&I so that repairs can be made.

DETROIT RENEWABLE POWER

PREVENTIVE MAINTENANCE INSPECTION SCHEDULE – Schedule 0001

1. CEMS PREVENTIVE MAINTENANCE INSPECTION SCHEDULE

Item	Description of Inspections	Frequency of Checks	Responsible Supervisor	
1	CHECK CAL GAS BOTTLES (PRESSURE, CONNECTIONS, LEAKS)	DAILY	E&I Group	Note that all of the CEMS checks are completed and documented by the E&I Group separate from this log.
2	CHECK SYSTEM PARAMETERS (PRESSURES, VACUUM, TEMPS.)	DAILY	E&I Group	
3	CHECK SAMPLE GAS FLOW (STEADY FLOW, FLOW RATE)	DAILY	E&I Group	
4	CHECK ANALYZERS (ALARMS, INDICATIONS)	DAILY	E&I Group	
7	CHECK DAILY CAL DRIFT RESULTS FOR OOC CONDITIONS	DAILY	E&I Group	
11	GAS ANALYZERS a. OBSERVE COMPLETE CALIBRATION CYCLE. 1-CHECK CAL GAS FLOW (STEADY FLOW, FLOW RATES). 2-CHECK SYSTEM PARAMETERS (PRESSURES, VACUUM),	WEEKLY	E&I Group	
13	CHANGE OUTLET PROBE FILTER	ANNUALLY	E&I Group	
14	REBUILD METERING PUMPS	BI - MONTHLY	E&I Group	
15	CHECK/REPLACE CEM TRAILER AIR FILTER	MONTHLY	E&I Group	
17	CALIBRATION GAS AUDIT TESTING	QUARTERLY	E&I Group	
18	REPLACE OPACITY BLOWER FILTERS	QUARTERLY	E&I Group	
20	REPLACE TRANSPORT PUMP DIAPHRAGMS	SEMI ANNUALLY	E&I Group	

WEEKLY Environmental Documentation - must keep for five years

SDA Preventative Mantenance Weekly Checks for SSM Plan

SSM Form-014
Revision 1
11/04/2016

Recordkeeping for the Startup, Shutdown, and Malfunction Plan required by the Consent Judgement (draft)

Instructions:
1. Review all listed equipment each week.
2. If issues are observed, initiate necessary actions to determine the cause and correct the issue. (Note the Work Order number if appliable)
3. Submit completed forms to Environmental Manager.

Inspect the following weekly	Date	Name	Signature	Comments below?
1. LIME SILO / WASH DOWN		Operations:		
2. LIME FEED SCREW - NORTH / SCREW INSPECTION		Operations:		
3. LIME FEED SCREW - SOUTH / SCREW INSPECTION		Operations:		
4. GRIT REMOVAL SCREW CONVEYOR / SCREW INSPECTION		Operations:		
5. DILUTION WATER PUMP A / RECORD INSPECT AND TEST		Operations:		
6. DILUTION WATER PUMP B / RECORD INSPECT AND TEST		Operations:		
7. SPRAY MACHINE / OIL LEVEL AND INSPECT		Operations:		
8. STANDBY SPRAY MACHINE / OIL LEVEL AND INSPECT		Operations:		
9. LIME SLURRY FEED PUMP NORTH / INSPECT AND ALTERNATE		Operations:		
10. LIME SLURRY FEED PUMP SOUTH / INSPECT AND ALTERNATE		Operations:		
11. NORTH LIME SLAKER / GREASE BEARINGS		Operations:		
12. SOUTH LIME SLAKER / GREASE BEARINGS		Operations:		
13. LIME SLURRY MIXING & STORAGE TANK / GEARBOX OIL LEVEL CHECK		Operations:		
14. STANDBY SPRAY MACHINE / ATOMIZING WHEEL		Maintenance:		
15. NORTH GRIT SCREEN / ACID WASH AND INSPECT		Maintenance:		
16. SOUTH GRIT SCREEN / ACID WASH AND INSPECT		Operations:		

Comments (reference the item):

Environmental Documentation - must be kept for five years

MONTHLY Environmental Documentation - must keep for five years

SDA Preventative Mantenance Monthly Checks for SSM Plan

SSM-Form-015
Revision 1
11/04/2016

Recordkeeping for the Startup, Shutdown, and Malfunction Plan required by the Consent Judgement (draft)

Instructions:
1. Review all listed equipment each month.
2. If issues are observed, initiate necessary actions to determine the cause and correct the issue. (Note the Work Order number if appliable)
3. Submit completed forms to Environmental Manager.

Inspect the following monthly	Date	Name	Signature	Comments below?
1. PENTHOUSE EAST UNIT HEATER / TEST OPERATION		Plant Engineer.		
2. PENTHOUSE WEST UNIT HEATER / TEST OPERATION		Plant Engineer:		
3. ROOF ENCLOSURE EAST VENT FAN / TEST AND ENSURE OPERATION		Operations:		
4. ROOF ENCLOSURE WEST VENT FAN / TEST AND ENSURE OPERATION		Operations:		
5. DILUTION WATER STORAGE TANK & MIXER / RECORD, GREASE AND CLEAN		Maintenance:		
6. SPRAY MACHINE / OIL FILTER CHANGE		Maintenance:		
7. DILUTION WATER PUMP A / INSPECTION		Maintenance:		
8. DILUTION WATER PUMP B / INSPECTION		Maintenance:		
9. AQC ELECT/CTRL BDLG WEST UNIT HEATER / INSPECT AND TEST RUN		Plant Engineer:		
10. AQC ELECT/CTRL BDLG WEST UNIT HEATER / DRIVE BELT INSPECTION		Plant Engineer:		
11. LIME FEED SCREW - NORTH / GREASE SHAFT BEARINGS & GEARBOX OIL LEVEL CHECK		Operations:		
12. LIME SILO / GREASE BEARING		Operations:		
13. GRIT REMOVAL SCREW CONVEYOR / GREASE AND OIL LEVEL CHECK		Operations:		
14. LIME SLURRY FEED PUMP NORTH / GREASE AND INSPECT		Maintenance:		
15. LIME SLURRY FEED PUMP SOUTH / GREASE AND INSPECT		Maintenance:		
16. LIME SLURRY MDCING & STORAGE TANK / GREASE AND INSPECT		Maintenance:		
17. DILUTION WATER STORAGE TANK & MIXER / GREASE AND INSPECT		Maintenance:		
18. LIME PREP BUILDING PREP HEATER LOWER / ENSURE OPERATION		Operations:		
19. LIME PREP BUILDING PREP HEATER UPPER / ENSURE OPERATION		Operations:		
20. NORTH LIME SLAKER / DRIVE BELT INSPECTION		Maintenance:		
21. SOUTH LIME SLAKER / DRIVE BELT INSPECTION		Maintenance:		
22. LIME SLURRY FEED PUMP NORTH / DRIVE BELT INSPECTION		Maintenance:		
23. LIME SLURRY FEED PUMP SOUTH / DRIVE BELT INSPECTION		Maintenance:		

Comments (reference the item):

Environmental Documentation - must be kept for five years

SEMI-ANNUAL Environmental Documentation - must keep for five years

SDA Preventative Mantenance Semi-annual Checks for SSM Plan

SSM-Form-016
Revision 1
11/04/2016

Recordkeeping for the Startup, Shutdown, and Malfunction Plan required by the Consent Judgement (draft)

Instructions:
1. Review all listed equipment semi-annually
2. If issues are observed, initiate necessary actions to determine the cause and correct the issue. (Note the Work Order number if appliable)
3. Submit completed forms to Environmental Manager.

Inspect the following weekly	Date	Name	Signature	Comments below?
1. DILUTION WATER PUMP A / GEARBOX OIL CHANGE		Maintenance:		
2. DILUTION WATER PUMP B / GEARBOX OIL CHANGE		Maintenance:		
3. LIME FEED SCREW - NORTH / GEARBOX OIL CHANGE		Maintenance:		
4. LIME FEED SCREW - SOUTH / GEARBOX OIL CHANGE		Maintenance:		
5. GRIT REMOVAL SCREW CONVEYOR / GEARBOX OIL CHANGE		Maintenance:		
6. LIME SLURRY MIXING & STORAGE TANK / GEARBOX OIL CHANGE		Maintenance:		
7. SPRAY MACHINE / OIL AND FILTER CHANGE (can be done annually)		Maintenance:		
8. DILUTION WATER STORAGE TANK & MIXER / GEARBOX OIL CHANGE (can be done annually)		Maintenance:		

Comments (reference the item):

WEEKLY Environmental Documentation - must keep for five years

Baghouse Preventative Mantenance Weekly Checks for SSM Plan

SSM-Form-017
Revision 1
11/04/2016

Recordkeeping for the Startup, Shutdown, and Malfunction Plan required by the Consent Judgement (draft)

Instructions:
1. Review all listed equipment each week.
2. If issues are observed, initiate necessary actions to determine the cause and correct the issue. (Note the Work Order number if appliable)
3. Submit completed forms to Environmental Manager.

Inspect the following weekly	Date	Name	Signature	Comments below?
1. BAGHOUSE BYPASS DAMPER A / RECORD, DRAIN AND GREASE		Operations:		
2. BAGHOUSE BYPASS DAMPER B / RECORD, DRAIN AND GREASE		Operations:		
3. A COMP BAGHOUSE INLET DAMPER / RECORD, DRAIN AND GREASE		Operations:		
4. B COMP BAGHOUSE INLET DAMPER / RECORD, DRAIN AND GREASE		Operations:		
5. C COMP BAGHOUSE INLET DAMPER / RECORD, DRAIN AND GREASE		Operations:		
6. D COMP BAGHOUSE INLET DAMPER / RECORD, DRAIN AND GREASE		Operations:		
7. E COMP BAGHOUSE INLET DAMPER / RECORD, DRAIN AND GREASE		Operations:		
8. F COMP BAGHOUSE INLET DAMPER / RECORD, DRAIN AND GREASE		Operations:		
9. G COMP BAGHOUSE INLET DAMPER / RECORD, DRAIN AND GREASE		Operations:		
10. H COMP BAGHOUSE INLET DAMPER / RECORD, DRAIN AND GREASE		Operations:		
11. J COMP BAGHOUSE INLET DAMPER / RECORD, DRAIN AND GREASE		Operations:		
12. K COMP BAGHOUSE INLET DAMPER / RECORD, DRAIN AND GREASE		Operations:		
13. A COMP BAGHOUSE OUTLET DAMPER / RECORD, DRAIN AND GREASE		Operations:		
14. B COMP BAGHOUSE OUTLET DAMPER / RECORD, DRAIN AND GREASE		Operations:		
15. C COMP BAGHOUSE OUTLET DAMPER / RECORD, DRAIN AND GREASE		Operations:		
16. D COMP BAGHOUSE OUTLET DAMPER / RECORD, DRAIN AND GREASE		Operations:		
17. E COMP BAGHOUSE OUTLET DAMPER / RECORD, DRAIN AND GREASE		Operations:		
18. F COMP BAGHOUSE OUTLET DAMPER / RECORD, DRAIN AND GREASE		Operations:		
19. G COMP BAGHOUSE OUTLET DAMPER / RECORD, DRAIN AND GREASE		Operations:		
20. H COMP BAGHOUSE OUTLET DAMPER / RECORD, DRAIN AND GREASE		Operations:		
21. J COMP BAGHOUSE OUTLET DAMPER / RECORD, DRAIN AND GREASE		Operations:		
22. K COMP BAGHOUSE OUTLET DAMPER / RECORD, DRAIN AND GREASE		Operations:		
23. A COMP REVERSE AIR DAMPER / RECORD, DRAIN AND GREASE		Operations:		
24. B COMP REVERSE AIR DAMPER / RECORD, DRAIN AND GREASE		Operations:		
25. C COMP REVERSE AIR DAMPER / RECORD, DRAIN AND GREASE		Operations:		
26. D COMP REVERSE AIR DAMPER / RECORD, DRAIN AND GREASE		Operations:		
27. E COMP REVERSE AIR DAMPER / RECORD, DRAIN AND GREASE		Operations:		
28. F COMP REVERSE AIR DAMPER / RECORD, DRAIN AND GREASE		Operations:		
29. G COMP REVERSE AIR DAMPER / RECORD, DRAIN AND GREASE		Operations:		
30. H COMP REVERSE AIR DAMPER / RECORD, DRAIN AND GREASE		Operations:		
31. J COMP REVERSE AIR DAMPER / RECORD, DRAIN AND GREASE		Operations:		
32. K COMP REVERSE AIR DAMPER / RECORD, DRAIN AND GREASE		Operations:		
33. FABRIC FILTER / INSPECT AND CLEAN		Operations:		

Comments (reference the item):

Environmental Documentation - must be kept for five years

MONTHLY Environmental Documentation - must keep for five years

Baghouse Preventative Mantenance Monthly Checks for SSM Plan

SSM-Form-018
Revision 1
11/04/2016

Recordkeeping for the Startup, Shutdown, and Malfunction Plan required by the Consent Judgement (draft)

Instructions:
1. Review all listed equipment each month.
2. If issues are observed, initiate necessary actions to determine the cause and correct the issue. (Note the Work Order number if appliable)
3. Submit completed forms to Environmental Manager.

Inspect the following monthly	Date	Name	Signature	Comments below?
1. FABRIC FILTER / INSPECT AND CYCLE		Operations:		
2. FABRIC FILTER / INSPECT AND RECORD		Operations:		
3. FABRIC FILTER REVERSE AIR FAN / GREASE BEARINGS		Maintenance:		
4. REVERSE AIR RECIRC DAMPER / GREASE AND INSPECT		Operations:		

Comments (reference the item):

Environmental Documentation - must be kept for five years

Detroit Renewable Power
Boiler Critical Spare Parts List

Item	Description	Critical
658	TROUGH, SIFTING SCREW TROUGH WITHOUT HOLE, 1/4" SA500 (375/425BHN) MATERIAL 62-1/4" WITH (2) LEG BRACKETS PER DRAWING# 990046	A
666	EDDY PLATE NOZZLE, IGNITOR NOZZLE	A
673	HOSE, HYDRAULIC HOSE, 2-3/4", 18-8 SS ASO 3651	A
674	IGNITOR, SPARK PLUG, # IG-4727-AA	A
675	PLUG, FLAME ROD PLUG, FLAMEROD ASSEMBLY # 1G-6126	A
698	GASKET FOR OIL GUNS,1", CU # 1G-885	A
730	TIP, AIR NOZZLE TIP	A
3262	Chain, Grate Chain Power house Technology brand. 10 pitch sections (1each =10 link section) pt# PT2C 7570 - Assy, # 103118	A
6304	DETECTOR, PLUG CHUTE DETECTOR, D220-S-11L-S SONAC	A
15074	BEARING, FLANGE BLOCK, 2" ID, 4 BOLT, F4B-E-200R, 023103, FOR SIFTING SCREWS	A
27768	AUGER, CONVEYOR, SIFTING SCREW, 5" DIA, 3-1/2" PITCH, 56" LG, 1/4" THK	A
35303	HIGH TEMP INSULATING GASKET/TAPE 2" X 1/8", 100' ROLL	A
35326	GLASS, BOILER SIGHT GLASS, 4-3/4" X 12-1/2" X 7/32",PYREX	A
35327	SHAFT, STUB SHAFT,1-7/8" DIA FOR SIFTING SCREW CONNECTOR, SEE LONG DESCRIPTION!	A
36348	PIN, GRATE BAR COTTER PIN,1-1/4" LG	A
36478	IGNITOR HOSE, HOSE,OIL/AIR,1/4" ID 18" LG,1/4" MPT E/E	A
36718	WRITE OIL GUN LONG PIN REMOVABLE PART	A
36917	GRATE BAR PIN, 3/4" X 6-3/8" LG,MILD CARBON, 2121CE-3C-608	A
40412	REFRACTORY - RC1118 - 50 LB. PAILS	A
41767	ASSEMBLY,MASTER PIN FOR 698 CHAIN	A
65279	OVERFIRE AIR CYLINDER, LINEAR ACTUATING, PNEUMATIC,3/4"-16 TPI FEMALE, V BLOCK, # P1AU-10A4D-AAA0	A
65848	DRIVE,VARIABLE SPEED,380V-460VAC 2.1A 3PH 50/60HZ 1.6KVA, # VFS15-4007PL	A
66143	GRATE BAR ASSEMBLY, FULLY ASSEMBLED	A

AAO SLAKER LOG 1 DATE:

1380 GPM / 1800 RPM LOW FLOW ALARM 480 GPM 1A CONDENSATE PUMP	03:00	07:00	11:00	15:00	19:00	23:00
DISCHARGE PSI						
OIL LEVEL						
1B CONDENSATE PUMP						
DISCHARGE PSI						
OIL LEVEL						
1A CLOSED CYCLE COOLING						
DISCHARGE PRESSURE						
OIL LEVEL						
1B CLOSED CYCLE COOLING						
DISCHARGE PRESSURE						
OIL LEVEL						
600 GPM/1750 RPM 1A BUILDING HEAT PUMP						
DISCHARGE PRESSURE						
OIL LEVEL						
SYSTEM TEMPERATURE						
EXSPANSION TANK LEVEL						
1B BUILDING HEAT PUMP						
DISCHARGE PRESSURE						
OIL LEVEL						
SYSTEM TEMPERATURE						
EXSPANSION TANK LEVEL						
1A AIR COMPRESSOR 790 cfm						
H.P. AIR TEMP OUT **180 F MAX**						
OIL TEMPERATURE **158 F MAX**						
OIL PRESSURE **20 PSIG MIN**						
OIL LEVEL						
WATER TEMPERATURE						
AIR DISCHARGE TEMPERATURE						
AIR FILTER DIFFERENTIAL						
AIR DISCHARGE PSI **100 PSIG**						
1B AIR COMPRESSOR 790 cfm						
H.P. AIR TEMP OUT **180 F MAX**						
OIL TEMPERATURE **158 F MAX**						
OIL PRESSURE **20 PSIG MIN**						
OIL LEVEL						
WATER TEMPERATURE						
AIR DISCHARGE TEMPERATURE						
AIR FILTER DIFFERENTIAL						
AIR DISCHARGE PSI **100 PSIG**						
1C AIR COMPRERSSOR (JOY)1025cfm						
INJECTION TEMPERATURE **40-60 F**						
DISCHARGE AIR TEMPERATURE **100 F**						
DISCHARGE AIR PRESSURE **110 PSI**						
OIL LEVEL						

DAY SHIFT' SIGNATURE:

NIGHT SHIFT 'SIGNATURE:

AAO SLAKER LOG 2 DATE:

1A DEMIN BOOSTER PUMP	03:00	07:00	11:00	15:00	19:00	23:00
DISCHARGE PRESSURE						
OIL LEVEL						
1B DEMIN BOOSTER PUMP						
DISCHARGE PRESSURE						
OIL LEVEL						
870 GPM / 3560 RPM **L.O. TEMP ALARM 170F TRIP 180F** **1A BOILER FEED PUMP**						
DISCH PSI **1118 PSI**						
SUCT PSI **145 PSI**						
LO TEMP **120-140 F**						
COOLER WATER OUTLET TEMP						
LUBE OIL LEVEL **CAP 35 GL**						
LUBE OIL PSI **15 PSI**						
BEARING OIL LEVEL						
AUXILLIARY LO PMP ON/OFF						
AUXILLARY LO PMP PSI						
SUCTION STRAINER DP						
1B BOILER FEED PUMP						
DISCH PSI **1118 PSI**						
SUCT PSI **145 PSI**						
LO TEMP **120-140 F**						
COOLER WATER OUTLET TEMP						
LUBE OIL LEVEL **CAP 35 GL**						
LUBE OIL PSI **15 PSI**						
BEARING OIL LEVEL						
AUXILLIARY LO PMP ON/OFF						
AUXILLIARY LO PMP PSI						
SUCTION STRAINER DP						
1C BOILER FEED PUMP						
DISCH PSI **1118 PSI**						
SUCT PSI **145 PSI**						
LO TEMP **120-140 F**						
COOLER WATER OUTLET TEMP						
LUBE OIL LEVEL **CAP 35 GL**						
LUBE OIL PSI **15 PSI**						
BEARING OIL LEVEL						
AUXILLIARY LO PMP ON/OFF						
AUXILLART LO PMP PSI						
SUCTION STRAINER DP						

COMMENTS:

COMMENTS:

DAY SHIFT SIGNATURE

NIGHT SHIFT SIGNATURE:

AAO SLAKER LOG 3 DATE:

17,650 gpm/ 885 rpm 1/2 CAP. CIRCULATING WATER PUMP IA	03:00	07:00	11:00	15:00	19:00	23:00
DISCHARGE PSI						
SEAL WATER PSI						
UPPER OIL LEVEL						
LOWER OIL LEVEL						
CIRCULATING WATER PUMP IB						
DISCHARGE PSI						
SEAL WATER PSI						
UPPER OIL LEVEL						
LOWER OIL LEVEL						
CIRC WATER HEAT EXCHANGER						
EAST DIFF PSI						
WEST DIFF PSI						
SERVICE WATER PUMPS						
DISCHARGE PSI						
4001 OIL LEVEL ON/OFF						
4002 OIL LEVEL ON/OFF						
4003 OIL LEVEL ON/OFF						
CT VACUUM PMP 1A						
SEAL WATER PSI						
INCHES Hg						
CT VACUUM PMP 1B						
SEAL WATER PSI						
INCHES Hg.						
15 HP/3535RPM 70 GPM						
FUEL OIL PUMP 1A						
DISCHARGE PRESSURE **245PSIG**						
FUEL OIL PUMP 1B						
DISCHARGE PRESSURE **245 PSIG**						
FUEL OIL TANK LEVEL CAP 500,000						

COMENTS:

COMMENTS:

DAY SHIFT SIGNATURE:

NIGHT SHIFT SIGNATURE

AAO SLAKER LOG 4 DATE:

11 SDA PENTHOUSE	03:00	07:00	11:00	15:00	19:00	23:00
OIL SUMP LEVEL 1/2 - 3/4						
OIL TEMP. 100 - 140						
SEAL AIR PRESSURE 35 - 45						
SEAL AIR CFM 2 - 5						
SLURRY HEAD TANK OVERFLOWING	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
DIL. WATER HEAD TANK OVERFLOWING	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
12 SDA PENTHOUSE	00:00	04:00	08:00	12:00	16:00	20:00
OIL SUMP LEVEL 1/2 - 3/4						
OIL TEMP. 100 - 140						
SEAL AIR PRESSURE 35 - 45						
SEAL AIR CFM 2 - 5						
SLURRY HEAD TANK OVERFLOWING	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
DIL. WATER HEAD TANK OVERFLOWING	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
13 SDA PENTHOUSE						
OIL SUMP LEVEL 1/2 - 3/4						
OIL TEMP. 100 - 140						
SEAL AIR PRESSURE 35 - 45						
SEAL AIR CFM 2 - 5						
SLURRY HEAD TANK OVERFLOWING	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
DIL. WATER HEAD TANK OVERFLOWING	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
SLURRY PUMP						
#1 SEAL WATER PRESSURE						
#1 DISCHARGE PRESSURE						
#2 SEAL WATER PRESSURE						
#2 DISCHARGE PRESSURE						
#3 SEAL WATER PRESSURE						
#3 DISCHARGE PRESSURE						
#4 SEAL WATER PRESSURE						
#4 DISCHARGE PRESSURE						
#5 SEAL WATER PRESSURE						
#5 DISCHARGE PRESSURE						
DILUTION WATER PUMP 180 gpm						
4001 SEAL WATER PSI 85 PSI						
4001 DISCH PSI						
4001 OIL LEVEL 1/2 - FULL						
4002 SEAL WATER PSI 85 PSI						
4002 DISCH PSI						
4002 OIL LEVEL 1/2 - FULL						
Slurry Specific Gravity						

COMMENTS:

COMMENTS:

DAY SHIFT' SIGNATURE:

NIGHT SHIFT 'SIGNATURE:

AO GRATE LOG 1 **DATE:**

BOILER 11	03:00	07:00	11:00	15:00	19:00	23:00
RIGHT UNDERGRATE AIR DAMPER POSITION						
LEFT UNDERGRATE AIR DAMPER POSITION						
ZONE 1 N/S PLENUM 15%						
ZONE 2 N/S PLENUM DAMPER 90%						
ZONE 3 N/S PLENUM DAMPER 90%						
ZONE 4 N/S PLENUM DAMPER 90%						
ZONE 5 N/S PLENUM DAMPER 15-45%						
11-A GRATE DRIVE % TORQUE SETTING						
11-B GRATE DRIVE % TORQUE SETTING						
Grate Speed (Every 2 Hours)						
Fuel Bed HeightChecked (Every 2 hours)						
PDA PRESSURE 15-25"						
SSC LEVEL						
SSC HYDRAULIC DRIVE OIL LEVEL						
SEAL TROUGH LEVEL						
BOILER PRESSURE						
NORTH GRATE DRIVE LEVEL OIL NORMAL						
SOUTH GRATE DRIVE LEVEL OIL NORMAL						
11 SLOPES CLEANED						
11 HOPPERS BAYS 1 THROUGH 6 CLEAR						
Boiler 12						
RIGHT UNDERGRATE AIR DAMPER POSITION						
LEFT UNDERGRATE AIR DAMPER POSITION						
ZONE 1 N/S PLENUM 15%						
ZONE 2 N/S PLENUM DAMPER 90%						
ZONE 3 N/S PLENUM DAMPER 90%						
ZONE 4 N/S PLENUM DAMPER 90%						
ZONE 5 N/S PLENUM DAMPER 15-45%						
12-A GRATE DRIVE % TORQUE SETTING						
12-B GRATE DRIVE % TORQUE SETTING						
PDA PRESSURE 15-25"						
Grate Speed (Every 2 Hours)						
Fuel Bed HeightChecked (Every 2 hours)						
SSC LEVEL						
SSC HYDRAULIC DRIVE OIL LEVEL						
SEAL TROUGH LEVEL						
BOILER PRESSURE						
NORTH GRATE DRIVE OIL LEVEL NORMAL						
SOUTH GRATE DRIVE OIL LEVEL NORMAL						
12 SLOPES CLEANED						
12 HOPPERS BAYS 1 THROUGH 6 CLEAR						
BOILER 13						
RIGHT UNDERGRATE AIR DAMPER POSITION						
LEFT UNDERGRATE AIR DAMPER POSITION						
ZONE 1 N/S PLENUM 15%						
ZONE 2 N/S PLENUM DAMPER 90%						
ZONE 3 N/S PLENUM DAMPER 90%						
ZONE 4 N/S PLENUM DAMPER 90%						
ZONE 5 N/S PLENUM DAMPER 15-45%						
13-A GRATE DRIVE % TORQUE SETTING						
13-B GRATE DRIVE % TORQUE SETTING						
PDA PRESSURE 15-25"						
Grate Speed (Every 2 Hours)						
Fuel Bed HeightChecked (Every 2 hours)						
SSC LEVEL						
SSC HYDRAULIC DRIVE OIL LEVEL						
SEAL TROUGH LEVEL						
BOILER PRESSURE						
NORTH GRATE DRIVE OIL LEVEL NORMAL						
SOUTH GRATE DRIVE OIL LEVEL NORMAL						
13 SLOPES CLEANED						
13 HOPPERS BAYS 1 THROUGH 6 CLEARED						

AO GRATE LOG 2

DATE:

# 4 FEEDWATER HEATER	03:00	07:00	11:00	15:00	19:00	23:00
FEEDWATER INLET TEMP						
FEEDWATER OUTLET TEMP 350F						
EXTRACTION						
WATER LEVEL						
# 3 FEEDWATER CAP 18,000 gl.						
PRESSURE 114.5 psig						
WATER LEVEL 80"						
COND. INLET TEMP						
FEEDWATER OUTLET TEMP						
ECTRACTION						
#2 FEEDWATER HEATER						
WATER LEVEL						
COND. INLET TEMP 202 F						
COND. OUTLET TEMP 274 F						
EXTRACTION						
#1 FEEDWATER HEATER						
WATER LEVEL						
INLET TEMP 120 F						
OUTLET TEMP 202 F						
EXTRACTION						
MAKE UP DA PRESSURE 2.5 PSIA						
GLAND SEAL COND. PUMP 1A ON/OFF						
GLAND SEAL COND. PUMP 1B ON/OFF						
AIR DRYER DEW POINT						

COMMENTS

COMMENTS:

DAY SHIFT SIGNATUE

NIGHT SHIFT SIGNATURE

BOILER #_____

MICHIGAN WASTE ENERGY

DATE:_____

Michigan Waste Energy Control Room Log

	Operator_____					
	0000	0400	0800	1200	1600	2000
Steam Flow 1000#/hr						
Feedwater Flow 1000#/hr						
Boiler Outlet Steam Temp °F						
Excess O2 %						
#4 Feedwater Outlet Temp °F						
Drum Pressure PSIG						
OFA Damper Position						
Forced Draft Fan Amps						
Induced Draft Fan Amps						
Boiler Outlet Steam Press PSIG						
Combustion Air Flow (Total) CFM						
UFA Pressure						
UFA Temperature °F						
OFA Pressure						
Furnace Pressure						
Attemporator Outlet Temp °F						
SDA Differential						
SDA inlet Temp °F						
Econo Gas Outlet Temp °F						
AH Gas Outlet Temp °F						
AH Air Inlet Temp °F						
AH Air Outlet Temp °F						
Roof Temp °F						
Baghouse DP						
Process Steam Flow						
T/G Megawatts						
Cameras						

BOILER #_____

MICHIGAN WASTE ENERGY

DATE:_____

	Operator					
	0100	0500	0900	1300	1700	2100
Steam Flow 1000#/hr						
Feedwater Flow 1000#/hr						
Boiler Outlet Steam Temp °F						
Excess O2 %						
#4 Feedwater Outlet Temp °F						
Drum Pressure PSIG						
OFA Damper Position						
Forced Draft Fan Amps						
Induced Draft Fan Amps						
Boiler Outlet Steam Press PSIG						
Combustion Air Flow (Total) CFM						
UFA Pressure						
UFA Temperature °F						
OFA Pressure						
Furnace Pressure						
Attemporator Outlet Temp °F						
Opacity %						
PDA Fan On/Off						
Econo Gas Outlet Temp °F						
AH Gas Outlet Temp °F						
AH Air Inlet Temp °F						
AH Air Outlet Temp °F						
Grate Temp (Highest) °F						
Baghouse DP						
Process Steam Flow						
T/G Megawatts						
Cameras						