

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

B623732619

FACILITY: YPSILANTI COMM. UTILITIES AUTHORITY		SRN / ID: B6237
LOCATION: 2777 STATE RD, YPSILANTI		DISTRICT: Jackson
CITY: YPSILANTI		COUNTY: WASHTENAW
CONTACT: Luther Blackburn, Director of Wastewater Operations & Compliance		ACTIVITY DATE: 12/15/2015
STAFF: Diane Kavanaugh-Vetort	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MINOR
SUBJECT: Complete scheduled inspection in conjunction with Performance Stack Testing. ROP Major Source. Fluidized bed sewage sludge incinerator, Municipal Waste Water Treatment Plant.		
RESOLVED COMPLAINTS:		

Contact: Luther Blackburn, Director of Wastewater Operations & Compliance, YCUA, (734) 484-4600 Ext. 121, lblackburn@ycua.org

On December 15, 2015, I conducted a complete scheduled inspection of the Ypsilanti Community Utilities Authority (YCUA) facility at the above location. The purpose of the inspection is to determine the facility's compliance with the applicable federal and state air pollution control regulations, in particular the Michigan ACT 451, as amended, Natural Resources and Environmental Protection Act, Part 55, Air Pollution Control and the administrative rules, and the conditions of their initial Renewable Operating Permit MI-ROP-B6237-2015. YCUA was required to obtain a ROP pursuant to Title 40 of the Code of Federal Regulations (CFR), Part 70, because the source is subject to Standards of Performance for New Stationary Sources (NSPS) for Sewage Treatment Plants promulgated in 40 CFR Part 60, Subpart M (hereinafter 4M). Act 451, Part 55, Air Pollution Control and the administrative rules specifically, R 336.1211(1)(c) (Rule 211) provide the State's authority to require a ROP for the existing sewage sludge incinerator as a source regulated by Part 129 of the Clean Air Act Amendments.

Today's compliance inspection coincides with a performance test observation (both Partial Compliance Evaluations (PCE)).

YCUA is subject to the following Federal standards:

NSPS

EU-FBSSI is subject to the New Source Performance Standards (NSPS) for Sewage Treatment Plants promulgated in 40 CFR Part 60, Subparts A and O.

EU-FBSSI will be subject to the NSPS and Emission Guidelines for Existing Sources: Sewage Sludge Incineration Units, promulgated in 40 CFR Part 60, Subparts A and M as an existing source.

FG-BOILERS at the stationary source are subject to the NSPS for Commercial, Industrial Boilers promulgated in 40 CFR Part 60, Subparts A and Dc. The boilers meet the definition of an affected source but have no applicable requirements because they only combust natural gas.

NESHAP / MACT

EU-FBSSI is subject to the National Emission Standard for Hazardous Air Pollutants (NESHAP) for Beryllium promulgated in 40 CFR Part 61, Subparts A and C.

EU-FBSSI is subject to the NESHAP for Mercury promulgated in 40 CFR Part 61, Subparts A and E.

EU-GASTANK is subject to the NESHAP for Gasoline Dispensing Facilities (GDF) promulgated in 40 CFR Part 63, Subparts A and CCCCC (Area Source MACT). The ROP contains special conditions provided by YCUA for applicable requirements from the GDF MACT. The AQD is not delegated the regulatory authority for this area source MACT.

FG-ENGINES are subject to the Area Source MACT, 40 CFR Part 63, Subpart ZZZZ (RICE MACT). The ROP contains special conditions provided by YCUA for applicable requirements from the RICE MACT. The AQD is not delegated the regulatory authority for this area source MACT.

Background

YCUA is a municipal wastewater treatment plant (WWTP) located in Ypsilanti, Washtenaw County. The WWTP serves the City of Ypsilanti and Townships of Ypsilanti, Pittsfield, Superior, Sumpter and Augusta, and the Western Wayne County Township Utility Authority. YCUA operates a fluidized bed sewage sludge incinerator (FBSSI) and air pollution control system (APCS) including a Venturi Scrubber (VS), Multi-stage impingement tray scrubber (MITS), a wet electrostatic precipitator (WESP), and a granular activated carbon adsorber (GACA) bed that includes a "gas conditioner" to remove moisture and to heat the incoming gas stream.

Today's compliance inspection centered on YCUA's stack testing of their primary emission unit the EU-FBSSI. Testing is being conducted by Thomas Schmelter, Senior Project Manager, Bureau Veritas (BV) (248) 344-3003, on December 15-16, 2015, for O₂, SO₂, NO_x, CO, 2,3,7,8-Tetrachlorodibenzo-para-dioxin, toxic equivalents (2,3,7,8 TCDD TEQ), Total polychlorinated biphenyls (PCBs), Hydrogen chloride (HCL), Particulate matter (PM), Arsenic (As), beryllium (Be), cadmium (Cd), total chromium (Cr), lead (Pb), and mercury (Hg).

Regular performance testing is required by YCUA's MI-ROP-B6237-2015. The last regular compliance testing was conducted in the spring of 2015. Today's testing is being conducted to verify the EU-FBSSI emissions with the new NSPS 4M requirements. March, 2016 is the deadline for compliance. David Patterson, AQD-TPU is assigned to this source testing and plans to observe on the 2nd day (December 16th).

COMPLIANCE INSPECTION

Upon my arrival to the facility at approximately 9:30 AM, I contacted Luther Blackburn by cell phone. He met me at the main office and we conducted a pre-inspection conference. I had previously informed Luther that I would be on-site to observe at least one day of testing. I now informed him that I would like to conduct the scheduled compliance inspection today as well. I told him that the inspection will entail walking through the main facilities and obtaining emissions and monitoring record keeping required by the ROP.

During the prior 12 month period there have been several significant compliance items, some ongoing, involving YCUA's EU-FBSSI. We discussed these and below is a brief summary:

- YCUA is 1 of 3 SSI in the State. The 4M compliance deadline is March 21, 2016 and requires companies to develop and implement an incinerator operator training program including an instructional course and test. DEQ-AQD developed & submitted to EPA a State Plan for delegation of the 4M standard; final approval comment period ends January 15, 2016, which should give us the authority for compliance & enforcement of the standard. The State is required to approve the Operator Training program. YCUA submitted a course syllabus but not the testing materials. Luther agreed to follow up with their consultant/SSI expert and estimated it will likely be January 2016, with the training and testing to take place in February.
- YCUA recently submitted a notification and a petition to EPA Region V. related to their EU-FBSSI 4M requirements for testing, operating parameters and monitoring. AQD was copied and the specific letters are filed with this report. Notification is of current testing date including a proposal to re-establish the Oxygen % (O₂%) in the exhaust (see #3). Petition is to request alternative compliance monitoring parameters for the GACA air pollution control equipment.
- 4M testing today will provide additional monitoring information and possibly set a new value for the O₂% in the exhaust stack. Current % was based on the initial Particulate testing under NSPS Subpart O. That test in July 2006 confirmed the Particulate Matter (PM) rate was 0.047 lb/ton (less than 0.75 lb/ton limit). The O₂ value is related to the sewage sludge throughput and YCUA experiences deviations of the value (range) because normal throughput is lower than maximum capacity. It is expected they will continue to report deviations of the ROP unless the level can be set at a more accurate/realistic throughput.
- Luther informed me that their new Desulfurization system was installed about two weeks ago and is fully functioning. He said it appears to be working well, getting good control so far. They added a Sodium Hydroxide (NaOH) injection pump to the top of the VS for enhanced control of Sulfur dioxide (SO₂) in order to maintain consistent compliance with the 4M limit (15 ppm), and for enhanced control of acid compounds in the GACA. A pH probe was added below the scrubber portion and YCUA needs to establish the pH operating parameter and SO₂ compliance for 4M. The actual 4M emission levels will be measured downstream of the GACA.
- During fall 2015, YCUA self-reported a biosolids sample that showed Total Chromium over the permit limit. YCUA conducts regular sampling more frequently than the ROP requires. The limit is instantaneous, requires SS sampling once per year, and it is to be done during testing if that occurs during the year. YCUA obtained a compliant sample in the spring 2015 during performance testing. A recent unusual situation caused the current exceedance and immediate steps were taken to identify the cause and

correct it and DEQ Divisions were notified. Additional frequent sampling was/is being conducted. In early November, Luther reported their 10-13-15 result was 350 mg/kg chromium and is now below the emission limit of 450 mg/kg dry sewage sludge. (Additional details & correspondence are documented in MACES and plant files)

Performance Testing

Luther accompanied me to the testing area after we first walked over to the UV Disinfection Building to observe one of the two EU-ENGINE emergency generators. Luther said testing today is scheduled for Dioxin and Polychlorinated Biphenyls (PCB) and also multi-metals. Dioxin is a 4 hour test and therefore some runs may be done tomorrow. The EU-FBSSI allows for stack testing to be set-up & conducted indoors on the top floor level. I observed it was extremely warm here (usually is) above and near the incinerator. Luther and I met with Thomas Schmelter, BV and Valerie Guenther, Tetra-Tech (YCUA consultant). Thomas was set-up inside a stair well on one side of the room with a fan in the doorway and it was much cooler there.

There is a need as I understand it to keep some of the equipment cool. The rest of the testing crew was located on the opposite side next to the main stack. I observed several stack testing probes along with associated technical equipment. Before leaving the area Thomas showed me the audit samples he had; he said they don't do anything with them they just submit them to the Lab with the collected samples. I observed the audit samples contained: Beryllium filter, metal in ampule, impinger solution, and Mercury, filter paper and ampule. I asked Thomas about the test schedule and the current test run status and he said:

- Reference Method (RM) 23 is for Dioxin and the 1st Run started at 9:30 AM (means will end @1:30 PM)
- RM 5/29 is for Particulate Matter (PM) and Metals. Thomas said the Particulate test 1st Run started at 8:30 AM and ran until 9:00 AM and then they switched the probe and continued at 9:07 AM to 9:37 AM.
- Run #2 RM 5/29: 9:57 AM -10:27 AM
- Run #3 RM 5/29: 12:02 PM ongoing at the time @ 12:30 PM.
- He said the testing to be done today is: (2) RM 23 Runs (1 Dioxin run will be done tomorrow), (1) HCl run ((2) will be done tomorrow).

Thomas said they are taking readings for O₂, CO₂, NO_x, SO₂, CO, but haven't recorded formal readings yet. O₂ was also being recorded in-stack for correction to 7% oxygen. YCUA has a Carbon Monoxide (CO) continuous emissions monitoring system (CEMS) under the Clean Water Act 503 Program – was not an air related requirement. I observed the reading was: 38.8 ppmv. A prior inspection report from AQD Glen Erickson indicated CO concentrations are “instantaneous” and the 503 regulation limit is 100 ppm averaged monthly.

RETURNING TO INSPECTION

I observed the separate structure that Luther identified as the (gas) Conditioner to the GACA: its purpose is to pre-condition the gas stream prior to the Carbon system, removing moisture and heating the gas to prevent condensation in the adsorber.

During the inspection I also observed the Main Control Room. Operators were monitoring and controlling the EU-FBSSI with numerous computer screens. While we were in the control room Luther and Valerie showed me what changes have been made in order to record the majority of the new 4M monitoring and recording keeping requirements for YCUA. There are specific averaging times in the standard and YCUA has developed a new computerized program that shows all the parameters and the averaging times.

I requested **screen print outs** of the data I was observing at this time. Parameters listed on Page 1 included: (Venturi) Scrubber liquid pH (related to desulfurization system pH probe), WESP Effluent flow rate, WESP Secondary power. Parameters on Page 2: Average Bed Temperature, VS Pressure drop, MITS Pressure drop, VS and MITS flow rates, GACA Pressure drop, GACA Conditioner Temperature.

Luther explained their computer data acquisition and recording system is PLC driven and called “SCADA” and at approximately 11:40 AM I obtained readings from one incinerator diagram, and from the new 4M Averaging screens:

- **Fluidized bed Temperature** approx. 1318 degrees F average (>1150 F permit minimum based on 15 minute avg.)
- **Freeboard Temperature** approx. 1707 degrees F (>1500 F permit minimum based on 15 min avg.)
- **VS:** 32.6 inches of H₂O pressure (permit range 30-40 during SS combustion; 20-40 during start-up); and from 4M screen printout: 325.5 GPM (permit limit minimum 300)

- **MITS:** 9.8 inches of H₂O pressure (permit range 5-15); and from 4M screen printout: 563.6 GPM (permit limit minimum 350)
- **WESP** from 4M screen printout effluent flow rate: 24 gpm (Did not see or obtain pressure drop)
- **GACA:** 4.1 inches of H₂O pressure (permit range 1-10);
- **SS Feed Rate:** 47 gpm; and 29,939 gallons (appeared to be totalizer and was increasing)
- Operators also keep a manual record chart and I obtained the following SS readings: 22% solids at 5398 dry pounds per hour.

The EU-FBSSI is equipped with "Interlocks" that prevent SS feed when temperatures drop below set points above minimums. From previous inspection report, former AQD inspector included a simple calculation of the pounds of dry sludge (SS) feed rate. I plugged in the current readings (above) and the result is:

$47 \text{ gpm} \times 60 \text{ min/hr.} \times 8.34 \text{ lbs/gal} \times 1.1 \text{ (assumed specific gravity of sludge)} \times .22 = 5691.5 \text{ lbs of dry sludge}$

On 12/3/15 YCUA submitted a petition to EPA to request specific monitoring parameters, operating limits and averaging periods for the GACA because it is an alternative to the control equipment listed in the standard (40 CFR 60.5175) for Mercury removal. The Screen Printouts are an example of what they have set up for compliance with 4M. It is also verification of my observation during the inspection. (All records obtained are attached to the inspection report to file).

During my review of record keeping following the inspection the GACA design was clarified to me. It consists of three vertical chambers or columns. The 1st chamber is a filter medium for removal of fine particulates; the 2nd and 3rd chambers contain activated carbon. Within each of the chambers are several columns (also referred to as chambers). There are 3 columns in each of the three chambers thereby = #1 - #9. I asked Luther to clarify this in their recordkeeping by means of diagram or photos. The same terms should be used in all documents going forward to avoid confusion. YCUA permit condition refers to GACA as having "two beds". The manufacturer CPPE Kombisorbon Process document refers to "carbon beds and layers" and YCUA's EPA petition and carbon sample/analysis records refer to both "chambers and columns". This is important for compliance purposes when it comes to sampling of carbon for breakthrough and replacement.

EU-BIOFILTER BUILDING AND DUCTWORK

Directly north of the SSI building is a separate building housing the blowers for the system that removes foul air from the Sludge building and directs it into the Finishing tanks. Luther and I walked over to this building, referred to as the "foul air control system". This is not a true "biofilter" but has retained the original referenced name in the ROP. Over the years control methods have been replaced/changed as equivalents pursuant to Rule 201 exemption. It now includes two Finnish-made bearing-less ID fans which supply vacuum to the many foul air sources in and around the sludge handling building and sludge blending storage tanks. All the equipment appeared to be operational and in good condition.

We then walked over to observe the two large outdoor ash storage lagoons which receive the air pollution control device water discharges for solids settling. The liquids then get pumped back to the headworks of the wastewater plant. I did not observe any significant odor and there were no fugitive dust emissions. Uncombined water vapor or steam was observed from the lagoon water. YCUA generated ash is all combined with water and is "wet" they do not handle dry ash.

ODOR BUILDING AND DUCTWORK

Luther and I then walked to another building to inspect the EU-CHEMSCRUBBER consisting of two chemical scrubbers for controlling hydrogen sulfide (H₂S-laden) foul air from the headworks and portions of the primary settling tanks. The scrubbers are equipped with monitoring devices for pH, reagent concentrations, and liquid flows. The first stage is a sodium hydroxide solution with observed pH = (11.02) and flow @ 530 gpm; followed by a second stage with sodium hypochlorite and I observed a pH reading = (10.12) and flow @ 503 gpm. The Oxidation Reduction Potential (ORP) = (659) mV, where the system minimum = 500 mV. I read the inlet concentration of H₂S = 50 ppm; while the outlet concentration of H₂S = 0.00 ppm.

Finally, we walked outdoors through the in ground water treatment process tanks. I observed the first anoxic tanks of the secondary treatment process where the foul air is pumped. Whenever a tank is drained for cleaning/repair the foul air is shut off to that tank until liquid is again restored. I noted some mild odor in and

around the tanks but only in the immediate vicinity.

According to AQD files, the overall fugitive foul air emissions from the treatment processes, and particularly the sludge blending, storage and handling has dramatically been reduced over the last 15 years or so at this facility. In the past individuals living in the West Willow subdivision, just west of the plant, had complained about foul odors. YCUA has spent a great deal of time, energy, and money in collecting and treating foul odors from the plant in a variety of ways, finally arriving at their current control design. There have been no odor complaints for several years.

MI-ROP-B6237-2015 RECORDKEEPING:

EU-FBSSI Emission limits: ROP contains limits for CO, 2,3,7,8 TCDD TEQ, Total PCB, HCl, and PM. All these emission limits are based on Test protocol. Limits for Metals: Arsenic, Beryllium, Cadmium, Total Chromium, and Mercury are based on instantaneous sewage sludge sampling once per year. SO₂ and NO_x are only limited pursuant to 4M. Testing to this date has demonstrated Compliance.

EU-FBSSI Material limits: Dry Sewage Sludge (SS) limit is **6300 lbs/hr 24 hour average, and 16,380 tons per 12 month rolling time period** as determined at the end of each calendar month. Fuel is limited to – only burn SS and natural gas. Monthly records for the 12 month period ending November 2015 were received on January 6, 2016 and demonstrate compliance with the hourly average limit, and the 12 month rolling time period limit. SS throughput for the period was **3801.396 tons**. Compliant.

Advanced APC System (controls) Operating Parameters: ROP contains monitoring requirements for all air pollution control systems and many design/equipment parameters have been established during performance testing. These are included in the conditions of the ROP and in YCUA's required plans (Malfunction Abatement, Preventative Maintenance, and Nuisance Minimization for Odor Management). Compliant.

YCUA's monthly monitoring records received cover all APC equipment. There are some instances where certain continuously monitored parameters were below minimum limit however record indicates in all cases it was for very short periods. One example, Freeboard temperature minimum is 1500 degrees F and if the temperature fell below the minimum they include comment: "freeboard temperature readings are recorded continuously, average... temperature less than 1500 F cannot be maintained for more than 15 minutes without sludge feed being inhibited."

YCUA's spreadsheets included the required APC temperatures, pressure drops, and water flow rates. All parameters are monitored and recorded continuously (or every 15 minutes as allowed) and any readings outside of the ranges or minimums include a comment (similar to the one noted above) indicating short duration.

YCUA's records submittal also included a spreadsheet of the Monthly Biosolids sampling dates and results for the requested 12 month period. The only issue was Chromium (discussed separately in this report).

Another one page record titled "Evaluation of Adsorbent Mercury Removal Capacity" was included. I had not previously seen this adsorbent sampling report from YCUA. The purpose of sampling is to determine available sulfur in carbon still available for mercury removal. The record identifies 2 columns (#5 and #8) of the GACA were sampled. Per earlier discussion, Luther clarified #5 is in the center of Chamber 2 Carbon and #8 is in center of Chamber 3 Carbon. ROP conditions require YCUA annually evaluate when the adsorbent needs to be rotated and replaced. They do this per Mercury Stack Testing and results have been well below limit and they have not had to change the carbon to date.

GACA Carbon Report:

Media Column #5 has 61% of sulfur available for mercury removal, and Media Column #8 has 54%. New Kombisorb BAS 46 is in the range of 6-7%. The sample result for #5 =4.36% and #8 = 3.92% (wt%)

YCUA spreadsheet for EU-GASTANK monthly fuel usage indicates monthly gallons are below the 10,000 throughput category indicated by GDF MACT (6)C.

YCUA included a spreadsheet of monthly natural gas usage for all natural gas using equipment including the EU-FBSSI. Required for MAERS/Fee reporting and for Boilers subject to NSPS Dc. For the indicated time period total natural gas usage ranged from a monthly low of 1.4 million cubic feet (mmcf) in July 2015 to 6.2 mmcf in October 2015.

All records obtained during and following the inspection are attached to the Full Compliance

Evaluation (FCE) report and have been placed in AQD plant files.

CLOSING CONFERENCE

Following the inspection Luther and I returned to the main office to wrap up the inspection. We went over the ROP record keeping requirements and I requested 12 month rolling records for the period ending November 2015. Due to the upcoming holidays and the current extensive testing, we agreed Luther will submit records to me electronically by January 6, 2016.

Records were received timely and appeared to be complete and indicated compliance. Luther and I spoke on January 13, 2016 to clarify some record keeping items - some were noted in this report.

The Oxygen % was discussed and determined to include two different monitor locations, one at EU-FBSSI exit and the other in the exhaust stack. This monitoring parameter may require further clarification related to the ROP condition (value shall not be less than 2% wet or 3% dry), and the value established during the Particulate testing under NSPS Subpart O (5.03% +3%). In addition, YCUA ROP record keeping condition requires they record the Oxygen content of the incinerator exhaust gas every 15 minutes. YCUA has a CEMS in the stack and %O₂ is continuously monitored for Water regulation 503. There is also a monitor at the freeboard exhaust.

It appears that YCUA is in substantial compliance with the applicable federal and state requirements of their ROP at this time. AQD will continue to work with YCUA regarding the future applicable NSPS 4M requirements including the pending Operator Training program. Other pending items include YCUA's petition to EPA regarding various EU-FBSSI / APCS monitoring parameters.

Again, all records obtained during and following the inspection are attached to the Full Compliance Evaluation (FCE) report and have been placed in AQD plant files.

NAME *Adam Kefauver* DATE *1/14/16* SUPERVISOR *[Signature]*