Manitouwadge Public Works
Presents:

The Wastewater Collection System Class II

and

Wastewater Treatment Plant Class I

2014

ANNUAL REPORT

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ANNUAL REPORT
2014

Township of Manitouwadge
Public Works Department
Wastewater Collection System Class II
And
Wastewater Treatment Plant Class I

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2014
Township of Manitouwadge
Public Works Department
Manitouwadge Wastewater Collection and Treatment System

1.0 INTRODUCTION

The Township of Manitouwadge, Public Works Department operates Manitouwadge Wastewater Collection System and Manitouwadge Wastewater Treatment System under a Certificate of Approval # 0031-86NKKA issued by the Ministry of the Environment on October 15, 2010.

As a condition of this Certificate of Approval, we are required to produce an Annual Compliance and Performance report for the benefit of the Ministry of the Environment and the residents of Manitouwadge within ninety days of the end of the calendar year.

Contained in this report you will find the information that we are required to keep in accordance with our Certificate of Approval from January 1, 2014 to December 31, 2014. As well, we include our accomplishments during the year.

Appendices in this report summarizes laboratory analysis test results for those parameters mandated by our Certificate of Approval as well as summarizes the annual daily flows, maximum daily flows, and minimum daily flow events for the year.

Currently the Manitouwadge Wastewater Collection System is classified as a Class II facility, and the Manitouwadge Wastewater Treatment System is classified as a Class I facility by the **O**ntario **E**nvironmental **T**raining **C**onsortium.

Paul Richard is fully licensed under Ontario Regulation 435/93 Utility Operator Licensing Program to operate these facilities. He is also designated by By-Law as the Operator in Overall Responsible Charge.

Our laboratory analysis for our Certificate of Approval sampling requirements are performed by Thunder Bay Analytical a division of the ALS Laboratories who are accredited by the Ministry of the Environment.

For the purposes of this report these facilities provide collection and treatment for a population of 2106. Approximately 1292 households are connected to the collection system. Households are deemed to include residential, institutional, multiple unit residential and industrial locations. Please note that the households located on Station Road, Sault Road and Black Road are not connected to our facilities.

2.0 MANITOUWADGE WASTEWATER COLLECTION & TREATMENT SYSTEM

2.1 HISTORY

The Manitouwadge Wastewater Collection System is a gravity flow network of underground sewer mains that connect the households of three Residential Areas, a Commercial Area and an Industrial Area to a sewage lift station located adjacent to Manitouwadge Lake beside a pedestrian way that links Ohsweken Road with Mississauga Drive.

Due to the lack of a comprehensive storm sewer infrastructure our collection system is deemed to be a combined system. Simply put, this means that the majority of the service connections to the sanitary sewer system are also connected to the weeping tile systems of the households. Hence, not only the sewage from the households but the groundwater from the households is directed to the wastewater collection system.

The piping material used in our system ranges from vitreous clay, concrete, cement asbestos (transite) to P.V.C. pipe. The vitreous clay and concrete piping was laid in 2.5 foot lengths and the joints sealed with oakum and mortar. The transite pipe was laid in 6.5 foot to 13 foot lengths with ringtite joints. P.V.C. piping was laid in 20 foot lengths with ringtite joints.

Manitouwadge area soil composition consists of bedrock, sand, clay and muskeg. This creates real problems with the vitreous clay and concrete pipe because of their short lengths and numerous joints when the ground moves during our freeze and thaw cycles. This leads to infiltration of groundwater during our summer months and possible exfiltration of raw sewage during freeze up.

Prior to 1986 the sewage collection at the lift station was pumped via a 12" inch cement asbestos force main to a sedimentation tank located approximately 3 km distant at Rudder Lake.

The sedimentation tank was pumped semi-annually into a drying bed. After leaching off the water the accumulated sludge was bulldozed and allowed to decompose naturally.

With the Hemlo Gold field discovery the townships ability to handle the expansion of the residential areas was brought into question. The existing lift station was aging and subject to frequent failures. Hence, in 1986 the Township undertook a Sewage Works Upgrading with the provision of a new lift station, a new 400 mm force main and a new two celled aerated sewage lagoon.

The sewage lift station features a single chamber wet well with an operating volume of 24 cubic meters with two 100 horsepower submersible pumps each capable of pumping 151 liters per second. As a backup to the lift station there is an overflow bypass tank

with an operating volume of 114 cubic meters with an 88 horsepower submersible pump capable of pumping 101 liters per second.

Two Milltronics Enviroranger flow monitors one dedicated to the wet well and the other dedicated to the overflow bypass tank measure the flows leaving the lift station.

A 200 KW generator set provides emergency power for the lift station and one sewage pump during a power outage. Due to Catastrophic failure of the 200 KW generator that supplied emergency power from well 3 & 4 pump house to the Sewage lift station it is no longer in use. This failure caused the Township of Manitouwadge to purchase a new 300 KW emergency generator. This generator going to be housed at the lift station and now feed power to well 3, 4 and well pump house 5 as well as supply emergency power to the sewage lift station.

The lift station is connected to the aerated sewage lagoons by a 400 mm diameter force main approximately 3.2 km in length. The force main route parallels the area 1D trunk sewer from the lift station to Matachewan Road, along Matachewan Road extending cross country to the Caramat Road. It then follows the Caramat Road to the intersection with the Rudder Lake Lagoon Access Road. These locations represent the low points in the profile of the force main. The vacuum/air release chambers representing the high points in the force main profile are located at the end of Matachewan Road and on the east side of the Caramat Road adjacent to the Cemetery.

The sewage then enters the inlet/outlet works where it enters the primary cell of a two cell aerated facultative lagoon with an operating volume of approximately 61,500 cubic meters. At its rated capacity of 4,100 average cubic meters per day and at its normal operating depth of 4 meters this allows for a minimum retention time in excess of 12 days.

Following the primary cell the sewage then enters the second or polishing cell of these lagoons returning to the inlet/outlet works where it outfalls to a clay lined outfall ditch to Rudder Lake. Please note that water from Rudder Lake enters the Pic River watershed. This is worthy of note inasmuch as the Township water supply is drawn from an aquifer that is drained by the Black River watershed.

At the lagoon site there is a building that houses two 50 horsepower positive displacement blowers that supply the air for the treatment process maintaining a minimum dissolved oxygen level of 2.0 mg/L in the lagoon wastewater.

The flows entering the lagoons are measured by a modified Parshall Flume complete with a Milltronics OCM III flow monitor.

The Corporation of the Township of Manitouwadge is in the process of constructing a drying bed having a treatment surface area of 10,450 m^2. The location of the drying bed is at the Northwestern end of Cell #1 and Cell #2. Once the drying bed construction is completed the sludge will be directly pumped into the drying bed with the excess water

flowing back into to Cell #1 and Cell #2 via gravity feed. The water will have to pass through many layers filtering out the water before entering the lagoons to insure that only the water and not the sludge is being reintroduced to the treatment Cells. Left behind will be a layer of sludge which will be left in the drying bed until it is dehydrated and then it will be shipped to the landfill site for disposal. Sludge removal will not only increase the life of the lagoons but will also increase the airflow supplied to the lagoons by the two blowers.

Surrounding the drying bed are four (4) monitoring wells which are being sampled by KGS to develop a history before the completion of the drying bed. Therefore the historical data will allow us to see any possible impacts of leachate entering the ground water surrounding the drying bed and ponds.

3.0 THE TREATMENT PROCESS

Our sewage is treated by the AIR-AQUA aeration system.

The primary purpose of the aeration system is to replace the dissolved oxygen in facultative lagoons where both aerobic and anaerobic digestion of the sewage has depleted the oxygen content. This is accomplished by generating millions of small air bubbles at the bottom of the lagoons and allowing them to flow slowly upward. The upward flowing of mixed air and water replenishes the dissolved oxygen and circulates the entire liquid mass.

The AIR-AQUA aeration system provides a quiet and efficient source of dissolved oxygen to the liquid content of the lagoon to meet the Biochemical Oxygen Demand (BOD) of the sewage digestion process by the aerobic bacteria. The gentle action of the system gives complete dispersion of the dissolved oxygen in the water and allows a large proportion of the solids to settle to the bottom for eventual anaerobic digestion. The process is relatively odorless.

The air bubbles for the treatment process are produced by a patented designed polyethylene tubing which has precisely formed check valves on the top centerline for careful metering of the air. This provides small bubbles of the proper size, which in turn produce a low velocity upward flow of mixed air, water and very fine suspended solids. The tubing laid on the bottom of the lagoon features a lead keel.

The aeration tubing arranged in a carefully engineered pattern is to provide optimum oxidation of the sewage liquid. The tubing is closer at the influent end of the lagoon to meet the greater demand for oxygen required by the raw sewage. The liquid volume on each side of the aeration tubing axis operates as a dynamic treatment cell. Thus the lagoon has a series of individual sewage treatment cells which extend through its length.

The objectives for the effluent entering Rudder Lake are Suspended Solids (SS) 25mg/L, BOD_5 20mg/L at a pH within the range of 6 to 9. The effluent limits must not exceed 30

mg/L for Suspended Solids (SS) and 25 mg/L for BOD_5 at a pH within the range of 6.0 to 9.5 at all times.

4.0 SOME WASTEWATER FACTS

4.1 DATA

During the period January1, 2014 to December 31, 2014 we pumped and treated 519,582,530 liters of wastewater.

Appendix A-2 gives the reader a Summary of the Monthly Sewage Flows highlighting the Month Flows, Average, Maximum and Minimum Daily Flows.

Appendix A-3 shows the reader a Monthly Summary of the Maximum and Minimum Daily Flow Events juxtaposed with the day that they occurred.

On a per capita daily basis the Annual Flow translates to a figure of 676 liters of wastewater generated per person per day based on the 2013 figure of 702 liters per person per day this represents a 3.7 % reduction in wastewater production. After review of the water report we showed that we had a 4.02 decrease. This decrease correlates directly to decrease in wastewater generated.

On a household basis this figure becomes 1101.79 liters per household per day of wastewater generation. Based on the 2013 figure of 1144.25 liters per household per day this represents a 3.71 % decrease in wastewater production. After review of the water report we showed that we had a 4.06 % decrease. This decrease correlates directly to decrease in wastewater generated.

During the period of January 1, 2014 to December 31, 2014 the Manitouwadge Water Treatment Plant Delivered 311,773,490 liters of potable water to its consumers. Relevant per capita water consumption generates figures of 406 liters per person per day and 661 liters per household per day.

It is a commonly held industry theory that a figure of 90 to 95 percent recovery of drinking water pumped returns to the Wastewater Collection and Treatment Systems

5.0 COMPLIANCE ISSUES

5.1 FLOW METERING

Our Certificate of Approval mandates that our raw sewage and final effluent meters must be within plus or minus 15 percent of each other. On November 5, 2014 Rob Kincaid a Milltronics trained technician of Trans-West, out of Thunder Bay calibrated the flow meters at the lift station including the overflow and the lagoons. During the flow meter calibration Rob Kincaid confirmed that the flow meters were within 6.25 percent of each

other for the Lift station wet well pump #1 and #2. Also, during this timeframe the overflow pump was also calibrated which yielded a 2.79 percent difference of each other.

It is important to note that the Milltronics Enviro-Ranger ERS 500 uses a mathematical algorithm to calculate flows based upon the fill time and pump time of the vessel being measured. Because the Overflow Tank is used infrequently its measured volumes are questionable. However, when the tank is put into regular service its accuracy will mirror the volumes measured by the OCM III at the lagoons.

5.2 LABORATORY ANALYSIS

Our **C**ertificate **o**f **A**pproval mandates that we sample Raw Sewage and Final Effluent on a bi-monthly basis.

Raw Sewage samples are analyzed for the following parameters Total Phosphorous (P), Biochemical Oxygen Demand, Total Suspended Solids, E-Coli, and pH. The results of our C of A Raw sewage sampling program are contained in Appendix B-1.

Final Effluent samples are analyzed for the following parameters Ammonia (N), Ammonia Un-Ionized (N), Total Phosphorous (P), Biochemical Oxygen Demand (BOD), Carbonaceous Biochemical Oxygen Demand (CBOD), Total Suspended Solids, E-Coli, pH and pH @ 15C, WSER. The results of our C of A Final Effluent sampling program are contained in Appendix B-2. During the 2013 timeframe there was no exceedence of the C of A during our bi weekly sample program.

Our C of A mandates that a Target Objective of 20 mg/L for **B**iochemical **O**xygen **D**emand be maintained with a Maximum Allowable Concentration of 25 mg/L. For **T**otal **S**uspended **S**olids a Target Objective of 25 mg/L is to be maintained with a Maximum Allowable Concentration of 30 mg/L.

To show the effectiveness of our Treatment Process we have appendices with the percentage reduction for the following parameters: Total Phosphorous (P) as Appendix B-3, B.O.D as Appendix B-4, T.S.S as Appendix B-5, and E-Coli as Appendix B-6. On an Annual basis the reductions were as follows:

a) Total Phosphorous (P)	25.8 %
b) Biochemical Oxygen Demand	88.6 %
c) Total Suspended Solids	87.0 %
d) E-Coli	99.9 %

5.3 MAXIMUM AVERAGE DAILY FLOW EXCEEDENCES

Our Certificate of Approval allows an Average Daily Maximum Flow of 4,100 m^3 per day with a minimum retention time of twelve (12) days or 5,125 m^3 per day.

For 2014 there were a total of nine (9) exceedences of the C of A requirement of 4,100 m^3 per day. These exceedences occurred due to the drastic combination of snow melt and spring rain fall for the first eight exceedences. The last two of the nine exceedences occurred due the heavy amount of rain fall received. Details of the events are contained in Appendix C together with the laboratory analysis results collected during these events.

5.4 FINAL EFFLUENT DISSOLVED OXYGEN

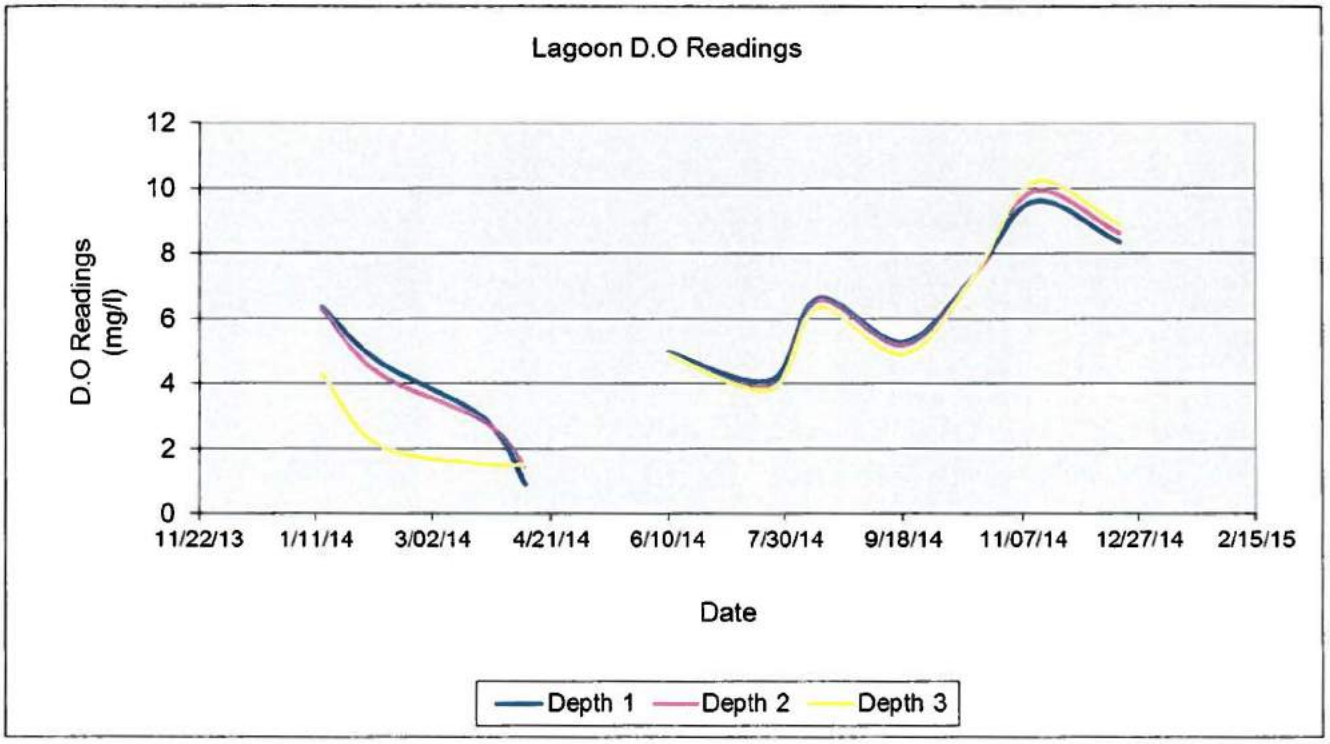
As part of our C of A for the sewage lagoons we are required to monitor the Final Effluent for Dissolved Oxygen levels. Listed below is a table that was developed to show the data collected for the 2014 period. Readings were collected at the discharge from the lagoons system before exiting over the effluent weir plate. See Figure 1 below for data and Figure 2 below for graphical analysis of the data collected.

Lagoon D.O. Readings
2014

Figure 1

Sample	Out Fall	Out Fall	Out Fall
	Depth 1	Depth 2	Depth 3
Date	mg/L	mg/L	mg/L
14/01/2014	6.35	6.3	4.3
07/02/2014	4.7	4.34	2.13
24/03/2014	2.92	2.84	1.54
10/04/2014	0.9	1.45	1.52
10/06/2014	4.98	4.92	4.9
24/07/2014	4.12	3.85	3.84
13/08/2014	6.63	6.56	6.36
18/09/2014	5.28	5.19	4.92
17/10/2014	7.26	7.24	7.23
12/11/2014	9.61	9.91	10.2
19/12/2014	8.36	8.64	8.9
Min	**0.9**	**1.45**	**1.52**
Max	**9.61**	**9.91**	**10.2**
Average	**5.56**	**5.58**	**5.08**

**Depth 1 is approx. 25% depth from surface
**Depth 2 is approx. 50 % of the depth from surface
**Depth three is approx. 75% of the depth from surface



5.5 CONSUMER COMPLAINTS

Jan 17, 2014

- Snake sewer main Sandpiper.

Jan 20, 2014

- Snake sewer main Shingwalk.

Jan 28, 2014

- Flush sewer main Fisher.

Mar 03, 2014

- Inspect sewer main Neebig.

Mar 03, 2014

- Potters Pumping flush sewer main Swallow and Sandpiper.

April 4, 2014

- Snake sewer lateral at 7 Swallow.

April 16, 2014

- Inspect sewer main for plugged lateral at 11 Heron.
- Advised to call a plumber

April 25, 2014

- Inspect sewer main for plugged lateral at 88 Warbler
- Advised to call a plumber

June 15, 2014

- Flush sewer main Fisher.

June 17, 2014

- Inspect sewer manhole Matachewan.

September 26, 2014

- Inspect sewer main and flush Swallow.
- Sewer main was clear of obstruction.

November 18, 2014

- Flush sewer main from end of Sandpiper to Heron.

December 8, 2014

- Inspect sewer main for plugged lateral at 28 Heron.

6.0 ACCOMPLISHMENTS

The Township of Maintouwadge spent a total of 17.5 hours of regular time and 2.5 hours of overtime completing tasks related to sewer mains.

The Township of Manitouwadge operators utilized 15 regular hours and 9 overtime hours inspecting, snaking, and repairing and camera sewer lateral.

7.0 CONCLUSION

2014 was a busy year for the Manitouwadge Wastewater Collection and Treatment System. There was a plethora of consumer complaints which mainly consisted of backed up sewers. All consumer complaints were dealt with in a timely fashion to insure consumer's satisfaction. The summary of these complaints are listed above in section 5.5 Consumer Complaints.

8.0 RECOMENDATIONS

From the operation stand point there are a few recommendations for the 2014 time frame. These recommendations are listed below.

1. The first would be the completion of the drying bed out at the lagoons
2. Repair of air relief valve in air relief chamber located at the end of Matachewan.
3. Possibly remove second pump for rebuild.
4. Tie in flow data from lift station and blower station into SCADA system.

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DAILY SEWAGE FLOW

Appendix A-1

	January		February		March		April		May		June		July		August		September		October		November		December
1	Wed	908.84	Sat	867.54	Sat	1063.25	Tue	1425.75	Thu	5056.19	Sun	2379.15	Tue	1524.98	Fri	827.02	Mon	925.72	Wed	1045.18	Sat	1535.15	Mon	938.50
2	Thu	915.36	Sun	897.02	Sun	1094.91	Wed	1402.84	Fri	4548.43	Mon	4176.89	Wed	1385.64	Sat	911.03	Tue	764.70	Thu	1292.04	Sun	1421.33	Tue	955.53
3	Fri	892.47	Mon	829.46	Mon	1112.87	Thu	1371.48	Sat	5015.92	Tue	4123.17	Thu	1385.72	Sun	777.21	Wed	814.35	Fri	2674.79	Mon	1307.78	Wed	1178.84
4	Sat	904.27	Tue	841.19	Tue	1056.06	Fri	1378.15	Sun	5223.43	Wed	3688.28	Fri	1273.49	Mon	819.98	Thu	792.29	Sat	2252.78	Tue	1306.22	Thu	612.00
5	Sun	934.65	Wed	820.83	Wed	1046.99	Sat	1493.41	Mon	4285.29	Thu	3131.32	Sat	1350.62	Tue	782.75	Fri	741.76	Sun	2224.65	Wed	1300.91	Fri	854.84
6	Mon	872.27	Thu	847.66	Thu	1070.76	Sun	1707.60	Tue	3675.15	Fri	2688.09	Sun	1529.58	Wed	768.17	Sat	753.64	Mon	2303.69	Thu	1252.32	Sat	939.03
7	Tue	895.30	Fri	791.66	Fri	1434.45	Mon	2094.03	Wed	3501.27	Sat	3270.50	Mon	1549.70	Thu	759.32	Sun	807.11	Tue	2081.04	Fri	1204.66	Sun	931.18
8	Wed	813.57	Sat	903.70	Sat	1081.04	Tue	1596.28	Thu	3328.54	Sun	2560.66	Tue	1471.39	Fri	806.47	Mon	732.01	Wed	1886.79	Sat	1219.04	Mon	848.80
9	Thu	890.14	Sun	893.79	Sun	1193.85	Wed	1497.36	Fri	3609.85	Mon	2298.05	Wed	1303.58	Sat	869.18	Tue	855.53	Thu	1977.14	Sun	1197.19	Tue	892.64
10	Fri	834.30	Mon	840.35	Mon	1052.45	Thu	2042.92	Sat	3394.20	Tue	2408.28	Thu	1294.45	Sun	825.10	Wed	1557.16	Fri	1629.19	Mon	1068.98	Wed	878.02
11	Sat	1096.34	Tue	833.95	Tue	1092.21	Fri	1799.01	Sun	3082.28	Wed	2233.63	Fri	1297.92	Mon	1070.92	Thu	1195.32	Sat	1528.53	Tue	1064.92	Thu	848.63
12	Sun	945.94	Wed	906.51	Wed	1099.97	Sat	1742.16	Mon	2998.70	Thu	2267.19	Sat	1248.56	Tue	861.72	Fri	1075.11	Sun	1479.07	Wed	1107.18	Fri	887.07
13	Mon	831.19	Thu	952.72	Thu	1141.38	Sun	1763.28	Tue	3688.70	Fri	2182.86	Sun	1267.13	Wed	920.84	Sat	1017.34	Mon	1471.24	Thu	1140.40	Sat	899.17
14	Tue	820.40	Fri	870.78	Fri	1127.94	Mon	1526.92	Wed	2852.73	Sat	2184.42	Mon	1202.98	Thu	820.36	Sun	1041.75	Tue	1450.11	Fri	1000.55	Sun	915.35
15	Wed	887.15	Sat	918.64	Sat	1280.40	Tue	1467.15	Thu	2705.55	Sun	2129.07	Tue	1206.50	Fri	792.61	Mon	967.86	Wed	1372.23	Sat	1110.31	Mon	1073.76
16	Thu	849.28	Sun	996.39	Sun	1266.17	Wed	1387.06	Fri	2827.89	Mon	1979.26	Wed	1154.64	Sat	879.14	Tue	957.35	Thu	1385.09	Sun	1078.52	Tue	935.50
17	Fri	823.94	Mon	908.84	Mon	1159.68	Thu	1414.31	Sat	2739.94	Tue	1890.71	Thu	1103.35	Sun	809.74	Wed	946.14	Fri	1669.26	Mon	965.66	Wed	1023.95
18	Sat	909.10	Tue	870.05	Tue	1165.89	Fri	1411.06	Sun	2502.37	Wed	1805.13	Fri	1015.40	Mon	727.07	Thu	1006.44	Sat	1587.10	Tue	1090.50	Thu	875.70
19	Sun	967.39	Wed	897.84	Wed	1170.15	Sat	1391.35	Mon	2447.72	Thu	1805.59	Sat	1011.54	Tue	744.79	Fri	1184.35	Sun	1650.37	Wed	920.50	Fri	915.42
20	Mon	842.41	Thu	860.60	Thu	1244.17	Sun	2143.55	Tue	2765.20	Fri	1654.92	Sun	1031.24	Wed	702.53	Sat	1386.84	Mon	1576.75	Thu	921.78	Sat	1098.77
21	Tue	790.38	Fri	936.61	Fri	1194.03	Mon	2713.75	Wed	3150.85	Sat	1712.77	Mon	1011.31	Thu	728.49	Sun	1277.18	Tue	1429.37	Fri	957.36	Sun	1068.24
22	Wed	837.06	Sat	1015.56	Sat	1231.71	Tue	2375.77	Thu	2517.90	Sun	1208.00	Tue	1074.14	Fri	679.58	Mon	1167.52	Wed	1365.30	Sat	967.19	Mon	1089.75
23	Thu	827.02	Sun	1034.52	Sun	1361.56	Wed	2630.70	Fri	2422.16	Mon	1522.25	Wed	1061.65	Sat	764.28	Tue	1123.23	Thu	1336.90	Sun	1178.92	Tue	1161.48
24	Fri	825.21	Mon	988.35	Mon	1204.84	Thu	3107.45	Sat	2322.15	Tue	1574.26	Thu	931.15	Sun	751.26	Wed	976.07	Fri	1362.96	Mon	1056.83	Wed	1209.91
25	Sat	853.11	Tue	1011.37	Tue	1255.70	Fri	3380.76	Sun	2285.42	Wed	1543.22	Fri	880.29	Mon	760.77	Thu	1027.13	Sat	1487.69	Tue	1042.67	Thu	1085.56
26	Sun	1019.09	Wed	1029.58	Wed	1274.03	Sat	2950.20	Mon	2291.16	Thu	1502.55	Sat	903.59	Tue	692.15	Fri	962.02	Sun	1296.17	Wed	956.87	Fri	1107.83
27	Mon	888.15	Thu	1062.65	Thu	1322.37	Sun	3070.76	Tue	2293.69	Fri	1545.33	Sun	894.56	Wed	659.78	Sat	949.81	Mon	1224.55	Thu	982.13	Sat	1169.32
28	Tue	804.90	Fri	998.84	Fri	1308.51	Mon	3327.85	Wed	2110.08	Sat	1434.23	Mon	991.32	Thu	677.32	Sun	1092.37	Tue	1442.93	Fri	912.67	Sun	1156.94
29	Wed	783.3007			Sat	1392.02	Tue	5339.72	Thu	1904.74	Sun	1637.92	Tue	633.66	Fri	734.84	Mon	1051.49	Wed	1546.86	Sat	1024.54	Mon	1105.34
30	Thu	781.0882			Sun	1462.28	Wed	5507.94	Fri	2021.28	Mon	1598.12	Wed	873.41	Sat	772.13	Tue	1005.23	Thu	1423.17	Sun	1064.59	Tue	1153.08
31	Fri	932.7624			Mon	1388.86			Sat	1861.30			Thu	826.01	Sun	732.22			Fri	1350.83			Wed	1168.62
		27176.40		25846.76		37370.5		66460.57		95432.06		66155.81		35689.5		24428.77		30154.62		49823.75		33337.68		30978.787
	AVE	876.66	AVE	915.96	AVE	1205.50	AVE	2215.35	AVE	3078.45	AVE	2205.19	AVE	1151.27	AVE	788.02	AVE	1005.16	AVE	1607.22	AVE	1111.26	AVE	999.32
	MAX	1096.34	MAX	1062.65	MAX	1462.28	MAX	5507.94	MAX	5223.43	MAX	4176.89	MAX	1549.70	MAX	1070.92	MAX	1557.16	MAX	2674.79	MAX	1535.15	MAX	1209.91
	MIN	781.09	MIN	791.66	MIN	1046.99	MIN	1371.48	MIN	1861.30	MIN	1208.00	MIN	633.66	MIN	659.78	MIN	732.01	MIN	1045.18	MIN	912.67	MIN	612.00

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SUMMARY OF SEWAGE MONTHLY FLOWS

Appendix A-2

Month	Total Flow	Daily Flows		
		m3/day		
	(m3)	Average	Maximum	Minimum
January	27,176.40	876.66	1,096.34	781.09
February	25,646.76	915.96	1,062.65	791.66
March	37,370.50	1,205.50	1,462.28	1,046.99
April	66,460.57	2,215.35	5,507.94	1,371.48
May	95,432.06	3,078.45	5,223.43	1,861.30
June	66,155.81	2,205.19	4,176.89	1,208.00
July	35,689.50	1,151.27	1,549.70	633.66
August	24,428.77	788.02	1,070.92	659.78
September	30,154.82	1,005.16	1,557.16	732.01
October	49,823.75	1,607.22	2,674.79	1,045.18
November	33,337.68	1,111.26	1,535.15	912.67
December	27,905.92	1,002.92	1,209.91	612.00
ANNUAL	**519,582.53**	**1,430.25**	**5,507.94**	**612.00**

ANNUAL REPORT
2014
Summary of Monthly Maximum and Minimum Daily Flow Events

Appendix A-3

Day	Date	Maximum Daily Flow	Month	Mimimum Daily Flow	Day	Date
		m3		m3		
Saturday	11th	1,096.34	**January**	781.09	Thursday	30th
Thursday	27th	1,062.65	**February**	791.66	Friday	7th
Saturday	30th	1,462.28	**March**	1,046.99	Tuesday	5th
Wednesday	30th	5,507.94	**April**	1,371.48	Thursday	3rd
Monday	4th	5,223.43	**May**	1,861.30	Sunday	31st
Monday	2nd	4,176.89	**June**	1,208.00	Sunday	22nd
Monday	7th	1,549.70	**July**	633.66	Tuesday	29th
Monday	11th	1,070.92	**August**	659.78	Wednesday	27th
Wednesday	10th	1,557.16	**September**	732.01	Monday	8th
Friday	3rd	2,674.79	**October**	1,045.18	Wednesday	1st
Saturday	1st	1,535.15	**November**	912.67	Friday	28th
Wednesday	24th	1,209.91	**December**	612.00	Thursday	4th
		5,507.94	**ANNUAL**	**612.00**		

ANNUAL SEWAGE REPORT
2014
Summary of Raw Sewage Laboratory Sampling Results

Appendix B-1

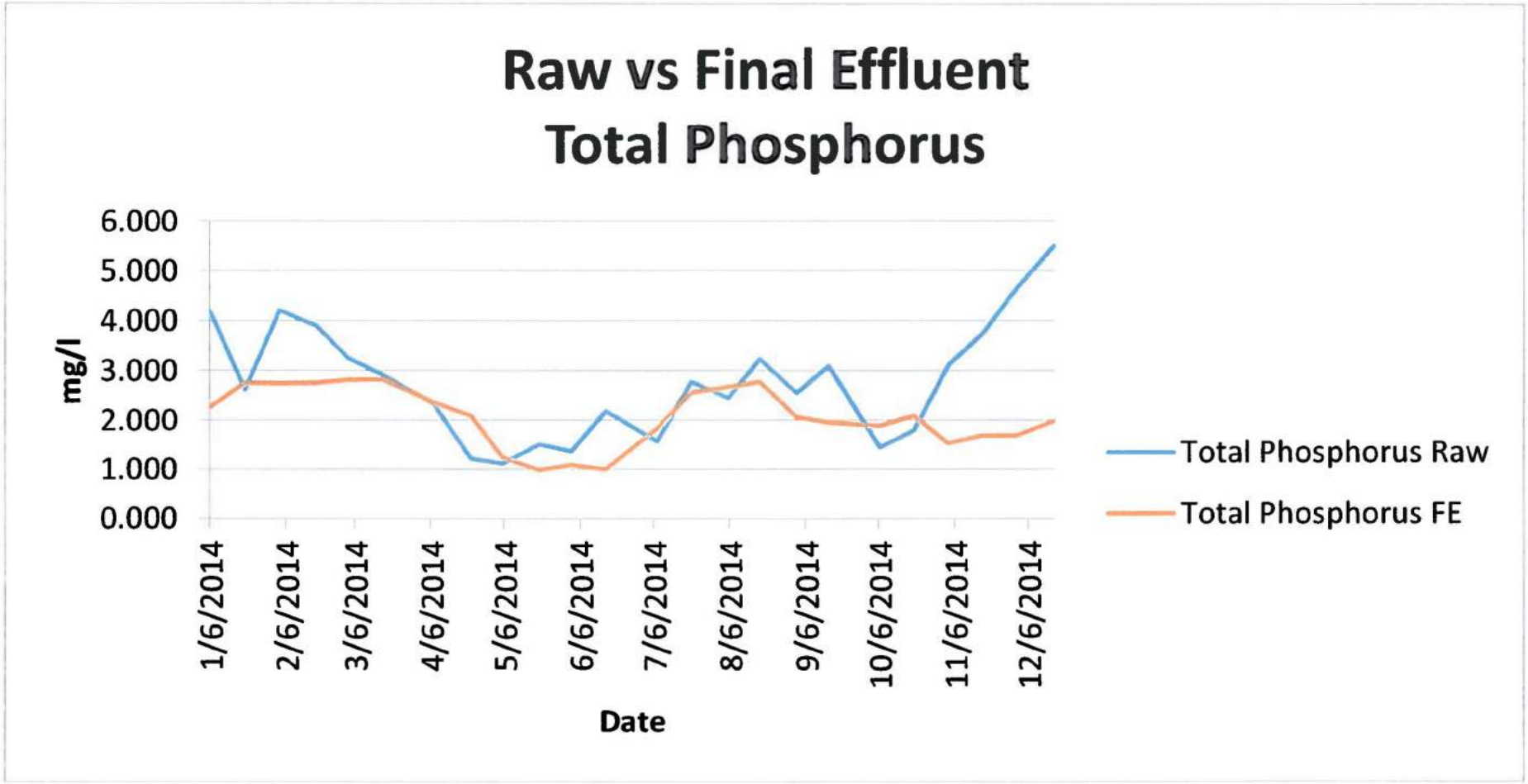
Laboratory Results							
Raw Sewage		Total Phosphorus (TP)	Biochemical Oxygen Demand	Total Suspended Solids	Temperature	E-Coli	pH
Month	Date	(mg/L)			°C	M.P.N./100ml	
January	06/01/2014	4.170	111	120	6.4	9,200,000	8.16
	20/01/2014	2.620	48	42.6	3.9	4,600,000	8.09
February	03/02/2014	4.210	104	99.4	4.5	>2420000	8.07
	18/02/2014	3.900	51	66.1	4.6	2,420,000	8.22
March	03/03/2014	3.260	103	135	5.2	4,350,000	8.18
	17/03/2014	2.920	70	106	5.8	1,300,000	7.45
April	07/04/2014	2.320	38.2	115	6.7	1,990,000	7.99
	22/04/2014	1.220	21.2	8.5	4.5	1,990,000	7.98
May	05/05/2014	1.120	7.7	29.8	6.3	5,170,000	7.58
	20/05/2014	1.510	28.1	53.4	6.7	1,200,000	7.53
June	02/06/2014	1.370	12.4	23.9	8.4	1,990,000	7.64
	16/06/2014	2.190	46	63.5	9.8	10,500,000	7.89
July	07/07/2014	1.570	15.1	38	12.8	1,990,000	7.75
	21/07/2014	2.780	36	19.9	12.1	12,000,000	7.75
August	05/08/2014	2.450	55	35.6	13.8	15,500,000	7.77
	18/08/2014	3.240	58	72.4	12.7	5,790,000	7.77
September	02/09/2014	2.550	56	47	13.1	5,790,000	7.89
	15/09/2014	3.100	55	61.1	13.9	2,850,000	7.72
October	06/10/2014	1.450	31	44.2	12.2	435,000	8.04
	20/10/2014	1.800	27.9	32.7	11.7	1,990,000	7.73
November	03/11/2014	3.120	65	87.4	10.1	1,480,000	7.98
	17/11/2014	3.750	108	115	9	4,880,000	7.97
December	01/12/2014	4.660	154	127	9.2	5,790,000	8.05
	16/12/2014	5.490	115	161	8.9	4,880,000	7.89
Annual	Average	2.78	59.03	71.02	8.85	4,699,348	7.88

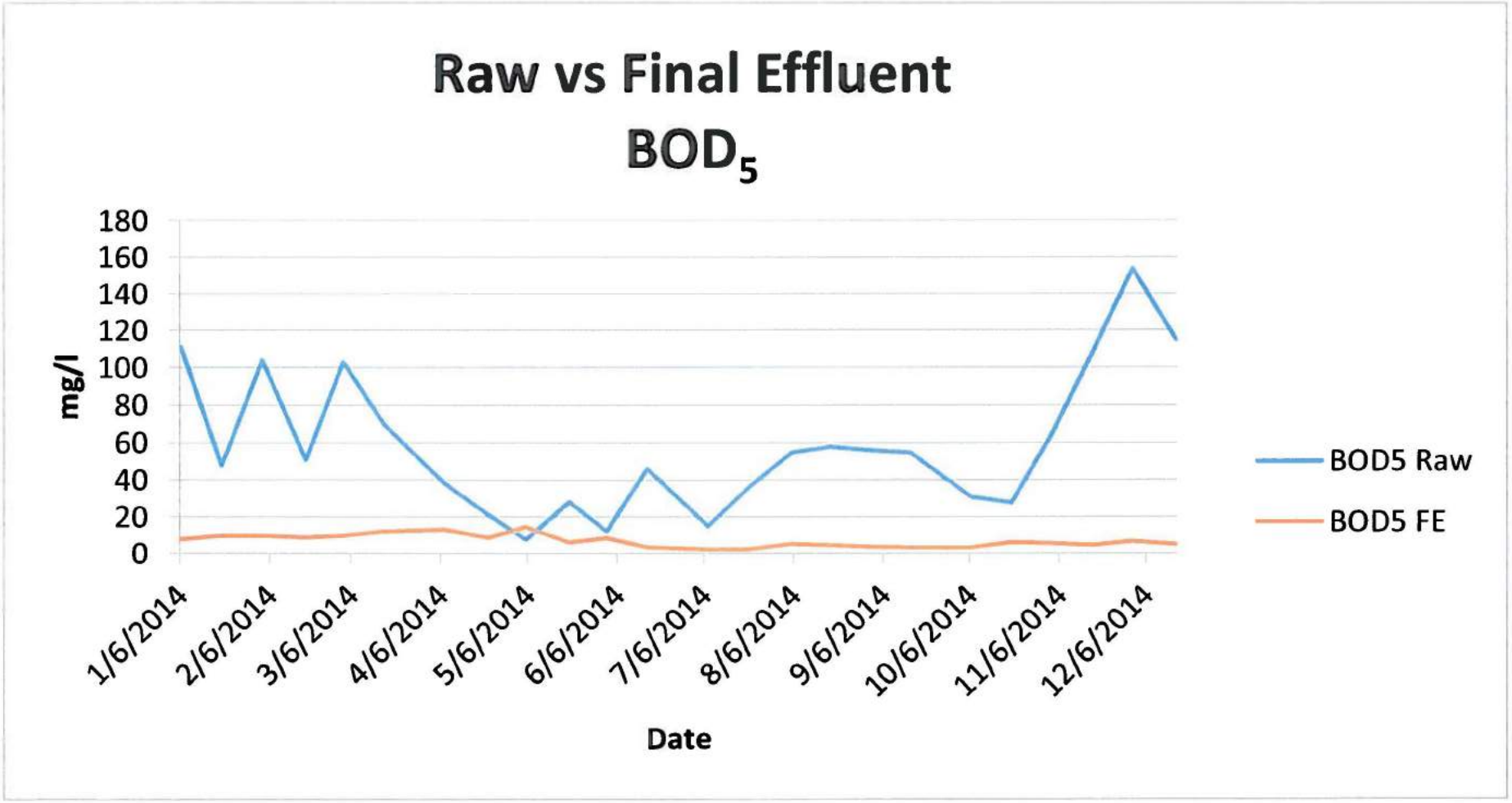
ANNUAL SEWAGE REPORT
2014
Summary of Final Effluent Laboratory Sampling Results

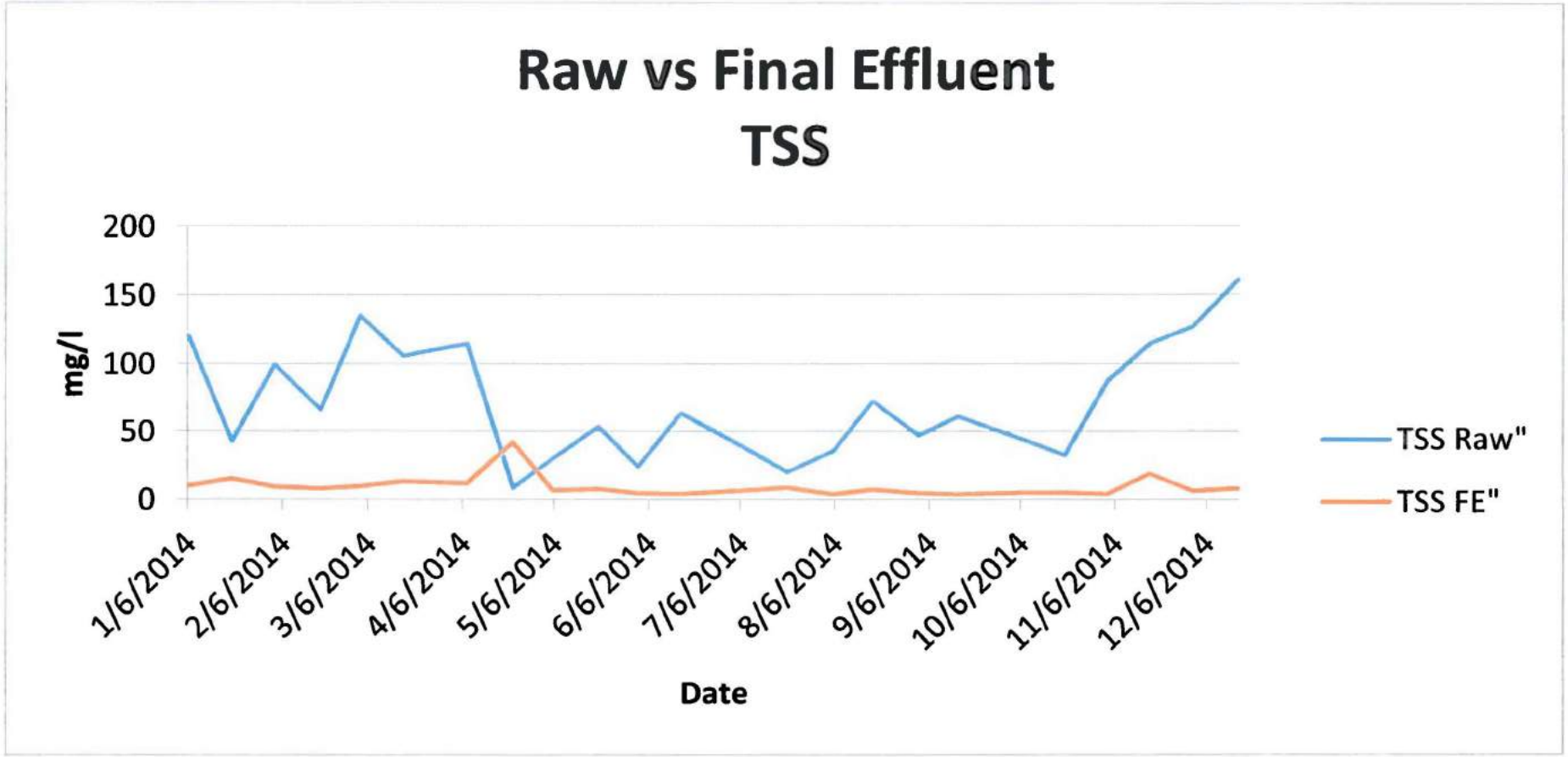
Appendix B-2

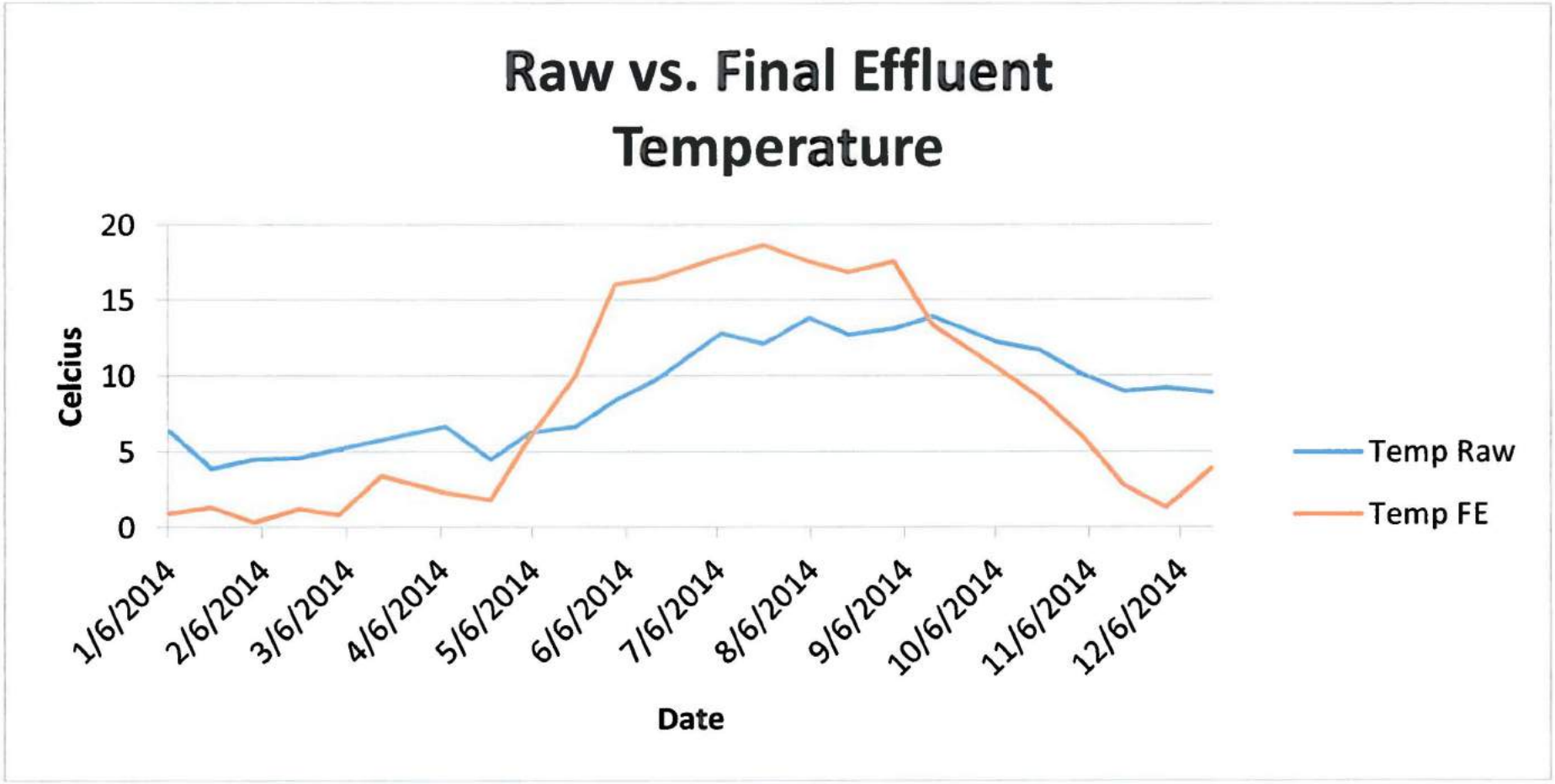
Laboratory Results									
Final Effluent		Ammonia (N)	Total Phosphorus	Biochemical Oxygen Demand	Total Suspended Solids	Temperature	E-Coli	pH	Exceedence
Month	Date	(mg/L)			(mg/L)	°C	M.P.N./100 ml		
January	06/01/2014	15.20	2.26	7.7	9.8	0.9	1,700	7.88	No
	20/01/2014	13.9	2.75	9.6	14.9	1.3	1,700	7.89	No
February	03/02/2014	17.80	2.74	9.7	8.9	0.3	> 2,420	7.90	No
	18/02/2014	20.70	2.75	8.7	7.7	1.2	> 2,420	7.70	No
March	03/03/2014	19.70	2.81	9.7	9.4	0.8	19,900	7.85	No
	17/03/2014	19.00	2.82	12	12.9	3.4	5,480	7.78	No
April	07/04/2014	16.50	2.35	13	11.6	2.3	19,900	8.00	No
	22/04/2014	14.30	2.09	8.6	41.7	1.8	2,310	7.77	(1)Yes
May	05/05/2014	7.92	1.24	14.5	6.5	6	2,200	8.00	No
	20/05/2014	5.72	0.98	6	7.6	10	930	8.02	No
June	02/06/2014	5.26	1.09	8.4	4.7	16	186	8.06	No
	16/06/2014	0.15	1.00	3.3	4.1	16.4	20	8.07	No
July	07/07/2014	11.10	1.83	2	6.5	17.8	2	7.87	No
	21/07/2014	14.30	2.55	2.1	8.6	18.6	9	8.11	No
August	05/08/2014	14.80	2.67	5.1	3.9	17.5	24	8.04	No
	18/08/2014	13.20	2.77	4.4	7.1	16.8	16	7.96	No
September	02/09/2014	13.60	2.06	3.4	4.7	17.5	34	8.00	No
	15/09/2014	13.40	1.95	3.2	3.8	13.3	45	7.95	No
October	06/10/2014	13.30	1.88	3	5	10.5	178	8.21	No
	20/10/2014	5.00	2.09	6	5	8.6	291	8.10	No
November	03/11/2014	10.70	1.53	5.4	4.1	6.1	194	8.10	No
	17/11/2014	11.00	1.69	4.5	18.6	2.8	> 2,420	8.06	No
December	01/12/2014	12.10	1.69	6.5	6.2	1.3	> 2,420	7.94	No
	16/12/2014	13.20	1.97	4.8	7.9	3.9	3,650	7.84	No
Annual	Average	12.58	2.07	7	9	8	2,852	7.96	No

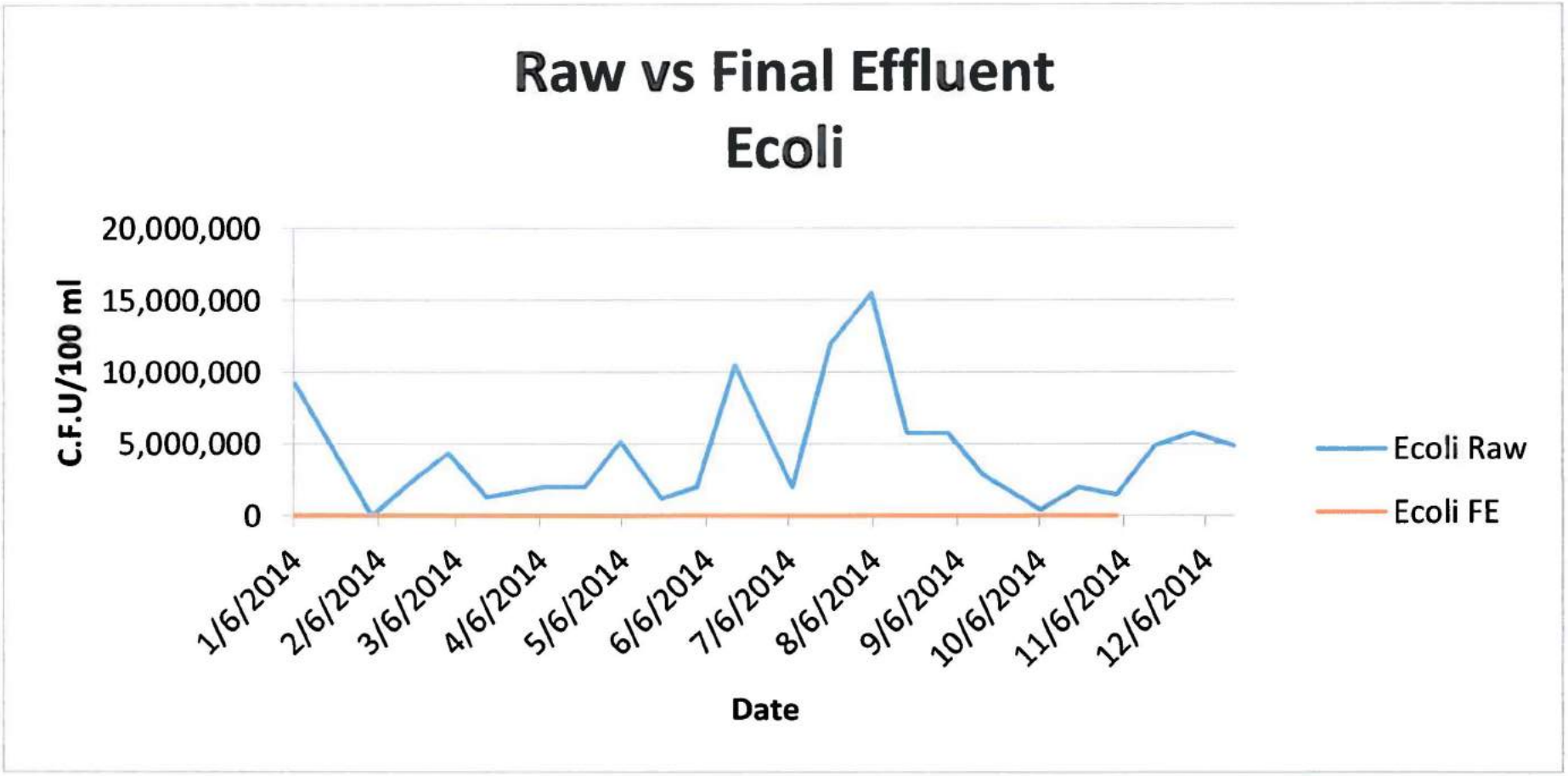
(1) The Ontario Spills Action Centre and the Ministry of Environment were notified
The final Effluent was resampled

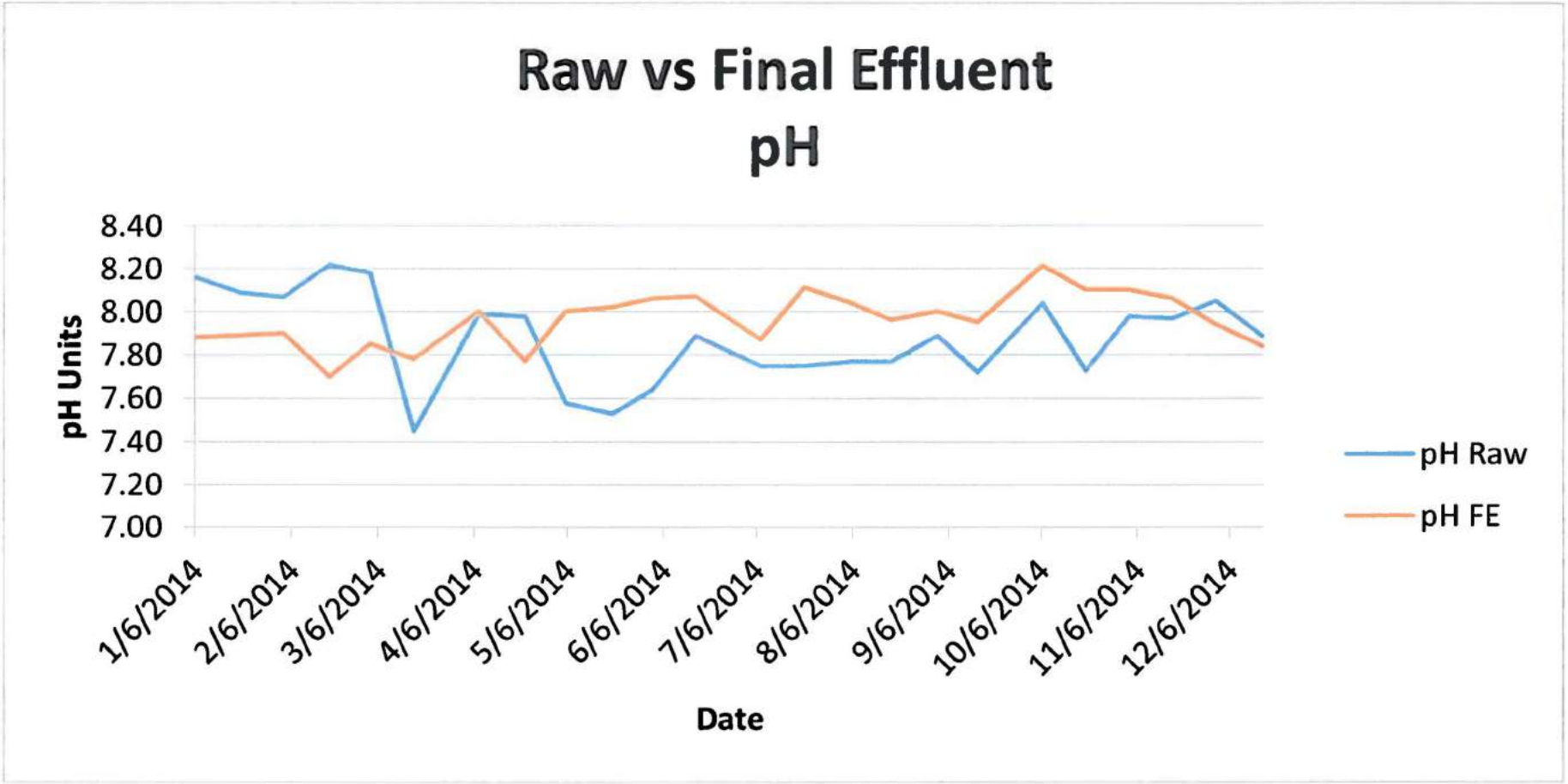

Raw vs Final Effluent
Total Phosphorus
6.000
5.000
4.000
3.000
2.000
1.000
0.000
mg/l
1/6/2014
2/6/2014
3/6/2014
4/6/2014
5/6/2014
6/6/2014
7/6/2014
8/6/2014
9/6/2014
10/6/2014
11/6/2014
12/6/2014
Date
Total Phosphorus Raw
Total Phosphorus FE

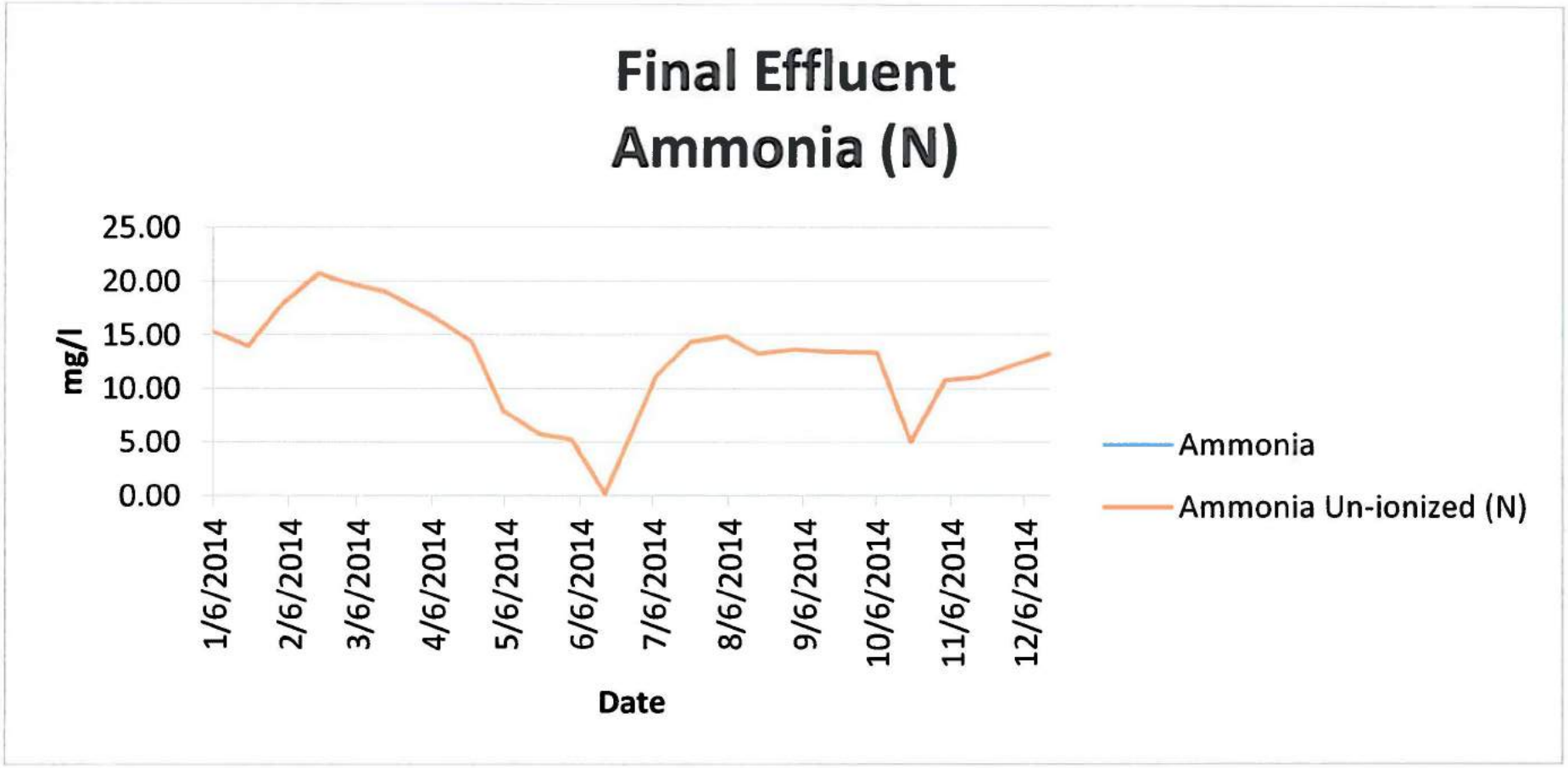

Raw vs Final Effluent
BOD5
mg/l
180
160
140
120
100
80
60
40
20
0
1/6/2014
2/6/2014
3/6/2014
4/6/2014
5/6/2014
6/6/2014
7/6/2014
8/6/2014
9/6/2014
10/6/2014
11/6/2014
12/6/2014
Date
BOD5 Raw
BOD5 FE


Raw vs Final Effluent
TSS
200
150
100
50
0
mg/l
1/6/2014
2/6/2014
3/6/2014
4/6/2014
5/6/2014
6/6/2014
7/6/2014
8/6/2014
9/6/2014
10/6/2014
11/6/2014
12/6/2014
Date
TSS Raw"
TSS FE"


Raw vs. Final Effluent Temperature
20
15
10
5
0
Celcius
1/6/2014
2/6/2014
3/6/2014
4/6/2014
5/6/2014
6/6/2014
7/6/2014
8/6/2014
9/6/2014
10/6/2014
11/6/2014
12/6/2014
Date
Temp Raw
Temp FE


Raw vs Final Effluent
Ecoli
20,000,000
15,000,000
10,000,000
5,000,000
0
C.F.U/100 ml
1/6/2014
2/6/2014
3/6/2014
4/6/2014
5/6/2014
6/6/2014
7/6/2014
8/6/2014
9/6/2014
10/6/2014
11/6/2014
12/6/2014
Date
Ecoli Raw
Ecoli FE


Raw vs Final Effluent
pH
8.40
8.20
8.00
7.80
7.60
7.40
7.20
7.00
pH Units
1/6/2014
2/6/2014
3/6/2014
4/6/2014
5/6/2014
6/6/2014
7/6/2014
8/6/2014
9/6/2014
10/6/2014
11/6/2014
12/6/2014
Date
pH Raw
pH FE


Final Effluent
Ammonia (N)
25.00
20.00
15.00
10.00
5.00
0.00
mg/l
1/6/2014
2/6/2014
3/6/2014
4/6/2014
5/6/2014
6/6/2014
7/6/2014
8/6/2014
9/6/2014
10/6/2014
11/6/2014
12/6/2014
Date
Ammonia
Ammonia Un-ionized (N)

ANNUAL REPORT
2014
Summary of Sewage Laboratory Sampling Results
PERCENT REDUCTION

Appendix B-3

Raw Sewage				Final Effluent	
Total Phosphorus				Total Phosphorus	Percentage Reduction
mg/L	Date	Month	Date	mg/L	%
4.170	1/6/2014	January	1/6/2014	2.26	45.8%
2.620	1/20/2014		1/20/2014	2.75	-5.0%
4.210	2/3/2014	February	2/3/2014	2.74	34.9%
3.900	2/18/2014		2/18/2014	2.75	29.5%
3.260	3/3/2014	March	3/3/2014	2.81	13.8%
2.920	3/17/2014		3/17/2014	2.82	3.4%
2.320	4/7/2014	April	4/7/2014	2.35	-1.3%
1.220	4/22/2014		4/22/2014	2.09	-71.3%
1.120	5/5/2014	May	5/5/2014	1.24	-10.7%
1.510	5/20/2014		5/20/2014	0.98	34.9%
1.370	6/2/2014	June	6/2/2014	1.09	20.4%
2.190	6/16/2014		6/16/2014	1.00	54.4%
1.570	7/7/2014	July	7/7/2014	1.83	-16.6%
2.780	7/21/2014		7/21/2014	2.55	8.3%
2.450	8/5/2014	August	8/5/2014	2.67	-9.0%
3.240	8/18/2014		8/18/2014	2.77	14.5%
2.550	9/2/2014	September	9/2/2014	2.06	19.2%
3.100	9/15/2014		9/15/2014	1.95	37.1%
1.450	10/6/2014	October	10/6/2014	1.88	-29.7%
1.800	10/20/2014		10/20/2014	2.09	-16.1%
3.120	11/3/2014	November	11/3/2014	1.53	51.0%
3.750	11/17/2014		11/17/2014	1.69	54.9%
4.660	12/1/2014	December	12/1/2014	1.69	63.7%
5.490	12/16/2014		12/16/2014	1.97	64.1%
2.782	Average	Annual	Average	2.07	**25.8%**

ANNUAL REPORT
2014
Summary of Sewage Laboratory Sampling Results
PERCENT REDUCTION

Appendix B-4

Raw Sewage				Final Effluent	
Biochemical Oxygen Demand				Biochemical Oxygen Demand	Percentage Reduction
mg/L	Date	Month	Date	mg/L	%
111	1/6/2014	January	1/6/2014	7.7	93.1%
48	1/20/2014		1/20/2014	9.6	80.0%
104	2/3/2014	February	2/3/2014	9.7	90.7%
51	2/18/2014		2/18/2014	8.7	82.9%
103	3/3/2014	March	3/3/2014	9.7	90.6%
70	3/17/2014		3/17/2014	12	82.9%
38.2	4/7/2014	April	4/7/2014	13	66.0%
21.2	4/22/2014		4/22/2014	8.6	59.4%
7.7	5/5/2014	May	5/5/2014	14.5	-88.3%
28.1	5/20/2014		5/20/2014	6	78.6%
12.4	6/2/2014	June	6/2/2014	8.4	32.3%
46	6/16/2014		6/16/2014	3.3	92.8%
15.1	7/7/2014	July	7/7/2014	2	86.8%
36	7/21/2014		7/21/2014	2.1	94.2%
55	8/5/2014	August	8/5/2014	5.1	90.7%
58	8/18/2014		8/18/2014	4.4	79.8%
56	9/2/2014	September	9/2/2014	3.4	93.9%
55	9/15/2014		9/15/2014	3.2	94.2%
31	10/6/2014	October	10/6/2014	3	90.3%
27.9	10/20/2014		10/20/2014	6	78.5%
65	11/3/2014	November	11/3/2014	5.4	91.7%
108	11/17/2014		11/17/2014	4.5	95.8%
154	12/1/2014	December	12/1/2014	6.5	95.8%
115	12/16/2014		12/16/2014	4.8	95.8%
59	**Average**	**Annual**	**Average**	7	**88.6%**

ANNUAL REPORT
2014
Summary of Sewage Laboratory Sampling Results
PERCENT REDUCTION

Appendix B-5

Raw Sewage				Final Effluent	
Total Suspended Solids				Total Suspended Solids	Percentage Reduction
mg/L	Date	Month	Date	mg/L	%
120	1/6/2014	January	1/6/2014	9.8	91.8%
42.6	1/20/2014		1/20/2014	14.9	65.0%
99.4	2/3/2014	February	2/3/2014	8.9	91.0%
66.1	2/18/2014		2/18/2014	7.7	88.4%
135	3/3/2014	March	3/3/2014	9.4	93.0%
106	3/17/2014		3/17/2014	12.9	87.8%
115	4/7/2014	April	4/7/2014	11.6	89.9%
8.5	4/22/2014		4/22/2014	41.7	-390.6%
29.8	5/5/2014	May	5/5/2014	6.5	78.2%
53.4	5/20/2014		5/20/2014	7.6	85.8%
23.9	6/2/2014	June	6/2/2014	4.7	80.3%
63.5	6/16/2014		6/16/2014	4.1	93.5%
38	7/7/2014	July	7/7/2014	6.5	82.9%
19.9	7/21/2014		7/21/2014	8.6	56.8%
35.6	8/5/2014	August	8/5/2014	3.9	89.0%
72.4	8/18/2014		8/18/2014	7.1	90.2%
47	9/2/2014	September	9/2/2014	4.7	90.0%
61.1	9/15/2014		9/15/2014	3.8	93.8%
44.2	10/6/2014	October	10/6/2014	5	88.7%
32.7	10/20/2014		10/20/2014	5	84.7%
87.4	11/3/2014	November	11/3/2014	4.1	95.3%
115	11/17/2014		11/17/2014	18.6	83.8%
127	12/1/2014	December	12/1/2014	6.2	95.1%
161	12/16/2014		12/16/2014	7.9	95.1%
71	Average	Annual	Average	9	87.0%

ANNUAL REPORT
2014
Summary of Sewage Laboratory Sampling Results
PERCENT REDUCTION

Appendix B-6

Raw Sewage				Final Effluent	
E-Coli				E-Coli	Percentage Reduction
C.F.U./100 ml	Date	Month	Date	C.F.U./100 ml	%
9,200,000	1/6/2014	January	1/6/2014	1,700	100.0%
4,600,000	1/20/2014		1/20/2014	1,700	100.0%
>2420000	2/3/2014	February	2/3/2014	2,420	#VALUE!
2,420,000	2/18/2014		2/18/2014	2,420	99.9%
4,350,000	3/3/2014	March	3/3/2014	19,900	99.5%
1,300,000	3/17/2014		3/17/2014	5,480	99.6%
1,990,000	4/7/2014	April	4/7/2014	19,900	99.0%
1,990,000	4/22/2014		4/22/2014	2,310	99.9%
5,170,000	5/5/2014	May	5/5/2014	2,200	100.0%
1,200,000	5/20/2014		5/20/2014	930	99.9%
1,990,000	6/2/2014	June	6/2/2014	186	100.0%
10,500,000	6/16/2014		6/16/2014	20	100.0%
1,990,000	7/7/2014	July	7/7/2014	2	100.0%
12,000,000	7/21/2014		7/21/2014	9	100.0%
15,500,000	8/5/2014	August	8/5/2014	24	100.0%
5,790,000	8/18/2014		8/18/2014	16	100.0%
5,790,000	9/2/2014	September	9/2/2014	34	100.0%
2,850,000	9/15/2014		9/15/2014	45	100.0%
435,000	10/6/2014	October	10/6/2014	178	100.0%
1,990,000	10/20/2014		10/20/2014	291	100.0%
1,480,000	11/3/2014	November	11/3/2014	194	100.0%
4,880,000	11/17/2014		11/17/2014	2,420	100.0%
5,790,000	12/1/2014	December	12/1/2014	2,420	100.0%
4,880,000	12/16/2014		12/16/2014	3,650	99.9%
4,699,348	Average	Annual	Average	2,852	**99.9%**

ANNUAL SEWAGE REPORT
2014
Summary of Exceedences of Certificate of Approval for Average Maximum Daily Flows

Appendix C

Laboratory Results												
#	Date	Daily Flow (m^3)	Reason	Ammonia (N)	Ammonia Un-ionized (N)	Total Phosphorus (TP)	Biochemical Oxygen Demand (BOD5)	CBOD	Total Suspended Solids (TSS)	pH @ 15°C, WSER (pH)	pH	Exceedence
				(mg/L)								
1	4/29/2014	5339.72	Snow Melt	10.90	0.27	1.56	9.5	8.2	14.2	7.97	7.97	No
2	4/30/2014	5507.94	Snow Melt	10.10	0.23	1.43	7.3	6.7	11.8	7.94	7.95	No
3	5/1/2014	5058.19	Snow Melt	9.370	0.199	1.340	7.6	6.8	8.2	7.90	7.95	No
4	5/2/2014	4548.43	Snow Melt	9.070	0.172	1.330	6.2	5.3	7.8	7.85	8.04	No
5	5/3/2014	5015.92	Snow Melt	8.480	0.201	1.230	7.1	5.8	7.4	7.95	8.04	No
6	5/4/2014	5,223.43	Snow Melt	7.920	0.192	1.240	14.5	5.7	6.5	7.96	8.00	No
7	5/5/2014	4285.29	Snow Melt	7.500	0.186	1.120	7.3	6.4	12.5	7.97	8.05	No
8	6/2/2014	4176.89	Rain	5.460	0.166	0.993	6.7	4	6.1	8.06	8.22	No
9	6/3/2014	4123.17	Rain	5.770	0.200	1.120	6.4	4.1	4.2	8.12	7.98	No

Sample analysis concluded an exceedence on our C of A for BOD_5. The M.A.C is 25 mg/L and the Target is 20 mg/L. Samples were also collected on the following day and results show that we were in compliance according to our C of A.