AI-PART C

ATTACHMENT C.9.v.

Belle River Power Plant

Startup/Shutdown and Preventative Maintenance, Malfunction Abatement Plan (SS&PM-MAP)

REV4

1. PURPOSE

This Start-up/Shut-down and Preventative Maintenance, Malfunction Abatement Plan (SS&PM-MAP) for Boiler No. 1 and No. 2, and the associated Electrostatic Precipitators (ESP) has been prepared to meet the requirements of the facility's Renewable Operating Permit (ROP) MI-ROP-B2796-2015c, issued by the Michigan Department of Environment, Great Lakes, and Energy, Air Quality Division (EGLE-AQD) for steam generating fuel burning an control equipment at the Belle River Power Plant. Section IX.8 of the flexible group "FG-Boilers-BR" of the ROP requires DTE Electric Company to "maintain and implement the approved Startup/ Shutdown and Preventative Maintenance, Malfunction Abatement Plan (SS & PM-MAP) for FG-BOILERS-BR and the electrostatic precipitators." The submittal is designed to address these permit conditions and has been prepared in accordance with Michigan Air Pollution Control Rule (MAPR) 911.

2. SCOPE

This order contains Limits, Responsibilities, Reporting Requirements, and Procedures used to comply with the SS&PM-MAP operating requirements for Boiler No. 1, Boiler No. 2, and the associated Electrostatic Precipitators.

3. DEFINITIONS

3.1. Start-Up:

That period of time after which the first fan is placed in service and until unit synchronization.

3.2. Shut-Down:

That period of time after which the machine breaker is OPEN.

3.3. Malfunction:

Any sudden, infrequent and not reasonable preventable failure of a source, process, process equipment, or air pollution control equipment to operate in a normal or unusual manner. Failures that are caused in part by poor maintenance or careless operation are not malfunctions.

3.4. Opacity:

The degree to which an emission reduces the transmission of light or obscures an observer's view.

3.5. Particulate Matter:

Any air contaminant existing as a finely divided liquid or solid as measured by standardized test methods. Particulate matter does not include uncombined water vapor.

3.6. Renewable Operating Permit (ROP):

A permit that contains air pollution emission limitations for a facility as well as any monitoring, record-keeping and reporting requirements applicable to a given source to demonstrate compliance with the emission limitations identified within the permit.

3.7. Reports and Records

The DAHS (Data Acquisition and Handling System) contains the official record of opacity. A quarterly report of stack opacity is issued to the Michigan Department of Environment, Great Lakes, and Energy. The reports and supporting information must be kept on file for a minimum of five years.

3.8. Excess Emission Period:

Emissions from a boiler stack with an average opacity rate greater than 20% for 6 minutes. Using the Data Acquisition Handling System (DAHS), which is part of the Continuous Opacity Monitoring (COM) System, the opacity rate must read greater than 20.4% opacity to register as an excess emission.

4. RESPONSIBILITIES

4.1. Plant Manager

Responsible for ensuring that Belle River Power Plant operates in compliance with all environmental and safety requirements and regulations. The Plant Manager delegates day–to-day responsibilities for operation of the plant to the Production manager. The Plant Shift Supervisor is responsible for all operations at the plant and is management's representative during off-hours (i.e. nights and weekends) when plant management is not on site.

Critical phone numbers are as follows:

Plant Director	(810) 326-3199
Plant Manager	(810) 326-3245
Production Manager	(810) 326-6333
Plant Shift Supervisor (available 24 hours per day)	(810) 326-3235
Environmental Engineer	(810) 326-3209
Environmental Engineer	(810) 326-3208

4.2. Operators

Complete facility rounds at least once per day and continuously monitor equipment performance. Exception reporting is performed, in which only situations meriting follow-up action are recorded. The following items are inspected or monitored to ensure proper operation of control equipment as scheduled:

4.2.1. Daily–ESP

Monitor power, voltage and amperages

Monitor fly ash-handling systems (to ensure hoppers do no overfill)

4.2.2. Daily-Combustion/Opacity

View flame to assess proper combusting characteristics
Observe furnace to ensure cleanliness or to check for tube leaks
Check for out of service burners
Check burner dampers and air registers

In addition, during periodic and forced outages, additional inspections and maintenance work will be performed as needed and as time allows:

4.2.3. Forced Outage - ESP

Clear broken electrodes or fly ash grounds
Inspect failures
Inspect grounded sections

4.2.4. Periodic Maintenance – ESP

Clean and inspect corona shields and support insulators
Replace cracked insulators and corroded shields
Remove ash build-up from wire frame assemblies and structural steel
Inspect precipitator duck work, perforated plates, collector plates, wire racks, wires, supports and other internals for soundness and proper clearances, making repairs as necessary
Inspect and repair all rappers

An extensive preventive maintenance and monitoring program has been implemented at the plant as well. In addition, if the plant identifies a monitor or equipment malfunction that could contribute to excess emissions, the plant's preventive maintenance or operating procedures will be updated to prevent reoccurrence.

The Job Instruction Training (JIT) guides that are used by the facility for these inspections are BR-095, "Inspect – Precipitator Rapper Unit 1" and BR-100, "Inspect, Take Readings and Reset Precipitators and Transformer/Rectifier."

5. PROCEDURES

5.1. DESCRIPTION OF AIR POLLUTION CONTROL EQUIPMENT

Belle River Power Plant's Unit 1 and Unit 2 are Babcock and Wilcox radiant reheat boilers providing steam to two Siemens steam turbines. The respective generating capacity of each turbine is nominally 697 megawatts each, for a combined total of 1,394 megawatts. Each boiler typically burns 320 tons of coal per hour at full load. Boilers combust fuel oil during unit start-up.

Each unit has a Wheelabrator Frye electrostatic precipitator (ESP). At typical high loads and normal coal quality, each precipitator processes 2,750,000 cfm of flue gas through the precipitators. As the ash collects in the precipitator hoppers, the fully enclosed fly transport system moves ash to the Fly Ash Silos. During unit operations, fly ash is continually collected in the precipitator hoppers, transported to the silos, and then loaded out into either truck or railcars.

As required by the State of Michigan Implementation Plan in Rule 336.1330(1), both ESPs have a saturable core reactor. Each is a hybrid design ESP using wires suspended in a rigid frame and each has collection efficiency greater than 99%. In addition, the average spark rate is metered and displayed both at the ESP control panel for both units as well as in the control room for both units. Each also employs solid state circuitry to preset power levels based on sparking rate limits. Power levels, sparks and firing angle for each of the fields are visible for both Units in real time on the PI, process computer databases. Changes to the Unit's system can be made from the unit control room or the precipitator control room.

Components of the control equipment systems fall under boilers or electrostatic precipitator controls and include the following major categories:

- Low NOx Burners
- Burner Controls
- Precipitator Controls
- Precipitator Box
- Precipitator Transformers, Rectifiers and Electrodes
- Precipitator Rappers
- Precipitator Hoppers

The precipitators for each unit are located outside of the main building. Each precipitator chamber consists of a metal shell containing vertical plates eleven inches apart. The shell and plates of the chamber are connected to a support structure that provides a ground potential. Suspended between the plates are discharge electrodes with insulator bushings. The discharge electrodes are negatively charged (up to approximately 50,000 volts DC) by high voltage silicon rectifier transformer set. Fly ash is negatively charged by the electrodes and is attracted to and attaches itself to the plates which are positively charged relative to the wires. Rappers are periodically energized to "rap" the plates and dislodge the ash. The ash falls into hoppers located below the precipitators.

5.2. REPLACEMENT PARTS

DTE Electric Company stocks parts necessary for routine maintenance and other common replacement parts. A list of parts kept in stock is listed in the company's computerized maintenance management system. The parts list is filed by system and major components and contains a complete list of parts for that component including: stock number, noun/qualifier (e.g. gear reducer), manufacturer part number and quantity on hand.

Replacement Parts may ordered from manufacturers or, since many systems used identical parts, retrieved from other units in the fleet that have been shutdown. A complete list of parts and catalog numbers in included in the operating manuals.

5.3. MONITORING REQUIREMENTS

Continuous emission monitoring systems (CEMS) are used to monitor NO_x levels from Unit 1 and Unit 2 boilers. These CEMS are certified as required under the Part 75 Acid Rain requirements and quarterly emission reports are prepared summarizing NO_x emissions and showing compliance with applicable requirements.

As Acid rain subject emission units, both boilers participate in DTE Electric Company's NO_x Averaging Plan under the Acid rain Program. In addition, the units are subject to the NO_x allowance allocations and trading requirements of Michigan Air Pollution Control Rules 810, 822, and 830 for both annual and the ozone season (May 1 through September 30) control periods. If the annual or ozone season emissions (as determined by CEMS) exceed allocations in any given control period, emission allowances must be purchased to cover those excess emissions. If the annual or ozone season emissions are less than allocations in any given control period, those excess allowances can either be banked for future control periods or sold to the emission allowance markets. Operating procedures are in place to ensure proper combustion and optimized levels of NO_x emissions.

Opacity is also monitored on each unit with a Continuous Opacity Monitoring System (COMS) to ensure compliance with the opacity limits. Michigan Air Pollution Control rule (MAPR) 301 limits opacity to 20% averaged over six minutes with the exception of one six-minute average per hour to 27%. These monitors comply with 40 CFR Part 75.10(a)(4) which requires the use of continuous opacity monitor meeting Performance Specification 1 (PS1) of 40 CFR Part 60, Appendix B for any coal fired or oil fired unit subject to the Acid rain Program as well as MAPR 1150(1). MAPR 1159 allows for alternative monitoring systems (e.g. use of qualified observers of visible emissions); however, approval must be obtained from the EGLE before implementing an alternative monitoring system. Several personnel at Belle River are qualified to perform Visible Emissions observations under U.S. EPS Reference Method 9. Belle River Power Plant prepares quarterly Excess Emissions reports (EERs) as required by MAPR 1170.

Opacity is also monitored using the COMS during start-up, shutdown and malfunction conditions. Operating procedures must be followed to ensure opacity remains in compliance during all operating periods. Specific Job-Instructional-Training procedures have been written to ensure emissions are minimized during start-up and shutdown.

Several operating parameters on both the boiler and the electrostatic precipitators are monitored to ensure proper operation. These monitors are often equipped with equipment

trip switches and/or alarms that will shut off the equipment of alert operators of a possible malfunction. Daily inspections of the system include an inspection of the control panel to check for failed or alarm conditions as well as to ensure operating parameters. Each system control panel is also equipped with a multitude of indicators for more specific system status information.

In the control room, hard alarms are present to alert the operator of an immediate problem that could potentially affect ESP burner performance. The following table summarized typical hard alarms present in the control room that are monitored continuously.

Alarm	Description	Possible Cause
Opacity – 20%	Instantaneous opacity exceeds 20%	Control equipment or boiler problems
Opacity – 40%	Instantaneous opacity exceeds 40%	Control equipment or boiler problems
CEM Trouble	CEMS is not reporting data	Failed calibration, CEMS shelter door open, power cable failure or flow fault
Coal Mill Trouble	Mill has come offline	Burner line plugged

5.4 CORRECTIVE ACTION PROCEDURES

Most equipment problems will not cause an opacity exceedances or excessive NO_x emission. However, the system must be returned to service as soon as possible in order to maintain maximum emission control. Plant Order BRE-6101 Air Quality Control outlines procedures to follow in case of abnormal opacity, NO_x or SO_2 emissions. A compliance assurance monitoring (CAM) alarm will inform operations of excessive opacity conditions (1 clock hour of average opacity exceeding 20%), another CAM alarm will also alert operators of a CAM excursion (2 consecutive, 1-hour block averages opacity values greater than 20%). CAM alarms will be in operation even during start up and shut down for BRPP Boilers; however it is understood that during start up and shut down periods, the CAM exceedances level is excluded. If a malfunction or failure occurs that cannot be corrected by an operator, then a Work Order will be issued to repair the system. An Environmental Work Order will receive immediate attention by the plant maintenance department.

The following reasonable measures to correct excess opacity shall be employed as necessary (Including start up and shutdown periods):

- Reduce boiler load
- Reduce boiler air flow by adjusting the forced draft fans
- Other actions as necessary to correct excess opacity, up to and including shutting down the boilers.

The following reasonable measures to correct excess NO_x emissions shall be employed as necessary:

- Reduce excess air
- Burner inspection and adjustment
- Adjust fuel blend
- All low NO_x burners are continually adjusted to ensure good performance.

In addition, DTE Electric Company employs the following additional measures to minimize CO emissions and optimize combustion performance as required:

- Adjusting oxygen percentage in the combustion air
- Empirically determining optimal CO emission rates and NO_x emission reductions during unit testing and tuning
- Testing coal mill performance and fuel and air flow distribution to maintain proper coal fineness and air to fuel ratios
- Visually monitoring combustion conditions to determine acceptable new flame characteristics
- Periodically measuring unburned carbon to determine how combustion can be optimized
- Determining proper control settings for optimum efficiency and minimal CO generation considering NO_x emission reduction objectives

Procedures for proper notification of the EGLE-AQD if excess emissions are identified have been included in the plant's operating procedures.

6. DOCUMENTATION

NA

7. REFERENCES

7.1. Belle River Power Plant; Plant Order BRE-6101 – Air Quality Control
7.2. Belle River Power Plant; Plant Order BRE-6110 – CAM Plan
7.3. Belle River Power Plant JIT BR-095 – Inspect-Precipitator Rapper Unit 1 & 2
7.4. Belle River Power Plant JIT BR-100 – Inspect, Take Readings and Reset Precipitators and Transformer/Rectifier

8. REVISION HISTORY

Revision No.	Changes	Authored/ Revised By	Plant Manager Approval	Date
4	Updated format to the Plant Order format, updated contact numbers, changed MDEQ to EGLE, & improved Definitions section.	J. Roggenbuck	L Fulsen	11/21/19

AI-PART C

ATTACHMENT C.9.vi.

Belle River Power Plant

Fugitive Dust Control Program

REV7

1. PURPOSE

The purpose of this plant order is to ensure that all reasonable actions are taken to control fugitive dust emissions from the Belle River Power Plant site.

2. SCOPE

This plant order applies to all personnel at Belle River Power Plant who are involved in any activity that may generate fugitive dust.

3. DEFINITIONS

Fugitive Dust – any visible particulate air contaminant emitted into the atmosphere from any site source (including equipment and moving vehicles) except for stacks.

4. RESPONSIBILITIES

5. PROCEDURES

Each supervisor will be responsible for scheduling their activities so as not to create a fugitive dust exceedance, keeping current wind and dryness conditions in mind. A current weather forecast is available by calling the System Supervisor.

A. PAVED TRAVEL SURFACES

The speed limit on all paved surfaces is 10 mph, as defined by Plant Order BRA-2007, except areas that are posted higher.

All paved roads will be wet vacuum swept as needed when freezing is not a concern. Additional control measures shall be taken as necessary to control fugitive dust emissions.

B. UNPAVED TRAVEL SURFACES

The speed limit on all unpaved travel surfaces around the plant buildings is 10 mph. The Ash Haul Road is posted at 20 mph.

All unpaved lots shall be sprayed with dust suppressants at least twice per year. Additional applications and control measures shall be taken as necessary to control fugitive dust emissions. These may include application of dust suppression, which would consist of water and/or calcium chloride solution.

C. ASH UNLOADING

During ash truck loading, the transfer site will be enclosed on at least two sides.

All ash transported for disposal will be conditioned using water sprays while loading fly ash trucks.

Commercial dry ash trucks, and or wheels, shall be cleaned prior to leaving the site.

Areas around the ash loading operations shall be flushed after ash loading is completed for each day, when freezing is not a concern. Additional control measures shall be taken as necessary to control fugitive dust emissions.

D. RESERVE COAL STORAGE PILE

St. Clair Power Plant Fuel Supply will compact and maintain the storage pile to minimize fugitive dust emissions. A stable crust is to be maintained on the storage pile by using compaction and water as appropriate. To maintain a sealed pile, no vehicular traffic is allowed on the pile except during reclaim and stacking operations.

During reclaim and stacking operations, the St. Clair Power Plant water wagon is available to control fugitive dust as necessary.

Additional control measures shall be taken as necessary to control fugitive dust emissions.

E. RANGE ROAD ASH DISPOSAL SITE

The St. Clair Fuel Supply Day Crew Supervisor is responsible for maintaining adequate fugitive dust control at the Range Road Ash Disposal site. All ash haul roads shall be sprayed with dust suppressant at least twice per year. Additional applications and control measures shall be taken as necessary to control fugitive dust emissions. These may include application of dust suppression, which would consist of water and/or calcium chloride solution.

The St. Clair Fuel Supply Day Crew Supervisor shall direct ash-filling locations in a manner to prevent fugitive dust carrying beyond site boundaries.

F. FG-REF-BRFC Facility

FG-REF-BRFC facility site manager is responsible to operate fugitive emission sources in a manner which will minimize fugitive particulate emissions. Daily non-certified VE observations during normal facility operation will be conducted and appropriate control measures taken.

G. FG-ISLANDS-BR

Operations manager is responsible to operate FG-ISLANDS-BR delivery operations in a manner which will minimize fugitive particulate emissions. Daily non-certified VE observations will be conducted during delivery of product to the silos and appropriate control measures taken.

6. DOUMENTATION
None

7. REFERENCES

Attachments A - MSDS for Calcium Chloride Solution – Calcium chloride solution used as appropriate Control fugitive dust on roads at the facility as approved by the MDEQ.

8. REVISION HISTORY

Revision No.	Changes	Revised By	Plant Manager Approval	Date
3	Unknown	R.E. Frantz and I.A. Fadanelli	B. Kiehl/s/	11/10/99
4	New format. Control Procedures C added.	J. Goodman	J.C. Dau/s/	10/18/07
5	Addition of 4.4 and Changes in 4.5 and 5.0 E	M. VanderHeuvel	J.C. Dau/s/	10/15/08
6	Addition of FG-CHEMMOD-BR in sections 4.0 and 5.0. Updating sections 3, 5 (B, C, D and E. Added Section 8 Attachments to Include MSDS for CaCl2	D. Huxhold	J.C. Dau/s/	08/26/10
7	Addition of FG-ISLANDS-BR in sections 4.0 and 5.0 Update sections 4.3 and 5.0.F to show FG-REF-BRFC change from FG-Chemmod-BR	D. Huxhold	T. Kerry/s/	4/11/16

Attachment A (pages 4-14)

Univar USA Inc.
17425 NE Union Hill
Road Redmond, WA
98052
(425) 889-3400

For Emergency Assistance involving chemicals call - CHEMTREC (800) 424-9300

The Version Date and Number for this MSDS is : 06/03/2008 - #008
PRODUCT NAME: CALCIUM CHLORIDE SOLUTION
MSDS NUMBER: DZ45297
DATE ISSUED: 05/06/2008
SUPERSEDES: 02/22/2007
ISSUED BY: 008360

****
Material Safety Data Sheet

1. Product and Company Identification
Product Name
CALCIUM CHLORIDE SOLUTION

Distributed by:
Univar USA Inc.
17425 NE Union Hill Rd.
Redmond, WA 98052
425-889-3400

2. Hazards Identification

Emergency Overview
Color: Clear
Physical State: Liquid
Odor: Odorless
Hazards of product:
WARNING! Causes eye irritation. May cause skin irritation. May be harmful if swallowed. Slipping hazard. Isolate area.

OSHA Hazard Communication Standard
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Potential Health Effects

Eye Contact: May cause severe eye irritation. May cause slight corneal injury. Effects may be slow to heal.

Skin Contact: Brief contact is essentially nonirritating to skin. May cause more severe response if skin is abraded (scratched or cut). May cause more severe response on covered skin (under clothing, gloves). Prolonged contact may cause skin irritation, even a burn.

Skin Absorption: Prolonged skin contact is unlikely to result in absorption of harmful amounts.
Inhalation: Mist may cause irritation of upper respiratory tract (nose and throat).

Ingestion: Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury. Swallowing may result in gastrointestinal irritation.

3. Composition Information

Component CAS # Amount
Calcium chloride 10043-52-4 28.0 - 42.0 %
Potassium chloride 7447-40-7 0.0 - 3.0 %
Sodium chloride 7647-14-5 0.0 - 2.0 %
Water 7732-18-5 53.0 - 72.0 %

4. First-aid measures

Eye Contact: Immediately flush eyes with water; remove contact lenses, if present, after the first 5 minutes, then continue flushing eyes for at least 15 minutes. Obtain medical attention without delay, preferably from an ophthalmologist.

Skin Contact: Wash skin with plenty of water.

Inhalation: Move person to fresh air; if effects occur, consult a physician.

Ingestion: If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

Notes to Physician: If burn is present, treat as any thermal burn, after decontamination. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. Fire Fighting Measures

Extinguishing Media: This material does not burn. If exposed to fire from another source, use suitable extinguishing agent for that fire.

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. This material does not burn. Fight fire for other material that is burning. Water should be applied in large quantities as fine spray.

Special Protective Equipment for Firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective firefighting clothing (includes firefighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during firefighting operations. If contact is likely, change to full chemical resistant firefighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

Unusual Fire and Explosion Hazards: Not applicable.

Hazardous Combustion Products: Not applicable

6. Accidental Release Measures

Steps to be taken if Material is Released or Spilled: Small and large spills: Contain spilled material if possible. Absorb with materials such as: Sand. Collect in suitable and properly labeled containers. Flush residue with plenty of water. See Section 13, Disposal Considerations, for additional information.

Personal Precautions: Spilled material may cause a slipping hazard. Isolate area. Keep unnecessary and unprotected personnel from entering the area. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental Precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

7. Handling and Storage

Handling
General Handling: Product shipped/handled hot can cause thermal burns. Avoid contact with eyes, skin, and clothing. Do not swallow. Wash thoroughly after handling. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Storage
Keep container closed. Protect from atmospheric moisture. Product may become a solid at temperatures below 0 deg C (32 deg F) (concentrations above 36% calcium chloride).

8. Exposure Controls / Personal Protection

Exposure Limits
Component List Type Value
Calcium chloride Dow IHG TWA 10 mg/m3
Sodium chloride Dow IHG TWA 10 mg/m3

Personal Protection

Eye/Face Protection: Use chemical goggles.

Skin Protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task. Remove contaminated clothing immediately, wash skin area with soap and water, and launder clothing before reuse or dispose of properly.

Hand protection: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Polyethylene. Neoprene. Natural rubber ("latex"). Polyvinyl chloride ("PVC" or "vinyl"). Nitrile/butadiene rubber ("nitrite" or "NBR"). Ethyl vinyl alcohol laminate ("EVAL"). Avoid gloves made of: Polyvinyl alcohol ("PVA"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Respiratory Protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. In misty atmospheres, use an approved particulate respirator. The following should be effective types of air-purifying respirators: Particulate filter.

Ingestion: Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating.

Engineering Controls
Ventilation: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

9. Physical and Chemical Properties

Physical State	Liquid
Color	Clear
Odor	Odorless
Flash Point - Closed Cup	Not applicable
Flammable Limits In Air	Lower: Not applicable Upper: Not applicable
Autoignition Temperature	Not applicable
Vapor Pressure	9 - 15 mmHg @ 25 deg C Literature
Boiling Point (760 mmHg)	110 - 122 deg C (230 - 252 deg F) Literature .
Vapor Density (air = 1)	Literature Same as water
Specific Gravity (H20 = 1)	1.275 - 1.439 Literature
Freezing Point	Varies
Melting Point	Not applicable

Solubility in Water (by water weight)	Literature completely miscible with
pH	9 Estimated (undiluted)
Kinematic Viscosity	2.6 cSt @ 25 deg C Estimated

10. Stability and Reactivity

Stability/Instability
Stable.
Conditions to Avoid: None known.

Incompatible Materials: Avoid contact with: Sulfuric acid. Corrosive to some metals. Avoid contact with metals such as: Brass. Ferrous metals. Mild steel. Flammable hydrogen may be generated from contact with metals such as: Zinc. Sodium. Reaction of bromide impurity with oxidizing materials may generate trace levels of impurities such as bromate.

Hazardous Polymerization
Will not occur.

Thermal Decomposition
Does not decompose.

11. Toxicological Information

Acute Toxicity

Ingestion
For the major component(s): LD50, Rat 900 - 2,100 mg/kg
Skin Absorption
For the major component(s): LD50, Rabbit > 5,000 mg/kg

Genetic Toxicology
The data presented are for the following material: Calcium chloride or CaCl2. In vitro genetic toxicity studies were negative. The data presented are for the following material Potassium chloride. In vitro genetic toxicity studies were positive. However, the relevance of this to humans is unknown.

12. Ecological Information

ENVIRONMENTAL FATE
Data for Component: Calcium chloride
Movement & Partitioning
No bioconcentration is expected because of the relatively high water solubility. Partitioning from water to n-octanol is not applicable.

Persistence and Degradability
Biodegradation is not applicable.

Data for Component: Potassium chloride
Movement & Partitioning
No bioconcentration is expected because of the relatively high water solubility. Partitioning from water to n-octanol is not applicable.

Persistence and Degradability
Biodegradation is not applicable.

Data for Component: Sodium chloride
Movement & Partitioning
No bioconcentration is expected because of the relatively high water solubility. Potential for mobility in soil is very high (Koc between 0 and 50). Partitioning from water to n-octanol is not applicable.

Persistence and Degradability Biodegradation is not applicable.

ECOTOXICITY
Data for Component: Calcium chloride
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50 >100 mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity
LC50, bluegill (Lepomis macrochirus): 8,350 - 10,650 mg/L

Aquatic Invertebrate Acute Toxicity
LC50, water flea Daphnia magna: 759 - 3,005 mg/L
Toxicity to Micro-organisms
EC50; activated sludge, respiration inhibition: > 1,000 mg/L

Data for Component: Potassium chloride
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50 >100 mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity
LC50, rainbow trout (Oncorhynchus mykiss), 96 h: 4,236 mg/L

Aquatic Invertebrate Acute Toxicity
EC50, water flea Daphnia magna, 24 h, immobilization: 590 mg/L

LC50, water flea Ceriodaphnia dubia, 96 h: 3,470 mg/L

Data for Component: Sodium chloride
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50 >100 mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity
LC50, fathead minnow (Pimephales promelas): 10,610 mg/L

Aquatic Invertebrate Acute Toxicity
LC50, water flea Daphnia magna: 4,571 mg/L

Toxicity to Micro-organisms
IC50, OECD 209 Test; activated sludge, respiration inhibition: > 1,000 mg/L

13. Disposal Considerations

All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Reclaimer. Waste water treatment system.

14. Transport Information

DOT Non-Bulk
NOT REGULATED

DOT Bulk
NOT REGULATED

IMDG
NOT REGULATED

ICAO/IATA
NOT REGULATED

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. Regulatory Information

OSHA Hazard Communication Standard
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200. Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312
Immediate (Acute) Health Hazard Yes

Delayed (Chronic) Health Hazard No
Fire Hazard No
Reactive Hazard No
Sudden Release of Pressure Hazard No

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313
To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:
To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Special Hazardous Substances List:
To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)
This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)
WARNING: This product (when used in aqueous formulations with a chemical oxidizer such as ozone) contains a chemical known to the State of California to cause cancer.

US. Toxic Substances Control Act
All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30

CEPA - Domestic Substances List (DSL)
All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

16. Other Information

Recommended Uses and Restrictions
A calcium chloride product - Dust Control De-icing fluid. For industrial use. We recommend that you use this product in a manner consistent with the listed use. If your intended use is not consistent with the stated use, please contact your sales or technical service representative.

Legend
N/A Not available

W/W	Weight/Weight
OEL	Occupational Exposure Limit
STEL	Short Term Exposure Limit
TWA	Time Weighted Average
ACGIH	American Conference of Governmental Industrial Hygienists, Inc.
DOW IHG	Dow Industrial Hygiene Guideline
WEEL	Workplace Environmental Exposure Level
HAZ DES	Hazard Designation
Action Level	A value set by OSHA that is lower than the PEL which will trigger the need for activities such as exposure monitoring and medical surveillance if exceeded.

For Additional Information:
Contact: MSDS Coordinator - Univar USA
During business hours, Pacific Time - (425) 889-3400

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END OF MSDS

AI-PART C

ATTACHMENT C.9.vii.

Belle River Power Plant

Malfunction Abatement and

Preventative Maintenance Plan

REV2

MALFUNCTION ABATEMENT AND PREVENTATIVE MAINTENANCE PLAN

Dry Sorbent Injection / Activated Carbon Injection

DTE Electric Co.

Belle River Power Plant

October 4, 2019

Revised By: Alexis Thomas
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Belle River Power Plant

Noted By:
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Approved by:
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Belle River Power Plant

1.0 BACKGROUND

This Malfunction Abatement Plan (MAP) has been prepared to meet the requirements of FG-ISLANDS-BR, of the Belle River Power Plant Renewable Operating Permit (ROP) No. MI-ROP-B2796-2015c. These permits require Belle River Power Plant to "… not operate FG-ISLANDS unless a MAP… …is implemented, updated as necessary, and kept at the facility." This Malfunction Abatement Plan has been prepared by DTE Electric Co. in accordance with Rule 911(2) of the Michigan Air Pollution Act (Part 55 of Michigan Act 451).

In accordance with the permit, this MAP must be updated within 45 days if new equipment is installed or if the MAP fails to address a malfunction. Additionally, any amendments to this MAP must be sent to the Air Quality Division's (AQD) District Supervisor for review and approval.

2.0 DESCRIPTION OF SYSTEM

Belle River Power Plant has installed 2 ACI/DSI *(Activated Carbon Injection/Dry Sorbent Injection)* Islands; one for Unit 1 and one for Unit 2. Each island consists of two silos for DSI and one silo for ACI. Each silo has a passive dust collector with a bin vent and a differential pressure indicator to minimize and control dust emissions generated by material handling operations, as well as, to comply with opacity, PM, PM10, and PM2.5 emission limits. This MAP will refer to these devices as dust collectors but they may also be referred to as bin vents or bin vent filters. The DSI Silos handle a sorbent, Sodium Sesquicarbonate (C2HNa3O6), also known by its trade name Trona, while the ACI silos handle powdered activated carbon (PAC). Both materials will be conveyed pneumatically. The DSI dust collectors are sized for a maximum of 1025 SCFM maximum while the ACI dust collectors are sized for 1000 SCFM maximum.

The following table lists the dust collectors covered by this Malfunction Abatement Plan.

2.1 Dust Collectors

Description	**ROP Stack/Vent ID**	**Exhaust Dimension** *PTI Max: 15.6"x15.6" (243.36 sq in)*	**Height Above Ground** *PTI Min: DSI 80.5' ACI 57.7'*
Units 1 DSI Silo 1	EU-BLR01-DSI_SILO1	20"x9.5" 190 sq in	80' 7.25" to mid-vent
Units 1 DSI Silo 2	EU-BLR01-DSI_SILO2	20"x9.5" 190 sq in	80' 7.25" to mid-vent
Units 2 DSI Silo 1	EU-BLR02-DSI_SILO1	20"x9.5" 190 sq in	80' 7.25" to mid-vent
Units 2 DSI Silo 2	EU-BLR02-DSI_SILO2	20"x9.5" 190 sq in	80' 7.25" to mid-vent
Unit 1 ACI Silo	EU-BLR01-ACI_SILO	10"x11.25" 112.5 sq in	59' 8" to mid-vent
Unit 2 ACI Silo	EU-BLR02-ACI_SILO	10"x11.25" 112.5 sq in	59' 8" to mid-vent

These stack/vents are discharged non-vertically.

2.2 DSI Dust Collectors

The dust collectors will prevent fugitive dust emission and allow displaced air to exit the silo during three operations:

1. Truck unloading of Sorbent, also known as Trona
2. Silo aeration
3. Use of the rotary feeder.

The dust collectors have a pulse jet self-cleaning system that can be placed in either Auto or Hand mode. In Hand mode, the dust collector will always remain on. In Auto mode, the dust collector will automatically turn on when the truck fill cap is removed. This ensures that the dust collector is always on during truck filling operations and is achieved by the use of a limit switch that senses the weight of the fill cap. The jet-pulsed bag cleaning system utilizes pulsed air jets to knock accumulated dust off of the bags and into the silo

Silo aeration is necessary to ensure the proper fluidization of the sorbent so that it flows smoothly from the silo to the two weigh hoppers below. The aeration system is built into the top section of the cone at the bottom of the silo. The fluidization of the sorbent is accomplished with compressed air that is controlled by a timer board.

Below each weigh hopper there is a variable speed rotary feeder that meters out the amount of sorbent and is controlled by the DCS. From this point the sorbent falls through a vent box into a continuous speed rotary feeder that transfers the sorbent into the dry, cool motive air that transfers it to the plant. The vent box uses a fan to return air and trapped dust back into the weigh hopper and ensures that there is no back pressure on the rotary feeder.

The dust collector's pulse jet self-cleaning system which, along with a differential pressure monitor, is monitored by a timer board.

The dust collectors consist of the following major components:

- Bin Vent Filter Housing
- Outlet Vent with Weather Cover and Bird Screen
- Bag Filters
- Pulse Jet Self-Cleaning System
- Differential pressure transmitter
- Air Lock Rotary Valve
- Slide Gate
- Controls & Indicating Lights
- Timer Board
- Instrumentation
- Annunciators
- Fire Protection System

2.3 ACI Dust Collectors

The dust collectors will prevent fugitive dust emission and allow displaced air to exit the silo during three operations:

1. Truck unloading of Powdered Activated Carbon (PAC)
2. Silo aeration
3. Use of the rotary feeder.

Air is introduced into the ACI silos while fluidizing the activated carbon and during silo filling operations. Some of this air must be able to exit the silo. In order to do this and ensure compliance with fugitive dust requirements, the air exits the silo through a dust collector located on top of the ACI silos. The dust collector will collect the activated carbon that is entrained in the air with filters prior to the air exiting the silo. The dust collectors allow clean air to exhaust to the atmosphere and the collected dust to be returned to the silo for its intended emission control use. The dust collectors consist of the following major components:

- Bin Vent Filter Housing
- Outlet Vent with Weather Cover and Bird Screen
- Filter Elements
- Compressed Air Header with Valves and Piping
- Jet Pulsation Timer Board
- Pressure Gauges and Controls
- Indicating Lights
- Instrumentation

3.0 PREVENTIVE MAINTENANCE PROGRAM

3.1 Responsible Personnel

The Belle River Plant Manager is responsible for ensuring that Belle River Power Plant operates in compliance with all environmental and safety requirements and regulations. The Plant Manager delegates day to day responsibilities for DSI-ACI equipment operations and maintenance to the Production Manager and Maintenance Manager. The Production Manager and Maintenance Manager are responsible for overseeing the inspection, maintenance, and repair of all air cleaning devices. The Plant Shift Supervisor is responsible for the day to day operations of the ACI-DSI system including conveyance systems and dust collectors. The Plant Shift Supervisor is responsible for all operations at the plant, and is management's representative during off-hours (i.e. nights and weekends) when plant management is not on site.

Critical phone numbers are as follows:

Plant Manager	810-326-3245
Production Manager	810-326-3333
Maintenance Manager	810-326-3204
Plant Shift Supervisor	810-326-6235 (Available 24 hours per day, every day)
Plant Control Room	810-326-6234 (Staffed 24 hours per day, every day)

3.2 Inspections/Maintenance

Plant Operators inspect all ACI-DSI dust collectors once daily. If visible emissions are detected, an EPA Method 9 certified observation will be performed and corrective actions indicated. These corrective actions will be implemented according to the cause of the visible emissions. If subsequent visible emissions are observed while the corrective actions are being implemented, additional Method 9 certified observations are not required.

Preventative maintenance activities will be tracked and scheduled through our work management system.

Annually, a Certified Method 9 emission observation must occur on each dust collector on each island.

3.3 Replacement Parts

DTE Electric Co. stocks parts necessary for routine maintenance and other common replacement parts. A complete list of parts kept in stock will be listed in the company's Maximo computer system. The parts list is filed by system and major components and contains a complete list of parts for that component including: stock number, noun/qualifier (e.g. gear reducer), manufacturer part number and quantity on hand.

Replacement parts (e.g. replacement bags and frames, timer, solenoids, diaphragm assemblies, rotary valves) may be ordered directly from the manufacturer. Most parts can be shipped within a short period of ordering.

4.0 MONITORING REQUIREMENTS

The two Belle River Power Plant DSI-ACI Islands will be operated and monitored by plant operators. **Each silo is limited to 12 hours of truck unloading operations (i.e. silo filling) per each calendar day**. Operational hours will be tracked automatically through an electronic system. There is no limit on the hours of Trona and/or activated carbon injection (i.e. silo emptying), hours of rotary valve operation, or hours of silo aeration. The number of hours of operation will be recorded daily for each island. No part of an island will be operated unless all associated, environmental control devices are operating according to manufacturer's recommendations.

A Reference Method 9 visible emission reading must be taken once per calendar year, documented on the Visible Emission Observation Report, and submitted to the Environmental Staff. This reading must be taken during maximum routine operation conditions (i.e. during silo filling operations). Additionally, **non-certified visible emission readings must be taken every day for all dust collectors associated with an operating island**. **If visible emissions are observed a Reference Method 9 visible emission reading must also be taken**, documented on the Visible Emission Observation Report, and submitted to the Environmental Staff. The readings, the reasons for the visible emissions, and the corrective actions for the visible emissions must be documented on the Visible Emission Observation Report and sent the environmental staff via the environmental mailbox on the 3rd floor, by the end of the shift. These corrective actions will be implemented when appropriate according to the cause of the visible emissions. If subsequent visible emissions are observed while the corrective actions are being implemented, additional Method 9 certified observations are not required.

The dust collectors automatically monitor operating variables that may affect the performance of the system, and are equipped with equipment trip switches and/or alarms that will shut off the equipment or alert operators of a possible malfunction. Daily inspections of the system include an inspection of the control panel to check for failed or alarm conditions.

5.0 CORRECTIVE ACTION PROCEDURES

If a malfunction or failure occurs that cannot be corrected by an operator, then a DTE Electric Co. service request must be entered into the work management system MAXIMO. Then an operating and maintenance work order will be issued to repair the system. These work orders will be assigned the highest priority and will receive immediate attention by the plant maintenance department.

Reasonable measures to minimize excess fugitive dust emissions will be implemented. These measures can vary depending on several factors including the extent of the visible

emission and the amount of material remaining in the unloading truck. These measures may include any of the following:

- Adjusting unloading rate.
- Unloading into a different silo.
- Finishing truck unloading before shutting down the system to prevent emissions from hose and piping connections.
- Immediate cessation of truck unloading, if emissions are determined to be excessive by plant/environmental staff.
- Once the current unloading operation is complete no further unloading will occur until corrective actions are implemented.

Procedures for corrective action and notification of regulatory agencies during a malfunction or excess emissions event are described in DTE Electric Co. Power Plant Order No. 223.

6.0 REFERENCES

1. DTE Electric Co. Power Plant Order No. 223 Air Quality Control

AI-PART C

ATTACHMENT C.9.viii.

Belle River Power Plant

MATS Site-Specific Monitoring Plan

REV0

DTE Electric Company – Belle River Power Plant
Mercury & Air Toxics Standards (MATS)
Site-Specific Monitoring Plan

1.0 Purpose & Scope

The purpose of this site-specific monitoring plan is to outline the compliance measures, monitoring methods, reporting and other requirements related to the Mercury & Air Toxics Standards (MATS) as outlined in 40CFR63.10000(d)(2) for Belle River Power Plant. The MATS rule, or EGU MACT is codified in 40CFR63, Subpart UUUUU. This plan will be amended and updated as required. This plan will be kept on site and available as requested, but is not required to be submitted. This plan does NOT replace the site's CEMS monitoring plan required by §Part75. The MATS rule became effective on April 16, 2012. The initial compliance date for Belle River Power Plant was April 16, 2015. Belle River Power Plant applied for and was granted a one-year compliance extension and the compliance date for the plant became April 16, 2016. Subsequent compliance requirements are based on that date.

2.0 Site Description

Belle River Power Plant is located in China Township, Michigan. The plant is located at 4505 King Road, north of Marine City Highway. Belle River Power Plant is an ISO14001 certified facility.

The plant operates two coal-fired boilers (Units 1 & 2) to generate electricity. The units operate under the conditions of the plant's Title V Renewable Operating Permit (ROP) and are regulated under MATS. Each unit is vented to its own stack. There are no bypass stacks. Each unit's stack has dedicated monitoring systems. The plant is subcategorized under §63.9990(a)(1) as a coal-fired electric generating unit (EGU) as defined by §63.10042.

3.0 MATS Emission Limits

MATS establishes emission limits for several pollutants from subject units. The MATS-regulated pollutants are mercury (Hg), non-mercury metals and acid gases. An emission limit for particulate matter (PM) can be used as a surrogate for non-mercury metals. An emission limit for hydrochloric acid (HCl) can be used to demonstrate compliance with the acid gas standard.

MATS allows for using an input-based (mass per heat input) or output-based (mass per electricity generated) emission limit. Belle River Power Plant uses output-based standards for demonstrating compliance with MATS emission limits. Permit emission limits for Belle River Power Plant differ from the MATS emission limits. The MATS emission limits for Belle River Power Plant are summarized in Table 1. All emission

limits are based on 30-day rolling averages calculated based on operating days as defined by MATS.

Table 1 – Belle River Power Plant MATS Emission Limits (each unit)

Pollutant	Emission Limit
Mercury (Hg)	0.013 lb/GWh
Particulate Matter (PM)	0.3 lb/MWh
Hydrochloric Acid (HCl)	0.02 lb/MWh

4.0 Demonstrating Compliance

Compliance must be demonstrated by conducting the required performance tests and other activities no later than October 13, 2016. Some testing or other requirements are required on a periodic basis. For items specified to be performed based on a prescribed frequency, the frequency is defined as follows:

Quarterly	≥45 days separation
Annual	≥320 days separation
Every 3 Years	≥1050 days separation

Compliance with the MATS emission limits can be demonstrated through monitoring or periodic emissions testing as outlined in the MATS regulations. There is no emission testing option for mercury. When using quarterly testing for demonstrating compliance, quarterly tests are not required to be performed in quarters with <168 boiler operating hours. In order for the plant to demonstrate compliance with the MATS emission limits, those emissions are controlled through various pollution control technologies. The methods for emissions control and monitoring/testing for demonstrating compliance for each pollutant are outlined below.

4.1 Performance Evaluation

Along with ongoing compliance requirements, an initial performance evaluation is required. The performance evaluations are done according to the performance evaluation plan outlined by §63.8(e)(3). The performance evaluation duration is 30 boiler operating days in order to show compliance with the 30-day rolling average emission limits outlined by the MATS rule. The performance evaluation must be completed within 180 days of the compliance date. Initial performance evaluations are planned to begin on the compliance date (April 16, 2016). Further information on certification testing, QA/QC and the test program are contained in this plan as required.

4.2 Mercury

Mercury emissions are controlled using activated carbon injection (ACI). Activated carbon is injected into the flue gas prior to the electrostatic precipitator (ESP). Oxidized mercury is adsorbed by the activated carbon and the ESP removes the carbon with the adsorbed mercury. Oxidation of elemental mercury in the flue gas is enhanced by the presence of halogens such as chlorine and bromine. Halogens are introduced into the process in two ways at Belle River Power Plant. First, the plant uses calcium bromide as a sorbent of the reduced emission fuel (REF) process. Also, the activated carbon used in the ACI system is brominated to promote mercury oxidation. As the activated carbon with adsorbed mercury moves downstream, the ESP removes the entire particle from the flue gas.

Mercury emissions are monitored by sorbent trap systems (STS). The STS pulls a stream of gas from the flue gas into a trap which contains activated carbon sorbent. The activated carbon adsorbs mercury. Each sorbent tube is then analyzed in a laboratory for mercury content. The STS installed at the plant is a dual system (system 1 & 2) and each contains two sorbent traps (trap A & B). One system is used for monitoring emissions during startup and shutdown and the other system monitors emissions during normal operation. Procedures outlined in Performance Specification (PS) 30B, 12B and Appendix A of Subpart UUUUU for certification, calibration and QA/QC are used to maintain the STS. Normal operation sorbent traps are scheduled to be changed weekly, however sorbent traps may be used for up tot 15 days. The amount of mercury, stack gas and the amount of time the trap is in the system are used to determine mercury emissions. Mercury emissions are calculated using the following equation:

$$Hg\ Emission\ Rate\ = \frac{Hg\ Conc.\ \times Stack\ Flow \times (1 - Stack\ Moisture)}{Electric\ Generation}$$

Once removed from the STS, sorbent traps are sent to a lab for analysis according to PS-12B. The data collected from the STS will be communicated to or entered into the data acquisition handling system (DAHS). The DAHS will be used to calculate emissions as required for demonstrating compliance and reporting. In addition to the certified STS to be used for compliance, Belle River Power Plant will operate continuous non-certifiable Hg monitors for process control. The monitors will provide real-time feedback for ensuring continuous compliance.

4.3 Particulate Matter

PM emissions are controlled by the plant's ESPs. The ESPs at the plant are considered very large ESPs. PM emissions are monitored by continuous PM monitors. Procedures outlined in Performance Specification 11 for certification, calibration and QA/QC are used to maintain the PM monitors. Data from the PM

monitors will be collected by the DAHS. The DAHS will be used to calculate emissions as required for demonstrating compliance and reporting.

Although Belle River Power Plant has PM monitors installed and operational on all units, MATS also allows for a stack testing option for demonstrating compliance with the emission limits. Should the plant opt to use the quarterly stack testing option in lieu of the PM monitors, there are several requirements for the testing outlined in the MATS including using a modified version of EPA test Method 5.

4.4 Hydrochloric Acid

HCl emissions are controlled through a dry sorbent injection (DSI) system. Trona, a sodium carbonate compound, is injected into the flue gas prior to the electrostatic precipitator (ESP). Trona absorbs and reacts with HCl in the flue gas to form sodium salt compound. As the transformed particle moves downstream, the ESP removes the entire particle from the flue gas.

Quarterly stack testing will be used to demonstrate compliance with the HCl limit. Although continuous HCl monitors are available, there is significant uncertainty as to whether the monitors can be certified to the EPA-prescribed performance specification (PS-18). Belle River Power Plant will be operating continuous HCl monitors for process control. The monitors will provide real-time feedback for ensuring continuous compliance.

4.5 Emissions Calculations

Emissions will be calculated by the DAHS for demonstrating compliance and reporting. Hourly data is recorded for all periods of operation. For calculation of hourly averages, the MATS rule refers to §Part75 & §Part60 data validation. Hourly averages are calculated for all hours of operation including startup and shutdown hours. MATS has no provisions for missing data substitution or bias adjustment factors. Requirements from the rule as to what constitutes a "valid" hour are programmed into the DAHS logic.

30-day average emission values required for reporting are also calculated by the DAHS. 30-day averages are updated at the end of each boiler operating day. A boiler operating day is defined as a 24-hour period (midnight to midnight) during which fuel is combusted at any time, excluding startup periods or shutdown periods. If all hours are startup/shutdown, it is not a boiler operating day. If one hour is normal operation, it is a boiler operating day and is included in the 30-day average. Any fraction of an hour in which startup &/or shutdown occurs is considered a startup/shutdown hour. The 30-day average is calculated based on an average of quality assured hours and not an average of days. There is no minimum data availability requirement in order to calculate a valid 30-day average.

5.0 Startup & Shutdown

MATS provides two definitions for startup. The plant is using what is commonly referred to as startup definition one (paragraph (1) of the definition for startup in §63.10042). This definition states that startup begins when fuel is combusted for any purpose and ends when steam is used to generate electricity for sale over the grid or for any other purpose. For the purpose of determining the end of startup for the plant, it has been determined that startup ends when the breaker is closed and electricity is sent to the grid for use/sale (Rule reference to be added one reconsideration rule is finalized).

MATS allows for a certain portion of startup and shutdown emissions as defined by the rule to be excluded from calculating emissions averages for demonstrating compliance. The end of startup determination outlined above will be used to determine emissions from startup versus normal operation. Normal operation will be used to determine operating days as outlined by the regulation. This logic is programmed into the plant's monitoring systems and will be used for emissions reporting.

6.0 Work Practice Standards

MATS outlines certain work practice standards aimed at minimizing startup and shutdown emissions as well as during normal operation. These work practice standards are outlined in Table 3 of MATS and the requirements are detailed below.

6.1 Startup Work Practice Standards

During startup, the following standards are required to be met:

- All emissions monitoring equipment must be operated.
- Clean fuels as defined by §63.10042 must be used for ignition. Clean fuels at Belle River Power Plant include distillate oil & ultra-low sulfur diesel oil.
- Clean fuels must be utilized to the maximum extent practicable.
- Applicable control devices must be started as expeditiously as possible, considering safety and manufacturer/supplier recommendations.
- Once firing converts to coal, all applicable pollution control technologies must be engaged.
- PM control devices must be engaged and operated within one hour of adding coal. (The ROP requires the ESP to be operating installed, maintained and operated in a satisfactory manner. The ESPs should be operated according to plant plans and procedures.)

6.2 Shutdown Work Practice Standards

During shutdown, the following standards are required to be met:

- All emissions monitoring equipment must be operated.
- While firing coal, all control devices must be operated.
- Control devices must be operated after the cessation of coal being fed into the boiler and for as long as possible thereafter considering operational and safety concerns.

6.3 Tune-Ups

In order to comply with the work practice standards requirements under MATS, a tune-up of the boiler burner and combustion controls must be conducted at least each 36 calendar months as specified in §63.10021(e). The first tune-up must be performed as part of the initial compliance demonstration prior to October 15, 2016. The first burner inspection can be delayed until the next scheduled unit outage.

The tune-ups required will be coordinated through the DTE Energy Engineering Support Organization (ESO). The tune-ups will be performed according to the Power Plant Order (PPO) covering the tune up process. The PPO contains detailed procedures and checklists associated with the tune ups; however the general requirements of the tune-ups include the following:

- Inspect burners and combustion controls. Clean or replace any components of the burners and combustion controls as necessary and at least once every required inspection period. Repair of a burner or combustion control components that affect the ability to optimize NO_x and CO requiring special order parts must be installed within three months after the burner inspection.
- Inspect the flame pattern and make adjustments to the burner or combustion controls necessary to optimize the flame pattern.
- Observe the damper operations and make adjustments &/or repairs as needed.
- Evaluate windbox pressures and air proportions and make adjustments &/or repairs as needed.
- Inspect the system controlling the air-to-fuel ratio and ensure that it is correctly calibrated and functioning properly. Any component out of calibration, in or near failure, or in a state that is likely to negate combustion optimization efforts prior to the next tune-up should be corrected or repaired.
- Optimize combustion to minimize generation of CO and NO_x consistent with the manufacturer's specifications or best combustion engineering practice.
- Measure the concentration of CO and NO_x in the effluent stream before and after tune-up adjustments are made.

7.0 Notifications, Reporting & Recordkeeping

The MATS rule requires several notifications to be submitted as well as significant reporting and recordkeeping. The notifications, reporting and recordkeeping covered by this plan are related strictly to that information required by the MATS rule and/or §Part63

provisions. Recordkeeping requirements addressed in this section include plans and other documentation required by the MATS rule which may not be required to be submitted by the rule. Any notifications, reporting or recordkeeping required by other regulations or permits and not required by MATS are not outlined in this plan. Most notifications and reporting are required to be submitted to the "Administrator" as defined by §Part63. Michigan is a "delegated authority" state. Required submittals will be made to MDEQ as required unless specifically outlined by the rule. For the purposes of this plan, the Designated Representative (DR) is the Vice President of Fossil Generation, the Alternate DR (ADR) is the Vice President of Environmental Management and Resources, and the Responsible Official (RO) is the Plant Manager. These persons may designate another person to act in that capacity under their authority as necessary and permitted.

7.1 Notifications

§Part63 general provisions and the MATS rule differ slightly on some notification timing requirements. Unless specified otherwise in this plan, notifications will be submitted based on the most conservative timing requirement (i.e. 60 days vs. 30 days). Exact requirements on the timing for specific notifications are outlined in this section.

Notification of MATS applicability was made to EPA pursuant to §63.9 on August 14, 2012, within 120 following the initial effective date of the rule of April 16, 2012. The initial notification outlined the emission units, capacities, fuels used, and that the facility is a major source of hazardous air pollutants (HAPs).

Performance testing and performance evaluations required by the MATS rule require 60-day prior notification of such testing and/or evaluation. Performance testing notifications pursuant to §63.7(b) & §63.10030(d) will be submitted to MDEQ at least 60 days prior to testing. Performance evaluation notifications pursuant to §63.8(e)(2) will be submitted at least 60 days prior to the performance evaluation.

After performing an initial compliance demonstration (within 180 days after April 16, 2016), a notification of compliance status (NOCS) must be submitted through the electronic reporting system according to §63.10030(e). Multiple NOCS submittals may be required based on the timing of tests or other criteria. The NOCS must contain the following information:

- A description of the source including identification of which subcategory the source is in, the design capacity of the source, a description of the add-on controls used on the source, a description of the fuel(s) burned, and justification for the selection of the fuel(s) burned during the performance test;
- A summary of the results of all performance tests and fuel analyses and calculations conducted to demonstrate initial compliance including all established operating limits;

- Identification of whether compliance with each applicable emission limit will be demonstrated through performance testing, CEMS, or an STS. Belle River Power Plant is demonstrating compliance by CEMS for PM and SO_2 and an STS for mercury;
- Identification of whether emissions averaging will be used for demonstrating compliance. Belle River Power Plant is not using emissions averaging;
- A certification signed by the RO stating:
  - That all applicable emission limits and work practice standards have been met;
  - "This EGU complies with the requirements in §63.10021(a) to demonstrate continuous compliance";
  - "No secondary material that are solid waste were combusted in any affected unit";
- If there had been a deviation from any emission limit, work practice standard, or operating limit, submit a brief description of the deviation, duration, emission point, and the cause of the deviation;
- A summary of the results of the annual performance tests;
- Identification that Belle River Power Plant is relying on paragraph (1) of the definition of "startup" in §63.10042.

7.2 Reporting

MATS imposes numerous reporting requirements which are required for different operation, at different frequencies, and in different formats. The general reporting requirements are outlined in this section and covered by §63.10031. These reporting requirements are in addition to any other regulatory or permit-required reporting. In general, reporting is done electronically. Prior to April 16, 2017, all electronic reports will be submitted using "MATS PDF Submit" in pdf format through the EPA's Emission Collection and Monitoring Plan System (ECMPS). Subsequent to April 16, 2017, electronic reports will be submitted using the EPA's Electronic Reporting Tool (ERT) which is in development.

Semi-annual compliance reports are required to be submitted for each affected source through the electronic reporting system. The first compliance report covers the period from April 16, 2016 through December 31, 2016 and must be submitted no later than January 31, 2017. Subsequent compliance reports must cover the semiannual reporting period from January 1 through June 30 or July 1 through December 31 and must be submitted no later than July 31 or January 31. Each semi-annual compliance report must contain the following information:

- The company name and address
- Identification of each HAP monitored
- Beginning & end dates of the reporting period
- Brief description of the process units
- Emission & operating parameter limitations

- Monitoring equipment manufacturer(s) & model number(s)
- Date of the latest monitor certification or audit
- Total operating time during the reporting period
- Summary of emission data, including duration of excess emissions, percent of operating time with excess emissions, and a breakdown of the reasons for any excess emissions periods
- Summary of monitor performance including total downtime, percent downtime and a breakdown of the reasons for downtime
- Description of any changes in monitoring, processes or controls
- Name, title and signature of the RO certifying the accuracy of the report
- Date of the report
- Total fuel use for each calendar month, including a description of the fuel and whether the fuel has received a non-waste determination
- Whether any new types of fuel were burned; if new types of fuel were burned, the date of the performance test when that fuel was used
- Date of the most recent tune-up
- For any excess emissions or monitoring system malfunction period, the information listed below must be reported; When no excess emissions or exceedances of a parameter have occurred, or a monitoring system has not been inoperative, out of control, repaired, or adjusted, such information shall be stated in the report:
    - Date & time which the monitoring system was inoperative or out of control (except periods of calibration or checks);
    - Date & time of each period of excess emissions occurring during startup, shutdown & malfunction;
    - Date & time of each period of excess emissions occurring during periods other than startup, shutdown & malfunction;
    - Nature and cause of any malfunction;
    - Corrective action taken or preventive measures adopted;
    - Nature of repairs or adjustments to the monitoring system that was inoperative or out of control
    - Total process operating time during the reporting period.

Within 60 days after the date of completing each CEMS (SO2, PM, & Hg) performance evaluation test, the relative accuracy test audit (RATA) data or PM CEMS RCA & RRA data must be submitted through the electronic reporting system. This data shall include calibration error testing, drift checks, and other information required by the performance evaluation.

For PM CEMS data, quarterly reports must be submitted to the MATS electronic reporting system within 60 days following the end of each calendar quarter. The quarterly reports must include all of the calculated 30-boiler operating day rolling average values derived from the CEMS. SO_2 quarterly data will continue to be reported through ECMPS as required under §Part75 within 30 days following the end of each calendar quarter. For Hg STS data, quarterly reports must be submitted to the

electronic reporting system within 30 days following the end of each calendar quarter. 30-day averages are not required to be reported for SO_2 and Hg.

7.3 Recordkeeping

MATS requires that records be maintained related to plans, operation, testing, notifications, monitoring, continuous compliance and other data. Records required to be kept may be kept in hard copy format or electronically.

This plan is required to be prepared 60 days prior to the initial performance evaluation pursuant to §63.10000(d)(1). The initial performance evaluation is scheduled to begin on April 16, 2016. This plan fulfills the requirements of §63.7(b) and (c) which require the facility to have a site-specific testing plan. This plan is not required to be submitted, however is available upon request.

CEMS QA/QC plans and monitoring plans will be submitted prior to certification as required by §Part75 or other requirements. The plans will also be kept by the CEMS QA analyst and made available upon request.

MATS record retention is outlined in §63.10032 and include following:

- Each notification and report submitted including all documentation supporting any initial notification, notification of compliance status or semi-annual compliance report submitted.
- Records of performance stack tests, fuel analyses, or other compliance demonstrations and performance evaluations.
- Records of monthly fuel use by unit must be kept including the type(s) of fuel and amount(s) used.
- Records related to continuous monitoring systems including:
    - Periods for which a system is malfunctioning or inoperable including out of control periods
    - All required measurements needed to demonstrate compliance, results of performance tests and evaluations, measurements necessary to determine the conditions of performance tests and evaluations, calibration checks, adjustments and maintenance performed, and records of the date and time that each deviation started and stopped and whether the deviation occurred during a period of startup, shutdown, or malfunction or during another period.
- Records of the occurrence and duration of each malfunction of an operation or the air pollution control and monitoring equipment.
- Records of actions taken during periods of malfunction to minimize emissions, including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment.
- During startup and/or shutdown, the following must be kept:
    - Records of the occurrence and duration of each startup/shutdown.

  - Records of the type(s) and amount(s) of fuel used during each startup or shutdown.
  - The date and time that clean fuels being combusted for the purpose of startup/shutdown begins and ends.
  - The quantity and heat input of clean fuel for each hour of startup/shutdown.
  - The electrical load for each hour of startup/shutdown.
  - The date and time that non-clean fuel combustion begins during startup and the date and time that non-clean fuel combustion ends during shutdown.
- For periodic unit tune ups, the following information must be maintained on site and submitted if requested:
  - An annual report of the tune up requirements and results;
  - The concentrations of CO & NO_x in the effluent stream in ppm by volume and oxygen in volume percent, measured before and after an adjustment of the EGU combustion systems;
  - A description of any corrective actions taken as a part of the combustion adjustment;
  - The type(s) and amount(s) of fuel used over the 12 calendar months prior to an adjustment, but only if the unit was physically and legally capable of using more than one type of fuel during that period.

8.0 Revision History

Rev. No.	Author	Date	Changes
0	B. Marietta	2/1/16	Original Document
1			
2			
3			