

**DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Self Initiated Inspection**

U63190907050601

FACILITY: Savoy Energy		SRN / ID: U631909070
LOCATION: 1234 West Commerce Street		DISTRICT: Southeast Michigan
CITY: Milford		COUNTY: OAKLAND
CONTACT: Dylan Foglesong , Production Engineer		ACTIVITY DATE: 08/27/2019
STAFF: Adam Bognar	COMPLIANCE STATUS: Compliance	SOURCE CLASS:
SUBJECT: Self Initiated Inspection		
RESOLVED COMPLAINTS:		

On Tuesday, August 27, 2019, Michigan Department of Environment, Great Lakes, and Energy-Air Quality Division (EGLE-AQD) staff, I, Adam Bognar, conducted a self-initiated inspection of Savoy Energy Milford 9 Production Facility located on West Commerce Road between Lake Forest Way and Tracy Lane, Milford, MI 48381. The purpose of this inspection was to determine the facility's compliance status with the Federal Clean Air Act; Article II, Part 55, Air Pollution Control of Natural Resources and Environmental Protection Act, 1994 Public Act 451; Michigan Department of Environment, Great Lakes, and Energy-Air Quality Division (EGLE-AQD) rules; and 40 CFR Part 60, Subpart KKK – Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants (NSPS KKK).

I arrived at the facility at around 9 am.

I met with Mr. Dylan Foglesong, Production Engineer and Mr. Jack Rokos, Operations Manager. I identified myself, provided credentials, and stated the purpose of the inspection. Mr. Foglesong and Mr. Rokos gave me a tour of the facility.

Savoy Energy ("Savoy" or the "Facility") is a Michigan based partnership whose general partner, Savoy Exploration, Inc., is a privately held Delaware Corporation. Headquartered in Traverse City, Michigan, Savoy Energy is primarily focused on exploration, exploitation/developmental drilling and production for both conventional and resource-oriented reserves in the Michigan Basin.

Process Equipment

Savoy Energy produces crude oil and natural gas at this location. Savoy Energy purchased this existing plant in mid to late 2016. All equipment on site was installed in the 1990's. There are three oil rigs on this site. The three rigs produce an emulsion of crude petroleum oil, brine water, and sweet natural gas.

Savoy is located in Oakland county which currently in non-attainment status regarding the EPA national ambient air quality standards (NAAQS) for ozone. This facility is surrounded by a golf course to the south, east, and west. North of the facility is mostly forested with some residential properties.

Downstream processing equipment located on this site includes a natural gas compressor, a refrigeration unit, a Joule Thompson skid and knock out vessel, iron sponges, heater treaters, a natural gas liquid tank, and crude oil/water tanks. This equipment is subject to NSPS KKK.

The three rigs pump a mixture of crude oil, natural gas, and brine water from natural underground rock formations located under this site and under surrounding areas. After the liquid mixture is pumped to the surface, it is sent to the heater treaters. The heater treaters warm the oil/water/gas mixture to help separate the fluids into polar/non-polar layers and reduce any emulsions. The liquids exit the heater treater through one of two outlets – the light fluid outlet (crude oil) and the heavy fluid outlet (brine water). The crude oil and brine water are pumped to storage tanks on-site. Approximately 120 barrels/day of crude oil is produced in this manner. The crude oil and brine water are eventually loaded out of the tanks into semi-truck trailers to be transported to a crude oil pipeline. The truck loadout area is equipped with a closed vent system to vent gasses displaced from the truck trailer to the storage tanks.

Separate from the liquids, the natural gas exits the rigs, travels through the heater treaters (above the oil/brine), and is piped to a compressor that squeezes the natural gas to around 700 psi. This pressurized natural gas is not yet considered "pipeline-quality" by industry standards. The natural gas exits the compressor and is piped to a Joule-Thompson skid/knockout drum. The pressurized gas rapidly expands in the larger diameter knockout drum, causing a cooling effect. This cooling is further assisted by a refrigeration unit that cools the knockout drum. The sudden cooling of the pressurized natural gas causes the heavier hydrocarbons to liquify and precipitate out of the gas due to gravity. The heavy hydrocarbons produced from the knockout drum are piped to

an on-site storage tank.

Pipeline quality natural gas must have greater than 70% methane content, and a sulfur content less than 0.5 grains/100 cubic feet. Once the heavy hydrocarbons have been removed from the gas, some amount of sulfur (H_2S) must be removed. The natural gas is piped from the knockout vessel into one of two parallel "Iron-Sponges". The iron sponges are packed bed vessels containing "sulfatreat", a name brand iron oxide packing material. The hydrogen sulfide in the natural gas reacts with the iron oxides to form ferric sulfides and water. Once a critical amount of ferric sulfides are formed in one of the vessels, the spent packing material is sent off site and replaced with a fresh bed of sulfa treat. This occurs approximately once every 2 years. These vessels are completely sealed (closed loop) at this facility. No emissions are expected from this equipment.

After these treatment steps the natural gas passes through a continuous sampling station that analyzes the gas composition to ensure it is pipeline quality. A small amount of mercaptan is used to odorize the gas at this time. If the gas passes the analytical test, then it is pumped directly into a natural gas pipeline at around 640 psi. At this site, around 230,000 cubic feet per day of pipeline quality natural gas is produced in this way.

Rule 201 Applicability

The natural gas fired compressor, a Waukesha Model F1197 G, has a maximum heat input of 255 HP (648,830 BTU/hr). This reciprocating internal combustion engine appears to be exempt from Rule 201 requirements pursuant to Rule 285 (2)(g). Since it was installed in the early 1990's it does not appear to be subject to NSPS JJJJ – Standards of Performance for Stationary Spark Ignition Internal Combustion Engines. The engine may be subject to 40 CFR Part 63, Subpart ZZZZ, Natural Emission Standards for Hazardous Air Pollutants for Stationary Internal Combustion engines (NESHAP ZZZZ). The AQD does not currently have the delegation to enforce the area source requirements of NESHAP ZZZZ.

Natural gas processing equipment (knockout drum, iron sponge, heater treater) is operated as a closed loop process – no emissions are expected other than from leaks. Additionally, this equipment appears to be exempt from Rule 201 requirements pursuant to Rule 288 (2)(d), which exempts equipment used for the separation or fractionation of sweet natural gas.

The mercaptan odorizing equipment appears to be exempt from Rule 201 requirements pursuant to Rule 288 (2)(a). The natural gas liquids storage tank appears to be exempt from Rule 201 requirements pursuant to Rule 284 (2)(b) because it's storage capacity is less than 40,000 gallons. The crude oil storage tanks appear to be exempt from Rule 201 requirements pursuant to Rule 284 (2)(f) because the storage vessels are less than 40,000 gallons and a vapor recovery system is utilized when filling or emptying the tanks.

NSPS KKK

Equipment at this facility was installed in the early-mid 1990's. According to Mr. Foglesong, this equipment has not been modified or reconstructed since that time. I did not observe any evidence of new equipment. Natural gas processing equipment installed after January 20, 1984 and before August 23, 2011 is subject to NSPS KKK. NSPS KKK adopts certain standards promulgated in 40 CFR Part 60, Subpart VV – Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for which Construction, Reconstruction, or Modification Commenced After January 5, 1981, and on or Before November 7, 2006 (NSPS VV).

To comply with the monitoring requirements of NSPS KKK, Savoy performs monthly inspections of equipment to check for leaks. An employee goes to each valve, connection point, and leak prone area with a soap spray bottle. The employee sprays each connecting point with soapy water to look for bubbling. The employee also looks for other visible, audible, and olfactory indicators of leaks. Records of these inspections are maintained at the facility. Savoy submitted a semi-annual report in accordance with the reporting requirements specified in NSPS KKK. The report indicated no deviations from the standards of NSPS KKK.

The valves in gas/vapor service, pumps in light liquid service, and pressure relief devices in gas/vapor service at Savoy appear to be exempt from the routine monitoring requirements of 40 CFR 60.482-2(a)(1), 40 CFR 60.482-7(a), and 40 CFR 60.633(b)(1). 40 CFR 60.633(d) exempts this equipment from these monitoring requirements if the plant is non-fractionating and has a maximum design capacity to produce less than 283,200 standard cubic meters per day of natural gas. This plant is designed to produce approximately 6,500 standard cubic meters per day of natural gas.

The compressor appears to be exempt from the compressor control requirements of 40 CFR 60.482-3 because the compressor is in wet gas service.

Savoy does not appear to be subject to 40 CFR Part 63, Subpart HH – National Emission Standards for

Hazardous Air Pollutants from Oil and Natural Gas Production Facilities (NESHAP HH) because this facility does not have a triethylene glycol dehydration unit.

Compliance Determination

Savoy Energy appears to be in compliance with the Federal Clean Air Act; Article II, Part 55, Air Pollution Control of Natural Resources and Environmental Protection Act, 1994 Public Act 451; Michigan Department of Environment, Great Lakes, and Energy-Air Quality Division (EGLE-AQD) rules; and NSPS KKK.

NAME *Alann Boyer*

DATE *9/26/2019* SUPERVISOR *SK*