

**Appleton Wastewater Treatment Plant  
Synopsis  
October 2018 – December 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 Effluent Quality Summary). The plant maintained good treatment and a healthy microbiological population with a sludge retention time of eight days. Dewatering processes functioned well and converted 18.4 Million Gallons (MG) of primary digested sludge to biosolids.

**Summary of Treatment**

Parameter	October	November	December	Average
Industrial Flow (MG)	58.3	54.5	52.4	55.0
Domestic Flow (MG)	437.2	286.8	289.8	338.0
Total Flow (MG)	495.5	341.3	342.2	393.0
Influent CBOD Load (Avg Daily lbs)	25,915	24,340	27,267	25,841
Influent TSS Load (Avg Daily lbs)	44,659	41,143	39,941	41,915
Influent Phosphorous Load (Avg Daily lbs)	368	437	454	420
Influent Ammonia Load (Avg Daily lbs)	1,930	2,246	2,101	2,092
Effluent CBOD Load (Avg Daily lbs)	607	664	437	569
Effluent TSS Load (Avg Daily lbs)	510	305	350	388
Effluent Phosphorous Load (Avg Daily lbs)	32	21	28	27
Effluent Ammonia Load (Avg Daily lbs)	119	153	300	191
% Treatment Removal of CBOD	97.7	97.3	98.4	97.8
% Treatment Removal of TSS	98.9	99.3	99.1	99.1
% Treatment Removal of Phosphorous	91.4	95.2	93.8	93.5
% Treatment Removal of Ammonia	93.8	93.2	85.7	90.9

**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):** Donohue & Associates finalized bidding documents during the reporting period. Bid advertisement was initiated on November 20, 2018 and a prebid conference held on December 4, 2018. Sealed bids were received and opened on December 20, 2018. August Winter and Sons Inc. was the least cost bid in the amount of \$1,721,500. Contract award process to occur in early January 2019.
- **Chemical Storage Room Rehab/Improvements Project:** August Winter & Sons Inc. initiated construction activities in January 2018. Construction activities continued during the reporting period with all new equipment installed. Final project punch list items were concluded in early December 2018. Receipt of construction as-build drawings and final equipment O&M manuals are anticipated in January 2019. AWWTP will resume high chemical dosing trials in the first week of January 2019 for TMDL phosphorus treatment evaluation purposes.
- **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 on the technical support for a new lower loop boiler that would utilize a portion of the excess biogas being

produced. During the reporting period Donohue incorporated improvements within project bidding documents that will complement the proposed new biogas boiler and existing biogas boilers (e.g. new biogas conveyance piping, mixing, gas compression system, 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 (Great Lakes Mechanical awarded construction contract in 4<sup>th</sup> quarter) in addition to other potential future biogas utilization upgrades. With information from that parallel project phase known, the final Biogas Utilization Study Update will be finalized in January 2019.

- **Briarcliff and Midway Improvement Projects:** McMahon finalized bidding documents in early October 2018. Bid advertisement was initiated on October 9, 2018 and a prebid conference held on October 23, 2018. Sealed bids were received and opened on November 5, 2018. Vinton Construction Company was the least cost bid in the amount of \$194,870. Common Council approved contract award on November 26, 2018. Start of construction is projected to occur in the spring of 2019.
- **Compost Site Evaluation:** Coker Composting and Consulting (Coker) was contracted in early 2018 to evaluate the viability of a concept biosolids compost facility and the technologies best suited for a hypothetical green-field site. The concept facility is to be scalable from 10,000 (comparable to current operations) to 40,000 wet tons (total projected future annual biosolids production). During the reporting period Coker developed concept alternatives that included green-field and hypothetical redevelopment sites within the City that could serve the needs of the Utilities Department and Appleton Department of Public Works (DPW). The hypothetical sites and technology alternatives being considered would facilitate Class B biosolids conversion to a Class A EQ biosolids compost and provide additional space for DPW annual leaf and snow storage needs. Coker has also provided the AWWTP with an updated biosolids storage building construction cost. The building expansion construction estimate will provide the AWWTP with a total 180-day storage capacity of 20,000 wet tons to meet future projected growth needs and will be used to compare against the selected compost technology option. .

### **Regulatory Summary**

- Monthly Discharge Monitoring reports for October, November, and December were filed electronically on time for regulatory compliance.
- Operations and Maintenance staff responded to an overflow of a digested sludge storage tank on December 2, 2018. The cause of the spill was attributed to a plugged overflow pipe. Staff initiated immediate spill countermeasures to contain, cleanup, and mitigate the effects of the spill. Less than five gallons of digested sludge was estimated to have seeped into the storm sewer. Following the spill event, staff incorporated improvements that will significantly mitigate a similar future occurrence. These include overflow trap modification with flushing connection to remove heavy material from the pipe and early warning SCADA alarms to prompt on duty staff when tank contents reach critical elevation. Spill documentation was completed and submitted to the WI DNR.

### **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:
  - October through December 2018 Long Forms
- Analysis of Single Blind Proficiency samples for laboratory recertification

- Completed Fox River Flow and Temperature Monitoring for Waste Load Allocation Season

**Work In Progress:**

- DATCP Pool Program State Audit

**Proposed Projects and Activities:**

- Compliance monitoring for 2019
- Review Laboratory weekly schedule of testing

**EFFLUENT QUALITY SUMMARY**  
**July 2017/2018 – December 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 <sup>(1)</sup> (mg/L)	Fecal <sup>(2)</sup> Coliform Colonies/ (100 ml)	Chlorine <sup>(2)</sup> Residual (mg/L)	pH (s.u.)
<i>Permit Limit</i>	25	30	1,322 <sup>(3)</sup>	1	23 <sup>(3)</sup>	10, 11, 4.4, 18	400 col/100ml Geo.Mean	0.038 mg/L daily	6.0 - 9.0  daily limit
July 2017	3	2	231	0.17	15.8	1.10	32	<0.032	7.2/7.5
August 2017	4	4	317	0.26	22.9	1.14	19	<0.032	7.1/7.4
September 2017	4	3	284	0.30	25.4	0.66	29	<0.032	7.1/7.3
October 2017	4	5	408	0.23	20.7	0.56	NA	NA	7.2/7.4
November 2017	6	5	386	0.21	17.6	2.01	NA	NA	7.1/7.3
December 2017	6	5	408	0.25	20.1	5.80	NA	NA	7.1/7.3

**Table 2 – 2018 Monthly Permit Summary**

Month	CBOD (mg/L)	TSS (mg/L)	TSS (lbs/day)	P (mg/L)	P (lbs/day)	NH3-N <sup>(1)</sup> (mg/L)	Fecal <sup>(2)</sup> Coliform Colonies/ (100 ml)	Chlorine <sup>(2)</sup> Residual (mg/L)	pH (s.u.)
July 2018	5	5	354	0.61	40.8	0.77	10.5	<0.032	7.4/7.6
August 2018	6	4	375	0.64	50.6	1.40	56	<0.032	7.4/7.6
September 2018	6	4	940	0.56	71.0	1.49	10	<0.032	7.4/7.6
October 2018	5	4	510	0.26	31.8	0.89	NA	NA	7.4/7.6
November 2018	7	3	305	0.22	21.0	1.59	NA	NA	7.4/7.5
December 2018	5	4	673	0.30	27.9	3.25	NA	NA	6.2/7.5

**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 30<sup>th</sup>. 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	\$ 221,947.22	\$ 169,002.66	\$ 191,766.49	\$ 183,511.53	\$ 192,292.61	\$ 183,877.34	\$ 2,376,773.72
Dean Foods	\$ -	\$ -	\$ -	\$ 2,037.90	\$ 13,720.58	\$ 12,704.93	\$ 11,872.28	\$ 13,016.10	\$ 11,107.43	\$ 12,774.45	\$ 8,593.43	\$ -	\$ 85,827.10
Hickory Meadows	\$ 19,432.60	\$ 17,842.90	\$ 15,000.34	\$ 46,037.59	\$ 110,250.34	\$ 30,545.91	\$ 29,156.65	\$ 42,053.31	\$ 71,641.75	\$ 42,304.63	\$ 32,671.73	\$ 36,399.51	\$ 493,337.26
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	\$ 57,347.03	\$ 50,438.03	\$ 51,878.69	\$ 61,693.34	\$ 37,918.73	\$ 36,079.78	\$ 589,800.98
Movin Materials	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Waldvogel Trucking	\$ 1,957.65	\$ 1,923.30	\$ 1,920.75	\$ 1,880.93	\$ 1,789.35	\$ 2,403.08	\$ 2,000.78	\$ 2,043.08	\$ 1,786.80	\$ 2,092.05	\$ 2,621.40	\$ 2,363.55	\$ 24,782.72
<b>2018 Total</b>	\$ 230,054.73	\$ 225,457.71	\$ 278,712.95	\$ 330,081.94	\$ 416,028.68	\$ 333,628.29	\$ 322,323.96	\$ 276,553.18	\$ 328,181.16	\$ 302,376.00	\$ 274,097.90	\$ 258,720.18	\$ 3,576,216.68
<b>2017 Total</b>	\$ 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: January 15, 2019  
Copies: K. Rindt (via email)  
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Utilities Committee