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May 26, 2016

Mr. Dennis Dunlop
Environmental Quality Specialist—Air Quality Division
MDEQ—Kalamazoo District Office
7953 Adobe Road
Kalamazoo, Michigan 49009

Re: Energy Suppliers, Lawton, Michigan

Dear Mr. Dunlop:

This letter provides additional information pursuant to your March 18, 2016 Violation Notice (VN) to Energy Suppliers. It also supplements Energy Suppliers' (Envirologic) March 25, 2016 initial response to the Violation Notice and our phone conversation on April 28, 2016.

Violation Notice

The Violation Notice was precipitated by an odor complaint about the operation. You concluded that the methanol recovery process, specifically the distillation column, requires a Permit to Install as required in R336.1201 (Rule 201).

Energy Suppliers has evaluated the NV with respect to the actual and potential emissions emanating from the methanol distillation column/recovery process and feels that the observations/statements made in the NV do not constitute a violation of the applicable legal requirements cited. Energy Suppliers has concluded that there is very limited emission of methanol from the distillation column, such that a Permit to Install is not required, and that the process is exempt under R336.290 (Rule 290—Sources with Limited Emissions).

Process Description

The distillation/methanol recovery process is composed of the following apparatus:

1. Distillation column
2. Re-boiler for non-contact steam generation
3. Condenser
4. Reflux Tank with conservation vent (emission source)
5. Various pumps and piping (Inlet pump from storage, reflux pump back to column, finished product to day tank storage)

Figure 1 presents a process flow diagram with the single emission point.

As the column heats up from by non-contact stream generated in the re-boiler, non-condensable gas expands thereby increasing pressure within the column. At a certain pressure it exits the column via a conservation vent located on the top of the reflux tank downstream ofthe column and condenser (Figure1). The vent is set to open/close at 0.5 psig. As soon as most of the non-condensable gas has exited and methanol-rich vapor reaches the condenser the pressure drops back to normal operating pressure (about 0.2 psig) and the venting stops. This occurs only when the system is started. The conservation vent remains closed during continuous operations.

The only source of emission from the distillation column is the conservation vent. This vent sees only distilled product vapors after the overheads are condensed. It is controlled by a pressure/vacuum valve that is set to release vacuum on the system at 0.0625 psi vacuum and release pressure from the system at 0.5 psig. There is a nitrogen purge on the vent set to add nitrogen when the system goes under vacuum. This is set to purge at 0.5 in water column (0.02 psi) vacuum.

There is only one time during normal operation when this vent may discharge to the atmosphere—when the column is started and the trapped gasses expand with heating as described above. When the column is shut down, the vapor collapses and the column goes under vacuum. The nitrogen purge adds nitrogen to release the vacuum.

Emission Calculations

The emission of methanol through the conservation vent can be calculated using the temperature change, void volume in the column and accessories, and the change in pressure. The percent methanol in the vapor can be calculated using the vapor pressure of methanol at the exit temperature. The average cold temperature of the column at start-up is calculated using plant data and correcting it for the average night-time ambient temperature for Kalamazoo for the year 2015. Details of these calculations are shown on the attached Excel spreadsheet. The calculation shows an emission of 0.65 lbs. of methanol each time the column is started. There are no other emissions from the column.

Currently, the column is started once per day and runs for 16 hours to produce 4,000 gallons of methanol product resulting in methanol emissions of 0.041 lbs./hr. (0.65 lbs./16 hrs.), or 1.63×10^{-4} lbs/gal methanol produced (0.65 lbs/4000 gal).

Rule 290 Demonstration

Monthly emissions of methanol based on an average of 277 operating hours per month would be 11.4 pounds. Rule 290 allows sources with limited emissions to emit 1000 lbs/month of non-carcinogenic VOC. Maximum, worst case annual emission of methanol (potential to emit) would be 359 lbs. (0.041 lbs./hr. x 8760 hrs./year).

Based on the above information, Energy Suppliers will continue to collect and record monthly production data and calculate emissions from the distillation column in order to show continued compliance with Rule 290.

If you have any questions, please do not hesitate to call.

Sincerely,

ENVIROLOGIC TECHNOLOGIES, INC.

David B. Warwick
Vice President—Hydrogeologist

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Attachments

cc: Mark Meulendyke, Energy Suppliers
Richard Reynolds, Chemical Engineer