DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: On-site Inspection

B182470573

FACILITY: Morton Salt, Inc.		**SRN / ID:** B1824
LOCATION: 180 6th Street, MANISTEE		**DISTRICT:** Cadillac
CITY: MANISTEE		**COUNTY:** MANISTEE
CONTACT: Tim Lovely , HSE&S Manager		**ACTIVITY DATE:** 01/16/2024
STAFF: Rob Dickman	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: On site inspection of this major source		
RESOLVED COMPLAINTS:		

Morton Salt, Inc. is located on the west shore of Manistee Lake in Manistee. The facility produces various grades of sodium chloride salt products, such as, granular salt, water softener pellets, and food grade salt. A process to produce salt blocks was recently decommissioned. Brine saturated with salt is extracted from wells and is processed through a series of temperature and pressure-controlled evaporators, wash tanks, and filters. The salt produced from this process is refined for packaging or is pressed into pellets or blocks.

The facility uses crushed coal to fuel a 180,000 pounds of steam (216 MMBtu) per hour Wickes spreader-stoker coal and natural gas co-fired boiler to extract the salt from the brine solution. and associated four module baghouse system. The boiler is used to generate electricity, steam, and heat for facility production of salt. A natural gas-fired boiler is also used at the facility as a back-up system for building heat. The process systems consist of mills, conveyors, bucket elevators, pellet presses, vibratory screens, and an enclosed crusher to recycle pellets.

The area around the facility is essentially residential immediately to the west and south. The north and east borders of the facility are Manistee Lake. On the north side of the facility is a large coal pile on the lake shore. Coal is brought in by freighter from Lake Michigan. Also on the north side of the facility is a small rail yard. The only industrial source in the immediate vicinity of the facility is a wastewater treatment plant to the south. There is other heavy industry on the lake including a paper company and a chemical company.

This facility was inspected per the conditions of Renewable Operating Permit Number MI-ROP-B1824-2023. Records required by this permitting were requested, reviewed, and documented prior to this inspection. Additionally, all required testing and reporting for this facility has been previously reviewed and documented and is not addressed in this report unless otherwise noted. Following are the findings of the inspection:

SOURCE-WIDE CONDITIONS

Emission Limits

Hazardous Air Pollutant (HAP) emissions from the facility are limited to 9.9 tpy for each individual HAP and 24.9 tpy of all HAPs (aggregate) both based on a 12-month rolling time period at the end of each calendar month. Records from the facility indicate the only significant HAP emitted from the facility is hydrogen chloride (HCl). Records reviewed at the facility indicate these emissions are tracked via coal analysis and usage. The most recent coal analysis was performed in December of 2022. Coal chlorine content was analyzed at 14 ppm or 0.0014% by weight (ug/g). The permitted limit for coal chlorine content is 1.9% by weight. Additionally, stack testing results from July 2021 indicated chlorine emissions were 1.4 tons per year, well below the major HAP threshold of 10 tons per year.

Material Limits

There are no source wide material limits.

Process or Operational Restrictions

There are no source wide process or operational restrictions.

Design or Equipment Parameters

There are no source wide design or equipment parameters.

Stack/Vent Restrictions

There are no source-wide stack or vent restrictions.

Other Requirements

The facility is required to have an approved Fugitive Dust Plan. This plan was originally submitted in 2002 and has had several revisions. The last revision was March of 2023, and was approved in November of 2023.

The facility is also required to have an approved Malfunction Abatement Plan (MAP). The most recent version of this approved plan is dated June of 2019. The last review of this plan was performed in January of 2019 and no changes were noted. This MAP was approved in July of 2021.

EUCOALCRUSHER

This unit includes coal crushing and handling equipment controlled by a venturi scrubber. Operation of this unit is intermittent and usually occurs on the afternoon shift. The reason for this is the majority of the coal received by the facility is within size specification, this equipment only crushes material that is too large to feed the boiler. At the time of the inspection, this emission unit was in operation.

Emission Limits

Particulate matter (PM) emissions are limited to 0.10 lb/1000 lbs exhaust gas. Demonstration of compliance with this limit is through optimal control equipment operation. This is indicated by compliant differential pressure and flow rate readings taken and recorded. During the onsite inspection, this equipment was in operation. The compliant differential pressure range for the scrubber as indicated in the MAP is 7-13 inches of water gauge and the compliant flow is greater than 25 gallons per minute. Readings taken during the inspection for differential pressure were 9.8 inches of water, gauge and 38 gallons per minute for flow. A cursory review of the log kept for the emission unit did not indicate any readings out of range of those indicated in the MAP.

Material Limits

There are no material limits associated with this equipment.

Process or Operational Restrictions

During the onsite inspection, this equipment was in operation. The compliant differential pressure range for the scrubber as indicated in the MAP is 7-13 inches of water gauge and the compliant flow is greater than 25 gallons per minute. Readings taken during the inspection for differential pressure were 9.8 inches of water, gauge and 38 gallons per minute for flow. A cursory review of the log kept for the emission unit did not indicate any readings out of range of those indicated in the MAP. It should also be noted that this equipment is fitted with an interlock system that requires the pressure drop across the scrubber to be within set specifications for the crushing equipment to operate.

Design or Equipment Parameters

A differential pressure gauge and a liquid flow rate indicator are required to be installed on the venturi scrubber. This equipment is installed but was not in operation at the time of the inspection.

Stack/Vent Restrictions

There are no stack or vent restrictions associated with this equipment.

Other Requirements

There are no other requirements associated with this equipment.

EU#6BOILER

This unit includes a Wickes spreader stoker coal and natural gas co-fired boiler capable of producing 180,000 pounds of steam per hour (216 MMBTU/hr heat input) which is used for generating process steam, electricity and heat for facility production. Control is by a four-module baghouse system and dry scrubber. A Lime Injection System for hydrogen chloride control is installed, but testing and fuel sampling has demonstrated it does not need to be operated.

Emission Limits

PM emissions are limited to 0.30 lb/1000 lbs exhaust gas. Demonstration of compliance with this limit is through periodic stack testing. This testing was last performed in May of 2023 and demonstrated a result of 0.003 lb/1000 lbs exhaust gas.

Sulfur Dioxide emissions are limited to 2.5 lbs/MMBtu. Demonstration of compliance with this limit is through coal content analysis, coal usage records, and emissions calculations. Coal used at the facility is limited to 1.5% sulfur content by weight. Analysis of coal is performed on a per ship load received basis. The most recent analysis for this was in December of 2022 and indicated a sulfur content of 0.47% by weight. Random dates selected for emissions calculations review are listed below. Additionally, while not required, the facility performed stack testing for SO2 in May of 2023. The results were 0.785 #/MMBtu.

Date	SO2 (#/MMBtu)
12/11/22	0.76
3/4/23	1.04
7/27/23	0.92
Limit	2.50

Mercury emissions are limited to 2.2 E-05 lb/MMBTU. Demonstration of compliance with this limit is through periodic stack testing. This testing was last performed in July of 2021 and demonstrated a result below the detection limit of the method (2.54 E-07 lb/MMBtu).

Carbon Monoxide emissions are limited to 420 ppm dry @ 3% oxygen. Demonstration of compliance with this limit is through periodic stack testing. This testing was last performed in July of 2021 and demonstrated a result of 125 ppm dry @ 3% oxygen.

Visible emissions are limited to 10% opacity. Demonstration of compliance with this limit is through an opacity monitoring system. At the time of the inspection, an instant opacity reading taken was 4% at the stack exit. This is typical for this source.

Pursuant to 40 CFR 63 Subpart JJJJJJ, the facility must demonstrate that it is not a major source of HAPs (ie. Less than 10 tons per year emissions of each individual HAP, 25 tons of emissions for aggregate HAPS). Records from the facility indicate the significant HAP emitted from the facility is hydrogen chloride. Records reviewed indicate these emissions are tracked via coal analysis for chlorine content and coal usage. The most recent coal analysis was performed in December of 2022. Coal chlorine content was analyzed at 14 ppm or 0.0014% by weight (ug/g). The permitted limit for coal chlorine content is 1.9% by weight. Additionally, stack testing results from July 2021 indicated chlorine emissions were 1.4 tons per year, well below the major HAP threshold of 10 tons per year.

Material Limits

Coal is limited to 1.5% sulfur content by weight. This is performed on a per ship load received basis. The most recent analysis for this was in December of 2022 and indicated a sulfur content of 0.47% by weight.

Coal is limited to 1.9% chlorine content by weight. This is performed on a per ship load received basis. The most recent analysis for this was in December of 2022. Coal chlorine content was analyzed at 14 ppm or 0.0014% by weight (ug/g).

The design maximum heat input for firing natural gas, of the total heat input capacity for all fuels fired in EU#6BOILER, shall not exceed a maximum of 82 MMBTU per hour. This is the maximum nameplate capacity of the natural gas burners.

Process or Operational Restrictions

The baghouse must be in proper operation when the boiler is operating. At the time of the inspection, the baghouse was in operation. Proper operation includes pressure drop, opacity, and oxygen level to be in prescribed parameters. As addressed in this section, the boiler was in proper operation at the time of inspection.

Periods of boiler startup and shutdown must be minimized. Compliance with this condition is through implementation of good engineering practices. Process issues associated with startup and shutdown are reported semi-annually as deviations. This reporting has been previously received, reviewed, and documented.

A device to monitor and record the natural gas usage from the boiler on a continuous basis is to be installed. The boiler is so equipped. Natural gas is typically only used for startup of the boiler. Natural gas usage is tracked and recorded by the facility.

A differential pressure gauge to determine pressure drop across the baghouse must be installed. The baghouse is so equipped. The compliant range for this pressure drop is 0.1 – 9.5 inches of water, gauge. At the time of the inspection, pressure drop across the baghouse was 5.6 inches of water, gauge.

A Continuous Opacity Monitor (COM) to monitor and record the visible emissions from the boiler on a continuous basis must be installed and operating. This equipment is installed. At the time of the inspection, opacity at the stack exit was 4%.

After the lime injection system is installed, devices to monitor and record the coal usage rate and hydrated lime injection rate to the boiler are to be installed. These devices are in place. However, it was determined through testing and fuel monitoring that the lime injection system is not necessary to maintain compliance with HAP emissions limits.

Upon installation of the lime injection system, an oxygen analyzer system must also be installed. This system is installed on the boiler. The 30-day rolling average oxygen level is to be maintained at or above the lowest hourly average oxygen level measured during the most recent performance test. The last performance test was in July of 2020. The lowest oxygen level measured during the testing was 6.6%. The oxygen monitor system monitors continuously. The data acquisition system for it compiles the data required. At the time of the inspection, oxygen levels in the boiler combustion chamber were 9.2%.

A one-time energy assessment by the time the lime injection system is installed is to be completed. This assessment was performed in November of 2009.

Design or Equipment Parameters

The COMS must be installed according to Performance Specification 1 of 40 CFR part 60, Appendix B. This system is installed per this criterion.

The design heat input rate for the boiler shall not exceed 216 MMBTU/hr. The nameplate heat input maximum to the boiler is 216 MMBTU/hr .

Stack/Vent Restrictions

There is one stack associated with the boiler. This stack is limited to a maximum diameter of 78 inches and a minimum height of 160 feet. The stack appears in compliance with criteria listed in the ROP and does not appear to have been recently altered.

Other Requirements

Notification shall be made to the AQD for the need to modify the CAM Plan if the existing plan is found to be inadequate. The CAM plan has not been modified and appears adequate.

All applicable requirements of 40 CFR, Part 64 are to be followed. By complying with the CAM specific conditions of this section, the facility is in compliance with 40 CFR 64.

All applicable provisions of the National Emission Standards for Hazardous Air Pollutants, as specified in 40 CFR Part 63, Subpart A and Subpart JJJJJJ for Industrial, Commercial, and Institutional Boilers Area Sources are to be followed. By complying with the conditions in this section, the facility is in compliance with all applicable parts of 40 CFR Part 63, Subpart A and Subpart JJJJJJ.

A site-specific monitoring plan for the oxygen analyzer system is to be developed. This monitoring system plan was submitted in December of 2015.

EUMILLTRANSFER

Equipment included a salt transfer system consisting of mills, conveyors, bucket elevators, screens, feed tanks, salt bagging equipment, and salt bulk loading equipment. Particulate control is through two wet scrubbers.

Emission Limits

PM emissions are limited to 0.10 lb/1000 lbs exhaust gas. Demonstration of compliance with this limit is through optimal control equipment operation. This is indicated by compliant scrubber differential pressure and flow rate readings taken and recorded. A review of records demonstrated compliance with this condition. Additionally, as described below, readings taken at the time of inspection indicated compliant operation of each scrubber.

Material Limits

There are no material limits associated with this equipment.

Process or Operational Restrictions

The compliant minimum liquid flow rate through the venturi scrubbers shall be included in the AQD approved MAP. The minimum required flow rate for each scrubber is 5 gallons per minute. At the time of the inspection, the northeast scrubber flow was 9 gpm and the northwest was 10 gpm.

Differential pressure gauges to determine pressure drop across each wet scrubber must be operated and maintained. The pressure drop range for the northwest and northeast scrubbers is 1-8 inches of water, gauge. At the time of the inspection, the northeast scrubber pressure drop was 2 and the northwest scrubber was 1.9 inches of water, gauge.

The wet scrubbers are to be in operation when the unit is operating. They were operating at the time of the inspection.

Design or Equipment Parameters

A differential pressure gauge and liquid flow rate indicator must be installed and operating on each wet scrubber. These instruments are installed and operational.

Stack/Vent Restrictions

There are no stack or vent restrictions associated with this equipment.

Other Requirements

There are no other requirements associated with this equipment.

EUPELLETCOOLING

This unit includes a water softener pellet product cooling system controlled by a venturi scubber.

Emission Limits

PM emissions are limited to 0.032 lb/1000 lbs exhaust gas. Demonstration of compliance with this limit is through periodic stack testing. This testing was last performed in May of 2023 and demonstrated particulate emissions of 0.0043 lb/1000 lbs exhaust gas..

Visible emissions are limited to 10% opacity. Demonstration of compliance with this limit is through visible emissions testing every five years. This testing was last performed in May of 2023 and demonstrated compliance.

Material Limits

There are no material limits associated with this equipment.

Process or Operational Restrictions

The wet scrubber is to be operating properly when the process is operating. At the time of the inspection, the scrubber was in operation. Proper operation includes compliant pressure drop and liquid flow values. The compliant pressure drop

range for the scrubber is 2.7 – 6.0 inches of water, gauge and the compliant minimum scrubber liquid flow rate is 20 gallons per minute. At the time of inspection, the pressure drop was 5.5 inches of water, gauge and the scrubber liquid flow rate was 36 gallons per minute.

Design or Equipment Parameters

The liquid flow rate indicator and differential pressure gauge are to be installed when the process is operating. This equipment was installed and operating at the time of the inspection.

Stack/Vent Restrictions

There is one stack associated with this EU. The maximum stack diameter is 21 inches, and the minimum stack height is 90 feet. The stack appears in compliance with criteria listed in the ROP and does not appear to have been recently altered.

Other Requirements

There are no other requirements associated with this equipment.

EUTM/BLOCK

This unit includes salt product process and packaging machinery for the production of salt and trace mineral blocks. Control of particulate emissions is through a baghouse. This equipment has not operated in the last 12 months and is currently dismantled and inoperable. It is anticipated that all permitted equipment will be removed from the facility by August of 2024.

EUBINTRANSFER

Equipment in this group includes material handling system consisting of conveyors and bucket elevators used to transfer salt to other processes within the facility. Control of particulate matter is through a wet impingement scrubber.

Emission Limits

PM emissions are limited to 0.027 lbs/1,000 lbs of exhaust gases. Demonstration of compliance with this limit is through optimal control equipment operation. This is indicated by differential pressure and liquid flow rate readings taken and recorded. Compliant ranges for the scrubber are 3 -10 inches of water, gauge for the pressure drop and a minimum of 5 gallons per minute of liquid flow. Readings taken at the time of the inspection were 9 inches of water, gauge and 13 gallons per minute.

Material Limits

There are no material limits associated with this equipment.

Process or Operational Restrictions

The wet impingement scrubber is to be installed and operating properly when the process is operating. The scrubber was operating at the time of the inspection.

The scrubber must have a differential pressure gauge and liquid flow rate gauge operating when the process is operating. These were in operation at the time of the inspection.

Design or Equipment Parameters

The scrubbers are to be equipped with a differential pressure gauge to determine pressure drop and a liquid flow rate gauge to determine the amount of liquid flow through the wet scrubber. The scrubber is so equipped.

Stack/Vent Restrictions

There are no stack or vent restrictions associated with this equipment.

Other Requirements

There are no other requirements associated with this equipment.

FGPELLPRETZEL

This group includes a totally enclosed pretzel salt production system which includes a main crusher, a pellet press, an screw conveyor, a recycle crusher, a bucket elevator, a sizing screener; and a water softener pellet production system which includes pellet briquetting machines, a vibratory screen, belt conveyors, bucket elevators, and an enclosed crusher to recycle pellets. Emission units include EUPELLPROD and EUPRETZELSALT. Control of particulate matter is through a baghouse.

Emission Limits

PM emissions are limited to 0.014 gr/dscf. Demonstration of compliance with this limit is through periodic stack testing. This testing was last performed in May of 2023 and demonstrated emissions of 0.0015 gr/dscf.

PM-10 and PM 2.5 emissions are limited to 3.96 lbs/hr. Demonstration of compliance with this limit is through periodic stack testing. This testing was last performed in May of 2023 and demonstrated emissions of 1.04 lbs/hr.

Visible emissions are limited to 7% opacity on buildings housing this group. Demonstration of compliance with this limit is through visible emissions testing via Method 22. This testing was last performed in January of 2021 and demonstrated compliance.

Material Limits

There are no material limits associated with this equipment.

Process or Operational Restrictions

The baghouse must be in operation when the process is in operation. At the time of the inspection, the baghouse was in operation.

Salt that is collected in and recovered from the baghouse shall be handled in a manner that minimizes the introduction of air contaminants to the outer air. Salt collected is re-entrained into the process.

The baghouse must be equipped with a differential pressure gauge. The baghouse is so equipped.

The compliant differential pressure range across the baghouse shall be included in the AQD approved MAP. This range, included in the MAP, is 1 – 5 inches of water, gauge. At the time of the inspection, pressure drop across this baghouse was 1.9 inches of water, gauge.

Design or Equipment Parameters

There are no design or equipment parameters associated with this equipment.

Stack/Vent Restrictions

There is one stack associated with this equipment. The maximum dimensions for this stack is 32 X 32 inches and the minimum height is 51 feet. The stack appears in compliance with criteria listed in the ROP and does not appear to have been recently altered.

Other Requirements

The facility is required to comply with all applicable requirements of 40 CFR Part 60, Subpart OOO. By complying with the condition of this section, the facility is demonstrating compliance with the Subpart.

FGRULE 287(c)

This group currently consists of one small coating booth with dry fabric filter control. This booth has been permanently dismantled.

FGCOLDCLEANERS

This group consists of one cold cleaner. It is serviced by the facility with disposal of spent solvents to an approved waste hauler. It was properly signed, had posted operation instructions, appeared in good condition, and was closed when not in use.

At the time of the inspection, this facility was in compliance with their air permitting.

NAME _____ DATE 1-31-24 SUPERVISOR _____