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Waterbury Wastewater Treatment Facility Improvements – Fall 2013 to Spring 2016

Prepared 2/12/2018 by the Facilities Engineering Division, Department of Environmental Conservation

Project Description: The Village of Waterbury installed an advanced phosphorus removal system that uses the Co-Mag® ballasted flocculation technology at its lagoon-based wastewater treatment facility (WWTF) to comply with the 0.8 mg/l Total Phosphorus (TP) limit in their discharge permit. At 0.8 mg/l, the amount of TP discharged has been reduced from 1.339 metric tons/year (mt/yr) to a maximum of 0.563 mt/yr. The Town chose this system because it is capable of meeting permit limits as stringent as 0.2 mg/l TP should the Lake Champlain Phosphorus TMDL require it. At 0.2 mg/, the amount of TP discharged will be limited to 0.141 mt/yr.

Ballasted flocculation systems continuously generate a chemical sludge that is similar to sludges generated by drinking water treatment facilities. Due to being generated on a continuous basis, it is not possible to manage the chemical sludge in the same manner as the biological sludge generated at the Waterbury WWTF. The biological sludge accumulates in the WWTF's lagoons and is removed on a periodic basis (once every 5 to 10 years). Due to this, the Waterbury WWTF needed additional facilities to dewater and store the chemical sludge prior to disposal in a landfill. An additional benefit of the Co-Mag® technology is it removes more organics than can be achieved with the lagoon wastewater treatment alone.

Project Funding: Financing consisting of federal and state grant and loan funds as summarized below:

Funding Source	Eligible Amount	Current (1-26-18) Awarded Funds	Balance Due Waterbury
Federal Grant	$800,000	$800,000	$0
State Grant	$6,426,145	$6,285,121	$141,024
CWSRF Loan	$154,300	$154,300	$0
Total	$7,380,445	$7,239,421	$141,024

Facility Photos: Attached photos as organized below:

Figure 1: Existing aerated lagoon system (pg. 2)
Figure 2: New process building housing CoMag® system for improved phosphorus removal (pg. 2)
Figure 3: New process building as viewed from the rear of the new sludge drying bed structure (pg. 3)
Figure 4: New covered sludge drying bed structure (with new process building in background) (pg. 3)
Figure 5: New sludge drying bed structure as viewed from the new process building (pg. 4)
Figure 6: Close-up of individual sludge drying bed (containing phosphorus sludge) (pg. 4)
Figure 7: Sludge drying beds viewed from the rear of the new structure (pg. 5)
Figure 8: New CoMag® process element (bottom left) located within process building (pg. 5)
Figure 9: Magnetic drum separator (removes magnetite from CoMag® treated wastewater) (pg. 6)
Figure 10: Chemical (PAC, $FeCl_3$ & NaOH) storage tanks utilized during TP removal process (pg. 6)
Figure 11: Comparison of WWTF influent, CoMag® system influent, and WWTF effluent (pg. 7)

Figure 1: Existing aerated lagoon system.

Figure 2: New process building housing CoMag® system for improved phosphorus removal.

Figure 3: New process building as viewed from the rear of the new sludge drying bed structure.

Figure 4: New covered sludge drying bed structure (with new process building in background).

Figure 5: Rear of the new sludge drying bed structure as viewed from the new process building.

Figure 6: Close-up of individual sludge drying bed (containing phosphorus-bearing chemical sludge).

Figure 7: Sludge drying beds viewed from the rear of the new structure.

Figure 8: New CoMag® process element (bottom left) located within process building.

Figure 9: Magnetic drum separator (removes magnetite from CoMag® treated wastewater).

Figure 10: Chemical (PAC, $FeCl_3$ & NaOH) storage tanks utilized during TP removal process.

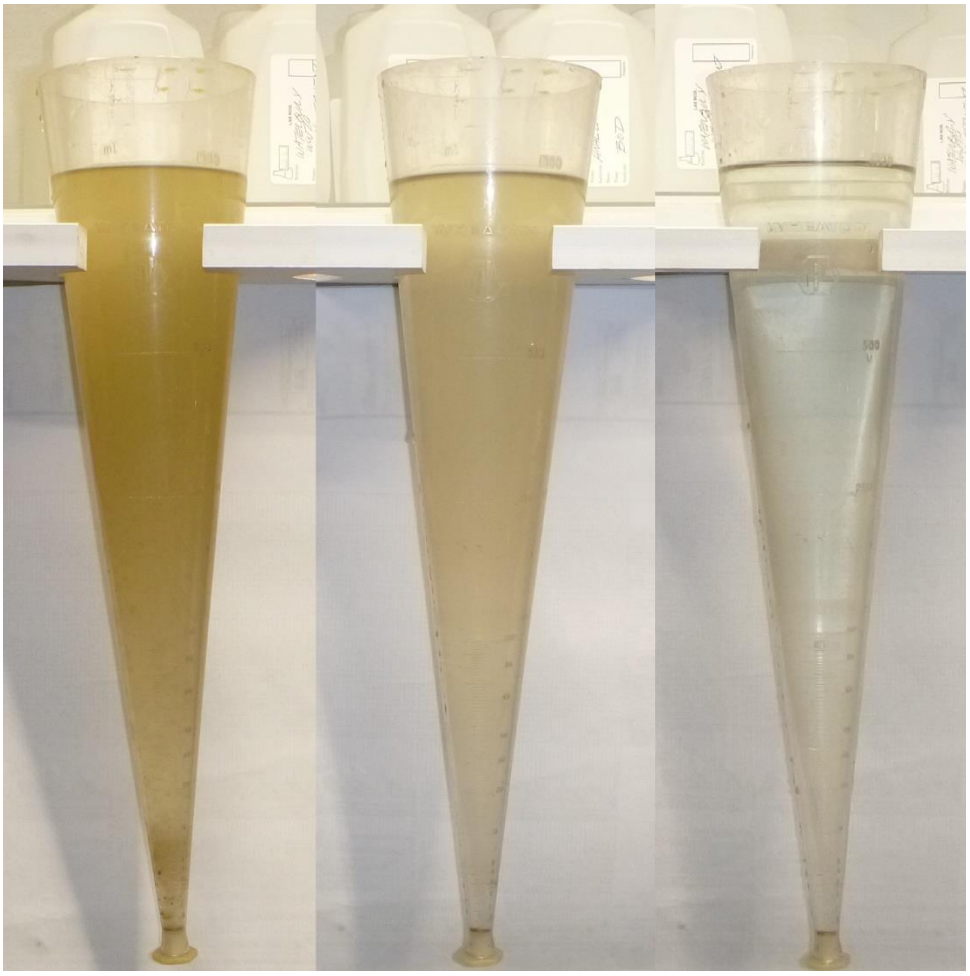

Figure 11: WWTF influent (left), CoMag® system influent (middle) and WWTF effluent (right).