

**DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Scheduled Inspection**

B149327941

FACILITY: Michigan Sugar Company - Bay City		SRN / ID: B1493
LOCATION: 2600 S Euclid Ave, BAY CITY		DISTRICT: Saginaw Bay
CITY: BAY CITY		COUNTY: BAY
CONTACT: Steven Smock, Environmental Engineer		ACTIVITY DATE: 12/08/2014
STAFF: Sharon LeBlanc	COMPLIANCE STATUS: Non Compliance	SOURCE CLASS: MAJOR
SUBJECT: Site inspection as part of full compliance inspection- note RATA scheduled to begin was postponed by at least half a day.		
RESOLVED COMPLAINTS:		

On Monday, December 8, 2014, AQD District Staff conducted a scheduled site inspection at The Michigan Company Facility (MSC) (SRN B1493) 2600 South Euclid Ave, Bay City, Michigan. One Renewable C Permit (ROP) (MI-ROP-B1493-2011a) is associated with the referenced facility and was issued on March revised on July 2, 2013 and will expire on March 14, 2016. The last scheduled site inspection was cond December 6, 2012.

The facility was operating upon arrival, and AQD staff conducted site inspection activities with Arnel I (Environmental and Desugarization Engineer) and Steve Smock (Environmental Engineer). The purpose inspection was to determine compliance with the referenced renewable operating permit.

In conjunction with the site inspection, District Staff had intended to observe the annual CEMS Relative / Testing Audit (RATA) for FGBOILERS (Boilers No. 6 & 7) and EUBOILER8. A test plan for the RATA was by AQD staff on November 3, 2014, and commented on in a review letter issued by AQD TPU staff on Nove 2014. However, testers had not arrived onsite at the time of the inspection, and testing was completed la day.

FACILITY DESCRIPTION

The MSC facility is comprised of over 175 acres located in a mixed commercial, agricultural and residential Monitor Township and the City of Bay City, Bay County Michigan. Located on South Euclid Avenue facility extends as far south as Hotchkiss and west as Westside Saginaw Roads. The referenced 1 reported to have begun operation at that location in 1901 and has operated previously as Monitor Sugar C Information available from Bay County Property Appraiser website indicated that property associated former Monitor Sugar Facility extended east across Euclid Avenue with properties providing access to the and the Saginaw River. Facility Staff reported that the facility was rebuilt in the 1980's which is partially in the 1984 installation dates for pieces of equipment such as the Lime Kiln and pellet production area.

The principal product for the facility is granulated table sugars from sugar beets. Other MSC process include powdered and brown sugar; betaine (a nitrogenous compound found in molasses) that is used as and livestock feed; concentrated molasses solids (sucrose and nonsucrose solids), which are used as feed supplement; pressed beet pulp which is sold in bulk as cattle feed; pelletized dry beet pulp (bagged which is used for animal feed; and spent sugar beet lime sold/used as a soil enhancement/supplement.

Operations at the MSC Facility are seasonal, with sugar beet processing conducted during "campaign normally runs from mid-late September through February-March. Operations during a campaign are repor 24/7 until both onsite and off-site stored sugar beets have been processed. Historical files indicate campaign was normally approximately 150 days. More recently the sugar campaigns have lasted up to 1 plus in duration.

Sugar production and packaging operations as well as molasses desugarization activities can be co independent of the beet processing campaign and can/may be conducted throughout the year.

Temperatures just below freezing were noted at the time of the site inspection. No visible staining, distressed vegetation was noted in the immediate vicinity of the facility. In addition to proces (desugarization and fugitive odors from the diffuser and other processing equipment), odors noted incl pressed pulp (slightly sweet), and raw beets (musty/earthy) that were being unloaded.

Compliance History –

As indicated above the MSC facility is presently operating under an active ROP (MI-ROP-B1493-2011a).

During the week of December 24, 2011, District Staff was notified that emission calculations for EUANAEROBIC DIGESTER to be reported for the months of November and December 2011 would include apparent exceed the 20.14 lb/hr sulfur dioxide limit for the emission unit. MSC Representatives and their consultant District Staff on January 5, 2012, regarding the Rule 912 notices and concerns by the facility that emissions used at the time of the initial permitting (0.5% by volume) for EUANAEROBIC DIGESTER were higher than hydrogen sulfide emissions generated by the emission unit. As a result of laboratory analysis of collected from the facility during the 2011-2012 and 2012-2013 campaigns, it was determined that the emissions were significantly lower than factors used during permitting and that the average emission 0.0210% by volume would be used for future determinations of emissions. The proposed emission factor approved by District Staff in February 2014 and corrected monthly reports for the periods reflecting the emissions were submitted by the company. Copies of the data may be found in District files.

A file review illustrates that the Facility has had a history of nuisance odor and pond management problem have resulted, in part, in two Consent Judgments (CJ) (1987 and 2002) with the DEQ and the Facility's predecessor Monitor Sugar Company, operating at the same location as the current Facility. The two companies merged. The CJs were satisfied on June 14, 1996, and October 17, 2006, respectively.

Since 2006, a total of over 264 odor complaints have been received, and 84 odor surveys have been conducted. Ten Violation Notices (VNs) have been issued by AQD district staff for nuisance odors emanating from the facility. The following table presents a further breakdown of the odor complaints, odor surveys and violation notices for 2006 by calendar year.

Year	Total No. of Complaints	Total No. of Odor Surveys	Total No. of Odor Verifications	Total No. of 901 Violations
2006	79	22	19	3
2007	40	18	3	2
2008	14	3	0	0
2009 - 2010	9	1	1	2
2011	6	0	0	0
2012	28	4	3	2
2013	81	15	8	2
2014	86	43	25	3

As a nuisance odor complaint received during the calendar year and NPDES violation cited,

9, 2014 a joint enforcement notice was issued to the facility by DEQ Water Resources and AQD staff. The facility is presently working with DEQ staff to address issues believed required to correct ongoing/recurring issues/violations associated with the waste water treatment ponds.

In addition to the above referenced violation notices, violation notices were issued to the facility on September 12, 2012 and September 28, 2012 for failure to submit a CO Minimization Plan, Start-up/Shut-down and Maintenance (SSM) Plan and NOx/O2 CEMS Monitoring Plan within the timeframes outlined in PTI 245-10 for EUBOIL. At the time of the 2012 inspection report preparation, the CO Minimization Plan was determined to be deficient and the company notified. As a result a Consultant has been hired by the facility to prepare and submit the CO Minimization Plan and the SSM Plan. The last draft documents submitted on behalf of the facility were in December 2013. Requests have been made, and the company informed of the outstanding violation notices. Approvable documents have not been received as of the time of this report.

At the time of the inspection, the company had attempted to complete stack testing of EULIMEKILN by December 1, 2014, deadline, and was notified verbally that they were in violation of the ROP Condition. Testing activities were attempted on November 20, 2014, however based on electrical problems and other issues (including low and/or negative flow rates) testing was unable to be completed. Testing was not completed by December 1, 2014, as required by the ROP, and a violation notice was issued December 29, 2014. The facility responded on January 12, 2015.

AQD Staff met with MSC staff and their consultant on December 18, 2014 to discuss other testing options and potential ROP minor modification to reflect changes in operation of the emission unit. These changes include operation of the unit with the two kiln stacks closed, redirecting all gases thru the pressure relief valve to the pressure header for the carbonation tanks/system, notification of District to any changes in operation of EULIMEKILN with respect to stacks, and emission testing at the pressure relief valve.

An ROP Minor Modification application was received for most of the proposed changes on January 20, 2015 and PM testing for EULIMEKILN at the proposed pressure relief was conducted on January 22, 2015. A set of supplemental conditions (to be incorporated into the ROP modification) to address operational changes for EULIMEKILN was sent to the company on January 23, 2015. At the time of this report, no agreement between the company and DEQ on the conditions has occurred.

Processing Activities and Equipment - The sugar beet processing operations are comprised of several steps including cleaning, washing, slicing, diffusion, juice purification using milk of lime, evaporation, crystallization, dried-pulp pelletizing, and sugar recovery from molasses. The following process description was determined from PTI applications and reports available in District Files as well as discussions with facility staff. CaO and SO₂ among other process additives are used to adjust pH in the various process stages to achieve the desired product.

Primary process steam is provided by three natural gas fired boilers. Heat and/or air conditioning are provided by the boilers and numerous exempt gas heaters.

Emission Unit	Heat Input -- lbs steam/hr	Comments
EUBOILER#6	180 million BTU/hr-- 150,000 lb steam/hr	
EUBOILER#7	180 million BTU/hr-- 150,000 lb steam/hr	
EUBOILER#8	243 million BTU/hr—200,000 lb steam/hr	Installed 2012
Summer Boiler	Exempt NG/oil-fired	Stand by for heating during non-campaign cool weather

Cleaning & Slicing –

Sugar beets received by MSC are staged both on and off-site for processing during the campaign. At the start of processing sugar beets are unloaded into one of two sugar beet receiving pits, loaded into the dry screw conveyor and dropped into the beet flume. The beet flume is the wash system that is used to transport the beets into the slicer and remove rocks, dirt and vegetation from the beets. From the beet flume, the beets move onto the belt conveyor which transports the beets up to the 4th floor and an additional wash system. From here the beets and water are separated, the beets go into the slicer(s), and the water associated with both the flume and washer goes to a clarifier whose underflow is sent to the mud setting ponds. The clarifier effluent and the clarified mud pond water are reused in the process. Excess flume water overflows from the mud ponds to the MSC Waste Water Treatment Plant (WWTP) which is composed of various settling/pretreatment ponds and anaerobic digester (AOD) system with flare, clarifier, and several aeration ponds. Residual vegetation and other organics are land applied.

Diffusion –

Sliced beets (cosettes) cross a weigh belt and are conveyed to the diffusers (aka diffusion towers). The diffusion system is reported to consist of a counter-current diffusers, with a capacity of approximately 49,000 tons per day. Cosettes are mixed with hot juice and pumped to the bottom of the tower. As the mixture travels up the diffuser hot water is added to the top, and the liquid/ raw juice travels down leaching sugars as well as other sugar compounds from the cosettes. Liquid/raw juice leaving the diffuser is sent to the pre-limer and mill for further processing.

Beet solids (aka beet pulp or wet pulp) from the diffuser is sent to pulp press. Liquids generated during diffusion activities are sent to the diffuser, and the pressed pulp is either sold as pressed pulp or is sent to the pulp mill. The pressed pulp is used by local farmers as animal feed, sales directly impacts the volume of pulp sent to the mill.

dried, and pellet production.

Dried Pulp Pelletizing-

Pressed pulp is sent to EUSTEAMDRYER where it is heated by non-contact steam. Steam generated during drying of the pressed pulp is captured and sent to the first evaporator. The moisture content of the pressed pulp is reported to be approximately 70-75%. The moisture content of the dried pulp reported to be typically 8-12%. Dried pulp can be either sold as shreds or pellets.

In the pellet production area (EUPELLETPRODUCTN), dried pulp is transferred to pellet mills, where the pulp is pressed into pellets and cooled in one of two pellet coolers (one vertical and one horizontal) exiting the mills are reported to be at approximately 75 degrees C and are cooled to approximately 30 degrees C in a pellet cooler. The cooler uses a fan to draw ambient air through the moving bed of pellets. The two pellet coolers have the capacity to cool up to 850 tons of beet pulp pellets per day. Cooled pellets are transferred by conveyor for storage into an approximately 5,000 ton silo onsite.

Juice Purification using Milk of Lime –

The lime kiln (EULIMEKILN) burns coke or anthracite coal to heat limestone rock producing calcium oxide and carbon dioxide gas (referred to as calcining). The carbon dioxide gas is cooled and purified in the gas cooler and the gas is used for purification/processing of the raw juices. Heated CaO is mixed with sweet water in a slaking drum to produce calcium hydroxide $[Ca(OH)_2]$ or “milk of lime” that is used for the purification/processing of raw juice.

The raw juice from the cossette mixer and diffusion towers go into the pre-carbonation tank(s) and then increased by the addition of limed juice from the intermediate liming tank and then reduced again using carbon dioxide gas from the lime kiln.

The alkaline juice is pumped to the intermediate liming tank and approximately 35% of the milk of lime used for processing is added to the juice. Part of the limed juice is pumped back to the pre-carbonation tank(s) where the balance is heated and fed into the main liming tank(s) where the remaining 65% of the milk of lime is added and reacts with the milk of lime the juice is pumped to the first carbonation tank(s) where it is again treated with carbon dioxide gas. The milk of lime and carbon dioxide cause the formation of a precipitate which captures impurities found in the beet juice. The beet juice from this stage is known as “first carb” juice.

First carb juice is pumped through another heater and is sent to a clarifier where the mud is allowed to settle, leaving a clear juice. The mud is further pressed and the filtrate known as “sweet water” is sent to the lime kiln where it is added to CAO to produce milk of lime. The filter cake which consists of calcium carbonate, lime, sugar impurities and insoluble materials such as filter aid and sand is sent to the spent lime storage area.

Clarified juice is heated and pumped into the second carbonation tank(s) for further purification with carbon dioxide. The carbonated juice is sent thru pressure leaf filters to remove precipitate. The resulting filtrate is light yellow in color and is referred to as “thin” juice. The precipitate cake is recycled in the carb juice production cycle, with the resulting sweet water re-entering the lime slaker and the filter cake being sent to the spent lime storage area.

The thin juice produced in the second carbonation tank(s) is treated with SO₂ (sulfitation process) from 90 tanks to control juice color.

Evaporization –

After the sulfitation process the juice is heated and concentrated in the steam heated evaporator to produce “thick” juice. During evaporation the dry substance content of the juice increases from approximately 16% and becomes a dark yellow to light brown in color.

From this point the thick juice passes thru a three step crystallization process to separate sugar, lime and impurities. Producing three grades of sugar product (white sugar, high raw and low raw) which are g

purity of the sugars.

Crystallization –

High raw and low raw sugars are melted into the thick juice to produce “standard liquor”. The standard is boiled in a vacuum pan to produce the white sugar crystals. The crystals are separated from the centrifuge processing, then dried (aka granulated), cooled, and stored for a short while to condition them for later packaging or processing into powdered and brown sugar products.

The separated liquid is sent to another vacuum pan for the second crystallization. The crystals produced are separated during centrifugal processing from the liquids, with the remaining liquids crystallized during vacuum pan and centrifugal processing to produce the low raw sugar and molasses (apx. 60% sugar molasses can be either sold as product or further processed to recover additional sugars).

Sugar Recovery –

The molasses desugarization process (EUMOLASSEDESUG/FGRULE290) utilizes chromatographic separation to further extract sugar and other products from the molasses. During the molasses desugarization process, molasses is diluted, filtered and degasified. The pretreated molasses is fed into a system of separation operating as a continuous loop. Water is added while a dilute sugar rich fractionation “extract” is removed. The system operates continuously with an inflow of diluted molasses and water and a simultaneous outflow of enriched extract and non-sucrose by-products.

The dilute sugar enriched extract and non-sugar molasses fraction are processed in an evaporation station. Steam heat is used to evaporate some of the water concentrating the sugar enriched extract.

The condensate water produced is cooled in the cooling tower (EU-COOLINGTOWER). The condensate contains ammonia, which is extracted along with sugar from the beets during the sugar making process. Waters from the tower are recycled in the process, reducing the quantities of additional fresh water drawn from the Saginaw River, and reducing the volume of process waters going into the waste water treatment system facility.

The concentrated sugar enriched extract is sent to storage tanks to be processed some of which occurs during the sugar beet campaign. The concentrated non-sugar molasses by-products (concentrated solids) are sold for use as liquid cattle feed, as a de-icing product, dust control materials and as a briquetting and/or pelleting dry materials.

Rule 285(DD) Exempt Equipment -- In addition to the above process equipment, the facility has a number of pieces of pollution control equipment that had been permitted under previous PTIs for the facility and were included in the ROP for the facility prior to the May 13, 2009, amendment. These pieces include the following:

- DVPOWDERSUGFILTR – pulse jet baghouse for collecting PM from powdered sugar milling and packaging
- DVROTOCLONE-CLR – rotoclone cyclone for collecting particulate from sugar cooler.
- DVROTOCLONE-DRY – rotoclone cyclone for collecting particulate from sugar dryers.
- DVSUGARPKGFILTER – shaker type baghouse (manually operate)
- DVPOWDERSUGARCYLON – single cyclone for collecting PM from vacuum system when sugar is in the packing room, warehouse and sugar silo#1 processes.
- DVFABFILTER#1 -- pulse jet baghouse for collecting particulate from sugar silo#1 processes,
- DVVACFABFILTER – manual shaker type baghouse for collecting particulate from vacuum process to recover sugar from silo floors and sugar silo#2 processes.

Sugar packaging activities are reported to be conducted year around at the MSC Bay City Facility.

Facility Changes - In the past few years a number of projects/changes have been made at the facility include:

- Replacement of the five previously existing slicers with two larger slicers and automated sh stations/equipment (completed in summer 2012) and
- Installation of three new pulp presses (completed in summer 2012), to replace existing pulp presse
- Construction of a new diffuser to replace one or both of the counter flow units (installed in 1960 ar for the 2013-2014 campaign.
- Installation of a concrete slab behind the limekiln to store limestone used in the limekiln. The storage location was near Euclid Ave.
- Installation of an odor neutralization system (Odor Management Inc.) for the aeration ponds locate west side of the facility (April 2014).
- Modification of cooling tower fans, change in blade pitch to increase cooling efficiency. Flow thru on pumps, no thruput change is reported.
- Replacement of cooling tower pumps (three total)(summer 2014) and installation of VFD pump (September 2014).

Nonexempt projects included the removal of Boiler #5 and installation of Boiler #8 (Summer 2012). In cor with the installation of Boiler #8, the facility removed the three previously decommissioned rotary pulp dry site.

Operational Issues - Since the 2009 Site Inspection, there have historically been some operational i record for the Anamet Tank (EUANAEROBICDIGESTER).

Date	Issue	Comment
November 2010	Totalizer not properly operating. Metcaff & Eddy calculations used to estimate emissions.	Repaired January 4, 2011
December 24, 2011	Emission calculations for months of Nov. & Dec. 2011 indicated apparent exceedances of 20.14 lb/hr SO2 limit.	RESOLVED - Facility initiate activities to determine actu emissions. Permit assumed 0.5% b volume. Final report submitte 11/15/2013. Avg. emission rat based on 12 samples was 0.0210' use of rate for emission calculatio approved by District February 2014.
November 2012	Malfunctioned biogas flow meter estimates were based on average biogas production per lb of COD recorded per day for the period of September 25, 2011 thru November 11, 2012	biogas flow meter was repaired on c before December 1, 2012
February 28, 2013	Malfunctioned biogas flow meter for January 2013. biogas flows were calculated based on COD removal.	RESOLVED - Replacement of flo meter made during interim campaig period for 2013.

The facility reports no operational issues since the 2013 meter replacement activities.

COMPLIANCE EVALUATION

Operational Status – During the onsite inspection, the facility (with the exception of the pellet production) is operating. Facility personnel reported that the limekiln starts up a couple days earlier than the rest of the facility to achieve operating temperatures for campaign. Once a campaign is initiated, MSC staff report that with the exception of the steam pulp dryer and the pellet production equipment that the facility operates 24/7 with production rates until the end of the campaign to achieve the most efficient output.

Campaign	Total Days of Slice	Days for Juice Run	Volume of Beets processed	Avg. Slice Rate *
2008-2009	182	36	1.46 million tons	362 tons/hr
2009-2010	159	24	1.4 million tons	355 tons/hr
2010-2011	186	24	1.6 million tons	362 tons/hour
2011-2012	175	27	1.5 million tons	294 tons/hour
2012-2013	208	22	1.8 million tons	360 tons/hr
2013-2014	186	21	1.5 million tons	336 tons/hour
2014-2015	Started up Sept. 5 th , 2014		unk	

*as reported by company.

At the time of the December 2012, inspection a slice rate of apx. 405 tons per hour was reported. It is important to note that slice rate will slow down as the beets being processed are frozen, and as beet quality decreases as the campaign progresses.

As previously indicated, the facility operates three natural gas fired boilers during the campaign. All three referenced boilers were installed with low NOx burners and flue gas recirculation. In addition, all three boilers have been installed or modified with ductwork to pull in heated air generated in the sugar processing portion of the facility minimizing the degree the input air into the boilers needed to be heated and the natural gas consumed by the boilers. It is also possible that fugitive emissions from the desugarization and other process activities can be captured and combusted in the boilers resulting in lower levels of process odors.

At the time of inspection the MSC Bay City Facility had one steam dryer (EUSTEAMDRYER). This unit was installed in 2006 to replace three direct-fired, natural gas pulp dryers onsite.

At the time of the inspection the pellet milling operations, basement silo conveyor and the associated equipment were not in operation. Hours of operation for the pellet production area vary with production/demand. At the time of the inspection, the facility was in the process of producing pressed pulp for a contract.

Operational conditions included in the ROP for EULIMEKILN include the installation, maintenance and operation of the associated wet scrubber. The equipment is installed and is maintained and operating; however this operational condition was contested in the ROP Renewal application by MSC at which time they labeled the equipment as a gas washer and stated that it was not a control device, but a piece of process equipment that is required for the purification and filtration process for sugar production. During the December 2014 discussions regarding EULIMEKILN testing issues MSC stated that the unit is more accurately a gas quencher. CO2 gas produced during limekiln travels through the gas washer (where some particulates maybe removed) and into the carbonate limekiln where it is used to precipitate out excess lime (CaO) from the juices in the form of calcium carbonate. During Limekiln testing activities conducted on January 22, 2015, Facility Staff described the gas washer as a bubble diffuser, the gases moving thru approximately 10-inches of water before entering the process tank.

The facilities WWTP was in operation, including EUANEROBIC DIGESTER. No operational problems were noted at the time of the inspection with reference to the emission unit or its associated flare. However, as previously noted there have been some operational issues with the totalizer and the flow meter within the past few years which have been resolved with the replacement of the components.

Material Usage Rates – A wide variety of materials are associated with MSC facility operation and production processes. Most notable are natural gas used to run the three steam generating boilers, the raw sugar

processed onsite, as well as the coke or anthracite coal and limestone associated with the lime kiln. Note facility requested approval to allow use of anthracite coal instead of coke as a fuel for the lime kiln in 2013.

EUBOILER8 and FGBOILERS (EUBOILER#6 and #7) are boilers used to provide process steam and heat facility. By permit the referenced emission units are limited to Natural Gas fuel. In addition, FGBOILERS limits the ratio of actual heat input for 12 consecutive calendar months to the maximum potential heat input on an operation of 8,760 hours to a maximum ratio of 0.50. Heat input data provided for the period of September 2012 through December 2014 for FGBOILERS indicated that heat input for the referenced boilers was below 0.50 ROP heat input limit. No material use limits exist for FGBOILERS. EUBOILER8 is limited to pipeline Natural Gas as fuel.

Previously reported material use rates associated with EULIMEKILN consist of approximately 25 tons of coke per day. Coke shipments are received on almost a daily basis. Permit conditions require record keeping and use for the referenced emission unit to either anthracite coal or coke. No material use limits exist for the referenced emission unit.

Operational Parameters –

With the exception of the emission units addressed, no operational limits are presented in the existing RC facility.

EULIMEKILN

Process restrictions/conditions for the referenced emission unit are limited to installation, maintenance and operation of the wet scrubber (aka gas washer/quencher) which is to be operating satisfactorily. At the time of inspection, all process equipment was reported to be operating properly and in general compliance with permit for the facility.

It should be noted however, that the requirement for the installation and operation of the gas washer (quencher) has been requested to be removed by MSC in the 2011 ROP Renewal application. The facility reports that the washer/quencher is not pollution control equipment but is part of the process equipment associated with the carbonization process. It was determined at the time of the 2011 ROP Renewal, that the requirement should be handled as a permit modification, as the requirement was from the Permit to Install for the emission gauges or other monitoring components are reported to be present for the gas washer/quencher. No application for a permit modification for the lime kiln (PTI 458-84) has been received from the facility to date to remove the requirement.

EUPELLETPRDCTN

Process restrictions associated with EUPELLETPRDCTN require the presence of plant personnel in the basement conveyor area for operation of the basement conveyor wall vent. MSC personnel have historically reported that the wall vent had been installed for the purpose of employee comfort and safety, during operation of the facility and is only operated when staff are present in the basement. The referenced conveyor loads out pellets from the silo bottom to the hoppers. No personnel were present at the time of the inspection, and the vent was not in operation. It should be noted that the vent at the time of the original PTI application vented directly outside. The permit was modified to reflect the connection of the vent to the dust collection equipment associated with the facility.

Conditions associated with EUPELLETPRDCTN also specify that all vehicles transporting pellets off the site will be covered or otherwise enclosed. In addition, the ROP requires that the pellet silo unloading elevator be equipped with an extendable chute to minimize the pellet drop height to a maximum of 6-inches above the vehicle bed (the ROP has a typo that indicates the conditions are for when the vehicle is being "unloaded" when vehicles were being loaded or leaving the site at the time of inspection to confirm compliance for the permit conditions.

EUSTEAMDRYER

Operational limits/conditions associated with EUSTEAMDRYER were identified in the existing ROP. Refer to the ROP for details.

dried pulp production are maintained as part of standard business practices, and include daily, we monthly totals, as well at "to date" totals of production. No limits are associated with this emission unit.

EUANAEROBIC DIGESTER

The referenced emission unit is part to the MSC WWTP and includes an anaerobic digesting system ("A tank) equipped with a flare which acts as a pollution control device. Conditions in the ROP for the facility that the anamet system will not be operated unless a spark-ignited flare pilot at the flare is installed and in a satisfactory manner. It also requires that flow of biogas to the flare shall stop if the flare fails to ignite time of the site inspection, the flare was operating, and MSC staff reported that no malfunctions had since the 2009 inspection date.

As design/equipment parameter conditions, no detectable emission from the pressure-relief device on the is allowed, except during malfunction. The permittee is required to conduct an inspection of the press device within 2 working days of a pressure release and at least once annually. Documentation provided that the emission unit is being inspected semi-annually. Per MSC staff, the pressure relief valve is under pressure and activates at approximately 12 psi of pressure. The pressure release device prevents damage to the anamet tank.

Emission Points –

EUBOILER#8 and FGBOILERS (EUBOILER#6 and #7)

The referenced emission units are natural gas fired boilers used to provide process steam and heat to the facility. Emission limits associated with the emission units are NOx and CO. The EU is equipped with CEMs for measuring NOx and O2. Required data is submitted quarterly and semi-annually.

The facility upon request provided the following emissions data for review for the October 1, 2013-December 31, 2014 period:

- **EUBOILER#8**
 - o Daily Gas usage in MCF
 - o NOx Emissions (lb/MMBTU)(daily)
 - o NOx Emissions (30-day rolling average)(daily)
 - o NOx Emissions (lb/hr), (daily) and
 - o Nox Tons/yr (12-month rolling total)(monthly)
- **FGBOILERS**
 - o Daily Gas usage in MCF
 - o NOx Emissions (lb/MMBTU)(daily average)
 - o NOx Emissions (lb/hr), (daily) and
 - o Nox Tons/yr (12-month rolling total)(monthly)

EULIMEKILN

The role of the lime kiln in the process, is the production of CO2 gas and CaO from limestone and coke/coal for purification and filtration of liquid sugars. Emission limits associated with this EU include SO2

from two stacks (approximately 185 feet high) associated with the lime kiln. No method for monitoring of PM emission limits was identified in the ROP. Based on information in the original PTI application, it that PM may be controlled by the gas washer associated with the carbonization system, but there are no testing/formal quantification/verification of PM emission values associated with EULIMEKILN in the District.

Daily visible emission surveys are required for opacity from SVLIMESTACK1 & 2. The facility reports that emission surveys were not recorded for emission unit since the permit renewal, and represented an over their part of a new permit condition.

SO₂ emissions are determined based on sulfur content of the coke used in the equipment. Sulfur content is determined by laboratory analyticals records of which are submitted to MSC by the vendor. In addition, the facility conducts verification sampling and analysis once per campaign in compliance with permit conditions. Laboratory analyticals provided for both anthracite coal and coke samples collected by the facility for the 2014 campaign, reported sulfur concentrations of 0.63% and 0.71% percent sulfur (dry basis) content for anthracite coal and coke samples, respectively.

EUPELLETPRODCTN

This emission unit is associated with the pellet production area and consists of two pellet coolers, conveyor, and associated storage silo. Particulates are the identified air contaminant associated with this process and control devices for the pellet production area consist of one cyclone for each of the two pellet coolers and an additional cyclone for the material handling and conveyor area. All three cyclones are in parallel and connected to a wet scrubber to control PM. Material collected as a result of the three cyclones is returned to the pellet processing. Note that the files indicate that prior to 1987-1988 the wall vent in the silo basement vented directly to the outside. The original PTI for the equipment was modified to connect the wall vent with the existing control equipment, with the material being drawn in by the fans associated with the existing control devices.

The ROP requires MSC to equip and maintain the wet scrubber with instrumentation to continuously measure pressure drop, instrumentation to measure the flow in the scrubber and an audible alarm which will sound if flow stops. At the time of the inspection, EUPELLETPRODCTN was not in full operation, however wet scrubber was inspected, and AQD staff verified that MSC staff are monitoring the pressure drop across the wet scrubber using a manometer, and that an audible alarm was installed.

As no pellet loading or transport activities were being conducted at the time of the site inspection, confirm compliance conditions associated with those activities could not be made.

EUANEROBICDIGESTER

Emissions associated with EUANEROBICDIGESTER include SO₂, which are controlled by the flare associated with the anamnet tank. Biogas generated in the tank is burned off at the flare, or is released from a pressure relief valve for the anamnet tank. At the time of the PTI application for this emission unit the anticipated composition of biogas was CH₄ (65%), CO₂ (29%), H₂O (5%), H₂S (0.5%) and N₂/H₂ (trace). SO₂ emission limits were determined based on conversion factor of 64 lbs SO₂ per 34 lbs of H₂S. This resulted in emission limits of 20.14 and 36.10 ton/year, respectively for SO₂. As previously noted, based on laboratory analysis of gas samples collected from the facility during the 2011-2012 and 2012-2013 campaigns, it was determined that the actual emissions were significantly lower than factors used during permitting and that the average emission factor of 0.03 volume would be used for future determinations of emissions. The proposed emission factor was approved by District Staff in February 2014.

Records of gas flow are kept on a daily basis. Monthly reports are submitted by the facility to the District Staff indicating the daily average biogas flow (cubic feet/day), the daily average SO₂ emissions (lb/hr), daily maximum SO₂ emissions (lb/hr), monthly total SO₂ emissions (tons) and 12 month rolling total SO₂ emissions (tons). Reported emissions are in compliance with permit limits.

Under the present permit the facility is required to conduct an inspection within two days of a pressure relief valve release or once a year to determine if there are detectable emissions. "No detectable emissions" is defined in the ROP as an instrument reading of less than 500 ppm above background by EPA Method 21 (VOCs) or equivalent. The Facility reported the most recent inspection was conducted August 29, 2014, using a MSA Altair 51F.

methane and CO2 concentrations. Concentrations were reported in percent (%) rather than in ppm as rec permit.

EUCOOLINGTOWER

Initially approved under a PTI in July 2001, MSC installed a three cell, water cooling tower to cool proces from the condensers. The tower allows for use of recycled/cooled water in the process, reducing the qua additional fresh water drawn from the Saginaw River, and reducing the volume of process waters going waste water treatment system for the facility.

Emissions associated with the process are the result of ammonia in the condensate waters. The am extracted along with sugar from the beets during the sugar making process, but remains in the water u sugars which are removed in the process. Emission limits for the referenced emission unit are listed as based on a 24-hour average. Maximum flow by permit is 10,500 gallons per minute. In addition, the f required to record ammonia concentrations (ppm) three times per week. A review of data presented for . 2014 indicated that the EU was in general compliance with the permit conditions.

FGRULE290

The molasses desugarization process (EUMOLASSEDESUG/FGRULE290) utilizes chromatographic sepa further extract sugar and other products from the molasses. During the molasses desugarization pro molasses is diluted, filtered and degasified. Equipment associated with molasses desugarization proces: extract and molasses scales, dilute and heavy molasses tanks, extract storage and supply tanks, r bodyfeed tank, molasses precoat tank, sluice tank, upgrade supply tank, raffinate (concentrated molasse supply and betaine supply tanks. Emissions of water vapor and VOCs are anticipated to be present as a the process activities, with both the steam and VOCs going into condensate.

Emission testing conducted in June 2004 on emissions based on filling and breathing losses from the supply tank and addressed citrate, malate, lactate, formate and acetate compounds identified in mola emitted as acids (citrate as citric acid, etc.). Based on throughput volumes reported during the time of tes VOC emissions of approximately 12 lbs per month were reported, well below the 1,000 lbs of VOC pr allowed under Rule 290. No visual emissions were noted in the molasses desugarization process area.

Monitoring and Testing –

EUBOILER8 and FGBOILERS (EUBOILER#6 and #7)

The referenced emission units are natural gas fired boilers used to provide process steam and heat to the FGBOILERS (EUBOILER#6 and #7) are equipped with Low NOx Burners and Flue Gas Recirculation, and stack each. Emission limits associated with FGBOILERS include NOx and CO. Emission limits for EU include NOx, CO and PM 2.5.

CEMS - The EUs are equipped with CEMs for monitoring NOx and O2. The referenced CEMs are c automatically on a daily basis with appropriate standards. The CEMS are reported to automatically alarm instrument calibration drifts outside of acceptable ranges. Documentation of CEMs emission readi calibration data is maintained electronically at the facility, and is obtainable by facility staff upon reques calibration data is requested and reviewed independent of site inspection activities. The most recent revi records in general compliance with the ROP.

Cylinder Gas Audits are conducted quarterly for each CEMs unit, with annual Relative Accuracy Test Aud activities have historically been conducted in December and the most recent tests are summarized below.

RATA DATE	Emission Unit	Parameters	Pass or Fail
12/8 & 9/2014	Boilers 6,7,8	NOx & O2	Not received to date
12/17 & 18/2013	Boilers 6,7,8	NOx & O2	Pass
12/18 & 19/2012	Boilers 6,7,	NOx & O2	Pass

11/20/2012	Boiler 8	NOx & O2	Pass
12/7 & 8/2011	Boilers 5,6,7	NOx & O2	Pass
12/8 & 9/2010	Boilers 5,6,7	NOx & O2	Pass

It should be noted that during a January 22, 2015, site visit to observe Lime Kiln Stack testing, that AQD verbally notified that the O2 CEMS for EUBOILER#7 had failed, and a new one had been installed over the weekend. Facility staff were in the process of scheduling the required activities for the new unit.

Boiler Operational and Emissions - The facility upon request provided the following emissions monitoring review for the October 1, 2013-December 31, 2014 period:

- EUBOILER#8
 - o Daily Gas usage in MCF
 - o NOx Emissions (lb/MMBTU)(daily)
 - o NOx Emissions (30-day rolling average)(daily)
 - o NOx Emissions (lb/hr), (daily) and
 - o Nox Tons/yr (12-month rolling total)(monthly)
- FGBOILERS
 - o Daily Gas usage in MCF
 - o NOx Emissions (lb/MMBTU)(daily average)
 - o NOx Emissions (lb/hr), (daily) and
 - o Nox Tons/yr (12-month rolling total)(monthly)

The referenced data provided appeared to be properly maintained and in general compliance with requirements.

Required reporting data is submitted quarterly and semi-annually by the facility, (copies of which are on 1 District Office).

Per the ROP, emissions testing are required for EUBOILER8 for PM 2.5, NOx, and CO exhaust gases. The testing was conducted on November 20, 2012, in compliance with the permit. Testing results reported that emissions were below appropriate permit limits.

EULIMEKILN

Under the present ROP the permittee is required to keep monthly records of the amount of coke/anthra used in the lime kiln, as well as to monitor and keep records of the sulfur content of the coke/anthracite of the lime kiln on an intermittent basis. The records are to include the percent sulfur content and the heat BTUs per pound of fuel.

In addition the permittee is required to maintain a record of the coke analysis of all shipments, and co independent verification sampling at least once per sugar campaign. Laboratory analyticals provided for collected by the facility for the 2013-2014 campaign, reported sulfur concentrations for both composite sa anthracite coal and coke. MSC staff provided the required records as part of the site inspection activities.

In addition, as a condition of the present ROP, the facility is required to test both stacks of EULIMEKILN and PM emissions. As previously discussed, stack testing activities were attempted on November ; however based on electrical problems and other issues (including low flow rates) testing was unak completed. Testing was not completed prior to December 1, 2014, as required by the ROP, AQD Staff MSC staff and their consultant on December 18, 2014 to discuss other testing. SO2 and PM te: EULIMEKILN at the proposed pressure relief was conducted on January 22, 2015.

EUPELLETPRDCTN

Monitoring activities associated with EUPELLETPRDCTN included monitoring of the differential press across the wet scrubber and three cyclones associated with the production area. The referenced reac recorded manually once per shift, meeting the once per calendar day required under the facilities ROP.

In addition to the audible alarm installed to go off if flow was stopped to the wet scrubber MSC staff has ir visual alarm in the form of a light which shuts off under alarm conditions. MSC staff indicated that th alarm is tested whenever the flow has to be shut off for the wet scrubber. The logs kept for EUPELLETT also included documentation as to whether flow was present for the wet scrubber. Copies of handwri reviewed and copies provided appear to be sufficient to meet compliance requirements.

EUANEROBICDIGESTER

Monitoring activities associated with EUANEROBICDIGESTER include monitoring and recording on a da the mass flow rate of methane gas and hydrogen sulfide gas going to the flare. In addition the per required to keep a record of each pressure release and each pressure-relief device inspection. With daily kept as log sheets, which are input into electronic databases. Records were found to be in general co with permit conditions.

EUCOOLINGTOWER

Emissions associated with the process are the result of ammonia in the condensate waters. The am extracted along with sugar from the beets during the sugar making process. ROP requirements monitoring and recording of the ammonia concentrations and water pump discharge pressure for the minimum of three times per week. A review of data presented for 2013 and 2014 indicated that the fac operating in general compliance of the permit.

Record Keeping and Reporting –

A review of reports received to date appear to indicate that the required reporting under the ROP conducted in a timely basis. This reporting includes monthly reporting of emissions associa EUANEROBIC DIGESTER, quarterly testing of the CEMS associated with EUBOILER#6 through #8, a annual operation and deviation reports for the facility.

EUPELLETPRODCTN

As previously indicated, monitoring activities associated with EUPELLETPRDCTN included monitorin differential pressures for the three cyclones as well as the differential pressure drop and flow across scrubber. As previously indicated the differential pressures and flow data is recorded once per shift, me once per calendar day required under the facilities ROP. No supplemental reporting is required for this unit.

EUANEROBICDIGESTER

A review of District files indicates that monthly reports of biogas associated with the ANAMET tank h submitted in a timely manner. Records of gas flow are kept on a daily basis. Monthly reports are submit facility to the District indicating the daily average biogas flow (cubic feet/day), the daily average SO2 e (lb/hr), daily maximum SO2 emissions (lb/hr), monthly total SO2 emissions (tons) and 12 month rolling t emissions (tons). Emissions reported have been in compliance with permit conditions.

SUMMARY

On Monday, December 8, 2014, AQD District Staff conducted a scheduled site inspection at The Michigan Company Facility (MSC) (SRN B1493) 2600 South Euclid Ave, Bay City, Michigan. One Renewable C Permit (ROP) (MI-ROP-B1493-2011a) is associated with the referenced facility and was issued on March revised on July 2, 2013 and will expire on March 14, 2016.

The facility was operating upon arrival, and AQD staff conducted site inspection activities with Arnel I (Environmental and Desugarization Engineer) and Steve Smock (Environmental Engineer). The purpose of the inspection was to determine compliance with the referenced renewable operating permit.

The last scheduled inspection for the facility was conducted on December 6, 2012. Facility changes since then include the following:

- Replacement of the five previously existing slicers with two larger slicers and automated shredders (completed in summer 2012) and
- Installation of three new pulp presses (completed in summer 2012), to replace existing pulp presses
- Construction of a new diffuser to replace one or both of the counter flow units (installed in 1960) for the 2013-2014 campaign.
- Installation of a concrete slab behind the limekiln to store limestone used in the limekiln. The storage location was near Euclid Ave.
- Installation of an odor neutralization system (Odor Management Inc.) for the aeration ponds located on the west side of the facility (April 2014).
- Modification of cooling tower fans, change in blade pitch to increase cooling efficiency. Flow through pumps, no throughput change is reported.
- Replacement of cooling tower pumps (three total)(summer 2014) and installation of VFD pump (September 2014).

Nonexempt projects included the removal of Boiler #5 and installation of Boiler #8 (Summer 2012). In connection with the installation of Boiler #8, the facility removed the three previously decommissioned rotary pulp dryers from the site.

Compliance issues associated with the facility since summer 2012 include:

- MSC Representatives and their consultant met with District Staff on January 5, 2012, regarding the notices for EUANAEROBIC DIGESTER and concerns by the facility that emission factors used at the time of the initial permitting (0.5% by volume) for EUANAEROBIC DIGESTER were higher than actual sulfide emissions generated by the emission unit. As a result of laboratory analysis of samples from the facility during the 2011-2012 and 2012-2013 campaigns, it was determined that the actual emissions were significantly lower than factors used during permitting and that the average emission factor of 0.0210% by volume would be used for future determinations of emissions. The permit emission factor was approved by District Staff in February 2014 and corrected monthly report periods reflecting the lower emissions were submitted by the company. This issue is considered resolved.
- Ongoing nuisance odor and pond management problems have resulted in increased odor complaints (81 complaints) and 2014 (86 complaints). Due to ongoing odor complaints and NPDES violations, a joint enforcement notice was issued to the facility on June 9, 2014, by DEQ Water Resources staff. The facility is presently working with DEQ staff to address issues believed required to resolve ongoing/reoccurring issues/violations associated with the waste water treatment ponds.
- Violation notices were issued to the facility on September 19, 2012 and September 28, 2012 for

submit a CO Minimization Plan, Start-up/Shut-down and Malfunction (SSM) Plan and NOx/O2 CEMS M Plan within the timeframes outlined in PTI 245-10 for EUBOILER#8. At the time of the 2012 in report preparation, the CO Minimization Plan was determined to be deficient and the company not a result a Consultant has been hired by the facility to prepare and submit the both the CO Min Plan and the SSM Plan. The last draft documents submitted on behalf of the facility was in D 2013. Requests have been made, and the company informed of the outstanding violation, but ap documents have not been received as of the time of this report.

- At the time of the inspection, the company had attempted to complete stack testing of EULIMEKIL the December 1, 2014, deadline, and was notified verbally that they were in violation of the ROP Co Stack testing activities were attempted on November 20, 2014, however based on electrical probl other issues (including low and/or negative flow rates) testing was unable to be completed. Tes not completed prior to December 1, 2014, as required by the ROP, and a violation notice wa December 29, 2014. The company responded on January 12, 2015. AQD Staff met with MSC staff consultant on December 18, 2014 to discuss other testing options and a potential ROP minor mo to reflect changes in operation of the emission unit. An ROP Minor Modification application was for most of the proposed changes on January 20, 2015. SO2 and PM testing for EULIMEKIL proposed pressure relief was conducted on January 22, 2015. A request for supplemental cond be incorporated into the ROP modification) to address operational changes for EULIMEKILN wa the company on January 23, 2015. At the time of this report, no agreement between the company on the conditions has occurred so the issue is not considered resolved.

As part of the 2014 scheduled site inspection, AQD Staff has noted that permit conditions for EUAN DIGESTER the facility is required to conduct an inspection within two days of a pressure relief valve r once a year to determine if there are detectable emissions. "No detectable emissions" is defined in the R instrument reading of less than 500 ppm above back ground by EPA Method 21 (VOCs) or equivalent. Th reported the most recent inspection was conducted August 29, 2014, using a MSA Altair 51R, to read metl CO2 concentrations. Concentrations were reported in percent (%) rather than in ppm as required by permi on this and above referenced unresolved issues, the facility is presently in non-compliance.

NAME

Sharon J. LeBlanc

DATE

3/6/15

SUPERVISOR

C. Hase