

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

N73831168

FACILITY: Green Plains Holdings II LLC		SRN / ID: N7383
LOCATION: 11440 CEMETERY RD, RIGA		DISTRICT: Jackson
CITY: RIGA		COUNTY: LENAWEЕ
CONTACT: Nicole Zielinski, EHSS Manager		ACTIVITY DATE: 09/15/2015
STAFF: Diane Kavanaugh-Vetort	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Complete scheduled compliance inspection. Major Source, ROP, PCE of FCE		
RESOLVED COMPLAINTS:		

Green Plains Holding II, LLC**CONTACTS:**

Nicole Zielinski, EHSS Manager, and phone: (517)486-6190 ext.4104, email: Nicole.Zielinski@gpreinc.com

Brad Geyman, Plant Manager, phone: (517)486-6190 email: Brad.Geyman@gpreinc.com

Safety Equipment: Long sleeves, hard hat, safety glasses and steel toe boots.

On September 15, 2015, I conducted a complete scheduled inspection of the facility, Green Plains Riga, a division of Green Plains Holdings II LLC (GP-Riga), located at 7025 Silberhorn Highway, Blissfield, MI 49276. The inspection was scheduled prior with the AQD contact in order to allow AQD to bring two new staff along for a training opportunity. The purpose of the inspection was to determine the facility's compliance status with the applicable federal and state air pollution control regulations specifically, Michigan Act 451, Part 55, Air Pollution Control and the administrative rules. GP-Riga has an existing Renewable Operating Permit (ROP) MI-ROP-N7383 -2014. The ROP contains hazardous air pollutant (HAP) emission limits making GP-Riga an Area Source for HAPs.

GP-Riga is a major source of Greenhouse Gas (GHG) emissions and therefore became subject to the Title V ROP program. GP-Riga's GHG estimate was 150,353 tons per year of CO₂e at the time of their ROP application. This is greater than the 100,000 tons major source threshold.

GP-Riga has process/process equipment subject to other federal standards contained in their ROP as follows:

- § EUNATGASTANK, EUDENATTANK1, EUDENATTANK2, EU200TANK1, EU200TANK2 are subject to the New Source Performance Standards (NSPS) for Volatile Organic Liquid Storage Vessels (including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984, promulgated in 40 CFR Part 60, Subparts A and Kb.
- § EUBOILER1 and EUBOILER2 are subject to the NSPS for Small Industrial-Commercial-Institutional Steam Generating Units promulgated in 40 CFR Part 60, Subparts A and Dc.
- § FGFACILITY (all pumps, valves, and pressure relief devices in light liquid and heavy liquid service; all valves and pressure relief devices in gas/vapor service; each sampling connection; and each open ended valve or line and all associated closed vent systems and control devices) is subject to the NSPS for Leak Detection and Repair (LDAR) promulgated in 40 CFR Part 60, Subparts A and VV.
- § EUFIREPUMP and EUGENSET are subject to 40 CFR Part 63 Subpart ZZZZ (Area Source RICE MACT). EUFIREPUMP is subject to 40 CFR Part 60 NSPS Subpart IIII.

Upon my approach to the GP-Riga facility location on September 15, I did not detect any odors in the area. I did observe a visible steam plume from the valveless Regenerative Thermal Oxidizer (VRTO) control equipment on the Dryer. I did not observe any other emissions. Upon my arrival I identified myself at the reception desk and my colleagues and I met with Nicole Zielinski and Brad Geyman for a pre-inspection conference.

PRE-INSPECTION CONFERENCE

I provided Nicole with the DEQ Environmental Inspection Brochure. Nicole, Brad and I discussed GP-Riga's existing ROP and the corresponding areas/changes identified during the prior 12 month period.

- New Subsidiary: GP Ethanol Storage LLC was created for EUNATGASTANK (denaturant storage tank), EUDENATTANK1 and EUDENATTANK2 (denatured ethanol storage tanks), EU200TANK1 and EU200TANK2 (200 proof ethanol storage tanks), EUTRUCKLOAD, EURAILLOAD and CE009 (flare).
- Yeast Tank replacement under exemption: GP-Riga submitted proposal to replace the existing tank with a "like for like" smaller tank. Referenced exemptions R278, R284(i) and R285(a). Tank has existing Scrubber control (CE016). As of the inspection date this has NOT been done but per Brad /Nicole they still plan to do it. It is noted I observed an obvious defect/dent in the existing tank that occurred due to pressurization issue of some type apparently.
- Malfunctions during the prior 12 month period: FGBOILERS experienced failure of natural gas fuel meters. These have been replaced. VRTO natural gas fuel flow meter recently failed and will be reported in 1st Semi-annual Certification /Deviation report. They replaced it and plan to maintain extra(s) in inventory.

Brad provided the following general facility information: GP-Riga has 50 employees and operates 24/7. I asked and he confirmed that they do not receive materials by railcar. The only product sent out by rail is the DDGS (Dry Distiller's Grains and Solubles). Wet and Modified DGS (WDGS) are hauled by truck only. All Ethanol is hauled by tanker truck.

GP-Riga conducts maintenance twice a year during shutdowns; the first is in the spring and was done May 11 to 15, 2015. The second is in the fall and is scheduled for October 12-16, 2015. At that time they "zero" the monitoring equipment and verify proper operation.

Nicole and Brad asked me a question related to the **VRTO exhaust stack**. They are considering extending the height because they are having an issue with icing. Their permit limits the stack to a minimum stack height and I informed them that they could make that change.

GP-Riga conducts their required NSPS Leak Detection and Repair, LDAR Subpart VV monitoring monthly through a hired contractor. The contractor uses a Flame Ionization Detector (FID) "Guardian" and the LDAR report is required to be submitted semi-annually to AQD. GP-Riga submittals are up to date at this time. No serious or long term issues with leaks have been identified in the past 2 years.

GP-Riga employees also conduct daily checks of valves, pumps, and connections. I obtained copies of some of the checks, one per month for January to September 2015. During my prior inspection I was told that some of the pumps/seals/valves they check are not directly in-line pumps/valves, etc... handling product, and are not part of LDAR. They said any leaks or maintenance problems they indicate result in a Work Order being requested and the repair made usually within a week. Some things depend on scheduled downtime since they operate 24/7.

FACILITY INSPECTION

Nicole and Brad accompanied me, Zachary, and Michael, during the facility walk through inspection. GP-Riga's ROP contains 5 Emission Units (EU) Tables and most EUs are incorporated into one or more Flexible Groups (FG). Therefore not all are listed or discussed in this report. There are (12) FG Tables and a FGFACILITY Table. Some FG are combined to form other FG, it is somewhat confusing and was clarified as much as possible by indicating them as "sub FG" under the FG ID column.

During the inspection I observed most of the EU and FG areas. I conducted an inspection of the main plant area (mostly out of doors). I observed many of GP Riga's specific add-on Air Pollution Control Equipment and the general process flow areas including storage areas and tanks, transfer conveyors and the primary dryer. In general, we walked according to the process flow i.e. from grain unloading to silos, to elevators, to storage, to scalping and hammermilling. Then we observed the Fermentation area with two scrubbers and then the further processing, strippers, sieve, and centrifuges to the final liquid product. I also observed the main control room, the FGDDGSDRY (Dryer) and Multiclone and VRTO control equipment, cooler, and storage of the various stages of wet solid product and the ethanol load-out area and flare control.

The first area observed was WDGS and Modified DGS storage area. This is an open concrete bin and EUWDGS conditions limit storage capacity to not more than three days' worth of production due to potential odors. I did not

notice significant odor.

I inspected the FGCORNHAND corn receiving terminal (unloading corn dump) from trucks. Trucks pass through weigh scales, undergo sampling, and drive through the terminal, which is open on both ends and has bottom dump for corn unloads. Corn travels by underground conveyor over to silos and processing area. Nicole said two trucks can unload at the same time. The north side has one top load out spout and it is equipped with its own fan/filter. Wet and modified DGS are loaded out by truck here. I did not observe any visible emissions or fugitive dust issues in this area.

The limited pollutant is PM10 and I observed as best as possible the Baghouses (CE001, CE010, CE011, CE012 and CE013) located between the grain unloading terminal and the transfer storage and handling. Elevators and conveyors are totally enclosed. Many controls are located at high elevation or on top of other equipment surrounded by equipment and ductwork and are not easily inspected. The FGCORNMILL corn hammer milling has a vibrator type baghouse with air injection that removes dust from bag filters. There is a "shaker type" Baghouse on the Scalper on top of the grain area. Non-grain materials that come in with raw grain are dropped down chute to waste bin. Baghouses for load-out and receiving are the tall cylinders located nearest to grain unloading area. GP-Riga uses Magnehelic as pressure differential monitoring on each baghouse.

Nicole records the differential pressure (DP) on each Baghouse, and other monitoring parameters on Other Sources, once per week. This is "Weekly Air Emission Equipment Reporting" form and she includes screen prints of computer diagrams with readings indicated. Copies were obtained for the prior 12 month period and are attached to this report to file.

I inspected the FGFERM area containing the yeast tank, four fermenters and beer well. The primary pollutants here are VOC and Acetaldehyde. FGFERM has a larger (also called) CO2 Scrubber (CE016) and FGLIQUIDHAND has a smaller Vent Gas Scrubber (CE005). The scrubbers are located near each other and are both subject to Compliance Assurance Monitoring (CAM). Both scrubbers are also part of GP-Riga's Malfunction Abatement Plan (MAP).

I observed that both scrubbers have liquid level meters and differential pressure monitoring gauges. The liquid flow rate has CAM required monitoring and a range in H2O gallons per minute (GPM) was set for each Scrubber. GP-Riga is also recording DP in "inches H2O".

During inspection I observed the DP reading at CE016 was: 57.1 inches H2O. This is within the required range of 50-100 inches H2O but is very close to the low end.

Brad indicated a "level transmitter" directs the flow in gallons to the tank and they maintain levels on both scrubbers. Per Brad the scrubbers' water level systems are tied together at the bottom and are maintained at @39.9% water, approximately 20 gallons per minute to the smaller Vent Gas, and approximately 80 gallons per minute to the larger FERM for a total of 100 gallons per minute H2O coming into them. Brad said fresh water is sent to the scrubbers and GP-Riga is connected to Blissfield City water. The liquid level transmitter is connected to the GP-Riga Digital Control Station (DCS) and is a continuous reading. Both scrubbers' liquid levels and pressure drop readings are monitored 24/7.

I inspected this Control Room containing the DCS located in a separate building in the center of the main plant area. If a problem is indicated a physical check of the specific gauge at the device is done to ensure it is reading properly. The control room monitors parameters of all control devices and process units to ensure proper operation. These gauges are also read *weekly* by Nicole; she records readings on the same form referenced above. Copies obtained above cover this equipment also.

During the inspection I observed the FGDDGSDRY area was operational and includes the VRTO (CE007) and Multiclone (CE006) air pollution control equipment. The VRTO continues to operate when the dryer shuts down because of the required 1600 degrees F temperature and the fact that GP-Riga operates 24/7, it doesn't make sense to turn it on/off. The limited pollutants include PM10, VOC, NOx, CO and Acetaldehyde.

The operation of the VRTO is integrated (interlocked) with the dryer, such that if there is a problem with the VRTO, the dryer will shut down. I observed the bypass stack for the VRTO/Multiclone. The control is also CAM subject with specific underlying applicable requirement noted in some permit conditions. The bypass exhaust stack would only be used if there was an actual emergency. Normal shut down procedure is that everything

shuts down automatically including the exhaust.

My review of the records found there have been no exceedances (temperatures below minimum required temperature) during the past 12 months. I did not notice significant odor or any visible emission from the dryer and associated ductwork. As noted in the pre-conference, the fuel flow meter to the VRTO recently failed and had to be replaced. I observed its location and that the meter was operational.

In the DCS main control room I observed the VRTO Temperature read: 1611 degrees F. The inlet temperature read 253.3 F and outlet read 374.5 F. At the VRTO there is another control room and another digital process screen and also a down-loadable temperature recording device. Here I observed the temperature read: 1610 F and a high level alarm is set for 1800 F.

The Multiclone (CE006) is part of GP-Riga's MAP with indicated Pressure Drop range of 0 to -0.50. Following the inspection I conducted a review of their records, I identified an inconsistency between the DP range indicated in GP-Riga's CAM Plan and MAP. Also, it was not clear to me where the required readings were being recorded.

On 10/2 I contacted Nicole by telephone and we spoke on 10/6 and she informed me that she has always recorded the Multiclone DP reading on the "Weekly..." form mentioned above, under the section: Cyclones.

The ROP FGDDGSDRY conditions VI. 5-7 contain requirements for the Multiclone. Condition 5. requires "record DP once, daily" and therefore because they are only recording this once per week **this is a Deviation**. GP-Riga has a continuous monitor. Nicole stated this was an oversight and they will immediately start recording this once per day. I advised her to revise and resubmit all prior Certification and Deviation reporting (since ROP effective date of 2/4/2014) to include this deviation and explain the reason and corrective action. All the weekly readings indicate compliance in the records obtained.

In addition we discussed that the ROP and CAM Plans contain the correct DP range but their MAP needs to be corrected. The indicated range should be what is required by permit condition and CAM Plan. The indicator range is 0.5 to 5 inches of water column. Again all weekly recordings indicate compliance.

During the inspection I observed the EUFIREPUMP which is located away from main plant in a separate building with a water tank and diesel tank. It appeared to be properly maintained and has a non-resettable hour meter and GP is recording monthly operation according to the NSPS.

EUFIREPUMP and EUGENSET are limited to 500 hours per 12 month rolling time period. EUFIREPUMP is also limited to 4 hours per day; only allowed more than this when FGBOILERS, EUDDGSDRYER, EUCOOLER, EUVRTO and EUHAMMERMILL2 are not operated simultaneously. FGEXIST-EMER-RICE covers EUGENSET1 emergency generator. This was not inspected on this day.

During the inspection I observed the plant's powerhouse containing the two natural gas fired boilers FGBOILERS. GP-Riga normally operates both 92 MMBTU boilers all the time. I observed they were operating during the inspection and appeared to be in good condition. I observed both fuel usage meters were installed and operating.

Miscellaneous processes:

During the inspection I observed the Corn Oil and Corn Syrup processing and load out areas. There are no specific permit conditions or limitations for these areas. I did not observe any odors or issues.

RECORDKEEPING:

I requested and obtained random copies of some of GP-Riga's preventative maintenance (PM) records or Work Orders over the past 12 months. I received copies for various process equipment. It appears there is regular and appropriate maintenance occurring.

I requested and received emission and other material usage summary recordkeeping for the 12 month rolling period ending August 2015. GP-Riga has facility wide emission limits in FGFACILITY. Nicole and I identified and briefly reviewed records on-site and she agreed to email the spreadsheets containing all requested information to me the next day. Following the inspection I conducted a review of all GP-Riga spreadsheets.

FGFACILITY Emission Limits and reported emissions are as follows:

NOx 89 tons per year (tpy) 12 month rolling period as determined at the end of each calendar month; 12 month ending August 2015 emissions **65.43 tons**

VOC 76 tpy; 12 month ending August 2015 emissions **26.04 tons**

CO 87 tpy; 12 month ending August 2015 emissions **15.93 tons**

PM 57 tpy; 12 month ending August 2015 emissions **20.1 tons**

PM10 46 tpy; 12 month ending August 2015 emissions **17.92 tons**

HAPs 8.9 tpy individual; 12 month ending August 2015 highest Acetaldehyde **3.92 tons**

HAPs 24 tpy aggregate; 12 month ending August 2015 emissions **8.33 tons**

CO2e GHG (no limit in permit); 12 month ending August 2015 emissions **97,516 tons**

Several other EU/FG have hourly emission limits and the facility emits particulate from grain handling, loading, unloading and storage. They also have significant natural gas combustion emissions, and some volatiles (acetaldehyde) from ethanol production and denaturant use i.e. gasoline.

FGCORNHAND and its related FGs have PM10 emission limits in pounds per hour from corn receiving, storing and handling operations. There are five Baghouses as control and one or more underwent performance testing in 2007 and results were compliant.

FGCORNMILL and its related EUs have PM10 emission limits in pounds per hour from corn hammermilling. There are two Baghouses as control and one or more underwent performance testing in 2007 and results were compliant.

FGLIQUIDHAND and its related EUs have VOC and Acetaldehyde emission limits in pounds per hour from the liquefaction, ethanol purification, evaporator, centrifuges and centrate tank. There is a Vent Gas Scrubber as control and it was performance tested in 2007 and results were compliant.

FGFERM and its related EUs have VOC and Acetaldehyde emission limits in pounds per hour from yeast tank, fermenters and beer well. There is a Fermentation Scrubber as control and it was performance tested in 2007 and results were compliant.

FGDDGSDRY and its related EUs have PM10, VOC, NOx, CO, and Acetaldehyde emission limits in pounds per hour from DDGS dryer, cooler, and valveless regenerative thermal oxidizer (control equipment). There is a Multiclone and valveless regenerative thermal oxidizer as control and it was performance tested in 2007 and results were compliant.

FGDDGSHAND and its related EUs have PM10 emission limits in pounds per hour from DDGS dump pit/auger, elevator, conveyor #1 and load spout. There are two Baghouses as control and one or more was performance tested in 2007 and results were compliant.

FGBOILERS which consists of two identical natural gas boilers has emission limits of NOx and CO in pounds per hour. The boilers are equipped with low NOx burners. One of the boilers was performance tested in 2007 and results were compliant.

FGBOILERS fuel flowmeters failed at the end of 2014 and into 2015. ROP Certification (Annual & Semi-annual 2014 and Semi-annual 2015) reported deviations. Flowmeters had to be replaced and it took longer than anticipated. Corrective action proposed is to obtain one or more extra flowmeters in inventory. Natural gas was pro-rated during this time. Acceptable.

FG material throughput limits reported:

FGETHLOAD and its EU for truck and rail load-out limit is **63.0 million gallons of Total Ethanol and Denaturant** throughput per 12 month rolling time period as determined at the end of each calendar month; for 12

month period ending August 2015 report **50,776,784.00 gallons Denatured Ethanol**. Compliant

Denaturant throughput limit is **3.0 million gallons**; for 12 month period ending August 2015 report **1,103,167.00 gallons Denaturant**. Compliant

Summary of GP-RIGA Air Pollution Control Equipment and required monitoring:

CE016 Fermentation Scrubber (refer to as CO2 Scrubber; larger of two scrubbers) CAM

CE005 Vent Gas Scrubber on Distillation Columns (refer to as Steam Scrubber) CAM

CE006 Multiclone combined with; CE007 VRTO CAM

CE009 Flare on ethanol load-out to tanker trucks.

CE001, 003, 004, 008, 010 to 014 (Baghouses-various types)

MONITORING Records:

GP-Riga is required to conduct control equipment, fugitive dust, and visible emissions monitoring. All monitoring records obtained during the inspection indicate compliance and are attached to this report.

MALFUNCTION ABATEMENT PLAN (MAP)

GP-Riga has an approved MAP on file with AQD and incorporated by reference into the Appendix 9 of the ROP. GP-Riga identifies the monitoring devices and parameters measured and included ranges for differential pressure (inches H2O), flow (gallons per minute), and temperature depending on the control device. Opacity is also a monitored parameter.

As noted earlier in this report, GP-Riga's DCS monitoring/recordkeeping system is located in the control room. From this system they can view / print daily log sheets. While I was there, I observed numerous computer screens diagraming process equipment and showing readings for the control equipment, production areas, emergency alarms, and other data.

I discussed quality assurance and quality control of monitoring devices with Nicole and Brad. Brad stated they zero devices during plant shutdowns as part of PMs. My understanding from the prior inspection and ROP Technical review is that GP-Riga has extra pressure gauges and thermocouples on site and regularly changes them out. PMs are conducted twice per year during major planned shutdowns, Spring (March/April) and Fall (Sept/Oct), lasting usually 3-5 days.

FUGITIVE DUST PLAN (FDP)

The FDP for GP-Riga is referenced in the Appendix 9 of the ROP. The fugitive dust control program consists of dry sweeping paved areas only. This is done a minimum of once per week. FDP also covers storage piles and grain unloading and handling. I did not observe any significant fugitive dust emissions during the inspection.

ODOR MANAGEMENT PLAN (OMP)

I did not detect any objectionable or unusual odors during the inspection. The OMP for GP-Riga is referenced in the Appendix 9 of the ROP. It covers all areas that are known to have odor or have the potential to be odorous.

COMPLIANCE SUMMARY

In the closing conference, it was agreed that all the recordkeeping information discussed and requested during the inspection would be sent by email from Nicole tomorrow. The requested records are necessary for me to make a compliance determination. I told Nicole that I will contact her with any questions or identified issues. I informed GP-Riga that a copy of my completed inspection report will be emailed to them. All requested records were received timely and were reviewed.

The AQD has determined that GP-Riga is in substantial compliance with the conditions of their permit MI-ROP-N7383-2014 and the applicable state and federal regulations evaluated at this time.

NAME Dane K. Votaw DATE 10/13/15 SUPERVISOR [Signature]