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PUCO

May 27, 2005

Evaluation of Huber Ridge Secondary Clarifiers

Dear Greg,

In accordance with the Rate Case Stipulation of February 2005, I respectfully submit the Engineering Evaluation of the Huber Ridge Secondary Clarifiers. Please feel free to contact me if you wish to discuss this matter.

Respectfully

David K. Little

Encl.

Cc: Gary VerDouw
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Huber Ridge Wastewater Treatment Plant

Report on the Evaluation of the Operational Status of Secondary Clarifiers

Submitted by
Ohio-American Water Company

Reported by

Dan Haddock, P. E., Engineering Manager
Thomas Schwing, Network Operations Superintendent

May 31, 2005

Huber Ridge Wastewater Treatment Plant

Report on the Evaluation of the Operational Status of Secondary Clarifiers

Introduction

The purpose of this report is to document an evaluation of the operating condition of the Huber Ridge Wastewater Treatment Plant's secondary clarifiers as specified in the Public Utility Commission of Ohio (PUCO) Case No. 03-2390-WS-AIR (see page 13, Item 9.h.3).

The Huber Ridge Wastewater Treatment Plant (HRWWTP) is a single stage nitrification activated sludge wastewater treatment plant. Secondary clarification of the activated sludge process is provided by two (2) secondary clarifiers.

During 2004, secondary clarifier No. 2 experienced a failure of the sludge collection drive unit's gear assembly. The failure was caused by natural wear of the components due to its length of time in-service.

As a result of the mechanical system failure, the PUCO directed American Water to evaluate the secondary clarification system at the Huber Ridge Wastewater Treatment Plant. The wastewater plant's two (2) secondary clarifiers were evaluated to determine their reliability, maintainability and operability.

This evaluation assumed that for the next 15 years there would be no change in the secondary clarification systems performance requirements set forth in the plant's NPDES permit standards currently in effect as of February 1, 2005.

Secondary Clarifier No. 1 (East Unit)

Secondary Clarifier No. 1 is a 50 foot diameter circular clarifier with an eight foot (8 ft) side water depth (SWD). It has a center feed with stilling well, peripheral single length fiberglass weir overflow, surface skimmer with three foot (3') outer scum trough, plow and scrapper sludge collection, and telescopic sludge withdraw control valve.

It was originally constructed in 1972. It was renovated in 1994 with new steel support structure, density baffles, and metal weirs were replaced with fiberglass units.

A new sludge collection mechanism gear drive unit was installed in 2000.

The unit does not have an "Over-torque" protection system on the gear box or motor drive unit.

Based on an expected 15 year operating life on the mechanical and steel structure systems, a complete mechanical rebuild should be planned for 2015.

Although an eight foot (8') side water depth is very shallow for separation and thickening of single stage nitrified activated sludge, current operating practice and process control strategy has demonstrated successful operation.

Secondary Clarifier No. 2 (West Unit)

Secondary clarifier No. 2 is a 32 foot diameter circular clarifier with a 12 foot side water depth (SWD). It has a center feed with stilling well, peripheral single length fiberglass weir overflow, surface skimmer with peripheral scum trough, plow and scrapper sludge collection, and telescopic sludge withdraw control valve.

Clarifier No. 2 was originally constructed circa 1964. The influent stilling well was rebuilt in 1988. The sludge collection plows have been replaced at least once. The sludge collection drive gear box has been replaced three times. In February 2005, the clarifier drive gear assembly was rebuilt with a new bull gear, worm gear, ring bearing and associated gaskets and parts.

The concrete structure is in fair condition with concrete cracking and chipping on the top of the tank's walls. The original steel support structure is in fair to poor condition. It has rust damage through portions of its support I-beams and the metal decking is corroded. The sludge collection mechanism has been modified and may be out of tolerance for proper operation. It should be replaced within four (4) years to insure its performance reliability.

Summary

Currently both secondary clarifiers Nos. 1 and 2 are fully operational and performing to the standards in effect at the time of their design and construction.

It is reasonable to assume that given regular preventive maintenance in conformance with manufacturer's recommendations, secondary clarifier No. 1 should operate properly and mechanically be in good condition for the next ten (10) years. Although not an efficient performance design by current standards, it has an acceptable performance to meet current NPDES permit conditions.

It is recommended that an "Over-torque" protection system be installed on clarifier No. 1 drive unit to protect it from physical damage in the event of over-torque conditions.

Clarifier No. 2 should be scheduled for the replacement of the steel support structure within the next four (4) years. The structure will include a new sludge collection drive, drive motor and "Over-torque" protection devices. It should include a new surface skimmer and full radius scum trough system.

Replacement of the steel support structure will cost approximately $75,000. It will take approximately 11 months for the new clarifier steel support structure project to be performed (2 months for design, 2 month for shop drawings and submittal approvals, 6 months for shop fabrication, and 1 month for demolition of old equipment and installation of new equipment). It is recommended that this project be initiated during 2006 with installation scheduled for the summer of 2007 (low flow season).