

TO: HOVMSD COMMISSION

**FR: KEVIN SKOGMAN
DIRECTOR OF OPERATIONS & MAINTENANCE**

RE: CHEMICAL USE REPORT FOR 2021

DT: MARCH 23, 2022

Attached is the Chemical Use Report for 2021; quantities plus cost of chemicals. The cost and quantities relative to millions of gallons of wastewater treated at the plant are also provided.

Included is the natural gas, electricity, and water consumption and the cost associated with each utility.

New this year is Removal Efficiency (page 3); influent & effluent pounds on solids, phosphorus, ammonia and BOD along with total pounds removed prior to discharge and the percent removed on a yearly basis.

With the increases to the chemical prices for 2021 it did make a slight difference in cost of chemicals purchased. Ferric sulfate kept the total cost of purchases down. The plant went from 57 truckloads in 2020 down to 48 truckloads of ferric in 2021. Contributing factors to using less ferric may have been that rainfall was more spread out, laser flow meters keeping flows more even resulting in the ability to optimize. The operation of the 30-inch siphon and not having real septic wastewater entering the interceptor was also a factor.

The increase in the sulfuric acid is because of price increases and using muriatic acid when sulfuric wasn't available. Muriatic acid per pound was double that of sulfuric, plus it required a slightly higher dose rate.

Overall the numbers turned out well for 2021 thanks to the HOV operations team, and the communities for their continued I & I efforts in keeping clearwater from entering the system.

2021 CHEMICAL USE REPORT

GALLONS	2014	2015	2016	2017	2018	2019	2020	2021
TOTAL INFLUENT FLOW	2,101,955,000	1,887,988,000	2,020,671,000	2,094,199,000	2,127,692,000	2,493,211,300	2,170,385,000	2,302,155,000
**FLOW, MAY - SEPTEMBER	905,023,000	780,667,000	769,869,000	902,376,000	923,535,000	1,015,345,000	911,676,000	1,101,997,000
TOTAL \$ COST OF PURCHASES								
TREATMENT CHEMICAL	2014	2015	2016	2017	2018	2019	2020	2021
FERRIC SULFATE - ACTIFLO	\$289,797.00	\$282,560.00	\$306,169.00	271,749.00	\$250,405.00	\$327,298.00	\$379,168.00	\$329,078.00
POLYMER - ACTIFLO	67,245.65	41,055.00	48,185.00	41,528.00	46,772.00	39,909.00	44,871.00	\$49,107.00
POLYMER - DAF	23,920.00	20,930.00	26,910.00	26,910.00	39,184.00	30,997.00	37,257.00	\$41,034.00
SULFURIC ACID - BIOFILTER	20,458.29	34,709.00	35,368.00	26,291.00	26,159.00	36,122.00	31,631.00	\$57,259.00
SODIUM HYPOCHLORITE**	14,315.34	14,695.00	14,530.00	19,726.00	21,049.00	29,565.00	35,922.00	\$31,117.00
SODIUM BISULFATE**	<u>2,632.29</u>	<u>2326.00</u>	<u>3,943.00</u>	<u>2902.00</u>	<u>4682.00</u>	<u>5455.00</u>	<u>5641.00</u>	<u>\$10,466.00</u>
TOTAL	\$418,368.57	\$396,275.00	\$435,105.00	\$389,106.00	\$388,251.00	\$469,346.00	\$534,490.00	\$518,061.00
\$ COST / MGD TREATED								
TREATMENT CHEMICAL	2014	2015	2016	2017	2018	2019	2020	2021
FERRIC SULFATE - ACTIFLO	\$137.87	\$149.66	\$151.49	\$129.76	\$117.00	\$131.28	\$174.70	\$142.94
POLYMER - ACTIFLO	31.99	21.75	23.84	19.83	22.00	16.01	20.67	\$21.33
POLYMER - DAF	11.38	11.08	13.32	12.84	18.00	12.43	17.17	\$17.82
SULFURIC ACID - BIOFILTER	9.73	18.38	17.50	12.55	12.00	14.49	14.57	\$24.87
SODIUM HYPOCHLORITE**	15.82	18.82	18.87	21.86	22.80	29.12	39.40	\$28.24
SODIUM BISULFATE**	<u>2.91</u>	<u>2.98</u>	<u>5.12</u>	<u>3.22</u>	<u>5.10</u>	<u>5.37</u>	<u>6.19</u>	<u>\$9.50</u>
TOTAL	\$209.70	\$222.67	\$230.14	\$200.06	\$196.90	\$208.70	\$272.70	\$244.70
TOTAL GALLONS PURCHASED								
TREATMENT CHEMICAL	2014	2015	2016	2017	2018	2019	2020	2021
FERRIC SULFATE - ACTIFLO	149,457	142,252	171,981	179,228	178,333	217,049	205,853	173,953
POLYMER - ACTIFLO	6,375	4,677	5,502	4,731	5,225	4,402	4,952	5,225
POLYMER - DAF	2,200	1,930	2,476	2,476	3,575	2,751	3,301	3,575
SULFURIC ACID - BIOFILTER	6,914	11,587	13,067	10,062	10,062	13,336	11,729	15,022
SODIUM HYPOCHLORITE**	9,130	9,220	9,116	12,360	13,156	16,628	18,360	13,816
SODIUM BISULFATE**	1,533	1,399	2,396	1,754	2,838	3,078	3,051	4,486

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GALLONS OF CHEMICAL / MGD TREATED									
TREATMENT CHEMICAL	2014	2015	2016	2017	2018	2019	2020	2021	
FERRIC SULFATE - ACTIFLO	71.10	75.35	85.10	85.61	85.2	87.1	94.8	75.6	
POLYMER - ACTIFLO	3.03	2.48	2.72	2.26	2.5	1.77	2.28	2.27	
POLYMER - DAF	1.05	1.02	1.23	1.18	1.7	1.10	1.52	1.55	
SULFURIC ACID - BIOFILTER	3.29	6.14	6.47	4.80	4.7	5.36	5.4	6.53	
SODIUM HYPOCHLORITE**	10.09	11.81	11.84	13.69	14.2	16.38	20.14	12.54	
SODIUM BISULFATE**	1.69	1.79	1.19	1.94	3.0	3.03	3.35	4.07	
** May through September chemical use only									
## Emptied bulk tank contents and switched to totes. Gallons estimated.									
GAS, ELECTRIC AND WATER CONSUMPTION									
NATURAL GAS	2014	2015	2016	2017	2018	2019	2020	2021	
Therms	104,315	81,752	70,013	76,013	89,690	82,885	200,826	200,641	
Cost \$	\$90,580.17	\$51,661.64	\$38,836.02	\$44,583.71	\$47,502.00	\$42,814.71	\$36,413.73	\$35,034.20	
\$ Cost / MGD Treated	-	-	-	-	\$22.33	\$17.00	\$16.78	\$15.22	
Therms / MGD Treated	-	-	-	-	-	-	92.53	87.15	
POTABLE WATER	2014	2015	2016	2017	2018	2019	2020	2021	
Cubic Feet	447,992	385,130	380,677	458,500	476,500	491,400	464,900	502,581.00	
Cost \$	\$21,010.64	\$20,226.56	\$20,436.52	\$22,278.74	\$22,655.00	\$24,437.90	\$21,920.54	\$24,462.34	
\$ Cost / MGD Treated	-	-	-	-	\$10.65	\$9.80	\$10.10	\$10.63	
Cubic Feet / MGD Treated	-	-	-	-	224	197	214	218	
ELECTRICAL POWER	2014	2015	2016	2017	2018	2019	2020	2021	
KWH	7,589,498	7,356,888	7,446,624	7,468,201	7,682,476	8,051,500	7,957,863	8,189,111	
COST \$	\$527,632.56	\$534,006.19	\$499,300.03	\$509,871.00	\$508,330.00	\$504,393.43	\$494,540.75	\$537,709.43	
KWH / MGD Treated	3,610.7	3,896.68	3,684.62	3,566.14	3,610	3,229.38	3,664.85	3,557.08	
\$ Cost / MGD Treated	-	-	-	-	\$238.91	\$202.31	\$227.86	\$233.56	

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REMOVAL EFFICIENCY								
SOLIDS								
						<u>2019</u>	<u>2020</u>	<u>2021</u>
Raw Influent						-	-	3,792,868
Final Effluent						-	-	131,927
Total Pounds Removed						-	-	3,660,941
Percent Removed						-	-	97%
PHOSPHORUS								
						<u>2019</u>	<u>2020</u>	<u>2021</u>
Raw Influent						75,998	84,460	91,720
Final Effluent						3,648	5,006	3,434
Total Pounds Removed						72,350	79,454	88,286
Percent Removed						95%	94%	96%
AMMONIA								
						<u>2019</u>	<u>2020</u>	<u>2021</u>
Raw Influent						-	-	705,049
Final Effluent						-	-	4,789
Total Pounds Removed						-	-	700,260
Percent Removed						-	-	99%
BOD								
						<u>2019</u>	<u>2020</u>	<u>2021</u>
Raw Influent						-	-	5,006,411
Final Effluent						-	-	110,270
Total Pounds Removed						-	-	4,896,141
Percent Removed						-	-	98%