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January 16, 2009

Mr. Rick Baer, Interim Utility Director
Antrim Township
10655 Antrim Church Road
Greencastle, Pennsylvania 17225

Re: Antrim Township Wastewater Treatment Plant Inspection Report 2008 Year
Equipment Condition and Maintenance
Brinjac No. 98011-R09

Dear Mr. Baer:

On January 13, 2009, Brinjac Engineering was present at the WWTP to review the condition of existing equipment with the plant operator, Mr. Lynn Shatzer. The WWTP was refurbished/ upgraded in 1998. Some additional modifications to the WWTP have been added since then:

a. In 2004/2005, a new larger J-press which can handle more than 14,000 gallons of 2% digested sewage sludge including new two story addition to the existing digester building.
b. Also in 2004/2005 a new chemical storage tanks which contain the polymer for the plate and frame press and the phosphorous removal chemical.

Antrim Township is located in Franklin County, in the south central section of Pennsylvania. The Township is served by wastewater treatment and conveyance facilities owned and operated by the Antrim Township Municipal Authority.

All sewage is treated at the Authority's wastewater treatment plant (WWTP). The plant's permitted hydraulic capacity is 1.2 million gallons per day (MGD) and the permitted organic capacity is 3,502 pounds of biochemical oxygen demand (BOD) per day. The plant discharges into Conococheague Creek. The NPDES permit for the facility, PA 0080519, expired January 1, 2008. A NPDES permit renewal was submitted to the PaDEP on July 6, 2007 and has not been received as of this time. It is anticipated that the new NPDES permit will include nutrient limits and mass load effluent nutrient cap load limits for total nitrogen and total phosphorous. PaDEP has indicated that the existing NPDES permit (expired) will be maintained at the facility until the new permit is issued because the PaDEP is behind in issuing new NPDES permits due to the impact of the Chesapeake Bay Strategy.

The current treatment train consists of a dual ICEAS SBR process followed by UV disinfection. The ICEAS process is a continuous flow time based sequencing batch reactor (SBR) process unlike other conventional batch flow based SBR processes. The influent flow into the basins does not stop but continues through the cycles. The ICEAS accomplishes aeration/mixing, settling and decant in a timed sequence, in a single reactor basin, whereas a conventional

continuous flow process required multiple structures/tanks and extensive pumping and piping systems. A single cycle for each reactor consists of three (3) discrete periods, Aeration/Mixing, Settlement, and Decant. One major advantage to using an ICEAS to treat peak flows is that flow equalization and treatment occur simultaneously. A Trojan UV4000 unit provides state-of-the-art disinfection for the effluent. The UV4000 unit adjusts UV intensity, automatically, based on flow and wastewater transmission quality. Following the UV disinfection process, the effluent discharges by gravity pipe to the Conococheague Creek.

All sludge produced during the treatment process is routinely pumped from the SBR by the submersible pumps to the sludge digester for further stabilization and pathogen reduction by aerobic digestion. Digested sludge is then pumped to a plate and frame press and processed for landfill disposal.

Results of the inspection are as follows:

The WWTP is generally in good condition with all equipment operating as required to meet permit limits. Based on the 2007 Chapter 94 Municipal Waste Load Management Report, the facility is not hydraulically or organically overloaded. There are two (2) licensed operators at the WWTP: Mr. Lynn Shatzer and Mr. Roger Nowell both of whom maintain Class B licenses as certified by the State of Pennsylvania for operation of this size WWTP. Mr. Lynn Shatzer is the chief operator for the facility and has an excellent record of compliance with the NPDES permit and has in the past several years been voted the outstanding operator for WWTPs for this size in the State of PA. His knowledge and experience are directly related to the excellent compliance record for this WWTP.

Several changes in the WWTP operations are noted:

a. The WWTP staff is not providing any laboratory support for the monthly discharge monitoring report as part of the NPDES permit compliance. All required sample analyses are sent to a private licensed wastewater laboratory. The operator maintains process control at the WWTP through evaluation of both suspended solids testing of the WWTP aeration tanks, settleability and general experience.
b. Recent organic loadings to the WWTP have increased and resulted in the operator stating that the existing aerobic sludge digester seems to be reaching its maximum capacity.
c. The operator is ordering new outdoor refrigerated automated composite samplers for the influent and effluent sample collection.

In general, equipment at the WWTP was found to be maintained in good condition. Maintenance is handled by the Antrim Township staff (when possible) and in 2008 the following were either performed or initiated:

1. Related to the Trojan UV4000 Disinfection System:
   a. In March of 2008, all UV bulbs were replaced. Some rebuilt bulbs were used, which do not last as long as new bulbs but provide a considerable savings.
   b. Several UV ballasts were replaced in 2008.
   c. The antifreeze for the UV bulbs was replaced in November 2008.

d. A new Trojan UV bulb cleaning gel is being used with auto-wiping system.
e. Currently, the UV system is operating at a 30% transmission level which powers up the units under decant to about 68% maximum power. This provides better protection of the equipment because each bank of UV bulbs ramps down to about 30% maximum power when the decant cycle is complete. This compares favorably to the previous 50% power level as the "hold" level between decants. This lower "hold" energy consumption level allows for longer bulb life and ballast life.

2. The #1 blower for the aerobic digester had to be replaced in late 2008. A ruptured oil line led to the failure of this unit. Antrim staff has the new blower at the facility and will install the unit in early 2009.
3. The aerobic digester equipment is working well with all decant pumps and tank units in good condition.
4. The existing aerobic digester developed a hole in the side of the unit in the spring of 2006 due to the failure of the sacrificial cathodes for the steel tank. The sludge from the tank leaked into a plant drain and was pumped back to the headworks. The existing steel tank was drained, repaired with a manufacturer steel plate patch and the sacrificial cathodes were replaced with three (3) times the original number to ensure no future problems. Operators have been provided with guidelines to verify conductivity of the tank protection system to verify integrity of the tank steel walls and to determine any future problems. Operators now verify tank integrity once per year as recommended by manufacturer through testing of these anodes.
5. Waste pumps located in the SBR tanks are original Flygt units and are operating well. Maintenance on these pumps is based on the existing O&M information. Pumps should be checked once a year and maintained as indicated. The basins would have to be emptied for this service to be carried out.
6. The blowers for the SBR are checked daily and oil is changed as a routine with complete voiding of all oil and new added one to two (2) times per year as needed.
7. The SBR tank anoxic mixers require that their oil is drained and replaced one (1) time per year, with this work to be performed in the next few weeks. This service requires that the operator drop each tank. Existing stainless steel cables on the mixers units may need replacement because they do not appear to be sufficient to lift the mixers which is the reason the operator must drain each SBR train.
8. The SBR decant arms require quarterly maintenance with the addition of oil to the transfer case to ensure proper operation. The operator performs this maintenance.
9. The headworks screening unit is operating properly with maintenance performed as needed.
10. The large J-press and smaller J press are operating properly. Cleaning of clothes is performed once the cake solids performance drops off. Each press is a hydraulic unit and checking of hydraulic system and washing of cloths constitutes the major maintenance on these items.
11. The sludge pumps for the new larger J-press are new Vogelsang units which are operating well. Maintenance is performed as needed.

12. The mixers for each sludge/polymer batch have to be maintained daily as hair in the sludge wraps around the mixers causing the mixers to vibrate and ruin the bearings. One unit has been repaired thus far. The operator removes hair from these mixers daily or every other day as a regular maintenance item.
13. The press pumps are compressed air diaphragm pumps (Wilden) which are maintained by the operator as needed. Pumps are in good condition.
14. The air compressor to drive the press pumps is a new Ingersoll Rand unit which is stored downstairs. The air compressor is maintained once a year with a service contract with an out of town company specializing in this type of equipment maintenance. A tarp to control sludge splatter onto the air compressors will be installed by the Township staff.
15. Chemical storage tanks holding the polymer for the press and the WWTP phosphorous removal chemical are located downstairs. The tanks are in good condition. Aluminum chlorhydrate is used for the press polymer and aluminum sulfate (alum) is used for chemical phosphorous removal. Chemical pumps are in good condition.
16. The existing WWTP emergency generator is operating but requires manual startup in the event of a power failure. This is not critical because specific WWTP equipment also requires startup by the operator. When there is a power failure the operator has to visit the WWTP for the equipment startup and at that time starts the emergency generator (if needed). Equipment which requires restarting includes the SBR blowers, air compressor and digester blowers. The operator is aware that the emergency power units needs some adjustment and will ensure that this issue is addressed in 2009 and the unit returned to fully automatic operation.

All information contained in this report is based on actual site visit observations and discussions with the operator.

If you have any questions related to this information, please feel free to contact me at (717) 233-4502(x 2416).

Sincerely,

Brinjac Engineering, Inc.

Stephen N. Zeller

SNZ:sc

c: Mr. Robert Schemmerling, P.E. Antrim Township Authority
Mr. Lynn Shatzer, Chief Operator Antrim Township WWTP
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