

**Appleton Wastewater Treatment Plant
Synopsis
April 2018 – June 2018**

Wastewater Treatment Program

- The Appleton Wastewater Treatment Plant (AWWTP) final effluent met all Wisconsin Department of Natural Resources (WDNR) discharge monitoring reporting limits including carbonaceous biochemical oxygen demand (CBOD), total suspended solids (TSS), phosphorous, and ammonia. (See Table 1). The plant maintained good treatment and a healthy microbiological population with a sludge retention time of eight days. Dewatering processes functioned well and converted 17.3 Million Gallons (MG) of primary digested sludge to biosolids.

Table 1 - Summary of Treatment

Parameter	April	May	June	Average
Industrial Flow (MG)	46.7	50.6	51.7	49.7
Domestic Flow (MG)	567.2	578.6	292.1	479.3
Total Flow (MG)	613.9	629.2	343.8	529.0
Influent CBOD Load (lbs)	896,236	852,132	877,253	875,207
Influent TSS Load (lbs)	1,420,223	1,811,599	1,628,742	1,620,188
Influent Phosphorous Load (lbs)	11,361	16,663	15,091	14,372
Influent Ammonia Load (lbs)	58,658	68,034	53,721	60,138
Effluent CBOD Load (lbs)	23,097	23,718	10,831	19,215
Effluent TSS Load (lbs)	17,950	6,352	9,064	11,122
Effluent Phosphorous Load (lbs)	1842	1825	1,343	1,670
Effluent Ammonia Load (lbs)	25,126	11,919	2,962	13,336
% Treatment Removal of CBOD	97.4	97.2	98.8	97.8
% Treatment Removal of TSS	98.7	99.6	99.4	99.3
% Treatment Removal of Phosphorous	83.8	89.0	91.1	88.0
% Treatment Removal of Ammonia	57.2	82.5	94.5	78.0

Work in Progress:

- **2017 Appleton Wastewater Plant Improvement Projects** (WAS Pumping System Replacement, High Pressure Blower #3 Replacement, Digester Biogas Mix Compressor Glycol Cooling System, and Final Effluent Firm Pump Capacity Improvements): Donohue & Associates continued preliminary design services associated with the improvements project. This includes engineering services as part of the updated hydraulic analysis. In May, staff collected field elevation data at 30 discrete locations identified by Donohue which were used to recalibrate the updated hydraulic model. These measurements were taken during a rain induced high flow event that experienced rates from 60-90 million gallons per day (MGD). The objective of the updated hydraulic analysis is to identify processes that hydraulically limit the AWWTP capacity at high flows. This information will be used to determine where future improvements are necessary to effectively increase total hydraulic capacity to 127 MGD. The tentative start of the construction bidding phase has been pushed back to late 2018. A 30% design meeting has been scheduled for July 11th.
- **Chemical Storage Room Rehab/Improvements Project:** August Winter & Sons Inc. initiated construction activities in January 2018. Construction activities continued during the reporting period with nearly all new equipment installed. The AWWTP intends on resuming high chemical dosing trials for TMDL phosphorus treatment evaluation purposes immediately following final project completion which is scheduled for late August.

- **Biogas Utilization Study Update:** Donohue and Associates (Donohue) submitted a draft Digester Biogas Utilization Report for review in late 2017. At that time the Facilities Management Department (FMD) was concurrently working on a project that would add a high efficiency boiler to support the lower heating loop at the AWWTP. Subsequent discussions with FMD led to a decision by the Utilities Department to temporarily delay finalization of the report based upon the initial findings that indicated the new lower loop boiler should utilize a portion of the excess biogas that is produced. FMD is currently working with Donohue to incorporate improvements including new biogas boiler, new biogas conveyance piping, mixing, boiler operational set points, automated controls, and operational strategies. These improvements are intended to further optimize the use of two existing upper loop boilers while facilitating the new lower loop biogas boiler in addition to other potential future biogas utilization upgrades. Donohue will produce a final draft report in the next reporting period once the full scope and costs of the aforementioned improvements is known.
- **Briarcliff and Midway Improvement Projects:** Preliminary engineering activities occurred during the reporting period. McMahon produced a draft conditions assessment and project alternatives technical memorandum for review. The initial opinion of costs based on equipment providers and contractor estimates was substantially higher for the Briarcliff lift station than anticipated. McMahon and the AWWTP are researching equipment alternatives that are comparable in performance and reliability to the standard specified Xylem Flygt pump systems but proportional in cost to the small sanitary area it will be serving.

Regulatory Summary

- Monthly Discharge Monitoring reports for April, May and June were filed electronically on time for regulatory compliance. The 2017 eCMAR was submitted in June, with a GPA of 4.00.

Laboratory Program

Work Completed:

- Program objectives of sampling and analysis were met for the time period, including results for the Discharge Monitoring Report (DMR) and Health Department pool testing program.
- Submitted the following eDMR reports successfully:
 - April through June 2018 Long Forms
- Analysis of Single Blind Proficiency samples for laboratory recertification
- Lab Technicians completed first semi-annual monitoring of Pretreatment Industries
- Newly hired staff completed BOD initial demonstration of capability (IDOC)
- Began Disinfection Season Monitoring
- Began review of plant laboratory testing schedules

Work In Progress:

- Compliance monitoring for 2018
- Second round for Pretreatment Program monitoring.
- Continue compliance monitoring requirements for 2018

Proposed Projects and Activities:

- Laboratory analysis assessment

EFFLUENT QUALITY SUMMARY
January 2017/2018 – June 2017/2018

Table 1 – 2017 Monthly Permit Summary

Month	CBOD (mg/L)	TSS (mg/L)	TSS (lbs/day)	P (mg/L)	P (lbs/day)	NH3-N ⁽¹⁾ (mg/L)	Fecal ⁽²⁾ Coliform Colonies/ (100 ml)	Chlorine ⁽²⁾ Residual (mg/L)	pH (s.u.)
<i>Permit Limit</i>	25	30	1,322 ⁽³⁾	1	23 ⁽³⁾	10, 11, 4.4, 18	400 col/100ml <i>Geo.Mean</i>	0.038 mg/L <i>daily</i>	6.0 - 9.0 <i>daily limit</i>
Jan 2017	4	3	344	0.23	26.3	2.28	NA	NA	7.1/7.3
Feb 2017	4	2	218	0.17	18.5	1.14	NA	NA	7.1/7.3
Mar 2017	3	1	136	0.06	9.4	1.58	NA	NA	7.1/7.3
April 2017	4	3	470	0.09	16.0	1.48	NA	NA	7.2/7.4
May 2017	3	3	388	0.12	16.0	1.43	6	<0.032	7.0/7.3
June 2017	3	2	257	0.13	15.0	1.25	4	<0.032	7.1/7.5

Table 2 – 2018 Monthly Permit Summary

Month	CBOD (mg/L)	TSS (mg/L)	TSS (lbs/day)	P (mg/L)	P (lbs/day)	NH3-N ⁽¹⁾ (mg/L)	Fecal ⁽²⁾ Coliform Colonies/ (100 ml)	Chlorine ⁽²⁾ Residual (mg/L)	pH (s.u.)
Jan 2018	8	4	331	0.16	12.4	2.82	NA	NA	7.0/7.3
Feb 2018	6	4	337	0.31	26.0	3.47	NA	NA	7.0/7.3
Mar 2018	6	2	211	0.39	34.6	4.63	NA	NA	7.2/7.5
April 2018	5	4	598	0.42	62.0	5.60	NA	NA	7.5/7.6
May 2018	4	1	205	0.38	59.0	2.11	5	<0.032	7.4/7.7
June 2018	4	3	302	0.47	46.0	1.04	6	<0.032	7.2/7.6

NOTES:

- 1) Seasonal NH3-N limits: 10 mg/L Jan. 1 – Mar. 31, 11 mg/L Apr. 1 – May 31, 4.4 mg/L Sep 30 – 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.

YEAR 2018 RECEIVING STATION REVENUE

Hauler	January	February	March	April	May	June	July	August	September	October	November	December	Y-T-D Total
A. & B. Leist Trucking	\$ 166,686.94	\$ 170,841.65	\$ 213,882.79	\$ 226,744.58	\$ 228,023.89	\$ 228,196.02							\$ 1,234,375.87
Dean Foods	\$ -	\$ -	\$ -	\$ 2,037.90	\$ 13,720.58	\$ 12,704.93							\$ 28,463.41
Hickory Meadows	\$ 19,432.60	\$ 17,842.90	\$ 15,000.34	\$ 46,037.59	\$ 110,250.34	\$ 30,545.91							\$ 239,109.68
Holland Sanitary Dist. 1	\$ -	\$ -	\$ 5,694.90	\$ -	\$ -	\$ -							\$ 5,694.90
Jeff Waldvogel Trkg.	\$ 41,977.54	\$ 34,849.86	\$ 42,214.17	\$ 53,380.94	\$ 62,244.52	\$ 59,778.35							\$ 294,445.38
Movin Materials	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -							\$ -
Waldvogel Trucking	\$ 1,957.65	\$ 1,923.30	\$ 1,920.75	\$ 1,880.93	\$ 1,789.35	\$ 2,403.08							\$ 11,875.06
2018 Total	\$ 230,054.73	\$ 225,457.71	\$ 278,712.95	\$ 330,081.94	\$ 416,028.68	\$ 333,628.29	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,813,964.30
2017 Total	\$ 172,735.08	\$ 184,476.03	\$ 223,618.34	\$ 231,886.70	\$ 227,389.07	\$ 273,509.72	\$ 244,134.28	\$ 214,324.93	\$ 222,482.09	\$ 257,598.16	\$ 225,732.80	\$ 223,705.96	\$ 2,701,593.16

Movin Materials new hauler in April 2017
 Holland Sanitary District 1 new customer in March 2018
 Dean Foods new customer in April 2018
 3% Rate Increase effective 1/1/18

Date: July 16, 2018
 Copies: K. Rindt (via email)
 C. Shaw (via email)
 B. Kreski
 Utilities Committee