Annual Performance Report
2010

Wellington Wastewater Treatment Plant

The Corporation of
The County of Prince Edward

Water and Wastewater Services
322 Main Street, Picton ON
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2010 Annual Wastewater Performance Report

Corporation of the County of Prince Edward
Wellington Wastewater Treatment Facility

MOE Identifier No. 120003165
Certificate of Approval No. 0157-6T6JBG

Monitoring and Analytical Data

Summary of all monitoring data and analytical data collected relative to the works during the reporting period

Table 1(a-d): Effluent Quality: Compliance Parameters, 2010

Table 1a. Carbonaceous Biochemical Oxygen Demand Effluent Quality Assessment

	CBOD	
	Monthly Mean Concentration	Annual Average Waste Loading (monthly cumulative averages)
CofA Limit	**25 mg/L**	**37.5 kg/d**
CofA Objective	**15**	**n/a**
Month	mg/L	kg/d
January	2.00	1.6
February	2.25	1.7
March	2.00	1.7
April	3.75	1.9
May	7.25	2.3
June	3.80	2.7
July	2.00	2.5
August	2.40	2.4
September	2.00	2.3
October	2.00	2.2
November	2.00	2.2
December	2.00	2.1
Annual Average	**2.8**	**2.1**

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Table 1b. Total Suspended Solids Effluent Quality Assessment

	Total Suspended Solids	
	Monthly Mean Concentration	Annual Average Waste Loading (monthly cumulative averages)
CofA Limit	**25 mg/L**	**37.5 kg/d**
CofA Objective	**15**	**n/a**
Month	mg/L	kg/d
January	7.5	6.2
February	6.8	5.7
March	3.2	4.7
April	12.8	5.7
May	28.0	7.8
June	22.6	10.2
July	4.8	9.4
August	4.2	8.6
September	5.0	8.1
October	3.3	7.5
November	3.4	7.0
December	7.0	6.8
Annual Average	**9.0**	**6.8**

Table 1c. Total Phosphorus Effluent Quality Assessment

	Total Phosphorus	
	Monthly Mean Concentration	Annual Average Waste Loading (monthly cumulative averages)
CofA Limit	**1**	**0.75**
CofA Objective	**0.5**	**n/a**
Month	mg/L	kg/d
January	0.14	0.1
February	0.13	0.1
March	0.27	0.1
April	0.32	0.2
May	0.74	0.2
June	0.59	0.3
July	0.14	0.3
August	0.21	0.2
September	0.16	0.2
October	0.10	0.2
November	0.05	0.2
December	0.07	0.2
Annual Average	**0.2**	**0.2**

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Table1d. pH Effluent Quality Assessment

	pH	
	Minimum: 6	Maximum: 9.5
Month	min	max
January	6.40	7.20
February	6.60	6.90
March	6.70	7.20
April	6.60	6.90
May	6.50	6.70
June	6.40	6.80
July	6.60	7.20
August	6.30	6.90
September	6.50	7.20
October	6.70	7.20
November	6.70	7.00
December	6.70	7.30
Annual Average	**6.6**	**7.0**

Table 1e. Geometric Mean Density of Escherichia coli Effluent Assessment

	Escherichia coli
	Geometric Mean Density
Month	Limit: 200 cts/100mL
January	20
February	40
March	36
April	9
May	26
June	20
July	20
August	26
September	20
October	20
November	20
December	20

Tables 1a – 1e detail all effluent quality data for determination of compliance with Certificate of Approval Conditions during the 2010 year.

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Table 2: Effluent Quality Operational Monitoring Data, 2010

	Alkalinity	Total Ammonia Nitrogen	Unionized Ammonia
	Monthly	Monthly Mean	
Month	mg/L	mg/L	mg/L
January	133	5.68	0.01
February	151	2.49	0.01
March	112	4.39	0.01
April	142	12.75	0.02
May	171	16.05	0.02
June	153	10.22	0.02
July	67	0.25	0.01
August	54	3.07	0.02
September	82	4.11	0.02
October	125	4.78	0.02
November	10	3.99	0.02
December	150	3.00	0.01
Annual Averages	**112.5**	**5.90**	**0.02**

Table 2 details additional results for monitoring of operational parameters and quality assurance of final effluent discharging from the facility.

Table 3: Influent Quality Monitoring Data, 2009

	BOD	Total Suspended Solids	Total Kjeldahl Nitrogen	Total Phosphorus
Month	mg/L	mg/L	mg/L	mg/L
January	89.3	64.0	51.0	4.1
February	105.0	134.0	30.0	4.1
March	86.8	104.0	30.0	3.1
April	153.6	246.0	50.0	4.9
May	117.0	107.5	30.0	3.7
June	159.6	167.2	30.0	4.6
July	222.0	273.8	40.0	6.8
August	168.0	153.4	39.0	5.2
September	177.0	145.3	7.5	6.2
October	154.5	138.8	35.5	4.5
November	167.4	146.0	8.0	4.4
December	91.5	70.3	17.4	2.4
Annual Averages	**113**	**119**	**29**	**3**

Table 3 details results for monitoring raw influent entering the facility for improved operational control and determination of removal efficiency from final effluent.

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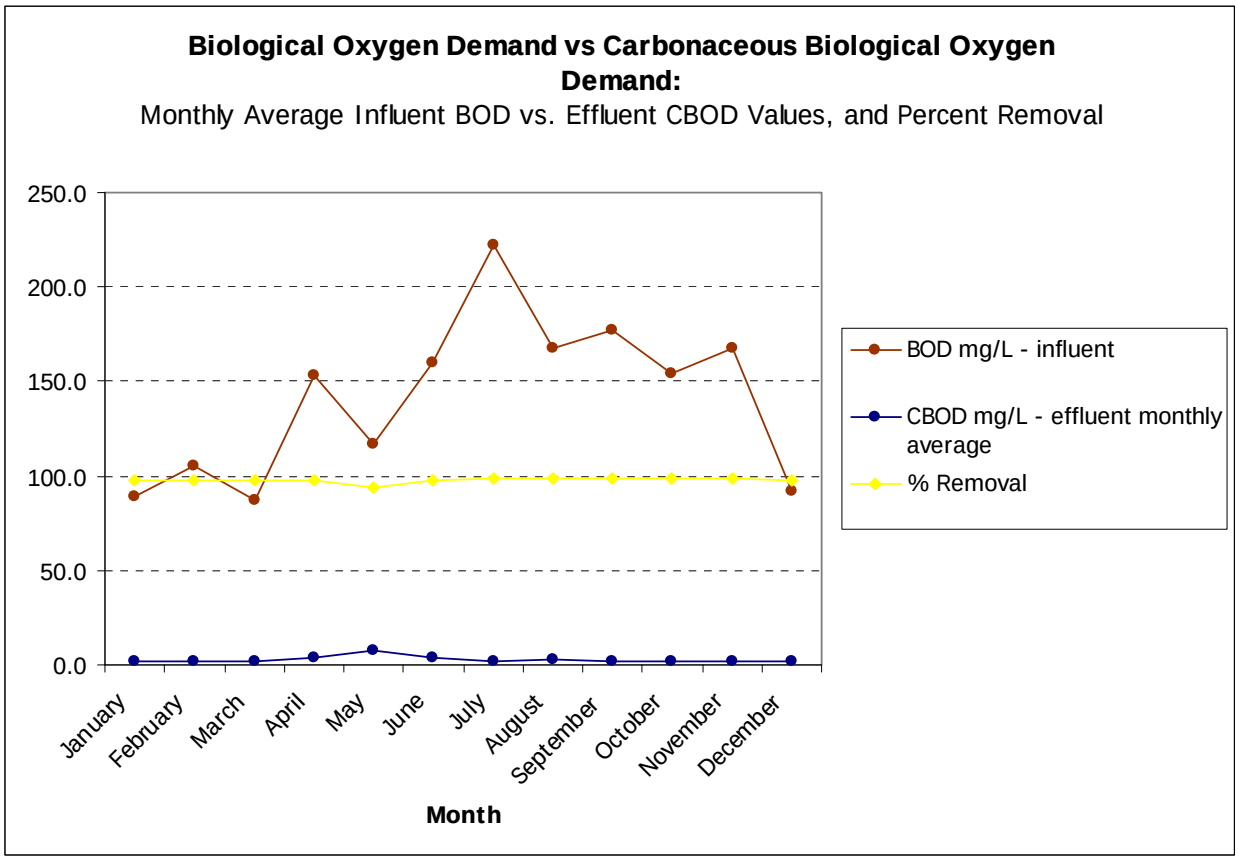
Effluent Quality Interpretations

Carbonaceous Biochemical Oxygen Demand (CBOD)

Both influent and effluent at the Wellington Wastewater Treatment Plant are monitored for Biological Oxygen Demand (BOD) and Carbonaceous Biological Oxygen Demand (CBOD), respectively on a weekly basis. The effluent monitoring meets the Certificate of Approval requirements, while sampling influent for BOD values exceeds the requirements of the applicable Certificate of Approval and is used as an operational control.

Although the CBOD concentrations in the effluent are being compared to the BOD concentrations in the influent, the average reduction rate of 97.8 % is a good indicator of the efficiency of the treatment process. As well, the CBOD concentrations are such that the Wellington Wastewater Treatment Facility was consistently below the Effluent Objectives of the Certificate of Approval.



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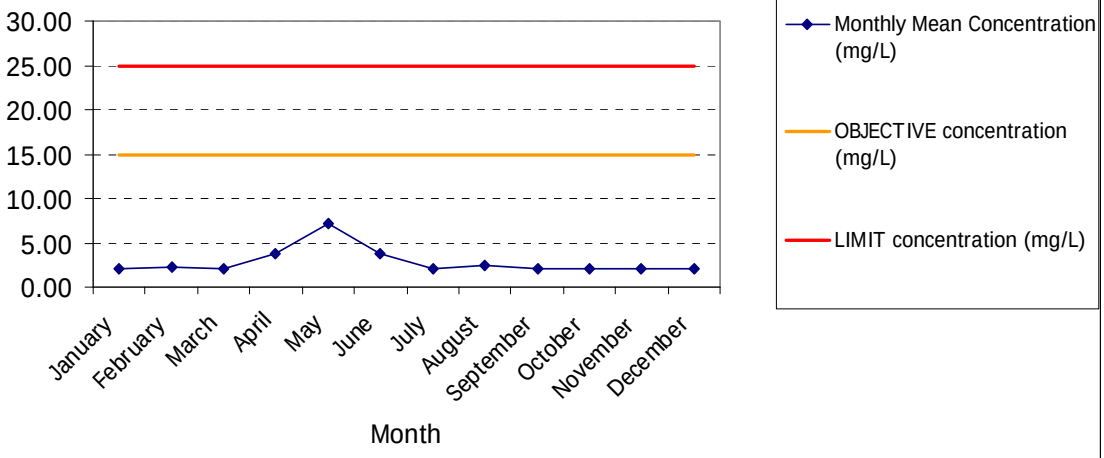
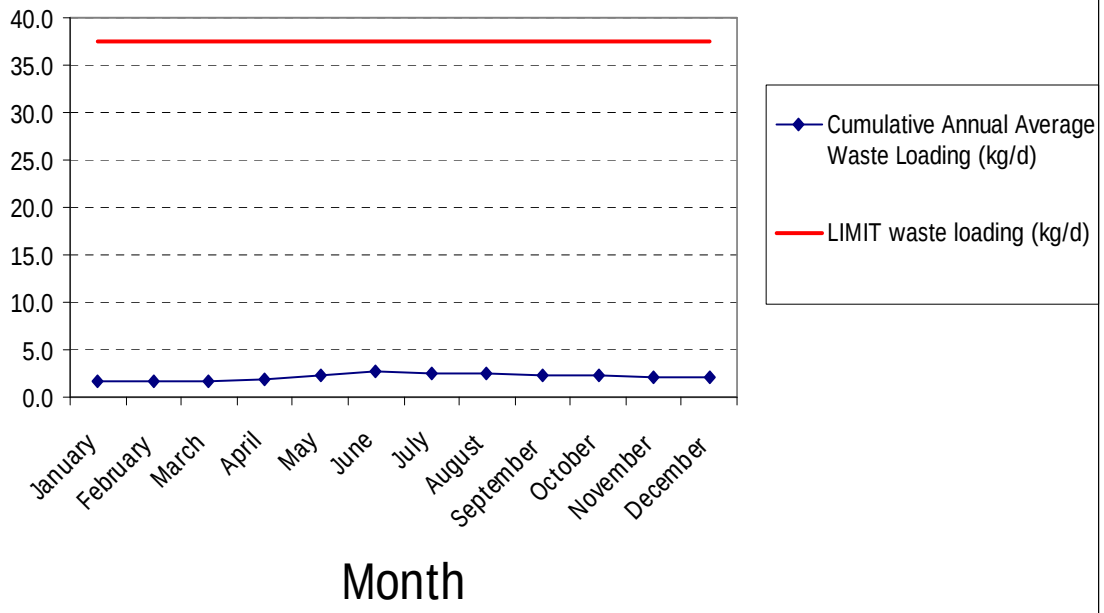
Carbonaceous Biological Oxygen Demand:
Effluent Quality: Actual vs. Objective & Limit CBOD Concentrations



Carbonaceous Biological Oxygen Demand Waste Loading
Effluent Quality: Actual vs. Objective & Limit CBOD Loadings



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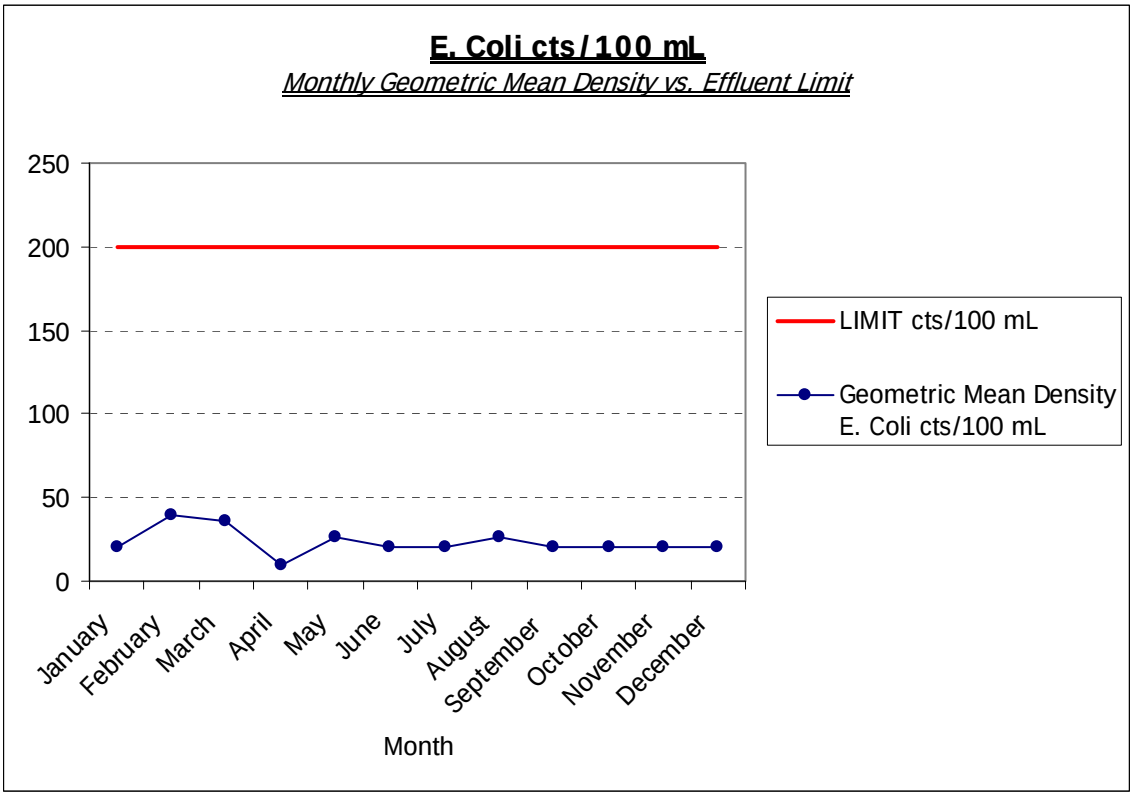
Disinfection: Escherichia coli Geometric Mean Density

The effluent was monitored weekly for E. coli levels to determine the efficiency of the disinfection process. This monitoring meets Certificate of Approval requirements. The performance of the disinfection process was successful for 2010 as the monthly geometric mean of E. Coli organisms were well below the limit as stated in the Certificate of Approval.



Nitrogen Removal

Effluent from Wellington Water Treatment Plant is monitored weekly for Total Ammonia Nitrogen (TAN), and Unionized Nitrogen (Ammonia). Total Kjeldahl Nitrogen was monitored monthly in the raw wastewater entering the plant. This monitoring meets the requirements of the applicable Certificate of Approval.

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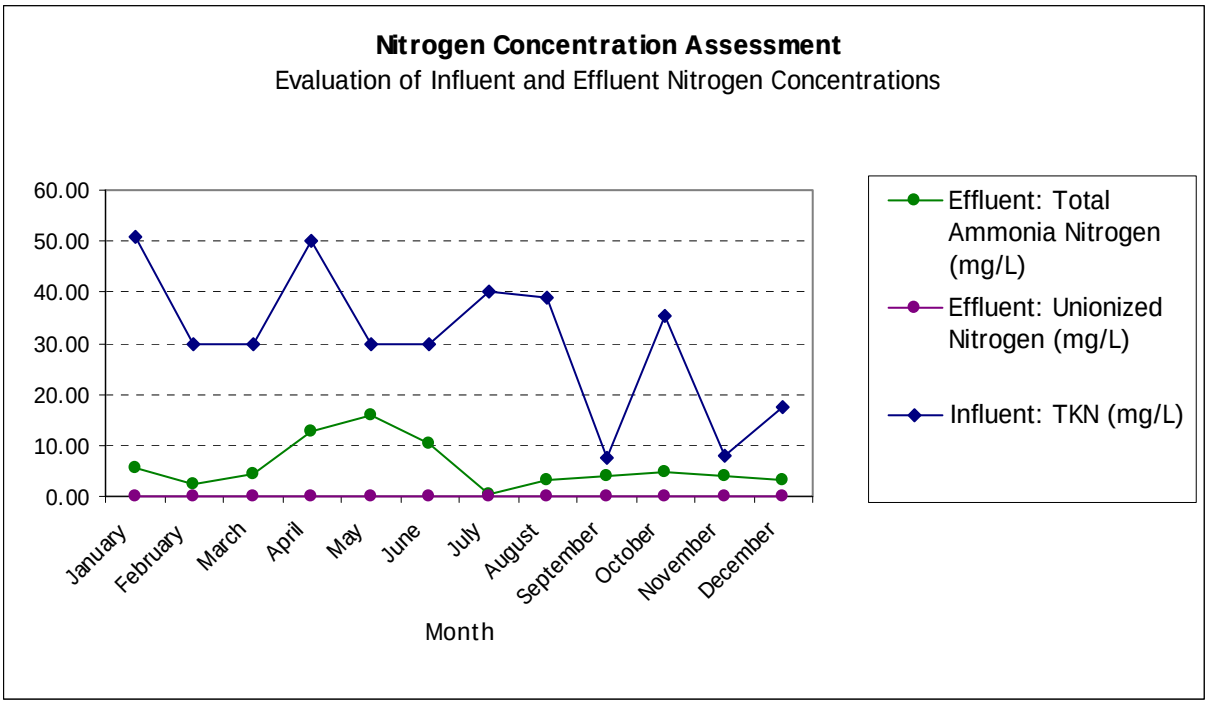
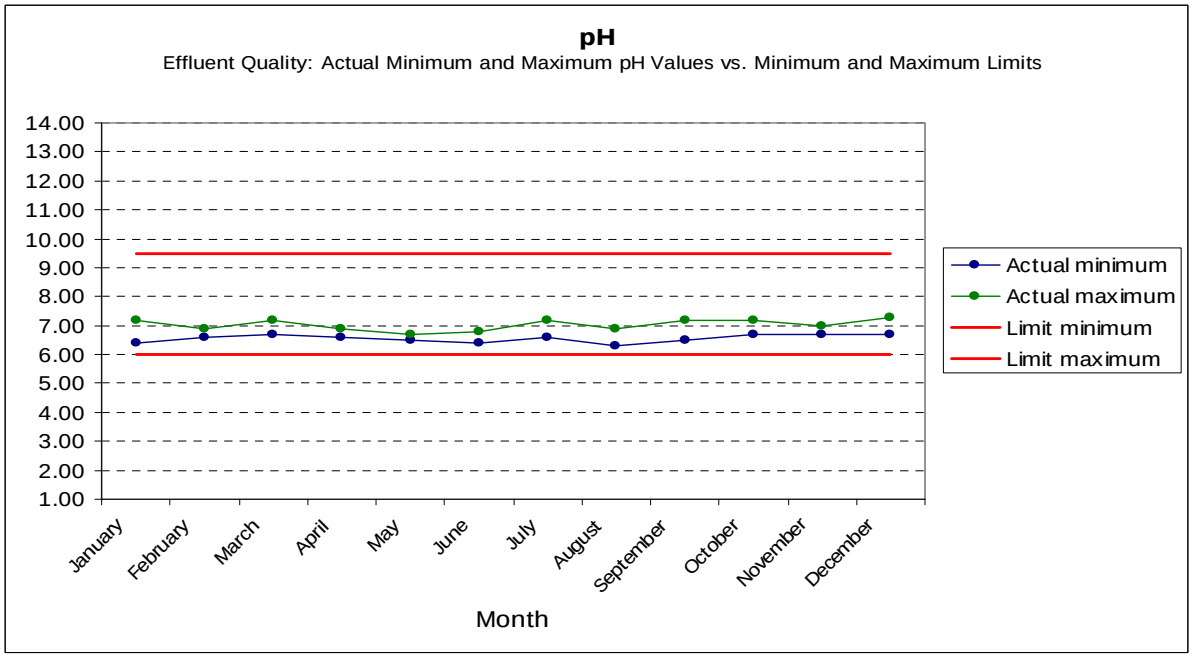


pH

The pH of the effluent was monitored on a daily basis and maintained between the limits as stated in the Certificate of Approval.



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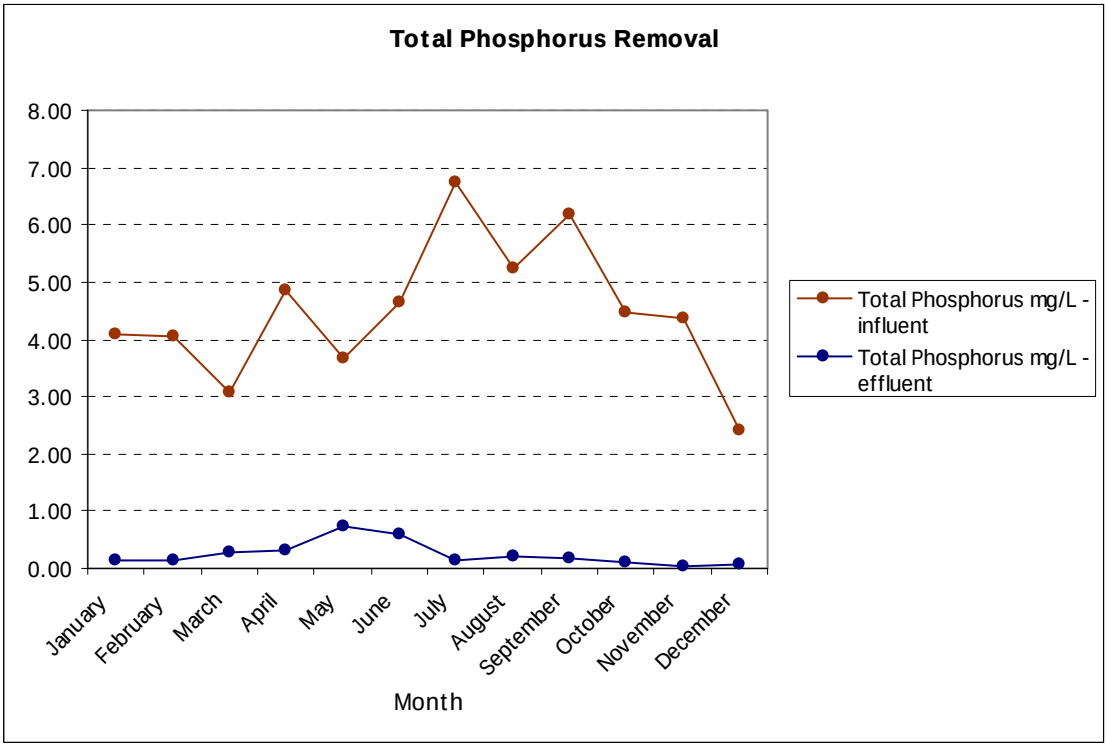
Total Phosphorus

The effluent was monitored for Total Phosphorus on a weekly basis meeting the requirements of the Certificate of Approval. Additional monitoring was performed on the influent; weekly to enable process control and analysis of the treatment process.

Under normal operating conditions, the Total Phosphorus concentrations and waste loadings were consistently below the stated Effluent Limits in the Certificate of Approval. The average Total Phosphorus removal for 2010 operational year was 94.2%.



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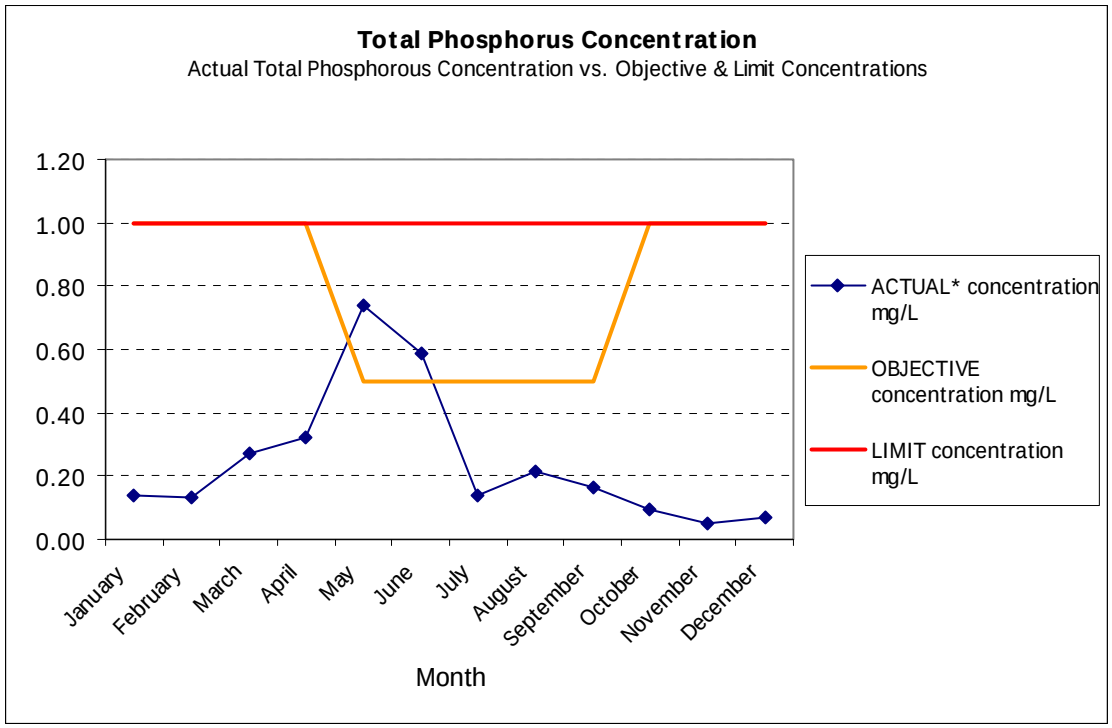

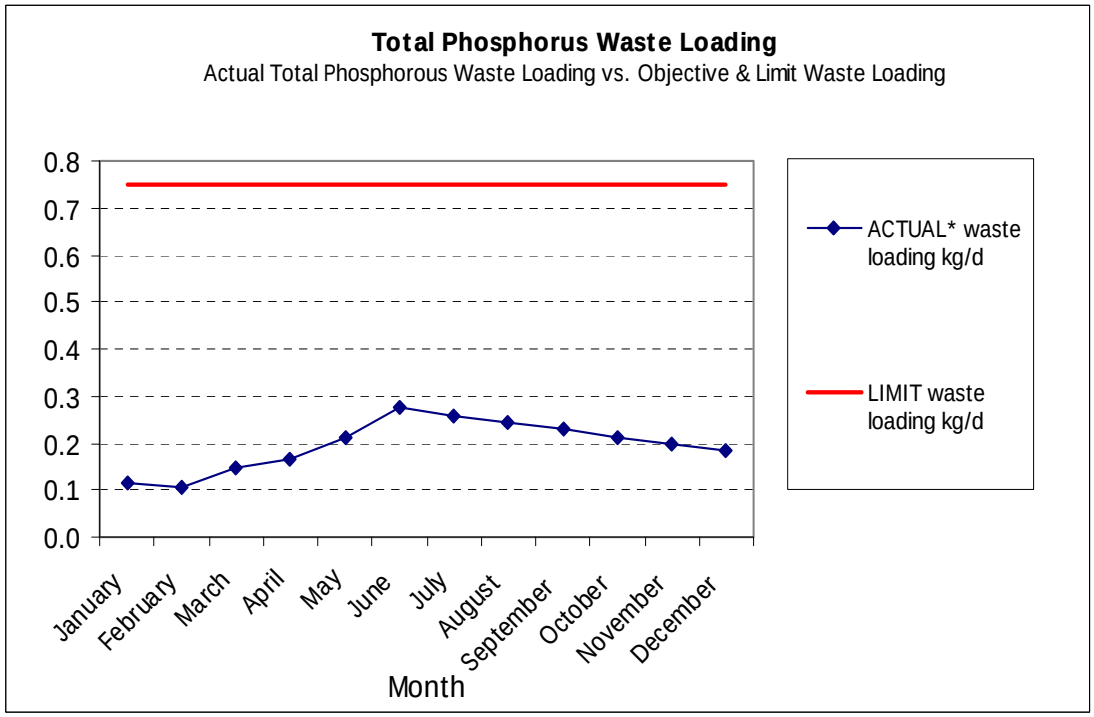

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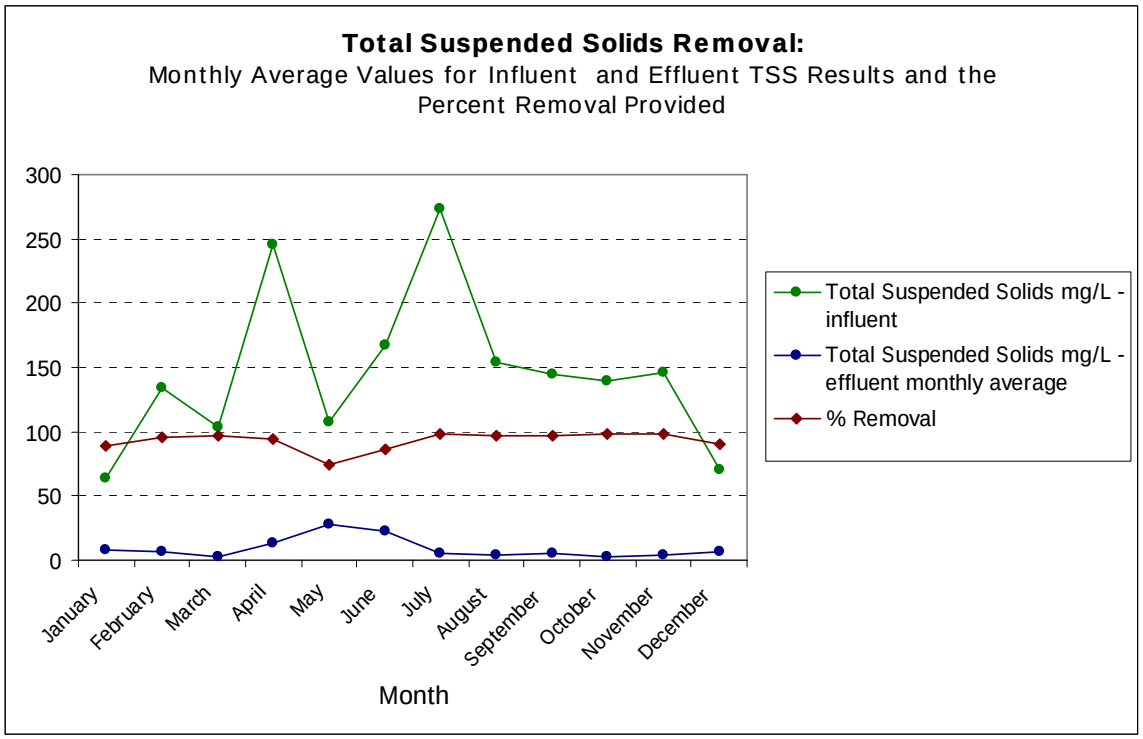
Total Suspended Solids

The influent and effluent waters of the Wellington WWTP were monitored for Total Suspended Solids on a weekly basis for 2010 – an increased frequency above what the Certificate of Approval requires.

The Total Suspended Solids concentrations and waste loadings were consistently below the stated Effluent Objectives in the Certificate of Approval, except during abnormal conditions which can be specifically seen in May. The average Total Suspended Solids removal was 92.7% for 2010.



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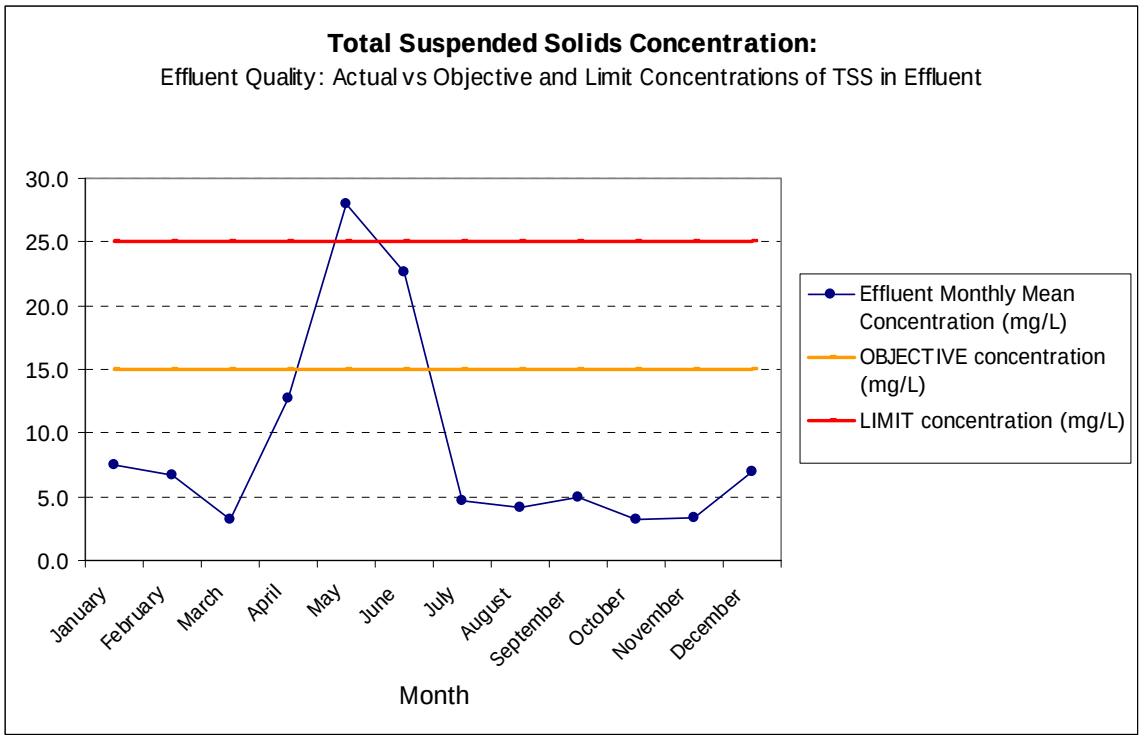

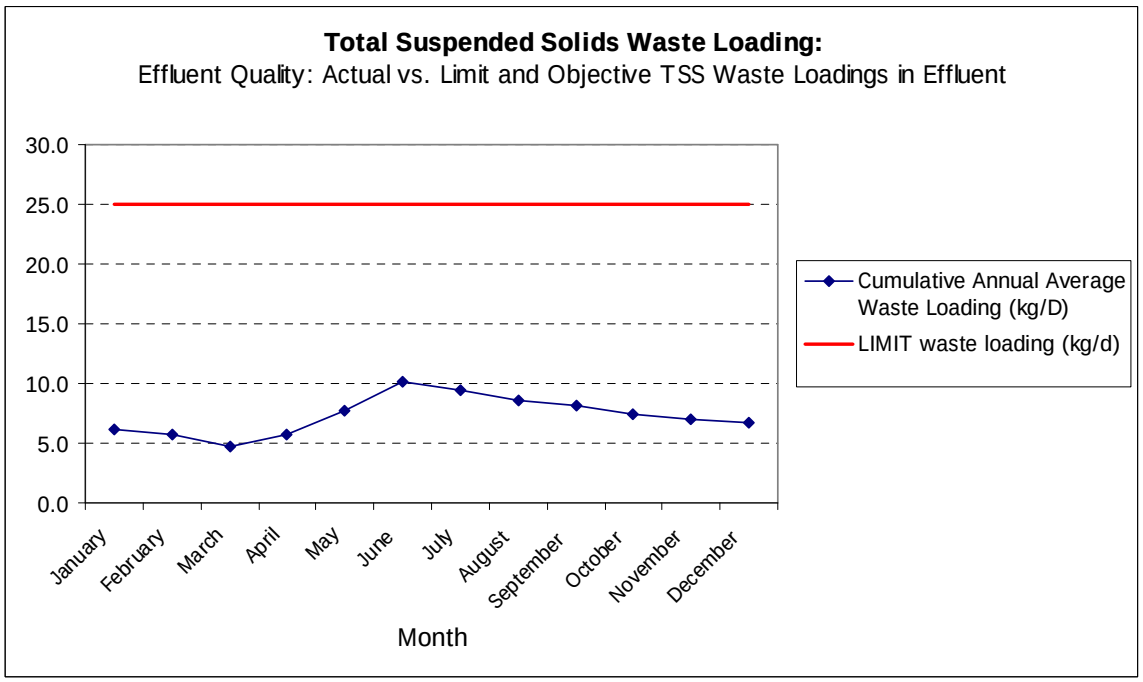

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Effluent Quantity: Capacity Assessment

Based on the 2010 flow data, the Wellington WWTP maintained operations within approved capacity requirements during normal weather conditions as per the applicable Certificate of Approval. For explanation of bypass events, please see the Reporting Summary for the 2010 operational year.

Table 4: Effluent Quantity; Flow Data 2010

	Approved Capacity Annual Average	Annual Cumulative Average	Monthly Average	Peak Flow	Total Flow
Month	m^3/day	m^3/day	m^3/day	m^3/day	m^3/month
January	1500	821	983	3349	30482
February	1500	800	764	1065	21389
March	1500	800	1025	1620	31778
April	1500	761	697	949	20907
May	1500	667	679	1251	21036
June	1500	757	694	1073	20819
July	1500	770	738	1245	22888
August	1500	769	588	812	18223
September	1500	767	540	878	16187
October	1500	764	583	1295	18086
November	1500	759	639	1020	19177
December	1500	749	1051	2518	32577

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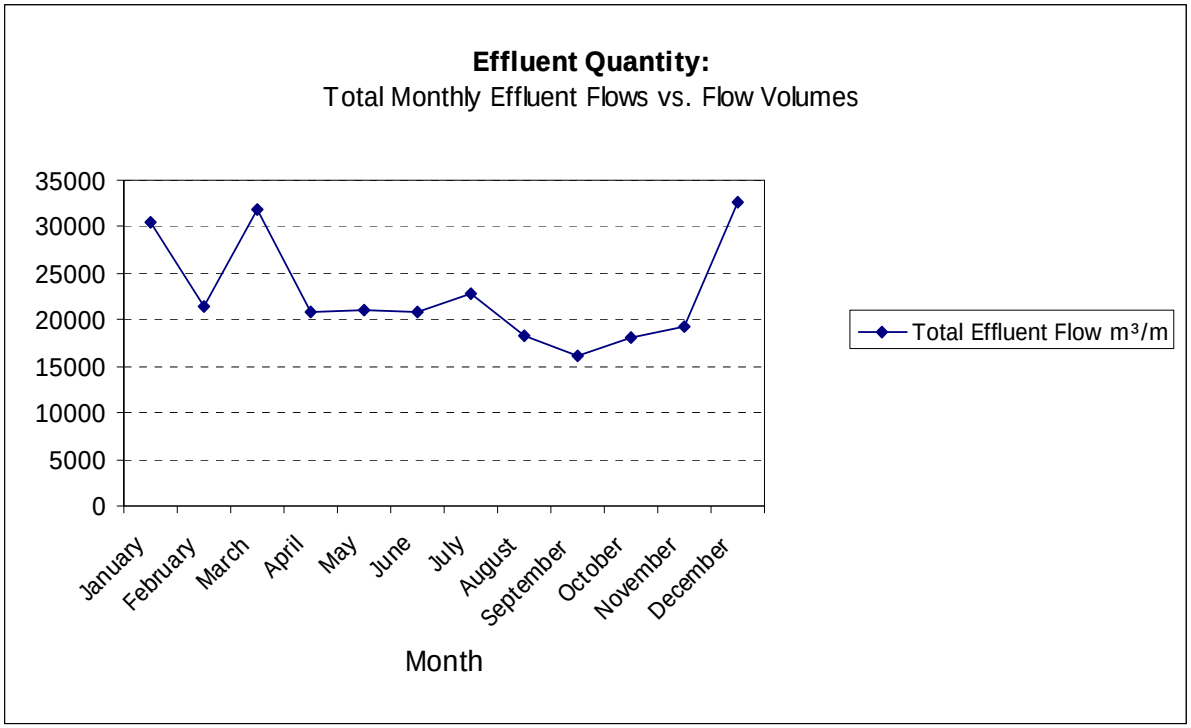

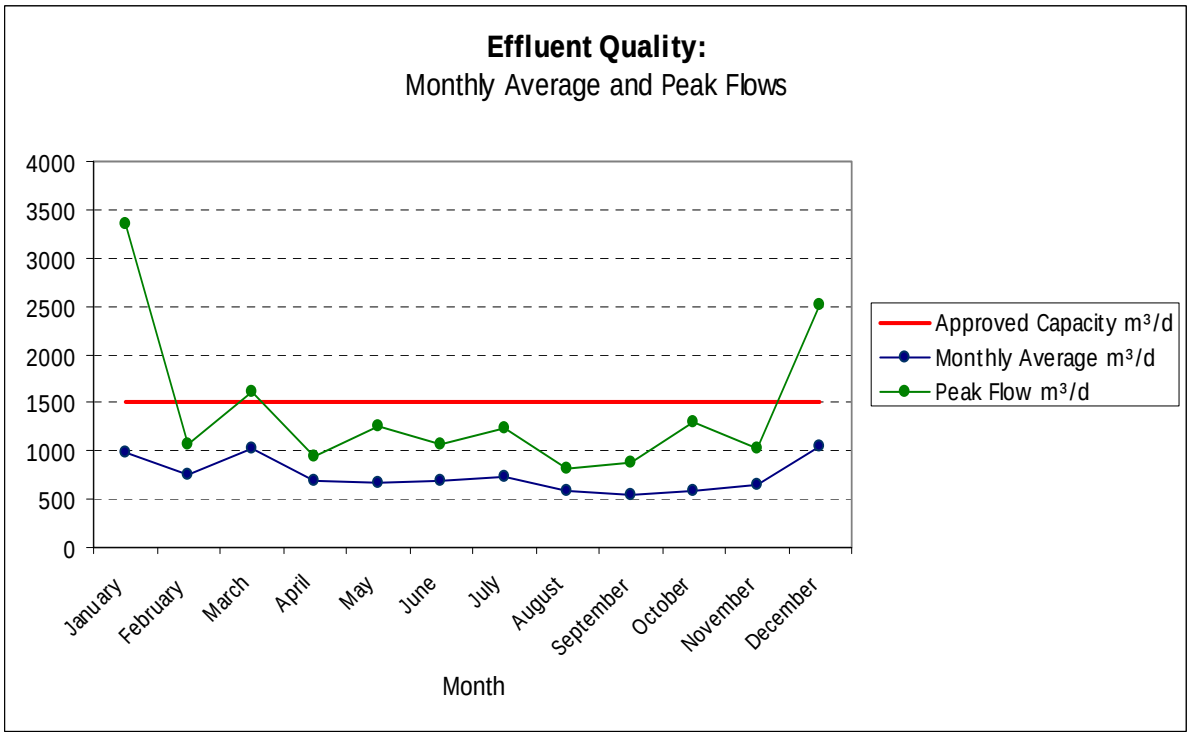

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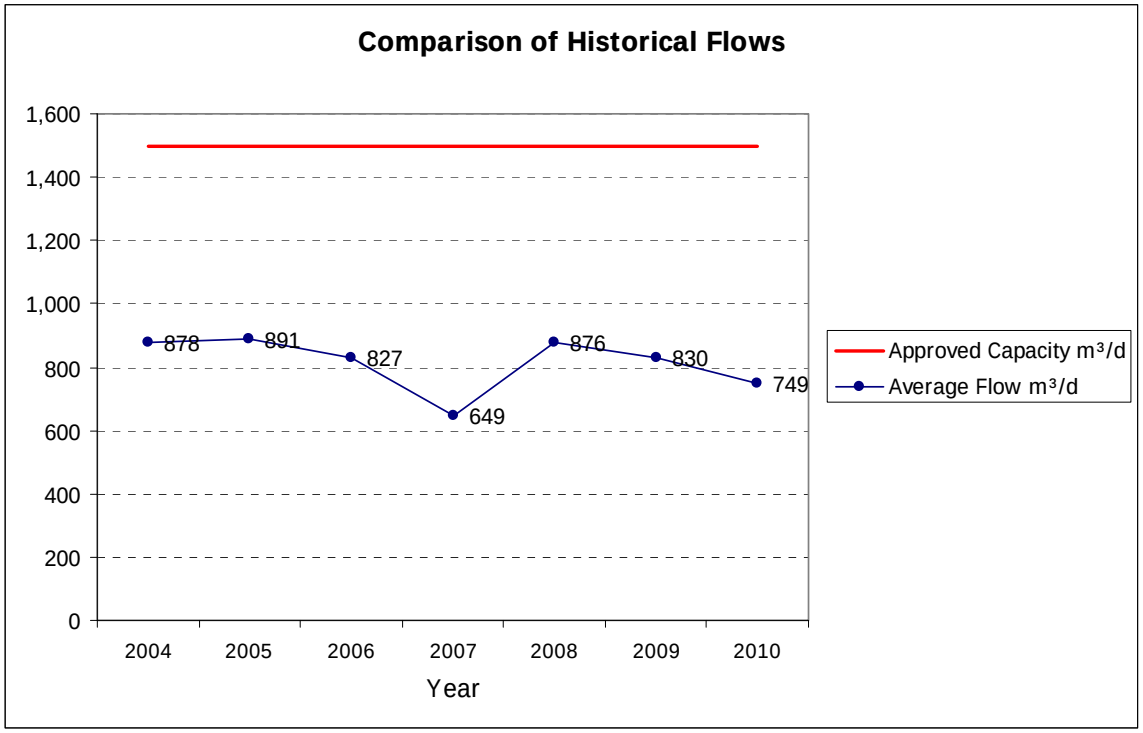
Table 5: Historical Effluent Flows, 2004-2010

	Total Effluent Flow	Annual Average Daily Flow	Peak Monthly Flow	Approved Capacity Annual Average
Year	m3	m3/day	m3/day	m3/day
2004	308104	878	3,123	1500
2005	325120	891	2606	1500
2006	301765	827	3217	1500
2007	232136	649	2624	1500
2008	271749	876	3436	1500
2009	293189	830	3156	1500
2010	241706	749	3349	1500



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2010 Bypass and Upset Condition Summary

Table 6: 2010 Bypass and Upset Condition Summary

Date	Description
May, 2010	Some abnormal operational considerations resulted in higher than normal total suspended solids values in effluent samples for four weeks during the month of May, 2010. The monthly average limit of 25mg/L was exceeded. Reported exceedance value was 28 mg/L based on an average of five weekly effluent composite samples. All other final effluent results were within Certificate of Approval effluent limits.
December 1, 2010	Increased influent flows on account of precipitation and snowmelt caused an exceedance of the capacity at Puming Station No.3. As a result, a bypass of primary treatment was experienced for approximately 23.5 hours with a total estimated volume of 8.2 m^3.

Overview of the success and adequacy of the Works - Effluent Quality vs. Quantity

The Wellington WWTP was successful in producing a good quality effluent during normal weather conditions, with the rated capacity of the facility being more than adequate to handle the normal peak and daily flows while maintaining consistent and appropriate treatment requirements. Percent removal determinations for various parameters have been consistently maintained between 2009 and 2010 operational years indicating a consistently adequate process control at the plant.

Description of any operating problems encountered and corrective actions taken during 2010

Please review the summary of reporting for 2010 with regard to the Wellington Wastewater Treatment Facility.

Summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the works

- Routine preventative maintenance performed throughout the 2010 operational year,
- Upgrades of outdoor facility lighting,
- Ongoing SCADA upgrades and chlorine monitoring options being explored and implemented throughout through 2011 in continuation of 2010 operational projects

Evaluation of the calibration and maintenance procedures conducted on all monitoring equipment

Calibration and maintenance procedures conducted on all monitoring equipment have been performed according to the manufacturer's recommendations. All work performed is scheduled through a preventative maintenance task scheduler database which indicates when the calibration/maintenance is to be performed and includes the procedure in the report generated. Upon task completion, the data is recorded in the database and logged.

In addition to regular maintenance carried out be certified operators, flow measuring devices at Wellington Wastewater Treatment Facility are calibrated by a trained third party representative and performed on an annual basis. Other operational equipment is submitted for third party review as required.

Tabulation of the volume of sludge generated in 2010 and an outline of the anticipated volumes to be generated in 2011:

All sludge disposals to landfill sites were handled by Entech during the 2010 operational year. The sludge volumes can be assessed as listed below in Table 7: Biosolids Management Quantities.

Table 7: Biosolids Management Quantities

	Hauled by Entech	
	Volume Sludge (Wet)	**Weight Sludge (De-watered)**
2010 Operational Year	m3	tonnes
June 14-21, 2010	1154	152.77
Total	**1154**	**152.77**

Outline of the proposed sludge handling methods in disposal areas to be utilized during 2011

Biosolids will be handled and disposed of by approved de-watering companies. Dewatering of biosolids will be performed by Entech Corporation, (formerly Salcin Haulage Inc.) and disposed at approved site(s). If the sludge handling services are required of another firm not listed, it will be ensured that the additional firm is an approved sludge handler. The Corporation of the

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County of Prince Edward does not participate in the application of biosolids to land.

Summary of any effluent quality assurance or control measures undertaken in 2010

Effluent analyses on all parameters are performed by accredited laboratory; Caduceon Environmental Laboratories. BOD, CBOD, Total Suspended Solids (TSS), Total, Total Phosphorus (TP), TKN, Ammonium and microbiological analysis are conducted by the laboratory for compliance purposes and operational controls. In addition to laboratory sampling, in house analysis for pH, Temperature, Total Chlorine Residual, Total Phosphorus, TSS and VSS are carried out by certified operators for the County of Prince Edward Water and Wastewater Services Department. Of the in house analysis conducted, Total Chlorine Residual and pH are conducted for compliance conformance, while the other parameters are utilized for operational controls.

It should be noted that samples are conducted in excess of the Certificate of Approval requirements as laid out by the Ministry of the Environment. Moving forward, the County of Prince Edward Water and Wastewater Services will continue to evaluate the adjust the frequency and variety of non-regulative samples conducted at the Wellington Wastewater Treatment Facility to ensure that the control measures for assuring effluent quality are optimized for plant operational efficiency and success.