

**Appleton Wastewater Treatment Plant
Operations Synopsis
October 2022 – December 2022**

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 9.0 days. Dewatering processes functioned well and converted 15.9 million gallons (MG) of primary digested sludge to biosolids.
- On December 26, 2022, a bulk load of cationic polymer was off loaded into the Hauled Waste Station. The polymer entered the anaerobic digesters and caused a cascade of equipment and process issues resulting in bypassing the digesters. This matter is being addressed separately from the synopsis and communicated to the Utilities Committee through a series of updates at the Utilities Committee meetings.

Summary of Treatment

Parameter	October	November	December	Average
Industrial Flow (MG)	30.0	30.1	37.9	32.7
Domestic Flow (MG)	219.9	320.0	276.5	272.1
Total Flow (MG)	249.9	350.1	314.4	304.8
Influent CBOD Load (Avg Daily lbs)	22,128	22,012	23,034	22,391
Influent TSS Load (Avg Daily lbs)	44,693	46,999	45,980	45,891
Influent Phosphorous Load (Avg Daily lbs)	423	434	439	432
Influent Ammonia Load (Avg Daily lbs)	2,537	2,194	2,287	2,339
Effluent CBOD Load (Avg Daily lbs)	445	608	556	536
Effluent TSS Load (Avg Daily lbs)	222	486	284	331
Effluent Phosphorous Load (Avg Daily lbs)	10	19	14	14
Effluent Ammonia Load (Avg Daily lbs)	37	89	172	99
% Treatment Removal of CBOD	98.0	97.2	97.6	97.6
% Treatment Removal of TSS	99.5	99.0	99.4	99.3
% Treatment Removal of Phosphorous	97.6	95.6	96.8	96.7
% Treatment Removal of Ammonia	98.5	95.9	92.5	95.7

Project Updates

- 2019 Appleton Wastewater Plant Improvement Projects: The project includes replacement of the Return Activated Sludge (RAS) pumps, process piping modifications (e.g., blended sludge, filtrate, waste gas flare), outside secondary chemical offloading containment repairs, primary clarifiers #5 & #6 drive replacements (2020 CIP), and H-Building effluent pump replacements (2020 CIP). Final project completion occurred during the 4th quarter of 2022. -- **COMPLETE**
- 2021 Secondary Clarifier Drive Rebuild Project: On June 2, 2021, Common Council approved contract award for the removal, rebuilding, and reinstallation of drive equipment on Secondary Clarifiers #1 through #6 to Sabel Mechanical. Sabel Mechanical successfully reinstalled the drives on Secondary Clarifiers #1 and #2 in August 2022. Sabel removed the last two drives on Secondary Clarifiers #4 and #5 for rebuilding

in September. Sabel completed work and successfully commissioned the final two drives in November 2022 which concluded this project. -- **COMPLETE**

- 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. The contract was subsequently fully executed with a formal notice to proceed issued by Applied Technologies, Inc. on August 2, 2022. The construction submittal process immediately pursued with active construction tentatively scheduled for March or April 2023.
- 2022 Phase I Appleton Wastewater Plant Belt Filter Press Equipment Upgrades: McMahon Associates, Inc. (McMahon) continued engineering services as part of the Solids Dewatering Equipment Upgrades project. The AWWTP will be replacing all three exiting Belt Filter Press (BFP) units and add one additional BFP. The additional BFP will provide the required dewatering capacity based on future growth projections and redundancy to facilitate critical maintenance events. The public bidding phase was initiated October 20, 2022, and closed on November 10, 2022, with Staab Construction as the least cost bidder at \$5,063,000. Contract award subsequently occurred at Common Council December 7, 2022 with the Notice to Award issued thereafter. Contract execution and formal Notice to Proceed is expected to occur in early January 2023.

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 is not yet known for when that step will occur, but the DNR is anticipating that the reissued permit will be administered sometime in 2023.

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.

EFFLUENT QUALITY SUMMARY
July 2021/2022 – December 2021/2022

Table 1 – 2021 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 2021	4	2	382	0.16	22	0.36	5	<0.032	7.1/7.4
August 2021	4	2	259	0.21	23	0.25	28	<0.032	7.1/7.3
September 2021	4	1	90	0.19	15	0.12	4	<0.032	7.1/7.3
October 2021	5	4	254	0.37	24	0.50	NA	NA	7.3/7.3
November 2021	6	4	223	0.28	18	0.69	NA	NA	6.5/7.4
December 2021	6	4	281	0.18	13	1.38	NA	NA	7.1/7.2
		Nov - April Period Average⁽³⁾		17.3					
		May - October Period Average⁽³⁾		21.1					

Table 2 – 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.)
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⁾		16.5					
		May - October Period Average⁽³⁾		14.0					

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.

YEAR 2022 RECEIVING STATION REVENUE

Hauler	January	February	March	April	May	June	July	August	September	October	November	December	Y-T-D Total
A & B Leist Trucking	\$ 155,140.59	\$130,533.65	\$ 156,997.30	\$ 182,013.10	\$ 144,798.81	\$ 152,868.28	\$ 169,189.98	\$ 139,270.91	\$ 89,065.61	\$ 99,523.36	\$ 104,753.43	\$ 80,601.91	\$ 1,604,756.93
Buttles Custom Ag	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Hickory Meadows	\$ 24,903.48	\$ 20,475.06	\$ 32,031.60	\$ 42,276.54	\$ 26,113.02	\$ 34,735.80	\$ 29,600.94	\$ 34,187.97	\$ 35,696.22	\$ 49,801.26	\$ 47,130.24	\$ 33,339.06	\$ 410,291.19
Holland Sanitary Dist. 1	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Jeff Waldvogel Trkge.	\$ 34,629.34	\$ 34,267.37	\$ 38,307.65	\$ 39,227.94	\$ 45,610.75	\$ 45,195.54	\$ 47,505.15	\$ 42,033.78	\$ 38,975.02	\$ 46,304.25	\$ 36,614.32	\$ 26,966.28	\$ 475,637.39
Movin Materials	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Waldvogel Trucking	\$ 1,638.34	\$ 1,815.63	\$ 1,789.65	\$ 1,722.67	\$ 1,876.88	\$ 1,622.57	\$ 1,538.66	\$ 1,903.44	\$ 1,960.88	\$ 1,857.87	\$ 1,983.29	\$ 1,661.49	\$ 21,391.37
2022 Total	\$ 216,311.75	\$187,091.71	\$ 229,126.20	\$ 265,240.25	\$ 218,399.46	\$ 234,422.19	\$ 247,854.73	\$ 217,396.10	\$165,697.73	\$197,486.74	\$ 190,481.28	\$ 142,568.74	\$ 2,512,076.88
2021 Total	\$160,614.00	\$157,415.55	\$178,568.93	\$193,304.25	\$197,959.99	\$183,861.33	\$240,826.87	\$261,064.97	\$231,369.79	\$217,146.14	\$172,718.91	\$ 173,227.16	\$ 2,368,077.89

3% Rate Increase effective 1/1/18

1% Rate Increase effective 1/1/19

5% Rate Increase effective 10/1/20

4% Rate Increase effective 01/01/22

Date: January 13, 2023

Copies: K. Rindt (via email)

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Utilities Committee