ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
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BRUCE RAUNER, GOVERNOR ALEC MESSINA, ACTING DIRECTOR

# FIELD REPORT

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| Facility Name: | Antioch WWTP |
| NPDES Permit No.: | IL0020354 |
| BOW#: | W0970050001 |
| Inspection Date: | November 19, 2015 |
| Inspected By: | Antwan Williams |
| Interviewed: | Jason Treat<br>Senior Operator |

## GENERAL INFORMATION

Responsible Officials:

The Mayor of Antioch is Lawrence M. Hanson. The operator in charge of this facility is Jason Treat. The plant number is 847/ 395-2740. The cell phone is 847/833-8324. The mailing address is 874 Main Street, Antioch, IL 60002.

Plant Location:
The plant is located NW of the main business district at 796 Holbeck Drive. The legal location is the NW quarter of Section 08, Township 46N, Range 10E, Lake County. The entrance is located on the corner of Depot St. and Holbeck Drive.

Receiving Waters:
The receiving stream is Sequoit Creek, which is classified as a general use stream. Sequoit Creek is tributary to Lake Marie, which in turn connects to the entire Chain-O-Lakes and ultimately discharges to the Fox River. The seven-day -10 year low flow at the point of discharge is 0.13 cfs. This stream has been rated ‘’D’’ under the Agency’s Biological Stream Characterization (BSC) program. While Sequoit Creek is not found on the 2006 Illinois 303(d) list, Lake Marie is. Impairments include aesthetic quality and fish consumption. Historically, Sequoit Creek's entry point into Lake Marie has been the location of significant algae blooms.

Permitted Capacity:

See attached pages 2 and 3 of the NPDES Permit.

## COLLECTION SYSTEM

Area Served:
The Antioch WWTP serves the portion of the Village located within the Antioch FPA, which is an area of about three square miles. The area includes several commercial and industrial users in the Village and the Village has an approved Pretreatment Program. The sewage collection system consists of separate sewer lines. Despite a history of heavy infiltration, there are no documented combined sewers. The collection system is maintained by a cooperative effort between the WWTP personnel and the Village Water Department. Attached is an updated list of lift stations tributary and significant industrial users to this facility.

Type of System:
Provide system details such as percent combined and separate, location of combined sewer areas and system age.
The village has a separate sewer system.

System Problems:
The village is aware that I/I exists within their boundaries.

Lift Stations:
The List of Lift Stations is attached.

Industrial Users:
Kay-Home Products is a CIU within the village; however the subject IU doesn't discharge their process waste into the sewer system. The process waste is hauled out by a waste hauler.

Pickard China is considered an SIU due to the fact that they have a pretreatment system, not because they have a significant amount of process waste entering the village's collection system. Pickard China makes china such as bowls, cups, plates, etc. The process waste goes into a 300 gallon settling tank for at least 48 hours. Then the effluent from that tank goes into another 300 gallon settling tank for at least 48 hours. After that the effluent is discharged through a final filter before it goes to the sanitary sewer collection system. The Senior Operator contacts the manager of Pickard China once

every quarter to collect samples from the discharge of the pretreatment system to determine if it meets pretreatment permit limits that the subject IU holds with the village.

## WASTEWATER TREATMENT PLANT

Raw Sewage:
Raw sewage appeared to have a normal grayish color and a normal odor.

Bypass/Excess Flow Treatment:
The plant doesn't have any bypass provisions or conditions, or any excess flow treatment.

Screening:
The village has a Lakeside Raptor Screen which is a fine mesh screen that washes, compacts, collects, and disposes of the screenings. The screenings are then hauled offsite by Waste Management to a landfill. The volume of screenings generated is approximately 2 yards per week.

Raw Sewage Pumping:
See attached lift station list.

Influent Flow Measurement:
The village has an area velocity meter which measures the width of the channel, the depth of the water, and the velocity of the flow. From that information the area velocity meter calculates the flow.

Secondary Treatment:
There are 3 aeration basins with a total volume of 1.44 MG. The aeration basins are a part of the Biological Nutrient Removal (BNR) system. The aeration basins carry a MLSS of about 2500 to 3000 mg/l. The RAS is kept at about 5000 to 6000 mg/l. The DO levels are kept at no less than 2 mg/l. The aeration tanks are designed to hold sludge for approximately 10 to 20 days. The subject facility holds their sludge for approximately 20 days. The village is in the process of acquiring the OPT 10 program to assist with maintaining the desired levels of their process control rationale.

Blowers:

The subject facility has 7 brand new positive displacement blowers manufactured by Kaeser. There are three blowers for the aeration basins, and four blowers for the aerobic digesters.

The subject facility had two new pipelines installed for the four blowers that connect to the aerobic digesters. This allows one blower to control digester 1 and digester 2 as opposed to each digester having an isolated blower. The same design is setup for digesters 3 and 4. This design allows two additional blowers to be used for backup.

Effluent Flow Measurement:
The subject facility has an ultrasonic meter that is situated in a Parshall Flume which measures the effluent.

Effluent Disinfection:
The subject facility has a Trojan UV 3000+ system with two banks, one bank is a back up. There are five modules per bank with 8 bulbs per module. The system is run automatically with alarms installed in case of system failure.

Phosphorus Removal:
The subject facility is currently utilizes enhanced biological nutrient removal (EBNR) to assist in the removal of phosphorus. The subject facility exceeded the permit limit for phosphorus in July 2014. According to the operator, this was due to the lack of available carbon source for the phosphorus accumulating organisms. The subject facility has started adding a carbon-rich product, QLF's Enhance BioP, which, according to the operator, helps the phosphorus accumulating organisms perform better. The operator states since adding the product the EBNR system has improved.

Belt Filter Press:
During the time of the inspection Antioch had an electrical short in the pump that pumps the sludge from the belt filter press to the sludge barn. This caused the facility not to be able to run their belt filter press. The senior operator was scheduling the maintenance during the time of the inspection.

SSO:
On November 28, 2014 at 6:40 PM the subject facility experienced an SSO at 910 David Street, Antioch, IL 60002 due to a blockage in 8" sewer line. According to the report submitted to the Agency the estimated volume of wastewater discharged was less than 50 gallons. See attached report.

Gravity Thickener:

The gravity thickener is offline because the plant doesn't have enough hydraulic loading for the size of the tank. There was frozen water in it during the time of the inspection.

## SLUDGE HANDLING

Sludge Permit:

Sludge is being land applied under permit 2009-SC-1784 which expires January 31, 2014. This permit allows for 500 dry tons a year of sludge to be to be land applied to agricultural lands. The permit disallows land application on ice and snow covered grounds.

## NPDES PERMIT COMPLIANCE

Permit Verification:

Permit verification was satisfactory. The permit is current and all discharges are included.

Facility Site Review:

During the time of the inspection Alum is being used for phosphorus removal. The chemical tank holds 2,500 gallons. The secondary containment area surrounding it has at least a 2500 gallon capacity. The tank is filled by Hawkins, Inc. When the tank is being filled an operator has to unlock the door to the chemical room and open the inlet valves to the tank. The tank has a site gauge on it to determine when the tank is full. The subject facility is in the process of determining a spill prevention plan for filling the tank.

The aerobic digesters were operating satisfactorily.

During the time of the inspection all improvements to the units and buildings were complete and the effluent looked clear.

Records and Reports:

A review of records and reports showed that the permittee has been in compliance with Standard Condition 10 (Monitoring and records) of the NPDES Permit requirements.

Flow Measurement:

Effluent and excess flow measurement appears to meet the NPDES Permit requirements.

Self-Monitoring Program & Laboratory:
All samples, analysis, and calculations are conducted by the Senior Operator and the other two operators on staff. Samples for $CBOD_5$ are collected and analyzed three days a week. They are analyzed using an YSI DO meter. Samples for TSS are collected and analyzed three days a week. They are analyzed using a glass fiber filter connected to a vacuum pump. The residual that is left on the filter is dried for 1 hour in the drying oven. Then the sample is weighed and the results are calculated and entered into the bench sheets. Samples for pH are grabbed and analyzed three days a week. They are analyzed using a bench top meter. The meter is first calibrated using known pH standards then the sample is tested for the pH value.

The subject facility utilizes in-line DO probe for the two day a week sampling requirement. The in-line DO probe, on a monthly basis, is calibrated by Village of Antioch Staff. In addition, the probe is double checked with an YSI 550A handheld unit quarterly. The YSI 550A handheld is annually calibrated by an outside company.

Samples for DO are grabbed and analyzed three days a week. They are analyzed using permanently installed DO meter located in the effluent channel. The DO is also double checked with the portable YSI DO meter. Samples for Fecal Coliform are grabbed and analyzed three days a week from March thru November. They are analyzed by first sterilizing the glassware using an autoclave. Next the sample is poured into the filter connected to a vacuum pump. Then the sample is put into a dry incubator at 45 degrees Celsius for twenty-four hours. Then the colonies are counted and input into the bench sheets. Samples for Total Nitrogen, Copper, and Silver are collected one day a week and sent to Suburban Labs for analyzing. Samples for Phosphorus are collected and analyzed three days a week. They are analyzed using a HACH (Test in Tube (TNT)) Kit. The sample is poured into the HACH Kit and shook then allowed to settle for an hour. After that the kit is put into a Spectrometer to determine the amount of Phosphorus in the kit. Then the value from the Spectrometer is entered on the bench sheet. Samples for Ammonia Nitrogen are tested and analyzed three days a week. The analysis is conducted by using another HACH TNT kit. The sample is poured into the HACH Kit and shook then allowed to settle for fifteen minutes. Then the kit is put into the Spectrometer to determine the amount of Ammonia Nitrogen in the kit. Then the value from the Spectrometer is entered into the bench sheet.

All results from data collected are recorded on bench sheets. Each bench sheet is compiled into a monthly excel spreadsheet by the Senior Operator. The Senior Operator completes the DMRs from the results of the spreadsheet and enters them into the USEAPA NetDMR system.

Suburban Laboratories, Inc. conducts the analysis for Copper, Total Nitrogen, and Alkalinity. A Chain of Custody record is attached to this report.

All laboratory procedures are attached to this report.

Effluent:

The effluent appeared clear at the time of the inspection.

Special Conditions:

During the time of the inspection the subject facility has appeared to be in compliance with Special Conditions 12, 16, and 18 of the NPDES Permit (proper operation and maintenance) since the construction of the new plant is complete. Compliance with Special Conditions 19 and 20 will be determined 18 and 24 months from the effective date of the permit, respectively. Special Condition descriptions are attached to this report.

Process control including MLSS testing and microscopic analysis is conducted three days a week.

Sludge Disposal:

Synagro is the contractor responsible for land application. No problems were noted. Based on analysis data, the parameter with lowest site life is Copper at 52 years.

## SUMMARY

The daily operation and maintenance of the facility during the time of inspection seem to be in fair compliance. During the time of the inspection the permittee was in compliance with their NPDES permit and Special Conditions. According to Special Conditions 19 and 20, the permittee has to prepare a phosphorous removal feasibility study to determine if the treatment plant can reduce their phosphorous loading, and develop a CMOM plan to eliminate SSOs, respectively.

Attachments:
3560-3 form
Plant Flow Diagram