



WASTE WATER TREATMENT PLANT
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David M. Monette
Division Head



September 11, 2018

Mr. Sebastian Kallumkal
MDEQ – Air Quality Division
Southeast Michigan District
27700 Donald Court
Warren, MI 48092-2793

RE: Violation Response from City of Warren for Violation that occurred on June 12.

On June 12, 2018 the City of Warren Waste Water Treatment Plant performed its annual sewage sludge incinerator emission test. This testing was compliant with the test plan approved by the Air Quality Division in correspondence from Mr. Dziadosz dated June 4, 2018.

During that testing it was recognized that the output of oxides of nitrogen from the incinerator exceeded the permit limit for this pollutant as regulated in CFR 40 Part 60, Subpart M. The exceedance of the oxides of nitrogen limit occurred during the entire test period from 9:17 a.m until 2:43 p.m.

The most likely cause of the NOx limit exceedance was the presence of excess oxygen in the incineration process during testing.

Causes and Duration of Violation

The limit exceedance did not occur during start up or shut down of the incineration process or during any known malfunction of the incineration or solids processing equipment.

However, during the actual emissions testing it was noted that the stack oxygen readings being recorded by the City's testing consultant (BTEC) varied from those being recorded by the City's oxygen instrumentation. The readings from BTEC were higher than the city's instruments from at least 1.5% to instantaneously as much as 5%. After the testing was completed and the City had failed to meet the NOx limit, the City and BTEC hooked up certified calibration gases to both sets of oxygen analyzers and it was discovered that the City's oxygen equipment was in fact erroneously reading lower stack oxygen levels than what existed in the emissions stream during the test runs.

The oxygen information is one of many real time parameters that is used by the incinerator operators to determine if the combustion conditions in the incinerator are favorable for meeting the emissions limits. Based on the post test maintenance and investigation it is estimated that the City's equipment was under reporting the amount of oxygen in the emissions stream by 2%. This resulted in an excess of combustion air being present in the incinerator with the result being elevated NOx readings once they were adjusted to 7% oxygen levels.

It is possible that the erroneous oxygen level readings could have existed since the reference gas was last changed on May 7, 2018. This may or may not directly correlate with a defined amount NOx in excess of the emissions limit being discharged to the atmosphere.

Sewage sludge was burned in the incinerator for a total of 680 hours between May 7th and June 13th. At an excess rate of 17 ppm of NOx, there was the potential to emit approximately 0.9 lbs of NOx per hour of operation, above the emission limit. For the time period in question this equates to a total of 612 lbs of NOx.

The violation is not ongoing and after corrective actions were taken the city was no longer in violation.

Actions taken to correct violation and preventive action to prevent reoccurrence

Measures that were taken to minimize emissions following the discovery of the erroneous oxygen readings included communication of the oxygen reading discrepancy to the operations staff, and shut down of the incineration process for maintenance and repair of the oxygen analyzers.

Sludge incineration was stopped on June 13th. The City has a service contract with Trace Environmental for the maintenance of its oxygen analyzers. Trace maintenance staff were on site on June 13th and 14th to perform normal maintenance of the analyzers and to determine why the oxygen readings were lower than they should have been.

During the course of Trace's work it was found that the daily standard oxygen reference gas used to calibrate the analyzers contained a different concentration of O₂ than what was shown on the tank label. The standard reference gas as purchased from the City's gas supplier was labeled as a 15% standard concentration, but was found through the re-calibration procedures for the analyzers to actually contain a concentration of 18% oxygen. This misrepresentation was causing the City's equipment to consistently report a lower concentration of oxygen in the stack emissions than what actually existed.

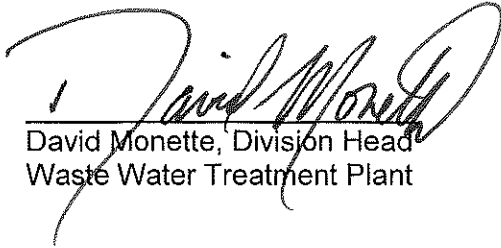
It should be noted that during the past two emissions certification tests, performed in 2016 and 2017, the oxygen sensing equipment at this facility was working correctly and Warren was able to certify that the incinerator stack emissions were within permitted limits. If correct oxygen readings were being displayed to our staff during this past test, the emissions would have met current permit limits as well. As such please find below a summary of actions that have been taken to prevent a recurrence of the aforementioned malfunction.

1. All solids handling equipment and incineration equipment were functioning normally during the test period so no operational changes are required.
2. Based on the results of the testing and the comparison of the BTEC oxygen monitoring equipment to the City's oxygen monitoring equipment the City brought in a qualified maintenance and repair contractor to evaluate the oxygen analyzers and repair any defects.
3. Incinerator operators for the City have been instructed to closely monitor the oxygen levels in the stack gas and to control the combustion through the introduction or reduction of ambient air as needed to maintain oxygen levels in the stack that were present during the last acceptable emissions certification test.
4. Incinerator operators have been instructed to closely monitor the other permit required combustion indicators – combustion temperature, scrubber differential pressure, scrubber water flow, and cake feed – so that those parameters do not fall out of tolerances with the minimum and maximum compliance indicators set during the last compliant emission certification test.

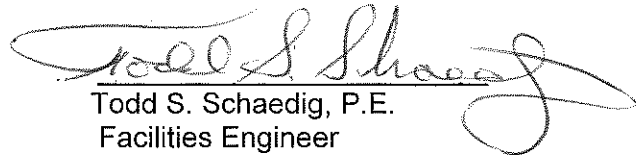
5. The company that supplies calibration gas for the City of Warren was contacted and instructed to check all future gas cylinders supplied to the City of Warren. The calibration gas company has assured us that this will not happen in the future and they are taking actions to assure us of good quality gas.

Please advise us if you have questions or need additional information.

Sincerely,
CITY OF WARREN



David Monette, Division Head
Waste Water Treatment Plant



Todd S. Schaedig, P.E.
Facilities Engineer

Bc/mvc

cc: R. Sabaugh
B. Clor
Jenine Camilleri, DEQ