

**Appleton Water Treatment Plant
Operations Synopsis
October, November, December 2013**

Summary

All produced water met Wisconsin Department of Natural Resources (WDNR) and Safe Drinking Water Act (SDWA) Standards during the quarter. The following table summarizes selected water production and quality performance metrics for the current and previous reporting periods.

During the quarter, average water production decreased about 15% due to reduced seasonal demand. However, average raw water turbidity remained elevated through early December until lake ice-over leading to increased chemical demand and backwashing energy expense.

WATER PLANT PARAMETERS	Previous (Q3)			Current (Q4)		
	July	August	September	October	November	December
Water Treated						
Finished (million gallons)	297	306	280	259	235	249
Finished (million gallons / day)	9.6	9.9	9.3	8.3	7.8	8.0
Electrical Energy (WTF)						
Consumption (Megawatt-hours)	627.7	645.7	583.7	546.5	513.8	548.7
MWH / million gallons produced	2.11	2.11	2.09	2.11	2.18	2.20
Turbidity						
Lake (NTU)	32.0	41.3	47.7	48.4	48.9	9.6
Finished (NTU)	0.02	0.02	0.02	0.02	0.03	0.02
Finished (<0.1 NTU standard)	100%	100%	100%	100%	100%	100%
Water System Microbial Quality						
Total Coliform Samples	81	81	81	81	81	81
Compliance with Standard	100%	100%	100%	100%	100%	100%
Disinfectant Contact Time						
Minimum CT Ratio Required	1.0	1.0	1.0	1.0	1.0	1.0
Minimum CT Ratio Achieved	1.76	1.90	1.92	1.95	1.88	1.88
Hardness						
Lake Total / Calcium (mg/L)	167/88	165/81	165/81	176/94	180/84	194/103
Finished Total / Calcium (mg/L)	93/15	84/17	86/19	91/23	99/30	101/41
Finished Water Quality						
Total Chlorine (mg/L)	2.13	2.32	2.27	2.33	2.36	2.29
pH	8.6/9.2	8.6/9.2	8.6/9.2	8.7/9.1	8.8/9.2	8.7/9.0
Water Temperature (Degrees F)	76.5	74.5	70.1	57.4	40.8	34.7
Fluoride (mg/L)	0.72	0.71	0.75	0.82	0.75	0.78
Orthophosphate (mg/L)	0.78	0.78	0.79	0.70	0.64	0.72

Laboratory

- In support of plant operations, staff conducted successful analyses according to method protocols for all parameters including pH, turbidity, alkalinity, hardness, free and total chlorine, ammonia, phosphorus, and fluoride.
- In support of distribution operations, staff performed required 81 monthly Coliform bacteria analyses along with heterotrophic plate count (HPC) testing.

- In December, the Department of Agriculture, Trade, and Consumer Protection (DATCP) completed a periodic audit of our laboratory procedures and equipment. Minor recommendations were identified by the auditor and a written response plan will be submitted by January 31, 2014.

Safety

WTF Safety programs were maintained by completing monthly safety meetings and all inspections. There were no significant incidents to report.

Operations

On November 27th, the Lake Station intake piping became obstructed by ice. Emergency procedures were implemented which included deployment of temporary portable pumps and diversion of sediment-laden raw water into off-line treatment basins. While full hydraulic flow to the treatment plant was restored within 24 hours, plant treatment processes required skillful hydraulic and chemical addition adjustments to restore acceptable steady-state conditions. Water storage inventories depleted during the event were restored in three days. Based on incident review, additional software and operational controls were implemented to decrease the probability of drawing sediment-laden raw water during future blockages. Utilities staff responded quickly, effectively, and professionally to the event resulting in no noticeable impact on the utility's customers during the Thanksgiving Day holiday weekend.

Water Plant Projects

- **RUPIP:** The Regulatory Upgrade and Process Improvement Project (RUIP) work continued apace with project bidding activities concluding the quarter. The project is expected to enter the construction phase in January 2014.
- **PAC Fire Suppression:** Design alternatives and equipment were reviewed with the design engineer during the quarter. Final design documents will be submitted for review during the first quarter of 2014.
- **Membrane Operations:** Full-scale testing of the TARGA II product from Koch Membrane Systems continued during the quarter. Preliminary indications are that the product meets or exceeds performance requirements. Additional TARGA II cartridges will be placed into service in the first quarter of 2014.
- **Utilities Air Emissions Project:** Short Elliott Hendrickson (S.E.H.) critically evaluated the EPA engine classification of 'emergency' generator units including the re-consideration of emission control equipment installation under a modified capacity agreement with Wisconsin Public Power Inc. (WPPI). A generator conditions assessment was also conducted as part of the scope. S.E.H. compiled this and other information into a benefit:cost analysis for the Utilities Department to make a recommendation for an alternative that satisfies EPA rules, minimizes costs, and preserves revenues from a capacity agreement with WPPI.

Staffing & Training

During the quarter, staff completed all general and safety training requirements for 2013. In addition, the two newest staff successfully completed certification testing in November.