

K5497
MWWLA

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

K549741630

FACILITY: Detroit Water & Sewerage, Southwest Plant		SRN / ID: K5497
LOCATION: 14700 Moran Road, ALLEN PARK		DISTRICT: Detroit
CITY: ALLEN PARK		COUNTY: WAYNE
CONTACT:		ACTIVITY DATE: 08/31/2017
STAFF: Stephen Weis	COMPLIANCE STATUS: Non Compliance	SOURCE CLASS: Synthetic Minor
SUBJECT: Compliance inspection of the Great Lakes Water Authority Southwest Water Treatment Plant facility in Allen Park. The Southwest facility is scheduled for inspection in FY 2017.		
RESOLVED COMPLAINTS:		

Location:

Great Lakes Water Authority (formerly Detroit Water and Sewerage Department)
Southwest Treatment Plant (SRN K5497)
14700 Moran Road
Allen Park

Date of Activity:

Thursday, August 31, 2017

Personnel Present:

Steve Weis, DEQ-AQD Detroit Office
Aaron Butler, GLWA

Purpose of Activity

A self-initiated inspection of the Great Lakes Water Authority (GLWA) Southwest Treatment Plant (hereinafter "Southwest Plant" or "Southwest facility") was conducted on Thursday, August 31, 2017. The Southwest Plant is on my list of sources targeted for an inspection during FY 2017. The purpose of this inspection was to determine compliance of operations at the Southwest facility with applicable rules, regulations and standards as promulgated by Public Act 451 of 1994 (NREPA, Part 55 Air Pollution Control), applicable Federal standards, and any applicable permits and orders.

Facility Description

The Southwest Plant is located on the north side of Moran Road, between Dix Rd. and Interstate 75. The facility is on a large parcel of land that stretches approximately ½ mile from east to west, and a third of a mile from north to south, that is located directly to the east of I-75 on the north side of Moran/Goddard Rd. The area around the Southwest facility primarily consists of residential properties in the cities of Allen Park, Lincoln Park and Southgate. The closest residential properties are located to the south of the facility directly across Moran Road.

The Southwest Plant operates as part of the Great Lakes Water Authority's drinking water distribution system. The system was formerly owned and operated by the Detroit Water and Sewerage Department (DWSD), but GLWA began a 40 year lease with the City of Detroit that provided for GLWA's operation of the regional water and sewerage system on January 1, 2016. GLWA operates five water treatment facilities that treat freshwater that is drawn from Lake Huron, Lake St. Clair and the Detroit River, and deliver the treated water to the drinking water customers of GLWA. There are currently nearly 4 million customers in 126 southeast Michigan communities that receive drinking water from GLWA. The drinking water is transported from the treatment facilities via a distribution system that consists of a network of water mains (larger transmission mains operated by GLWA, and distribution and water mains maintained by the various municipalities), fire hydrants, pressure reducing valves (on the distribution mains) and reservoirs and booster stations operated by GLWA that ensure that proper water flow and pressure are maintained in the water mains. The Southwest Plant is one of the water treatment facilities in the drinking water distribution system.

The Southwest Plant has a pumping capacity of 240 million gallons per day. The facility receives water from the Detroit River, and treats the water for distribution to the portion of the drinking water system serving the

downriver communities of Wayne County, the southern half of Wayne County and the portion of Monroe County served by GLWA. The Southwest Plant consists of a large settling basin in which the water drawn into the facility from the Detroit River receives its first treatment, which allows solids to settle out; a treatment building in which the water is filtered and chemically treated to disinfect it; one clarifier tank; three treated drinking water storage tanks, each with a 10 million gallon capacity; and a residuals handling building.

The Southwest facility also has some equipment that is subject to air quality regulations. There are four diesel-fired emergency engines that were installed at the facility in September of 1999 to provide emergency back-up power to the Southwest Plant in case of a power outage. The engines are both Caterpillar Model 3516B generators rated at 1,825 kW electrical output, with a maximum heat capacity of 18.3 MMBTU per hour. The generators are fueled via two above ground diesel fuel storage tanks, each having a storage capacity of 8,000 gallons. The generators and storage tanks are located to the north of the treatment building. There are three boilers located in the northern portion of the treatment building. The three boilers are natural gas-fired Clayton units that were installed in 1992. One of the boilers is a model E-154, having a maximum rated heat input capacity of 6,123,476 BTU per hour, and the other two are Clayton Model E-304 boilers, each having a maximum rated heat input capacity of 12,246,951 BTU per hour.

There are also two fuel dispensing pumps and associated underground storage tanks. There is one pump each for gasoline and diesel, and two underground gallon capacity storage tanks, one for each type of fuel. The dispensing operation is located to the south of the treatment building, and provides fuel for facility personnel and GLWA vehicles.

Facility Operating Schedule

The Southwest Plant operates on a 24 hour per day basis every day of the year.

Inspection Narrative

I arrived at the facility at 11:40am. I was met by the facility contact, Aaron Butler in the treatment building. We first visited the diesel engines. The engines are located to the north of the treatment building in four separate housings, and there is a common control room for the engines. The above ground diesel fuel storage tanks that provide the fuel for the engines are located adjacent to and to the north of the engines. I read the labels that are affixed to one end of each tank, which provide that the tanks each have a storage capacity of 8,000 gallons, and they were installed in September of 1999. As at other GLWA facilities with engines, I was told that the installation date for the fuel storage tanks corresponds to the installation date for the engines, as well. Aaron and I went into the control room for the generators. An operational log is kept in the control room through which GLWA staff who operate and maintain the equipment at the facility keep records of all times that the engines are operated. In looking at the log, the dates that the engines were operated were noted, as well as the times that the engines were turned on and off, and the reason for the operation (e.g. maintenance testing, emergency use). I was told that the engines are started for a monthly "no load" test to check the engines' operation. I asked if the engines are used for peak shaving purposes, and Aaron replied that he cannot recall the engines being used for this purpose. The log book did not indicate any peak shaving; the pages that I looked at covered operations for 2017 and part of 2016.

Aaron and I next looked the facility's boilers, which are located at the north end of the treatment building. There are three boilers, which are described in the "Facility Description" section of this report. Aaron and I looked at the boilers, and tried to find information about them. There were no boiler plates affixed to the boilers. There was a label that provided the year that the boilers were installed, which was 1992. The boiler model and serial numbers were also displayed on all three units, and I was able to find the maximum rated heat input capacity for the two boiler models on site via the internet. The Model E-304 units are identified at the facility as SG-1 and SG-2, and the Model E-154 boiler is identified as SG-3.

We then walked through the rest of the treatment building. Aaron described the water treatment process, and he pointed out the pumps. There are six low lift pumps, which bring influent water to the Southwest Plant for treatment, and seven high lift pumps, which serve to move treated water to the drinking water transmission main. In the lobby of the treatment building, we stopped and looked at a model of the facility that showed the buildings and storage tanks on the property, with labels describing them all. I pointed out a newer building at the west end of the facility property near I-75. Aaron told me that this is the residuals handling building. Here, solids from the influent water that are settled out in the settling basins are dewatered using two centrifuges; the dewatered solids are disposed of off-site.

We then proceeded to the fuel dispensing equipment, which is located to the south of the treatment building, just east of the facility's main driveway. There are two fuel pumps, one for gasoline, and one for diesel fuel, and two underground storage tanks. Aaron told me that the fuel is used for plant personnel and GLWA vehicles.

After concluding our tour of the facility, we briefly returned to Aaron's office to wrap up our discussion. I left the facility at 12:30pm.

Permits/Regulations/Orders/

Permits

The facility currently has one active air permit, PTI No. 254-99B. The original permit, PTI No. 254-99, was applied for in June 1999 by DWSD to address the pending installation of the four Caterpillar engines. The application material states that the engines were being installed "...to provide power to the water pumping station in the event of a power outage in January 2000 or at any time thereafter." The PTI limited the hours of operation of the engines to 500 hours per year to limit the potential emissions from the engines to below major thresholds (the permit also limited emissions of NOx to 12 tons per year). The permit was issued in August of 1999.

PTI No. 254-99A was issued to allow an increase in the hours of operation of the engines from 500 hours per year to 2,550 total combined operating hours per year. DWSD applied for this permit revision in May of 2002 to increase the allowed hours of operation of the engines so that the engines could be operated for electrical load peak shaving in addition to their use in providing emergency back-up power to the pumps. This PTI also increased the allowable NOx emissions to 39.4 tons per year. PTI No. 255-99A was issued in August of 2002.

The current PTI, No. 254-99B, was issued on December 1, 2008. DWSD applied for this permit to change the permitting operating limit on the engines from an hours of operation basis to a fuel restriction basis. DWSD requested this change on the basis that the hours of operation limit from the past versions of the permit were based on 100 percent load during the operation of the engines. DWSD provided that the engines are frequently operated at reduced loads, but that any operation was essentially being regulated, from an emissions standpoint, as being at 100 percent load. The fuel usage restriction was calculated based on the NOx limit of 39.4 tons per year. Thus, the current permit still serves to limit the potential emissions from the engines to below major source thresholds.

The compliance status of the Southwest Plant Pump Station facility with the requirements of PTI No. 254-99B is summarized, as follows:

Special Condition I.1 (Emission Limits) – This condition limits the total emissions of nitrogen oxides (NO_x) from the operation of the two engines to 39.95 tons per year. As of the finalizing of this report, GLWA has not provided me with valid information demonstrating how NOx emissions are being calculated and tracked by GLWA. Based on the low usage of these generators (typically an hour or less per generator, per month), the NOx emissions should be well below the permitted limit. The application materials that were submitted for PTI No. 254-99A provide a Caterpillar guaranteed NOx emission rate of 30.9 pounds per hour, based on 100% load. The four engines would need to operate for 2,585 hours during a 12-month time period to meet the permit limit. Based on the operational logs that I looked at, the engines look to be in compliance with this emission limit.

Special Condition II.1 (Material Limits) – The facility is in compliance with this condition. All of the fuel that is used at GLWA facilities is ultra low sulfur diesel, and has a sulfur content of less than 0.05% by weight.

Special Condition II.2 – As of the finalizing of this report, GLWA has not produced any records to demonstrate that diesel fuel usage is no more than 328,333 gallons per 12 month rolling period. The engines have a maximum fuel consumption rate of 130.8 gallons per hour, per engine. Given the number of hours that the engines are being used, the diesel fuel usage should be well below 328,333 gallons per 12 month rolling time period. It is assumed that the facility is complying with the requirement.

Special Condition IV.1 (Design/Equipment Parameters) – There is no device associated with the engines to monitor the fuel usage. Rather, the fuel usage is monitored based on the flow of fuel to each engines' day tank. Compliance.

Special Condition VI.1 (Monitoring/Recordkeeping) – As of the finalizing of this report, GLWA has not demonstrated that the monthly calculations of the NOx emissions from the engines are being performed and recorded. Non-compliance.

Special Condition VI.2 – GLWA maintains fuel specifications for each delivery of fuel at GLWA facilities. Compliance.

Special Condition VI.3 – As of the finalizing of this report, GLWA has not demonstrated that the monthly and 12 month rolling time period records of diesel fuel usage is being maintained. Non-compliance.

Special Conditions VIII.1 and 2 – These conditions put forth the ambient exhaust parameters for the four engines. This information was provided in the PTI applications. The stack parameters were not evaluated during this site visit.

Federal regulations

The engines were installed in 1999, and have not been modified since they were installed. The installation date for these engines is prior to the dates that make up the applicability criteria associated with 40 CFR Part 60, Subpart IIII (Standards of Performance for Stationary Compression Ignition Internal Combustion Engines), as put forth in 60.4200(a). Thus, the four engines at the Southwest facility are not subject to Subpart IIII.

The requirements of 40 CFR Part 63, Subpart ZZZZ (National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines) apply to owners and/or operators of stationary reciprocating internal combustion engines (RICE) at both major and area (or minor) sources of hazardous air pollutant (HAP) emissions, except if the RICE is being tested at a test cell/stand. The Southwest facility is a minor source of HAP emissions, as the potential to emit HAPs is less than 10 tons of any single HAP, and less than 25 tons for combined HAP emissions. Engines that meet the definition of "Emergency Stationary RICE" in Subpart ZZZZ are not subject to the provisions and requirements of this Subpart. In order to be considered an emergency RICE, the operation of the engines must meet the requirements put forth in 40 CFR 63.6640(f). If the operation of an engine does not comply with the requirements in 63.6640(f), then the engine is not considered to be an emergency stationary RICE for the purposes of this Subpart, and the engine is subject to the requirements of Subpart ZZZZ. Among the criteria for an engine to be classified as an emergency stationary RICE is the requirement put forth in 63.6640(f)(4) that while an engine can operate for up to 50 hours per year in non-emergency situations, after May 3, 2014, the 50 hours per year cannot be used for peak shaving or non-emergency demand response. The hours of operation of the engines is quite low, but if any of the operating hours at the Southwest facility occurred for purposes of peak shaving, then the engines could conceivably be subject to the requirements of Subpart ZZZZ.

Boilers

The three boilers are exempt from the requirement to obtain a Permit to Install per the provisions of Michigan Administrative Rule 282.

Two of the boilers are subject to the requirements of 40 CFR Part 60, Subpart Dc (Standards of Performance for Small Industrial-Commercial-Industrial Steam Generating Units). Subpart Dc applies to steam generating units/boilers for which construction was commenced after June 9, 1989, and that has a maximum heat input capacity between 10 and 100 MMBTU per hour. The two Clayton Model E-304 boilers (SG-1 and SG-2) are subject to Subpart Dc as they were installed after 1989, and have a heat input capacity between 10 and 100 MMBTU per hour. 60.48c requires that GLWA submit notification that includes the date of construction and startup of the boilers, and the design heat input capacity of the boilers. 60.48c also requires that records of the amount of fuel combusted in the boilers on a monthly basis.

Fuel Distribution

As previously mentioned, the Southwest facility has two underground storage tanks (one for diesel fuel, one for gasoline), and two corresponding fuel pumps. The fuel dispensing facility is potentially subject to State and Federal regulations, including:

- Michigan Administrative **Rule 606**, which applies to gasoline storage tanks with a gasoline throughput of more than 120,000 gallons per year that have tanks of more than 2,000 gallons capacity. The throughput of gasoline at the Southwest facility is presumably well below 120,000 gallons per year.
- **Rule 703**, which applies to dispensing operations at which gasoline is loaded into tanks of more than 2,000 gallons capacity.
- **40 CFR Part 63, Subpart CCCCCC** (National Emission Standards for Hazardous Air Pollutants for

