MUNICIPALITY OF WEST ELGIN

RODNEY WASTEWATER TREATMENT PLANT

2014 ANNUAL REPORT
January 1 to December 31, 2014

Environmental Compliance Approval # 3-0871-88-949

Prepared by:

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

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Section 1: Overview

The wastewater treatment plant was operated under Environmental Compliance Approval 3-0871-88-949 dated April 12, 1994 with amendments September 24, 1998.

Collection System
The collection system contains gravity sewers that lead to the Main Pumping Station located on Furnival Road. It contains a wet well with two submersible pumps that pump to the treatment plant. Backup power is supplied by an onsite generator.

Plant Description
The Rodney Wastewater Treatment Plant is an extended aeration facility which consists of: extended aeration, settling, UV disinfection (seasonal), phosphorus removal, and filtration. The extended aeration process is designed to remove carbonaceous and nitrogenous organic compounds (BOD). Aluminum Sulphate is used for phosphorus removal. After the clarifier the effluent is filtered and seasonally disinfected using ultraviolet light, then discharged to Sixteen Mile Creek. Sludge is directed to the lagoon for storage and settling. Decant liquid off the lagoon is returned to the influent of the plant.

Process Details

- Wastewater is directed into the sewage lift station from the Village of Rodney by gravity. Wastewater is pumped from the sewage lift station located near the junction of Furnival Road and King Street by force main into a reinforced concrete splitter chamber, provided with a mechanical rake bar screen.
- The secondary treatment system consists of two aeration basins, one reinforced concrete clarifier tank and two return activated sludge pumps.
- The phosphorous removal system consists of one 30,000 L fiber reinforced tank with spills containment equipped with 2 diaphragm type metering pumps (1 duty and 1 standby).
- Three mechanical aerators in each aeration tank provide oxygen at a low pressure in the aeration tanks.
- The tertiary treatment system consists of four (4) continuous back wash 2 metre deep bed, granular single media sand filtration units housed in the filter building. Hydrogen peroxide is introduced for filter cleaning when necessary.
- The disinfection system consists of a ultra-violet (UV) unit through which the effluent is discharged seasonally.
- A concrete V-notch weir flow measuring chamber is installed between the clarifier and the filter building.
- Operations are controlled by a programmable logic controller (PLC). A data logging computer system with local monitoring capability is used to monitor, trend, and record select process parameters.
- Laboratory space is also located at the WWTP to allow for basic laboratory analyses to be conducted by the plant operator.
- Process control is monitored by SCADA at the West Lorne Wastewater Treatment Facility.

Section 2: Monitoring Data

Sample Collection and Testing

All samples are collected and tested as per the requirements of the Environmental Compliance Approval.

Raw sewage is sampled bi-weekly and tested for BOD_5, total suspended solids, total phosphorus, and total Kjeldahl nitrogen. The raw samples are collected as 24 hour composite samples.

Final effluent is sampled bi-weekly and tested for BOD_5, total suspended solids, total phosphorus, free ammonia nitrogen, total Kjeldahl nitrogen, nitrite, nitrate, pH and alkalinity. Samples are collected using an automatic composite sampler and collected over a twenty-four hour period. Grab samples for dissolved oxygen and temperature are collected bi-weekly. A grab sample for E. coli is sampled bi-weekly during the disinfection period from April 15 to October 15.

In-house tests are conducted on a weekly basis on the final effluent, raw influent and the mixed liquor suspended solids at the plant to check plant performance and to make any operational changes required.

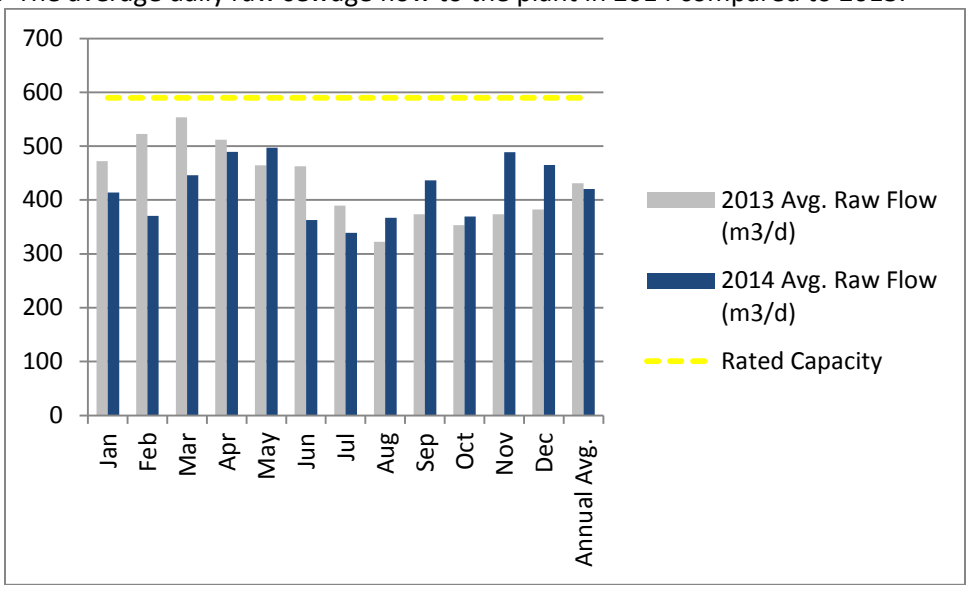
In 2014, all chemical and microbiological sample analyses were conducted by SGS Lakefield Research. Temperature, pH and dissolved oxygen were conducted by staff at the treatment plant.

The receiving stream temperature is performed at Sixteen Mile Creek.

Flows

Detailed monthly flow information is summarized in Appendix A. The total flow treated in 2014 was 153,496m^3, which corresponds to a 2.4% decrease from 2013 raw flows. The annual average daily flow for the reporting period was 420.5m^3/day, or 71.3% of the plant's rated design capacity of 590m^3/day (refer to Chart 1).

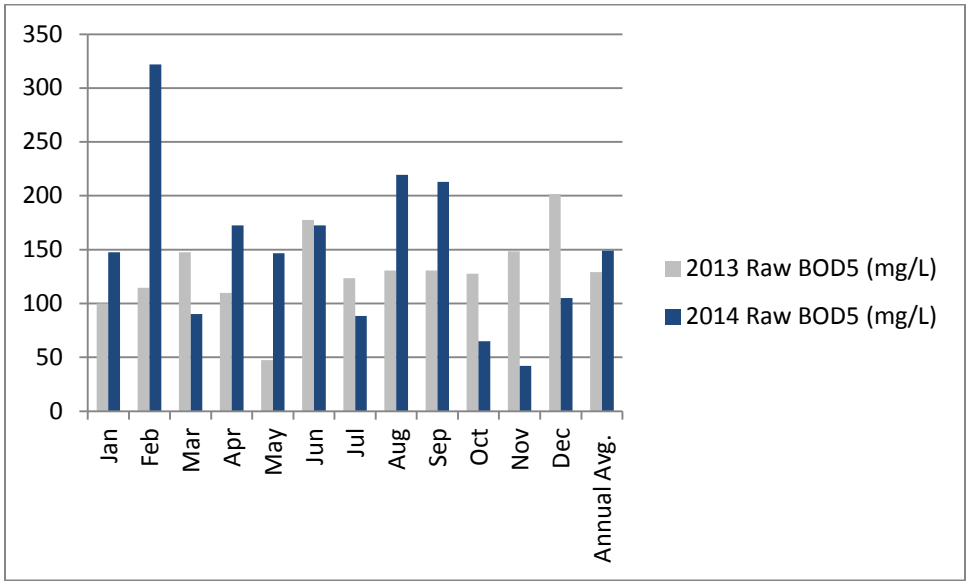
Chart 1. The average daily raw sewage flow to the plant in 2014 compared to 2013.



Raw Sewage Quality

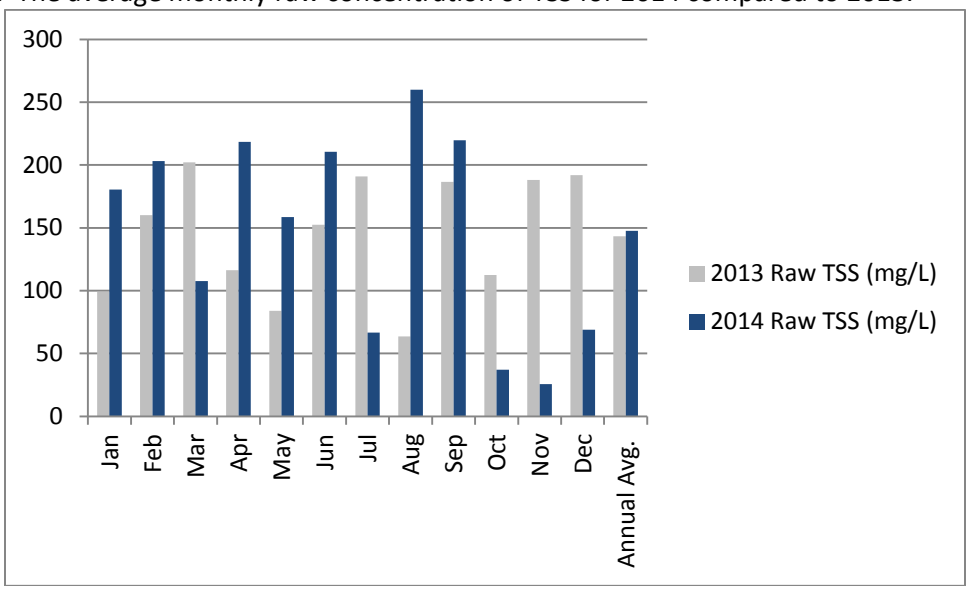
The annual average raw sewage BOD_5 concentration to the plant was 148.9mg/L with a maximum concentration of 480mg/L. The average BOD_5 loading to the plant was 62.6kg/d for 2014. The annual average concentration of BOD_5 has increased 15.4% from 2013, refer to Chart 2.

Chart 2. Average monthly raw concentration of BOD_5 for 2014 compared to 2013.



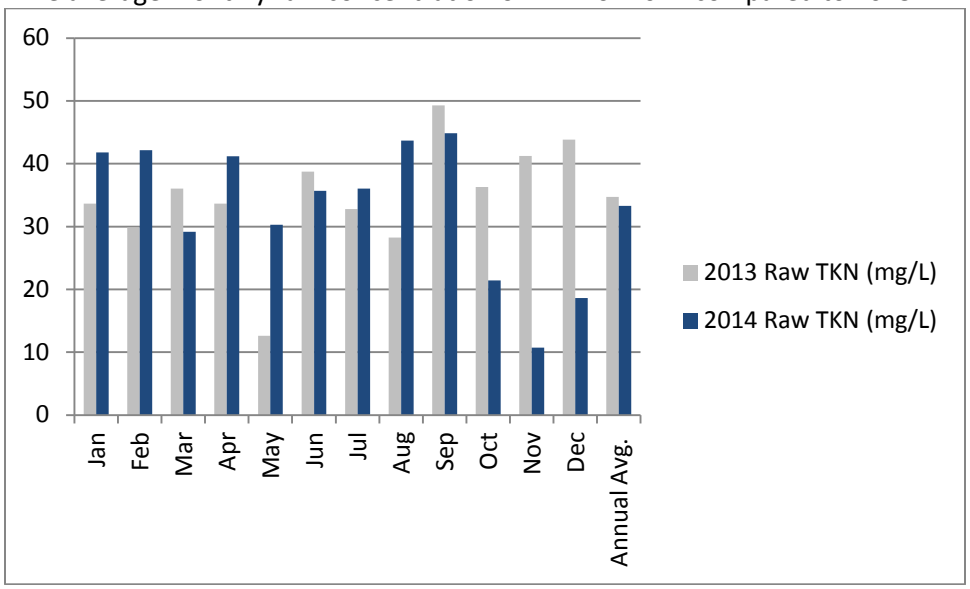
The annual average raw sewage suspended solids (TSS) concentration to the plant was 147.7mg/L, with a maximum of 360mg/L. This corresponds to an average TSS loading to the plant of 62.1kg/day. The average concentration of TSS has increased 3.1% from 2013, refer to Chart 3.

Chart 3. The average monthly raw concentration of TSS for 2014 compared to 2013.



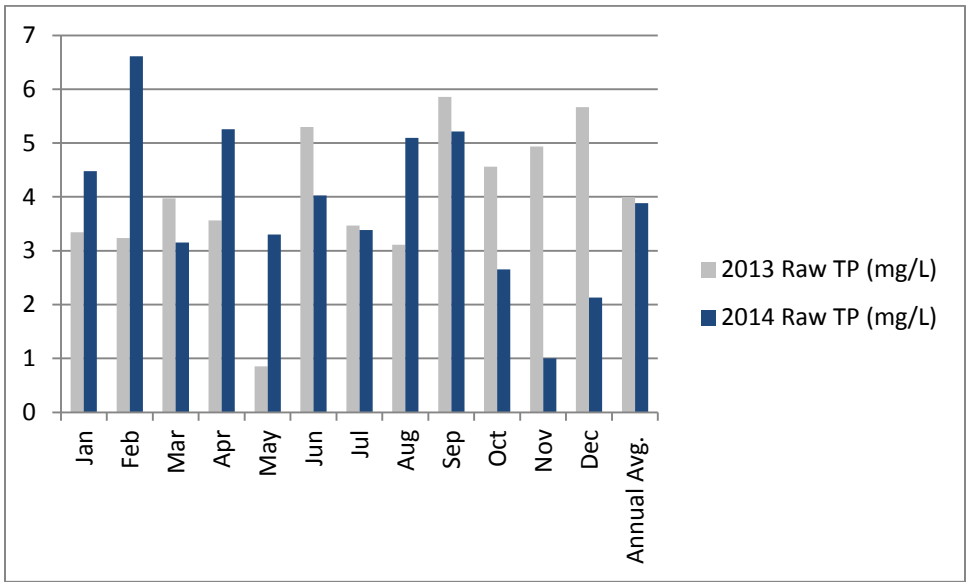
The annual average raw sewage Total Kjeldahl Nitrogen (TKN) concentration to the plant was 33.3mg/L, with a maximum of 59.6mg/L. This corresponds to an average TKN loading to the plant of 14kg/day. The average concentration of TKN has decreased 4.1% from 2013, refer to Chart 4.

Chart 4. The average monthly raw concentration of TKN for 2014 compared to 2013.



The annual average raw sewage Total Phosphorus (TP) concentration to the plant was 3.88mg/L, with a maximum of 8.81mg/L. This corresponds to an average TP loading to the plant of 1.63kg/day. The average concentration of TP has decreased 2.8% from 2013, refer to Chart 5.

Chart 5. The average monthly raw concentration of TP for 2014 compared to 2013.



Effluent Limits

Detailed analytical data is attached to this report as Appendix A. The following table provides a summary of the monthly average concentration and loading ranges compared to the limits set in the Environmental Compliance Approval.

Summary and Comparison of Compliance Data

Table 1. Monthly average concentration and loading ranges for 2014.

Parameter	Monthly Average Effluent Limit (mg/L)	Monthly Average Effluent Result Ranges (mg/L)	Monthly Average Loading Limit (kg/d)	Monthly Average Loading Result Ranges (kg/d)
BOD_5	10(a)	<2 – <2	6.9	0.7 – 3.0
	15(b)	<2 – 8		
Suspended Solids	10(a)	<2 – <3	6.9	0.7 – 4.1
	15(b)	2.5 – 11		
Total Phosphorus	0.5(a)	0.04 - 0.21	0.4	0.01 -0.08
	1.0(b)	0.05 – 0.21		
Total (Ammonia + Ammonium) Nitrogen	3.0(a)	<0.1 - <0.20	2.2	0.04 – 6.4
	5.0(b)	<0.1 – 14.4		
E. coli	200	<1.7 - <2		
Unionized Ammonia*	0.1	0 – 0.58		

NOTE: (a) limit applies during the non-freezing period
(b) limit applies during the freezing period
*single sample results

Discussion on Monitoring Data as Compared to the Effluent Limits

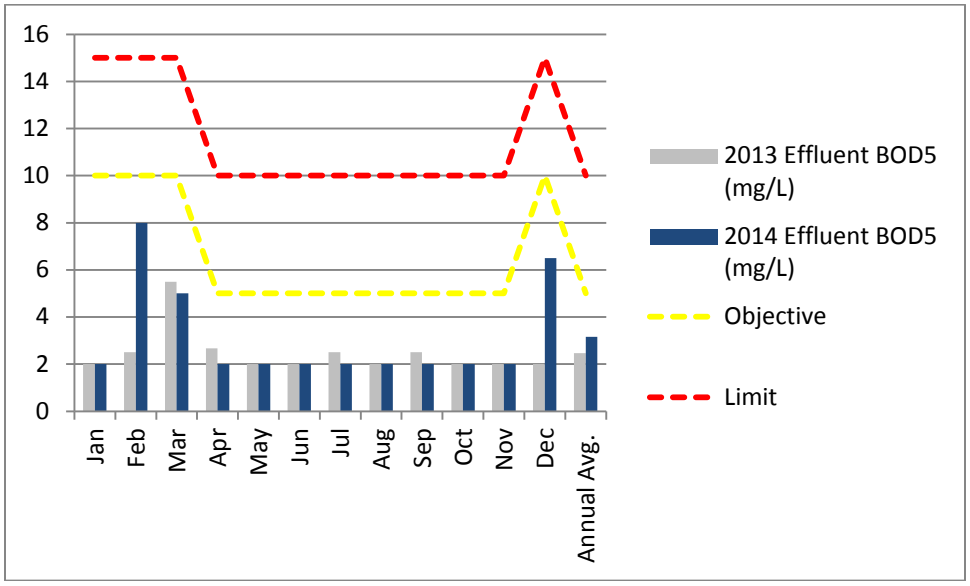
There were several non-compliances reported to the MOECC in February and March of 2014, refer to Table 2. These non-compliances were all related to very cold temperatures during these months which inhibited the nitrification process. Refer to Section 3 for more details.

Table 2. Non-compliances reported to the MOECC in 2014.

Parameter	Date of Non-Compliance (yyyy-mm-dd)	Result
Total Ammonia as Nitrogen	2014-02	9mg/L
Unionized Ammonia	2014-02-20	0.4mg/L
Total Ammonia as Nitrogen Loading	2014-02	3.4kg/d
Total Ammonia as Nitrogen	2014-03	14.4mg/L
Unionized Ammonia	2014-03-04	0.58mg/L
Unionized Ammonia	2014-03-19	0.23mg/L
Total Ammonia as Nitrogen Loading	2014-03	6.4kg/d

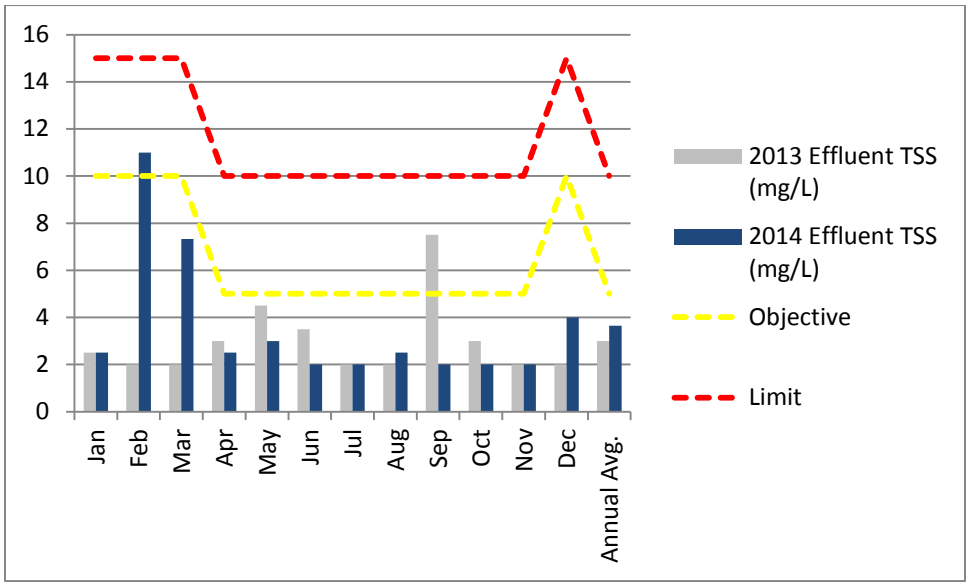
The annual average effluent BOD_5 for 2014 was 3.2mg/L, which is a 28.1% increase from 2013 (refer to Chart 6). The annual loading of BOD_5 at the plant in 2014 was 1.3kg/d. Refer to Table 1 for a list of monthly average effluent limits and loading limits.

Chart 6. The effluent monthly average concentration of BOD_5 in 2014 compared to 2013 concentrations.



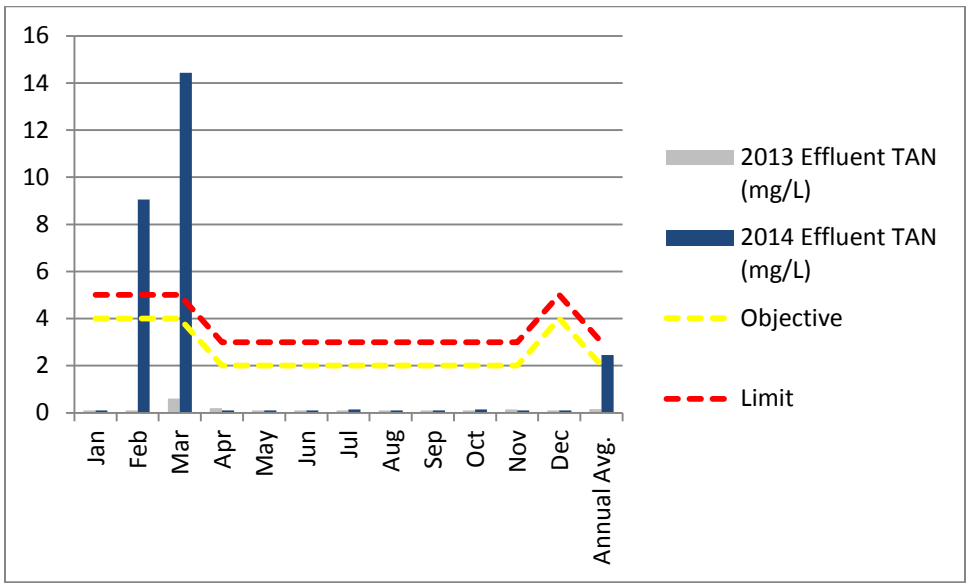
The annual average effluent Total Suspended Solids (TSS) for 2014 was 3.7mg/L, which is an increase from 2013 by 21.8% (refer to Chart 7). The annual loading of TSS at the plant in 2014 was 1.5kg/d. Refer to Table 1 for a list of monthly average effluent limits and loading limits.

Chart 7. The effluent monthly average concentration of TSS in 2014 compared to 2013 concentrations.



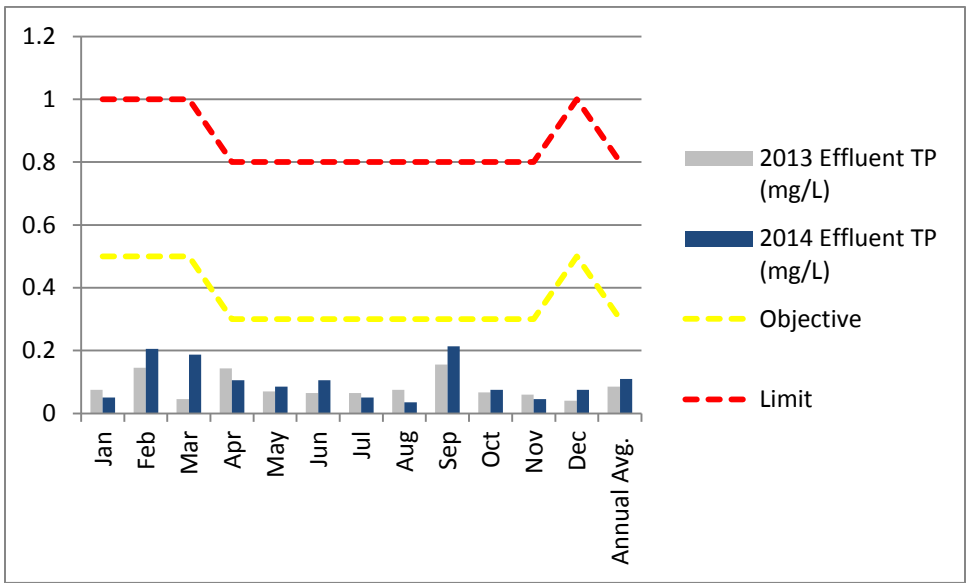
The annual average effluent Total Ammonia + Ammonium Nitrogen (TAN) for 2014 was 2.5mg/L, which is a 1492% increase from 2013 (refer to Chart 8). This very large increase is due to two non-compliances that were reported in February and March. Along with these non-compliances there were five others reported for unionized ammonia and loadings (refer to section 3 for more details). The annual loading of TAN at the plant in 2014 was 1.3kg/d. Refer to Table 1 for a list of monthly average effluent limits and loading limits.

Chart 8. The effluent monthly average concentration of TAN in 2014 compared to 2013 concentrations.



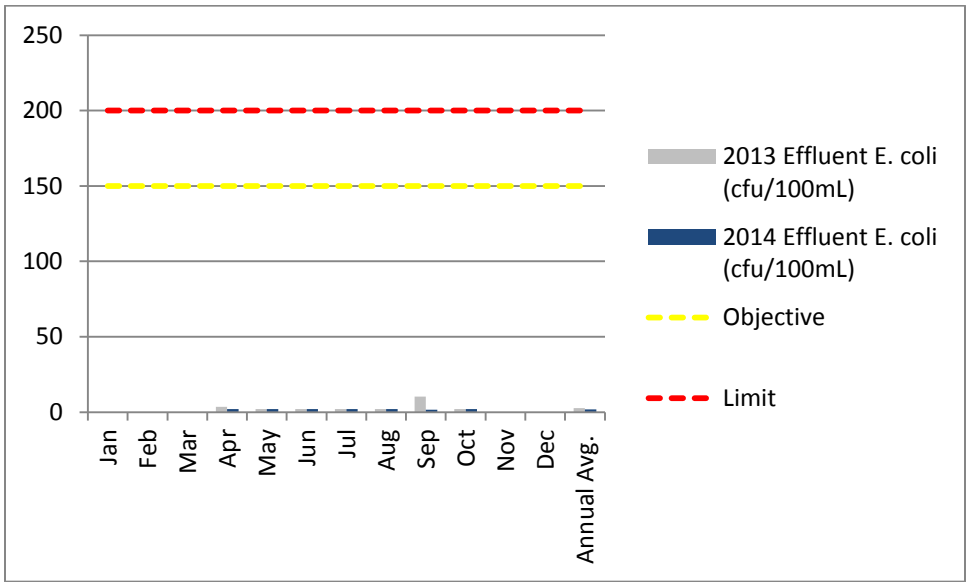
The annual average effluent Total Phosphorus (TP) for 2014 was 0.11mg/L, which is a 28.8% increase from 2013 (refer to Chart 9). Despite this increase the concentrations are well below the objective and limit. The annual loading of TP at the plant in 2014 was 0.05kg/d. Refer to Table 1 for a list of monthly average effluent limits and loading limits.

Chart 9. The effluent monthly average concentration of TP in 2014 compared to 2013 concentrations.



The annual geometric mean effluent E. coli for 2014 was 1.9cfu/100mL, which is a 30% decrease from 2013 (refer to Chart 10). Refer to Table 1 for a list of monthly geometric mean effluent limits.

Chart 10. The effluent monthly geometric mean concentration of E. coli in 2014 compared to 2013 concentrations.



Section 3: Operating Problems and Corrective Actions

Cold temperatures can affect the treatment of the sewage. The mechanical surface aerators in the aeration tanks lowers the temperature of the contents further. Added to this the winter of 2014 was very cold and proved to be detrimental to the plant. There were seven non-compliances reported to the MOECC in February and March attributed to the cold temperatures (refer to Section 2). Usually, adjustments to the mixed liquor suspended solids at the plant is enough to remain in compliance during these cold periods, but this wasn't the case in 2014. The cold temperatures also caused freezing of the clarifiers which inhibits the sludge (RAS/WAS) system to operate effectively.

There were some other issues in 2014 which caused some operational challenges. There were communications issues with the SCADA system, which required repairs. The alum tank required extensive cleaning as there was a large build up of solidified alum at the bottom of the tank. A day tank was used to feed the alum to the system while the tank was out of service.

Section 4: Maintenance

Regular scheduled monthly preventative maintenance is assigned and monitored using the Workplace Management System (WMS) program. The following is a summary of maintenance performed other than WMS work orders:

- Replaced heat trace on suction line of alum tank
- Replaced contact starter on aerator #3
- Roof repairs
- Decant pump repairs
- Generator repairs
- SCADA communication part replacement
- Extensive cleaning of the alum tank

Section 5: Effluent Quality Assurance

Effluent quality assurance is evaluated by monitoring parameters and changes throughout the plant processes. The operators monitor the aeration tank by performing weekly tests on the mixed liquor. These tests include dissolved oxygen, pH, temperature, settling tests, Mixed Liquor Suspended Solids (MLSS), and Mixed Liquor Volatile Suspended Solids (MLVSS). As well, monitoring of the alum dosages, wasting volumes and Return Activated Sludge Suspended Solids is completed. Data collected from these tests provide information to the operator to make the appropriate adjustments in the treatment process and take corrective actions before the plant reaches its effluent limits.

Section 6: Calibration and Maintenance

Annual maintenance on the generator was completed in March by Albert's Generator Services. Flowmetrix Technical Services Inc. performed the annual calibration on the flow meter in May. In house meters for pH and dissolved oxygen are calibrated by OCWA operators as per manufacturer's instructions.

Section 7: Effluent Quality

Effluent Objectives

The following table shows the monthly average effluent concentrations ranges and loadings to the effluent objectives outlined in the Environmental Compliance Approval.

Table 3. Monthly average effluent concentration and loadings compared to objectives.

Parameter	Average Monthly Effluent Objective (mg/L)	Average Monthly Effluent Result Ranges (mg/L)	Average Monthly Loading Objectives (kg/day)	Average Monthly Loading Result Ranges (kg/day)
BOD_5	5(a)	<2 – <2	3.9	0.7 – 3.0
	10(b)	<2 – 8		
Suspended Solids	5(a)	<2 – <3	3.9	0.7 – 4.1
	10(b)	2.5 – 11		
Total Phosphorus	0.3(a)	0.04 - 0.21	0.28	0.01 -0.08
	0.8(b)	0.05 – 0.21		
Total (Ammonia + Ammonium) Nitrogen	2.0(a)	<0.1 - <0.20	1.57	0.04 – 6.4
	4.0(b)	<0.1 – 14.4		
E. coli	150	<1.7 - <2		
Dissolved Oxygen	5	7.6 - 13.8		

Discussion of Effluent Objectives

The Rodney WWTP did not meet all monthly average concentration and loading objectives set out in the Environmental Compliance Approval.

Table 4. Objectives that were not met in 2014.

Month	Parameter	Objective	Result	Cause
February	Suspended Solids Concentration	10mg/L	11mg/L	-cold temperatures -poor treatment
February	Suspended Solids Loading	3.9Kg/d	4.1Kg/d	-cold temperatures -poor treatment
February	Total Ammonia Nitrogen Concentration	4.0mg/L	9.1mg/L	-cold temperatures -loss of nitrification
February	Total Ammonia Nitrogen Loading	1.57Kg/d	3.4Kg/d	-cold temperatures -loss of nitrification
March	Total Ammonia Nitrogen Concentration	4.0	14.4mg/L	-cold temperatures -loss of nitrification
March	Total Ammonia Nitrogen Loading	1.57Kg/d	6.4Kg/d	-cold temperatures -loss of nitrification

The annual average flow for 2014 was 421m^3/d, which is below the design flow of 590m^3/d. The design average daily flow for the plant was exceeded 17 times during the year, compared to 29 times in 2013. The hydraulic peak flow of 2,190m^3/day for the plant was not exceeded 2014.

Section 8: Biosolids

The lagoon is used for sludge digestion and storage as per the Environmental Compliance Approval. The waste activated sludge (WAS) process transfers to the lagoon. The sludge is allowed to settle at the bottom of the lagoon and the liquid is pumped back to the head of the plant for treatment. There is some sludge build up at the discharge pipe from the plant to the lagoon. In 2014, the amount of WAS transferred to the lagoon was approximately 4,200m^3. It is anticipated that a similar amount will be transferred in 2015 (4,200m^3).

Section 9: Community Complaints

No community complaints with regards to plant operations were received in 2014.

Section 10: Bypasses, Spills, and Abnormal Discharges

There were no by-pass events for the Rodney WWTP during 2014.

The Rodney Wastewater Treatment Plant can direct raw sewage from the pump station to the lagoon when there is a power failure of long duration. The pump station has back up power, however, the treatment plant does not have any back up power.

Section 11: Alterations, Extensions or Replacement of the Works

An evaluation of the aeration system may be conducted in 2015 to determine if a more efficient operation would benefit the treatment plant and energy conservation concerns. This may require approval if the work is completed.

Section 12: Summary

Overall the Rodney Wastewater Treatment Plant provided effective treatment in 2014.

Some items that are being considered for capital work in 2015 are:

- SCADA upgrades
- Replace autosampler
- Alterations to decant line in lagoon
- Repairs to building at Pump Station

APPENDIX A

Analytical Data

							January 2014 Stream < 5°C			February 2014 Stream < 5°C			March 2014 Stream <5°C			April 2014 Stream >5oC			May 2014 Stream >5oC			June 2014 Stream >5oC			July 2014 Stream >5oC			August 2014 Stream >5oC			September 2014 Stream >5oC			October 2014 Stream >5oC			November 2014 Stream >5oC			December 2014 Stream <5oC		Summary	Annual Loading
		Objective Concentration	Objective Loading	Limits	Loading Limits		Results		Loading	Results		Loading	Results		Loading	Results		Loading	Results		Loading	Results		Loading	Results		Loading	Results		Loading	Results		Loading	Results		Loading	Results		Loading	Results		Loading		
Raw Flow (m3/d)	Avg	590		590 (ann)			414			371			446			489			497			363			339			367			437			369			488			465			421	
	Max			2190			613			497			653			754			903			481			525			445			737			453			660			595			903	
	Min						260			272			335			328			359			238			254			250			325			259			346			257			238	
	Sum						12,840			10,374			13,820			14,677			15,406			10,881			10,510			11,380			13,096			11,448			14,655			14,409			153,496	
Effluent Flow (m3/d)	Avg						414			371			446			489			497			363			339			367			437			369			488			465			421	
	Max						613			497			653			754			903			481			525			445			737			453			660			595			903	
	Min						260			272			335			328			359			238			254			250			325			259			346			257			238	
	Sum						12,840			10,374			13,820			14,677			15,406			10,881			10,510			11,380			13,096			11,448			14,655			14,409			153,496	
Raw BOD5 (mg/L)	Avg						147.5	61.1		322	119.3		90.3	40.3		172.5	84.4		146.5	72.8		172.5	62.6		88.5	30.0		219.5	80.6		213	93.0		65	24.0	<	42	20.5		105	48.8	<	148.9	62.6
	Max						152			480			126			234			180			212			104			313			301			69			44			138			480		
	Min						143			164			41			111			113			133			73			126			130			61		<	40			72		<	40		
Raw SS (mg/L)	Avg						180.5	74.8		203	75.2		107.6667	48.0		218.5	106.9		158.5	78.8		210.5	76.3		66.5	22.5		260	95.4		219.6667	95.9		37	13.7		25.5	12.5		69	32.1		147.7	62.1
	Max						204			282			178			337			182			212			99			360			359			52			27			100			360		
	Min						157			124			45			100			135			209			34			160			108			22			24			38			22		
Raw TKN (mg/L)	Avg						41.8	17.3		42.15	15.6		29.1667	13.0		41.2	20.2		30.3	15.1		35.7	12.9		36.05	12.2		43.7	16.0		44.8333	19.6		21.4	7.9		10.7	5.2		18.6	8.6		33.3	14.0
	Max						49			56.2			36.3			43.7			40.9			35.8			38.8			48.9			59.6			24.1			12			21			59.6	
	Min						34.6			28.1			17.5			38.7			19.7			35.6			33.3			38.5			33.8			18.7			9.4			16.2			9.4	
Raw TP (mg/L)	Avg						4.48	1.85		6.61	2.45		3.15	1.40		5.26	2.57		3.30	1.64		4.025	1.46		3.39	1.15		5.10	1.87		5.22	2.28		2.655	0.98		1.00	0.49		2.13	0.99		3.88	1.63
	Max						5.09			8.81			4.01			6.39			4.13			4.06			3.56			6.16			7.20			3.04			1.08			2.55			8.81	
	Min						3.86			4.41			1.93			4.12			2.47			3.99			3.21			4.03			3.90			2.27			0.92			1.71			0.92	
Effluent BOD5 (mg/L)	Avg	5 (10)	3.9	10 (15)	6.9	<	2	0.8		8	3.0		5	2.2	<	2	1.0	<	2	1.0	<	2	0.7	<	2	0.7	<	2	0.7	<	2	0.9	<	2	0.7	<	2	1.0		6.5	3.0	<	3.2	1.3
	Max					<	2			14			7		<	2		<	2		<	2		<	2		<	2		<	2		<	2			2			7			14	
	Min					<	2			2			4		<	2		<	2		<	2		<	2		<	2		<	2		<	2		<	2			6		<	2	
Effluent SS (mg/L)	Avg	5 (10)	3.9	10 (15)	6.9		2.5	1.0		11	4.1		7.3	3.3	<	2.5	1.2	<	3	1.5	<	2	0.7	<	2	0.7	<	2.5	0.9	<	2	0.9	<	2	0.7		2	1.0		4	1.9	<	3.7	1.5
	Max						3			16			10			3		<	4		<	2			2			3		<	2		<	2			2			5			16	
	Min						2			6			6		<	2		<	2		<	2		<	2		<	2		<	2		<	2			2			3		<	2	
Effluent TAN (mg/L)	Avg	2 (4)	1.57	3.0 (5.0)	2.2	<	0.1	0.04		9.1	3.35		14.4	6.43	<	0.1	0.05	<	0.1	0.05	<	0.1	0.04	<	0.2	0.05	<	0.1	0.04	<	0.1	0.04	<	0.2	0.06	<	0.1	0.05	<	0.1	0.05	<	2.5	1.03
	Max					<	0.1			17.9			22.2		<	0.1		<	0.1			0.1			0.2		<	0.1		<	0.1		<	0.2			0.1			0.1			22.2	
	Min					<	0.1			0.2			7.4		<	0.1		<	0.1		<	0.1		<	0.1		<	0.1		<	0.1		<	0.1		<	0.1		<	0.1		<	0.1	
Effluent TKN (mg/L)	Avg					<	0.6	0.23	<	10.2	3.78		14.7	6.57	<	0.5	0.24	<	0.5	0.25		2.7	0.96	<	0.8	0.27	<	0.7	0.26	<	0.8	0.35	<	0.5	0.18	<	0.7	0.32	<	1.1	0.49	<	3.2	1.34
	Max						0.6			19.9			23.2		<	0.5		<	0.5			3.8			1.1			0.9			1		<	0.5			0.8			1.6			23.2	
	Min					<	0.5		<	0.5			7.8		<	0.5		<	0.5		<	1.5		<	0.5		<	0.5		<	0.5		<	0.5		<	0.5		<	0.5		<	0.5	
Effluent NO2 (mg/L)	Avg					<	0.04	0.01		0.55	0.20		1.98	0.88	<	0.07	0.03	<	0.03	0.01	<	0.03	0.01	<	0.17	0.06	<	0.03	0.01	<	0.03	0.01	<	0.03	0.01	<	0.03	0.01	<	0.04	0.02	<	0.31	0.13
	Max						0.04			1.06			4.93			0.11		<	0.03		<	0.03		<	0.30		<	0.03		<	0.03		<	0.03		<	0.03			0.04			4.93	
	Min					<	0.03			0.03			0.03		<	0.03		<	0.03		<	0.03		<	0.03		<	0.03		<	0.03		<	0.03		<	0.03		<	0.03		<	0.03	
Effluent NO3 (mg/L)	Avg						20.1	8.3		13.0	4.8		4.3	1.9		18.4	9.0		19.9	9.9		25.9	9.4		26.6	9.0		23.4	8.6		19.7	8.6		22.1	8.2		14.9	7.3		16.6	7.7		18.2	7.7
	Max						21.4			20.4			6.6			21.0			20.2			27.4			28.1			25.1			22.7			24.2			16.3			16.6			28.1	
	Min						18.8			5.6			2.4			15.7			19.6			24.4			25.1			21.7			16.0			20.0			13.5			16.5			2.41	
Effluent TP (mg/L)	Avg	0.3 (0.8)	0.28	0.5 (1.0)	0.4		0.05	0.02		0.21	0.08		0.19	0.08		0.11	0.05	<	0.09	0.04		0.11	0.04	<	0.05	0.02	<	0.04	0.01		0.21	0.09		0.08	0.03	<	0.05	0.02		0.08	0.03	<	0.11	0.05
	Max						0.06			0.35			0.21			0.12			0.14			0.13			0.07			0.04			0.54			0.09			0.06			0.12			0.54	
	Min						0.04			0.06			0.15			0.09		<	0.03			0.08		<	0.03		<	0.03			0.05			0.06		<	0.03			0.03		<	0.03	
Effluent pH	Avg						8.07			7.29			8.17			8.09			8.05			7.91			7.78			8.01			7.99			7.85			7.64			7.61			7.89	
	Max						8.62			8.57			8.48			8.36			8.32			8.33			8.07			8.42			8.54			8.12			7.80			7.82			8.62	
	Min						7.33			5.37			7.84			7.85			7.80			7.59			7.47			7.81			7.56			7.64			7.54			6.77			5.37	
Effluent Alkalinity (mg/L)	Avg						74			84.5			141.5			93.5			74			61.5			41.2			43			56			64.5			77.5			89.6			74.3	
	Max						80			128			172			142			82			72			46			60			68			80			88			116			172	
	Min						66			14			96			66			64			44			28			22			42			56			58			80			14	
Effluent E. coli (cfu/100	Geomean			200											<	2		<	2		<	2		<	2		<	2		<	1.7		<	2								<	1.9	
	Max														<	2			2		<	2		<	2		<	2		<	2		<	2									2	
	Min														<	2		<	2		<	2		<	2		<	2			0		<	2									0	
Effluent Temp. (oC)	Avg						2.6			2.1			3.9			7.6			12.7			17.4			18.2			18.6			16.6			13.3			6.5			5.3			10.5	
	Max						6.6			3.5			6.1			9.9			16.5			19.6			21.3			21			20.6			16.1			10			7.7			21.3	
	Min						0.2			1.2			0.8			5.7			9.1			14.7			16.5			16.1			14			10.8			2.5			4			0.2	
Effluent DO (mg/L)	Avg	5 (min)					12.03			12.76			11.47			10.08			9.28			8.13			8.19			8.14			8.79			9.28			11.12			11.38			10.00	
	Max						12.67			13.75			13.09			10.86			10.23			8.65			8.59			8.76			9.52			9.98			12.18			11.81			13.75	
	Min						10.70			11.57			10.87			9.36			8.51			7.69			7.60			7.63			7.77			8.42			10.07			10.37			7.60	
Eff Unionized Amm	Avg						0.0024			0.2064			0.3113			0.0018			0.0013			0.0014			0.0008			0.0034			0.0033			0.0038			0.0008			0.0005			0.0554	
	Max	0.1		0.1			0.0034			0.4122			0.5756			0.0018			0.0026			0.0028			0.0016			0.0035			0.0038			0.0058			0.0009			0.0008			0.5756	
	Min						0.0015			0.0005			0.1276			0.0017			0			0			0			0.0033			0.0028			0.0018			0.0007			0.0001			0	