

Thermal Treatment Unit 870 Malfunction Abatement Plan

1.0 Summary

Thermal Treatment Unit 870 (TTU-870) is a Regenerative Thermal Oxidizer (RTO) installed as an additional device for controlling emissions from an existing emission unit (EU_PROCESS). Currently, EU_PROCESS is controlled by four catalytic thermal treatment units (TTUs). Upon completion of the RTO, EU_PROCESS process vents will be controlled by 5 TTU's (four existing catalytic thermal treatment units and one proposed regenerative thermal oxidizer).

The EU_PROCESS at SRN B4942 in Harbor Beach, Michigan, operates 365 days per year, 24 hours per day with periodic shutdowns for maintenance. The bacteria *saccharopolyspora spinosa* is used to biosynthesize Spinosyn A (CAS # 131929-60-7), Spinosyn D (CAS # 131929-63-0), Spinosyn J (CAS# 131929-67-4), and Spinosyn L (CAS# 149092-01-3). Other biosynthesized byproducts include methanol and organic acids.

All vents are routed to a closed vent system and sent to TTUs for emission control. The existing configuration includes four catalytic TTUs. When any one unit is down for maintenance, the remaining units control emissions. In the unlikely event that two units malfunction at the same time, the process initiates mitigating actions which may include a controlled shutdown based on the nature of the event.

The Regenerative Thermal Oxidizer, as a 5th TTU, will increase redundancy and to improve the reliability of the EU_PROCESS process vent control system. TTU-870 controls combustible compounds present in the vent stream. Natural gas is used as the fuel. Combustion heat is transferred to a monolith block type structured packing heat exchanger media which contacts and preheats the incoming air. The preheating of the process vent stream results in less fuel required once it has been transferred to the combustion chamber. The more VOC present in the stream, the less natural gas is required as more heat is available from vent stream combustion. The RTO that Dow AgroSciences, LLC plans to install will have a maximum rated heat input of 5.78 MMBtu/hr and an average rated heat input of 3.83 MMBtu/hr. Process airflow is expected to range between 30,000 scfm and 38,000 scfm and the combustion chamber operating temperature will be approx. 1,550 ° F.

2.0 R336.1911 Malfunction Abatement Plans

Permit #107-18 condition III.2 requires a Malfunction Abatement Plan (MAP). Requirement Rule 911(2) requires a malfunction abatement plan to include, at a minimum, the following:

- a. A complete preventative maintenance program, including identification of the supervisory personnel responsible for overseeing the inspection, maintenance, and repair of air-cleaning devices, a description of the items or conditions that shall be inspected, the frequency of the inspections or repairs, and an identification of the major replacement parts that shall be maintained in inventory for quick replacement.
- b. An identification of the source and air-cleaning device operating variables that shall be monitored to detect a malfunction or failure, the normal operating range of these variables, and a description of the method of monitoring or surveillance procedures.
- c. A description of the corrective procedures or operational changes that shall be taken in the event of a malfunction or failure to achieve compliance with the applicable emission limits.

3.0 §63.1362 Parameter Requirements

SRN B4942 is subject to 40 CFR 63, Subpart MMM. This standard requires the owner or operator of thermal incinerators used to control process vent emissions subject to this standard to establish a minimum combustion chamber exit gas temperature operating parameter.

Per §63.1362, the owner or operator must monitor the temperature of the gases exiting the combustion chamber must be measured and recorded at least once every 15 minutes during the period in which the combustion device is controlling HAP from an emission stream subject to the standards in § 63.1362.

The temperature monitoring device must be accurate to within ± 0.75 percent of the temperature measured in degrees Celsius or ± 2.5 °C, whichever is greater, and the monitoring device must be calibrated annually.

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4.0 Permit No. 107-18

Requirement IV.2 and VI.1 specifies TTU-870 operating requirements.

Requirement IV.2. Design/Equipment Parameters, states the permittee shall not operate the portions of EU_PROCESS ducted to TTU-870 unless TTU-870 is installed, maintained and operated in a satisfactory manner, Satisfactory operation of TTU-870 includes all the following:

- i. A maximum outlet organic HAP concentration of 20 ppmv or minimum organic HAP destruction of 98%
- ii. Maintaining a minimum combustion chamber temperature as specified in the approved MAP.

Per Requirement VI.1. Monitoring/Recordkeeping, records shall be maintained on file for a period of five years. (R 336.1201(3)). The permittee shall install, calibrate, maintain and operate in a satisfactory manner a device to monitor and record the temperature of each TTU on a continuous basis. (R 336.1225, R 336.1331, R 336.1910)

5.0 TTU-870 MAP

Regenerative Thermal Oxidizer TTU-870 controls EU_PROCESS process vent emissions as required by Permit #107-18 and 40 CFR 63, Subpart MMM. Permit #107-18 requires the site maintain a Malfunction Abatement Plan pursuant to R336.1911. Regenerative Thermal Oxidizer TTU-870 MAP requirements:

1. **Responsible Person:** The Maintenance Leader is the supervisory personal responsible for overseeing the inspection, maintenance and repair.
2. **Operating Parameter:** Temperature of the gases exiting the combustion chamber
3. **Monitoring Method:** Thermal Couple
4. **Monitoring Frequency:** measured and recorded at least once every 15 minutes during the period in which TTU-870 is controlling process vents. This frequency complies with § 63.1366.
5. **Operating Limit:** Minimum temperature of the gases exiting the combustion chamber as established per 40 CFR 63, Subpart MMM compliance testing.
6. **Malfunction Corrective Action:** If the temperature of the gases exiting the combustion chamber falls below the operating parameter limit established during 40 CFR 63, Subpart MMM compliance testing for greater than 15 minutes the inlet damper allowing process vent gas to enter the combustion chamber will be shut. In the event of a catastrophic failure of more than one TTU system that compromises the ability to control process vent system the volumetric flow to the TTU system will be reduced. If this action is not adequate, the process will be shutdown. In the event of a process shutdown, it may be necessary to open one of more TTU damper to safely relieve process pressure. This process safety action may prevent process relief activation leading to an uncontrolled release to the atmosphere.
7. **Preventative Maintenance:** Annually, the thermal couples measuring the temperature of the gases exiting the combustion chamber will be inspected and calibrated by a competent person to ensure temperature monitoring device accuracy to within ± 0.75 percent of the temperature measured in degrees Celsius or ± 2.5 °C, whichever is greater. Associated records will be maintained for five (5) years.
8. **Maintenance Spare Parts:** Redundant thermal couples measuring the temperature of the gases exiting the combustion chamber will be maintained. Electrode wires will be kept onsite.

6.0 Conclusion

Regenerative Thermal Oxidizer TTU-870 MAP requirements are established to ensure ongoing and sustainable compliance with Permit #107-18 and 40 CFR 63, Subpart MMM requirements. Combustible toxic air contaminants and hazardous air pollutants are controlled by TTU-870. Measuring and recording the temperature of the gases exiting the combustion chamber ensures compliance with the minimum temperature requirements established during 40 CFR 63, Subpart MMM compliance testing.