

**Appleton Wastewater Treatment Plant
Operations Synopsis
October 2023 – December 2023**

Wastewater Treatment Program

- The Appleton Wastewater Treatment Plant (AWWTP) final effluent met Wisconsin Department of Natural Resources (WDNR) discharge monitoring reporting limits for carbonaceous biochemical oxygen demand (CBOD), total suspended solids (TSS), phosphorous, and ammonia. The plant maintained good treatment and a healthy microbiological population with a sludge retention time of 10 days. Dewatering processes functioned well and converted 16.3 million gallons (MG) of primary digested sludge to biosolids.

Summary of Treatment

Parameter	October	November	December	Quarter Average
Industrial Flow (MG)	35.1	35.9	39.7	36.9
Domestic Flow (MG)	299.3	301.1	301.2	300.5
Total Flow (MG)	334.4	337.0	340.9	337.4
Influent CBOD Load (Avg Daily lbs)	28,618	28,850	28,904	28,791
Influent TSS Load (Avg Daily lbs)	56,010	51,561	55,416	54,329
Influent Phosphorous Load (Avg Daily lbs)	449	487	535	490
Influent Ammonia Load (Avg Daily lbs)	2,811	2,486	3,093	2,797
Effluent CBOD Load (Avg Daily lbs)	524	649	482	552
Effluent TSS Load (Avg Daily lbs)	385	413	300	366
Effluent Phosphorous Load (Avg Daily lbs)	24	22	26	24
Effluent Ammonia Load (Avg Daily lbs)	79	114	211	135
% Treatment Removal of CBOD	98.2	97.8	98.3	98.1
% Treatment Removal of TSS	99.3	99.2	99.5	99.3
% Treatment Removal of Phosphorous	94.7	95.5	95.1	95.1
% Treatment Removal of Ammonia	97.2	95.4	93.2	95.3

Project Updates

- Appleton Wastewater Treatment Plant Sludge Storage Building Addition: The construction contract with Miron Construction in the amount of \$5,330,989 was approved by Common Council on July 20, 2022. Active construction continued during the quarter with the building addition approximately 95% complete. Remaining project highlights include conveyor commissioning and site restoration. Substantial completion projected in January 2024 and final completion is projected to occur late in the 2nd quarter of 2024.
- Phase I Appleton Wastewater Plant Belt Filter Press Equipment Upgrades: The construction contract with Staab Construction (Staab) in amount \$5,063,000 was approved by Common Council on December 7, 2022. Construction activities during the reporting period included demolition of an obsolete biosolids hopper system and associated truck scale, installation of a new motor control center (MCC) to power the new belt filter presses (BFP), and HVAC work that will support the two new BFP units. The two new BFP units are scheduled for delivery in late January. February 2024 remains the contractual final completion date but will likely need to be extended because longer than expected equipment lead times.

- Phase II Appleton Wastewater Plant Belt Filter Press Equipment Upgrades: McMahon is currently under contract for Phase II Solids Dewatering Equipment Upgrades engineering services. The construction bid documents are approximately 99% complete with project public bidding projected to occur in the 1st quarter of 2024 based on the projected equipment lead times associated with the Phase I construction.
- Grit Trap Vortex System Drive and Raw Sludge Pump Replacement Projects – The construction contract with August Winter and Sons, Inc. in the amount of \$573,355 was approved by Common Council on September 6, 2023. The contract was subsequently executed in early October. The construction submittal process immediately pursued with active construction not expected to occur until June 2024 because of extremely long equipment lead times.
- Digester Circulation Piping, Blended Sludge Piping, and Heat Exchanger Replacement Project – McMahon is under contract to provide engineering, contract administration, contract management, field services, and construction management services as part of a project that will address the compromised integrity of pipe which support primary anaerobic digester processes (e.g., sludge feed, sludge circulation, and sludge heating pipe) caused by over 20 years of erosion and corrosion. McMahon completed design plans and specification during the reporting period. Public bidding commenced in December 2023 with a bid closing date of January 10th, 2024.

Regulatory Summary

- Monthly Discharge Monitoring reports for October, November, and December were filed electronically on time for regulatory compliance.
- The AWWTP Wisconsin Pollution Discharge Elimination System (WPDES) electronic permit application was submitted on October 2, 2021, as part of reissuance. The current WPDES permit expired on March 31, 2022. The AWWTP continues to operate under the expired permit limits until DNR reissues a permit. Procedurally, the DNR has yet to submit a draft permit for review and public comment. The exact timeline remains unknown for when that step will occur. However, we are anticipating that the reissued permit will be administered sometime in early 2024.

Laboratory

- All sampling and laboratory testing procedures were performed in accordance with requirements outlined in the AWWTP WPDES permit.
- Discharge Monitoring Report (DMR) and Health Department testing program objectives associated with sampling and analysis were met during the reporting period.
- Sampling of influent in support of Wisconsin State Lab of Hygiene COVID Sewage Surveillance continued during the reporting period.

Staffing & Training

- Utilities Director Chris Shaw announced his retirement late in the quarter, with a last day of January 3rd, 2024. The Mayor and HR began the process to advertise the position, with interviews in January 2024.
- Staffing levels remain reduced following the resignation of one Wastewater Plant Operator in late 2023. A Wastewater Plant Operator hired in the 3rd quarter completed the training process by successfully passing the Wastewater Plant Operator Practical Exam.
- Maintained operations schedules with overtime and deferred maintenance work assignments as a result of the Wastewater Plant Operator training and vacancy.

- Common Council approved the additions of a Treatment Specialist and Safety, Training, & Public Relations Coordinator as part of the 2024 budget. Work began in the 4th quarter to advertise those positions and evaluate candidates. Interviews are scheduled for January 2024.

EFFLUENT QUALITY SUMMARY
July 2022/2023 – December 2022/2023

Table 1 – 2022 Monthly Permit Summary

Month	CBOD (mg/L)	TSS (mg/L)	TSS (lbs/day)	P (mg/L)	P ⁽³⁾ (lbs/day)	NH3-N ⁽¹⁾ (mg/L)	Fecal ⁽²⁾ Coliform Colonies/ (100 ml)	Chlorine ⁽²⁾ Residual (mg/L)	pH (s.u.)
Permit Limit	25	30	1,322⁽³⁾	1	23⁽³⁾	10, 11, 4.4, 18	400 col/100ml Geo.Mean	0.038 mg/L daily	6.0 - 9.0 daily limit
July 2022	4	1	67	0.17	13	0.18	10	<0.032	6.9/7.4
August 2022	5	4	406	0.22	20	0.40	4	<0.032	7.0/7.4
September 2022	4	2	205	0.17	15	1.11	4	<0.032	7.0/7.2
October 2022	7	3	223	0.15	10	0.54	NA	NA	6.9/7.2
November 2022	6	5	486	0.19	19	0.89	NA	NA	6.9/7.3
December 2022	6	3	284	0.17	14	2.00	NA	NA	6.2/7.2
				Nov - April Period Average⁽³⁾	18.6				
				May - October Period Average⁽³⁾	14.0				

Table 2 – 2023 Monthly Permit Summary

Month	CBOD (mg/L)	TSS (mg/L)	TSS (lbs/day)	P (mg/L)	P ⁽³⁾ (lbs/day)	NH3-N ⁽¹⁾ (mg/L)	Fecal ⁽²⁾ Coliform Colonies/ (100 ml)	Chlorine ⁽²⁾ Residual (mg/L)	pH (s.u.)
July 2023	4	1	104	0.27	19	0.66	3	<0.032	6.7/7.2
August 2023	4	2	177	0.31	24	1.07	3	<0.032	6.8/7.2
September 2023	5	3	220	0.40	27	0.79	12	<0.032	6.8/7.1
October 2023	6	4	385	0.27	24	0.95	NA	NA	6.8/7.2
November 2023	7	5	413	0.23	22	1.18	NA	NA	6.9/7.2
December 2023	5	3	300	0.29	26	2.26	NA	NA	6.7/7.2
				Nov - April Period Average⁽³⁾	24.1				
				May - October Period Average⁽³⁾	21.9				

NOTES:

- 1) Seasonal NH3-N limits: 10 mg/L Jan. 1 – Mar. 31, 11 mg/L Apr. 1 – May 31, 4.4 mg/L June 1 – Sep 30, 18 mg/L Oct 1 – Dec 31.
- 2) Seasonal fecal and residual chlorine limits are in effect May 1st through September 30th. Limit of Detection 0.032 mg/L.
- 3) April 1, 2017 WPDES Reissuance with new TSS limits expressed as monthly concentration limit (mg/L) and loading limit (lbs). The future TMDL phosphorus limit will be 23 lbs/day expressed as a 6-month average during the months of May – October and November – April.