



Ontario Clean Water Agency
Agence Ontarienne Des Eaux

2019 Client Monthly Operations Report

Lambton Area Water Supply System

October 31, 2019

Facility Description

Facility Name:	Lambton Area Water Supply System
Facility Type:	Municipal
Classification:	Class 4 Water Treatment Class 4 Water Distribution
Title Holder:	Municipality
Operation Status:	OCWA
Sr. Operations Manager:	Dave Hunt (519) 344-7429 Ext. 251
Business Development Manager:	Susan Budden
Capacity (m3/d):	181844
Service Area:	City of Sarnia, Village of Point Edward, Township of St. Clair, Township of Warwick-Watford, Municipality of Lambton Shores, Town of Plympton-Wyoming
Service Population:	104,162
In service Date:	1975

Operational Description

The Lambton WTP is a direct filtration surface water facility consisting of chemically assisted filtration with disinfection. The facility consists of an intake system (and alternate intake), a low lift pump station, a treatment system and distribution pumping system situated in the City of Sarnia. Water is drawn into the plant (a zebra mussel system is available as needed) and screened at the surge wells (pre-disinfection is utilized). Water flows to the pump wells where a total of 4 vertical turbine pumps are located and used as needed which pump to a discharge header. Coagulant is added, flashed mixed (PAC is also applied at this location when needed) the raw water is then flocculated (Polymer is added at the flocculation trains as needed) and diverted to filtration (10 dual media filters). The gravity fed filter effluents combine into two clear wells where sodium hypochlorite is injected. To maximize the contact time the water is diverted to the two baffled reservoirs (in series). Six vertical turbine pumps are available for supplying the distribution demand as needed. The entire water treatment system is continuously monitored (via SCADA) with continuous on-line analyzers equipped throughout the processes. The utility serves a large part of Lambton County and has over 250 kilometers of pipeline of various sizes and materials. There is also the East Lambton Booster Station with 9,000 cubic meters of storage capacity which is remotely monitored and controlled from the Lambton WTP via SCADA. During the 1997 calendar year the West Lambton Pumping Station, with the largest above ground water storage in the province with a capacity of 90,000m³, was brought on-line. This pumping station is also remotely monitored and controlled from Lambton WTP via SCADA. The LAWSS distribution system has 5 towers/elevated tanks that the utility monitors via SCADA. In 2007 the Residual Management System (RMS) which treats backwash effluent was brought on-line.

Treatment Process

Pre-treatment Chemicals:	Prechlorination (sodium hypochlorite); Zebra mussel control
Coagulation/Flocculation:	Aluminum Sulphate (Clar+Ion A7)
Filtration:	Dual Media; Filter Aid polymer
Disinfection Method:	Sodium hypochlorite
Post Treatment Chemical Addition:	Fluoride
Waste Residue Management:	Filter backwash effluent is treated by an Actiflo system.
Waste effluent/residue Disposal:	Sludge is hauled to Sarnia WPCP on a needed basis.

Inspections: None

Maintenance, Operations & Distribution Works Summary 2019

Maintenance

October:

Date	(P)reventative Capital Major Mtc (C)orrective	Description
Oct 1	P	Ran generator at East Lambton Pumping Station.
Oct 1	C	Repaired retaining wall at Port Lambton Tower.
Oct 2	C	Installed new transformer for vacuum pump at East Lambton Pumping Station.
Oct 2	P	Completed annual inspection on Highlight Room butterfly valves #13 and 15 and discharge header.
Oct 2	P	Completed annual inspection on all Highlift Pump globe valves.
Oct 2	P	Completed monthly maintenance on West Lambton Pumping Station chlorine analyzers.
Oct 2	P	Completed annual inspection on Highlift pressure relief valves #33 and 45.
Oct 3	P	Completed monthly inspection on emergency showers and eyewash stations at the water treatment plant.
Oct 3	P	Completed monthly maintenance on all water treatment plant chlorine analyzers.
Oct 3	P	Pumped out rain water from HFS and diesel containment areas
Oct 4	P	Ran generators at West Lambton Pumping Station.
Oct 4	C	Cleared and fixed fault on sodium bisulphite pump #1.
Oct 7	C	Replaced batteries on generator #2 at West Lambton Pumping Station.

Oct 7-8	P	Sentry fire in to do annual checks at all facilities.
Oct 8	Major mtc	Conducted test of HMI replacement.
Oct 7-9	P	Completed monthly maintenance on all turbidity analyzers at the water treatment plant.
Oct 9	Major mtc	Installed Wonder Ware licenses for HMI replacement.
Oct 9	P	Completed semi-annual inspection of highlift pumps 6 and 3.
Oct 9	P	Conducted annual inspection of highlift discharge valve gear drive.
Oct 9	P	Completed monthly inspection of water treatment plant compressor.
Oct 10	P	Tested generators at West Lambton Pumping Station
Oct 10	P	Completed annual inspection of air handling unit above Health and Safety Room.
Oct 11	C	Replaced belt on air handling unit #3 in Highlift area.
Oct 11	P	Completed annual inspection of HFS dosing pumps.
Oct 15	C	Repaired service leaking service line near Valve House hallway.
Oct 15-16	P	Completed monthly inspection of all floc gear drives.
Oct 17	P	Completed monthly inspection of travelling screens in Low Lift Room.
Oct 18	P	Conducted monthly inspection of vacuum priming system at East Lambton Pumping Station.
Oct 18	C	Installing new plumbing for storm drain dechlorination project.
Oct 21	P	Completed annual cleanout of East alum tank.
Oct 21	P	Completed monthly maintenance on pH probes at the water treatment plant.
Oct 22	P	Completed monthly calibration verification of all hand held chlorine analyzers.
Oct 22	P	Completed monthly calibration of East Lambton Pumping Station chlorine analyzers.
Oct 22	P	Completed monthly maintenance on fluoride analyzer.
Oct 23	P	Completed monthly maintenance on streaming current analyzer.
Oct 23	C	Replaced heater element on Cargocaire unit at water treatment plant.
Oct 23-29	P	Completed annual calibration of all water treatment plant level transmitters.
Oct 24	C	Installing new plumbing for storm drain dechlorination project.
Oct 24-31	C	Upgrading T12 ballasts to T8 ballasts at West Lambton Pumping Station.
Oct 28	C	Installing new plumbing for storm drain dechlorination project.
Oct 30	P	Two year annual MCC checks on MCC 2 and 3 at the water treatment plant complete.
Oct 31	C	Installed new level transmitter probe on North Clearwell.

Operations and Compliance

October:

Oct 1	Annual calibration and inspection of all Hach lab equipment completed by Hach Service.
Oct 1	Monthly TSS sample taken in the Residual Management System.
Oct 2	Changed PAC bag.
Oct 3	Lead reports completed and sent out.
Oct 3	Bisulphite pump #1 failed.
Oct 8	Prechlorine pumps 1 and 3 failed due to air lock. Pumps and panel was reset with no issues.
Oct 8	Tested RMS and storm water drain for total chlorine residuals. No issues.
Oct 16	Watford recirculation line on for hydrant replacement on Zion Line.
Oct 17	Took bacteriological sample for City of Sarnia watermain break repair on Scott Rd.
Oct 17	Switched over sample pumps for Stations 1, 5 and 6.
Oct 19	Ran Pump 1 at West Lambton Pumping Station.
Oct 20	Ran Pump 5 at West Lambton Pumping Station.
Oct 21	Pre chlorine pump failed. Pump and panel was reset with no issues.
Oct 22	Quarterly test of Critical Control Point Limits completed.
Oct 22	Pre chlorine pump #1 failed due to air lock. Pump and panel was reset with no issues.
Oct 23	Resample 20 weekly bacteriological due to delayed shipment by Purolator.
Oct 24	Conducted monthly test of water treatment plant polymer system.
Oct 25	South clearwell pump #2 failed with P+. Pump and panel was reset without issues.
Oct 26	Ran Pumps 1 and 5 at West Lambton Pumping Station.
Oct 26	South clearwell pump failed with air lock. Pump and panel were reset without issues.
Oct 27	East Lambton hypo pump failed. Pump was reset the next day during the sample run.
Oct 28	Shut down water to kiosk at water treatment plant for winter.

Distribution

October:

Oct 1	Meter reads for September completed.
Oct 1	Site meet for work near Bear Creek Bridge.
Oct 1	Flushing hydrants in Plympton-Wyoming.
Oct 2	Flushing hydrants in Sarnia and Warwick.
Oct 2	Site meet for bore hole work on LaSalle Line.
Oct 4	Valve operations and chamber checks in Plympton-Wyoming.
Oct 8	Onsite for third party work at Indian Rd overpass.
Oct 8	Pump out chambers in preparation for hydrant replacement on Zion Line.
Oct 9	Valve operations and chamber checks in Plympton-Wyoming.
Oct 10	Valve operations and chamber checks in Plympton-Wyoming and Warwick Watford and on White Line in St Clair Township.

Oct 11	Valve operations and chamber checks in Plympton-Wyoming on Oil Heritage.
Oct 16	Replacing hydrant #21 on Zion Line.
Oct 22	Valve operations and chamber checks on London Line in Sarnia.
Oct 22	Painted and pumped out hydrants on Zion Line.
Oct 23	Replaced air relief valve on chamber on London Line.
Oct 23	Onsite for third party work at Indian Rd Tower.
Oct 24	Onsite for third party work at 4738 Confederation Line for crossing of LAWSS watermain.
Oct 24	Conducting valve and chamber checks in the City of Sarnia.
Oct 28	Hydrant isolation repair at 3955 Leeland Dr in St Clair Township.
Oct 29	Onsite for third party work for sinkhole repair at 4046 St Clair Parkway in St Clair Township.
Oct 29	Onsite for daylighting of LAWSS 36" watermain on Michigan Ave.
Oct 30	Onsite for crossing of LAWSS watermain on Murphy Rd.
Oct 30	Valve operations and chamber checks in Plympton-Wyoming.
Oct 31	Completed meter reads for October.

Call Outs 2019

October: none

One Call Utility Locates

These numbers represent the number of locate notifications that were cleared from LAWSS assets

Number of Locates/Month

YEAR	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
2018	50	64	107	149	189	166	163	146	141	163	111	58
2019	69	62	104	164	189	149	182	153	121	148		

RMS Sludge Haulage

These numbers represent total monthly amounts of sludge produced by the Residual Management System and hauled to Sarnia WPCP

Amount of sludge produced per month in m³

YEAR	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
2018	493	300	239	320	230	318	240	240	79	227	238	234
2019	236	158	237	236	216	158	313	237	160	160		

Required Monthly Reports

Monthly System Flows- see separate attached summary report

Workplace Management System Reports – see separate attached reports

Performance Data and Compliance – See separate attached report

Required Financial Reports

Quarterly Financial Summary –Q4 due January 30, 2020

Semi-Annual “Schedule G” Reconcilable Commodities Report –Due January 30, 2020

Lambton Area WT 2019

For the period of Jan 1, 2019 to September 30, 2019

Org. # : 5544

Project # : LAWSSM5544W-002

Date : 9/30/19

	2018 Actuals	2019 Budget	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	YTD Budget	YTD Actuals	Variance (< YTD budget)
OPERATING CHARGES									
OCWA Service Fee	2,112,364.00	2,166,229.00	541,557.25	541,557.25	541,557.25		1,624,671.75	1,624,671.75	0.00
Diesel	5,416.15	9,000.00	0.00	0.00	0.00		6,750.00	0.00	-6,750.00
Insurance**	94,276.44	91,050.24	22,762.56	22,762.56	22,762.56		68,287.68	68,287.68	0.00
Point Edward Sewage	89,354.82	91,000.00	0.00	0.00	85,869.98		91,000.00	85,869.98	-5,130.02
Chemicals	246,867.34	266,463.00	48,878.91	52,888.97	87,581.19		199,847.25	189,349.07	-10,498.18
Hydro	1,369,006.60	1,640,000.00	338,436.26	328,673.94	350,433.64		1,230,000.00	1,017,543.84	-212,456.16
Sludge Haulage	129,507.29	155,401.00	25,876.85	25,034.58	29,116.59		116,550.75	80,028.02	-36,522.73
TOTAL OPERATING COSTS	4,046,792.64	4,419,143.24	977,511.83	970,917.30	1,117,321.21	0.00	3,337,107.43	3,065,750.34	-271,357.09
TOTAL OPERATING CHARGES	4,046,792.64	4,419,143.24	977,511.83	970,917.30	1,117,321.21	0.00	3,337,107.43	3,065,750.34	-271,357.09

Note: The information contained in this report is current as at September 30, 2019

From: 01/01/2019 to 31/10/2019

Facility Org Number:	5544
Facility Works Number:	210000906
Facility Name:	LAMBTON AREA WATER SUPPLY SYSTEM (LAWSS)
Facility Owner:	Local Services Board: LAMBTON AREA WATER SUPPLY SYSTEM
Facility Classification:	Class 4 Water Treatment
Receiver:	
Service Population:	100000.0
Total Design Capacity:	181844.0 m3/day

	01/2019	02/2019	03/2019	04/2019	05/2019	06/2019	07/2019	08/2019	09/2019	10/2019	Total	Avg	Max	Min
Coagulation/Floculation / Coagulant Dosage-Calculated - mg/L														
Max IH	38.605	29.517	32.268	31.172	26.559	26.095	23.836	25.822	22.272	31.139			38.605	
Mean IH	26.801	24.002	23.839	22.375	22.91	21.551	20.805	20.898	19.819	21.006			22.396	
Min IH	21.912	18.131	18.009	17.868	19.041	18.452	18.086	19.041	17.621	18.079				17.621
Coagulation/Floculation / Coagulant Used - kg														
Max IH	1792	1408	1651.2	1241.6	1344	2150.4	2060.8	1804.8	1356.8	1472			2150.4	
Mean IH	1220.542	1167.086	1160.671	1009.067	1129.29	1339.307	1594.632	1397.677	1108.139	996.335			1213.314	
Min IH	972.8	947.2	832	768	934.4	921.6	1088	1100.8	844.8	652.8				652.8
Total IH	37836.8	32678.4	35980.8	30272	35008	40179.2	49433.6	43328	33244.16	30886.4	368847.4			
Coagulation/Floculation / Coagulant Volume Used - m³														
Max IH	1.4	1.1	1.29	0.97	1.05	1.68	1.61	1.41	1.06	1.15			1.68	
Mean IH	0.954	0.912	0.907	0.788	0.882	1.046	1.246	1.092	0.866	0.778			0.948	
Min IH	0.76	0.74	0.65	0.6	0.73	0.72	0.85	0.86	0.66	0.51				0.51
Total IH	29560	25530	28110	23650	27350	31390	38620	33850	25972	24130	288162			
Coagulation/Floculation / Polymer Dosage - mg/L														
Max IH	0.042			0.024									0.042	
Mean IH	0.02			0.024									0.021	
Min IH	0.002			0.024										0.002
Coagulation/Floculation / Polymer Used - kg														
Max IH	2.1			1.1									2.1	
Mean IH	1.025			1.1									1.04	
Min IH	0.1			1.1										0.1
Total IH	4.1			1.1							5.2			
DW THM Data / Trihalomethane: Total - µg/l														
Max Lab		30			37			58					58	
Mean Lab		27			31.667			52.667					37.111	
Min Lab		24			25			46						24
East Lambton Booster Station / Cl Residual: Inlet Free - mg/L														
Max OL	1.74	2.49	1.68	1.58	1.43	1.4	1.36	1.29	1.56	1.64			2.49	
Mean OL	1.535	1.401	1.428	1.388	1.3	1.277	1.22	1.124	1.344	1.348			1.337	
Min OL	0	0	0	0	0	0	0	0	0	0				0
Filter Backwash / Backwash Volume - m³														
Max IH	4792	2408	2992	3006	3004	3004	2998	3002	2418	2418			4792	
Mean IH	2268.323	1929.786	2028.194	1927.733	1900.774	2043	2095.032	2056.903	1966.067	1893.871			2012.086	
Min IH	1794	1788	1794	1198	1204	1792	1788	1059	1796	1204				1059
HFS / Fluoride Dosage - mg/L														
Max IH	0.64	0.644	0.614	0.622	0.592	0.628	0.612	0.589	0.573	0.655			0.655	
Mean IH	0.556	0.557	0.559	0.557	0.542	0.548	0.535	0.537	0.531	0.533			0.545	
Min IH	0.46	0.417	0.482	0.487	0.486	0.464	0.486	0.49	0.474	0.476				0.417
HFS / Fluoride Used - l														
Max IH	108.877	97.419	97.419	94.553	100.284	186.246	171.916	143.263	117.475	114.611			186.246	
Mean IH	85.495	87.63	89.655	83.952	90.041	115.949	139.658	123.298	101.43	85.218			100.355	
Min IH	65.901	66.384	71.631	71.631	74.497	88.823	111.745	103.149	85.957	68.766				65.901
Total IH	2650.36	2453.634	2779.305	2518.562	2791.284	3478.466	4329.406	3822.244	3042.903	2641.76	30507.93			
HFS / HFS (kg) - kg														
Max IH	132.83	118.851	118.851	115.355	122.347	227.22	209.737	174.781	143.32	139.825			227.22	
Mean IH	104.304	106.908	109.379	102.422	109.851	141.458	170.383	150.424	123.745	103.966			122.433	
Min IH	80.399	80.989	87.39	87.39	90.886	108.364	136.329	125.842	104.868	83.895				80.399
Total IH	3233.439	2993.434	3390.752	3072.646	3405.367	4243.728	5281.875	4663.138	3712.342	3222.947	37219.67			
HFS / Treated Water Fluoride Residual - mg/L														
Max OL	0.71	0.7	0.7	2	0.84	0.82	0.79	0.7	0.68	2			2	
Mean OL	0.631	0.601	0.578	0.597	0.611	0.575	0.63	0.611	0.576	0.565			0.597	
Min OL	0.56	0.54	0.51	0	0.51	0.24	0.49	0.55	0.42	0				0
Post Disinfection / Chlorine Dosage - mg/L														
Max IH	1.668	1.854	1.682	1.832	1.795	3.071	2.185	2.463	2.654	2.116			3.071	
Mean IH	1.434	1.391	1.458	1.468	1.535	1.696	1.952	2.087	2.142	1.883			1.707	
Min IH	1.215	0.891	1.048	1.271	1.05	1.097	1.594	1.842	1.522	1.64				0.891
Post Disinfection / Hypochlorite Dosage - mg/L														
Max IH	13.899	15.45	14.016	15.268	14.96	25.593	18.208	20.526	22.113	17.637			25.593	
Mean IH	11.947	11.588	12.152	12.232	12.79	14.136	16.268	17.39	17.847	15.692			14.225	
Min IH	10.126	7.428	8.737	10.593	8.747	9.142	13.282	15.347	12.686	13.665				7.428
Post Disinfection / Hypochlorite Used - kg														
Max IH	653.3	665.05	681.5	706.175	808.4	1975.175	1590.95	1434.675	1257.25	974.075			1975.175	
Mean IH	543.456	564	590.191	552.994	632.264	885.167	1241.672	1162.454	997.614	749.157			793.948	
Min IH	444.15	326.65	454.725	407.725	431.225	460.6	956.45	930.6	689.725	471.175				326.65
Total IH	16847.15	15792	18295.93	16589.83	19600.18	26555	38491.83	36036.08	29928.43	23223.88	241360.3			
Post Disinfection / Hypochlorite Volume-Total - m³														
Max IH	0.556	0.566	0.58	0.601	0.688	1.681	1.354	1.221	1.07	0.829			1.681	
Mean IH	0.463	0.48	0.502	0.471	0.538	0.753	1.057	0.989	0.849	0.638			0.676	
Min IH	0.378	0.278	0.387	0.347	0.367	0.392	0.814	0.792	0.587	0.401				0.278
Total IH	14338	13440	15571	14119	16681	22600	32759	30669	25471	19765	205413			
Post Disinfection / Station 7 Cl Residual: Free - mg/L														
Max OL	1.89	1.85	1.92	1.78	1.71	1.75	5	1.76	1.91	1.87			5	
Mean OL	1.699	1.712	1.716	1.608	1.521	1.504	1.533	1.562	1.716	1.706			1.628	
Min OL	1.52	1.54	1.53	1.4	1.29	0	1.26	1.33	1.44	0				0
PrTr / P.A.C. Dosage - mg/L														
Max IH						0.464	0.367	0.54	0.624	0.731			0.731	
Mean IH						0.338	0.291	0.409	0.525	0.622			0.446	
Min IH						0.176	0.218	0.274	0.431	0.499				0.176
PrTr / P.A.C. Used - kg														

Max IH										28.9	25.634	29.462	29.452	29.452			29.462		
Mean IH										22.199	21.929	26.752	29.152	29.311			26.212		
Min IH										12.27	16.36	22.089	26.179	25.09					12.27
Total IH										377.381	679.812	829.31	874.545	908.636	3669.684				
Pre-chlorination / Chlorine Dosage - mg/L																			
Max IH		1.248	1.52	1.193	1.467												1.52		
Mean IH		1.173	1.106	1.07	1.111											1.115			
Min IH		1.061	0.931	0.91	0.972														0.91
Pre-chlorination / Cl Residual: Free - mg/L																			
Max IH		0.74	0.74	0.68	0.7												0.74		
Mean IH		0.632	0.657	0.623	0.623											0.634			
Min IH		0.55	0.59	0.5	0.56														0.5
Pre-chlorination / Cl Residual: Total - mg/L																			
Max IH		0.91	0.89	0.83	0.84												0.91		
Mean IH		0.783	0.824	0.774	0.783											0.79			
Min IH		0.69	0.78	0.66	0.72														0.66
Pre-chlorination / Hypochlorite Dosage - mg/L																			
Max IH		10.399	12.665	9.939	12.221												12.665		
Mean IH		9.773	9.216	8.92	9.258											9.294			
Min IH		8.838	7.76	7.581	8.098														7.581
Pre-chlorination / Hypochlorite Used - kg																			
Max IH		524.05	556.95	511.125	560.475												560.475		
Mean IH		443.657	447.717	433.461	417.692												435.629		
Min IH		383.05	394.8	340.75	338.4														338.4
Total IH		13753.38	12536.08	13437.3	12113.08										51839.83				
Pre-chlorination / Hypochlorite Volume-Total-1 - m³																			
Max IH		0.446	0.474	0.435	0.477												0.477		
Mean IH		0.378	0.381	0.369	0.355											0.371			
Min IH		0.326	0.336	0.29	0.288														0.288
Total IH		11705	10669	11436	10309										44119				
Raw Water / Background - cfu/100mL																			
Max Lab		160	82	82	410	260	720	2800	2800	8600	56						8600		
Mean Lab		69.2	33.25	21.5	105.8	69.25	346.25	751.2	1137.5	2760	15.5					566.455			
Min Lab		18	0	1	13	0	0	0	0	160	0								0
Raw Water / Conductivity - µS/cm																			
Max IH		228.5	223.2	231.5	232.3	243.7	238.2	238.8	236.2	235.2	228.6							243.7	
Mean IH		221.019	219.725	222.174	225.038	233.042	232.617	236.165	235.252	231.17	227.025						228.395		
Min IH		217.8	218	217.9	170	222.6	228.5	232.2	234.1	223.8	225.2								170
Raw Water / E. Coli: EC - cfu/100mL																			
Max Lab		1	0	0	1	0	0	10	< 10	< 10	0						< 10		
Mean Lab		0.4	0	0	0.2	0	0	3.8	< 3.25	< 2.4	0					< 1.068			
Min Lab		0	0	0	0	0	0	0	< 0	0	0								< 0
Raw Water / Raw Flow Daily - m³/d																			
Max IH		52987	56479	56245	51694	56670	100783	98594	80666	61463	59068							100783	
Mean IH		45445.45	48755.75	48621.65	45139.4	49348.52	62028.87	76680.9	66893.58	55870.33	47562.55						54695.56		
Min IH		40082	40763	41664	36877	42212	47569	60157	54511	47226	34339								34339
Raw Water / Raw Flow Rate - l/s																			
Max IH		613.27	653.69	650.98	598.31	654.75	1166.47	1141.13	933.63	926.67	683.66							1166.47	
Mean IH		526.72	565.27	562.75	522.45	571.13	717.93	887.51	774.13	653.31	550.49						633.86		
Min IH		463.91	471.79	482.22	426.82	488.56	550.57	696.26	630.91	546.6	397.44								397.44
Raw Water / Raw Water Turbidity - NTU																			
Max OL		21.4	7.14	13.7	12.2	6.8	3.1	7	2.17	2.4	26.5							26.5	
Mean OL		2.887	1.135	2.448	2.458	1.769	1.08	0.97	0.75	0.785	2.341						1.662		
Min OL		0.46	0.23	0.201	0.57	0.445	0.365	0.33	0.34	0.2	0.284								0.2
Raw Water / Raw Water pH - ---																			
Max IH		8.22	8.12	8.2	8.9	8.35	8.35	8.41	8.41	8.39	8.4							8.9	
Mean IH		8.045	8.008	8.056	8.197	8.239	8.269	8.331	8.355	8.307	8.241						8.206		
Min IH		7.94	7.88	7.86	8.09	8.18	8.2	8.26	8.26	8.22	8.11								7.86
Raw Water / Temperature - °C																			
Max IH		8.01	6	8	11.5	13.1	18.5	23	25	22.5	17.6							25	
Mean IH		6.396	5.025	5.653	9.285	11.661	15.612	21.142	23.064	19.033	14.308						13.183		
Min IH		3	3.25	4	7	10	13	17.8	22	16	12								3
Raw Water / Total Coliform: TC - cfu/100mL																			
Max Lab		39	15	10	31	4	2	100	71	< 66	0						< 100		
Mean Lab		10.2	4.5	2.5	8.2	1.25	0.75	23.6	< 20.25	< 29.2	0						< 10.75		
Min Lab		2	0	0	0	0	0	0	< 0	0	0							< 0	
Treated Water / Background - cfu/100mL																			
Max Lab		0	0	0	0	0	0	0	0	0	0							0	
Mean Lab		0	0	0	0	0	0	0	0	0	0						0		
Min Lab		0	0	0	0	0	0	0	0	0	0								0
Treated Water / E. Coli: EC - cfu/100mL																			
Max Lab		0	0	0	0	0	0	0	0	0	0							0	
Mean Lab		0	0	0	0	0	0	0	0	0	0						0		
Min Lab		0	0	0	0	0	0	0	0	0	0								0
Treated Water / Electrical Consumption - kWh																			
Total IH		963849.2	1042697	1022817	1067361	931726.5	922742.6	979665.2	1081486	978235.3	849895.7	9840475							
Treated Water / Flow: Total of All Sources - m³/d																			
Max IH		51137	53292	51967	49343	52401	97988	96442	77634	64029	60875							97988	
Mean IH		44841	46364	46748.23	44048.37	48460.74	61126.97	76220.23	67154.84	56044.43	47285.74						53904.01		
Min IH		41397	41527	41284	39452	41184	41283	60988	56137	50125	41493								39452
Total IH		1390071	1298192	1449195	1321451	1502283	1833809	2362827	2081800	1681333	1465858	16386819							
Treated Water / HPC - cfu/mL																			
Max Lab		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10						< 10		
Mean Lab		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10						< 10		
Min Lab		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10								< 10
Treated Water / Total Coliform: TC - cfu/100mL																			
Max Lab		0	0	0	0	0	0	0	0	0	0							0	
Mean Lab		0	0	0	0	0	0	0	0	0	0						0		
Min Lab		0	0	0	0	0	0	0	0	0	0								0
Treated Water / Turbidity - NTU																			
Max OL		0.117	0.08	0.1	0.082	0.11	0.095	0.096	0.097	0.096	0.088							0.117	
Mean OL		0.062	0.063	0.065	0.063	0.064	0.066	0.066	0.067	0.067	0.066						0.065		
Min OL		0.043	0.047	0.046	0.047	0.046	0.046	0.049	0.052	0.052	0.047								0.043
West Lambton Booster Station / Cl Residual: Outlet Free - mg/L																			
Max OL		2.19	1.86	1.83	1.8	1.6	1.62	4.99	1.67	2.17	4.99							4.99	
Mean OL		1.684	1.685	1.595	1.586	1.429	1.413	1.395	1.395	1.651	1.868						1.57		
Min OL		0	0	0	0	0	0	0	0	0	0								0
Zebra Mussel Control / Chlorine Dosage - mo/L																			

Max IH						1.125	1.173	1.25	1.327	1.29	1.218	1.285				1.327		
Mean IH						1.125	1.068	1.127	1.158	1.206	1.126	1.112			1.133			
Min IH						1.125	0.955	1.01	1.028	1.113	0.948	0.955						0.948
Zebra Mussel Control / Cl Residual: Free - mg/L																		
Max IH						0.36	0.67	0.66	0.63	0.64	0.64	0.63					0.67	
Mean IH						0.36	0.6	0.588	0.559	0.586	0.59	0.587			0.584			
Min IH						0.36	0.44	0.52	0.39	0.52	0.52	0.5						0.36
Zebra Mussel Control / Cl Residual: Total - mg/L																		
Max IH						0.54	0.81	0.8	0.79	0.79	0.81	0.78					0.81	
Mean IH						0.54	0.746	0.712	0.679	0.72	0.736	0.726			0.719			
Min IH						0.54	0.55	0.63	0.51	0.66	0.66	0.62						0.51
Zebra Mussel Control / Hypochlorite Dosage - mg/L																		
Max IH						9.374	9.777	10.417	11.057	10.753	10.149	10.71					11.057	
Mean IH						9.374	8.898	9.392	9.649	10.049	9.382	9.266			9.439			
Min IH						9.374	7.961	8.418	8.569	9.277	7.9	7.954						7.9
Zebra Mussel Control / Hypochlorite Used - kg																		
Max IH						433.575	514.65	848.35	851.875	774.325	598.075	548.725					851.875	
Mean IH						433.575	439.147	582.408	735.512	670.735	524.246	439.715			564.711			
Min IH						433.575	336.05	444.15	619.225	538.15	413.6	367.775						336.05
Total IH						433.575	13613.55	17472.25	22800.88	20792.8	15727.38	13631.18	104471.6					
Zebra Mussel Control / Hypochlorite Volume-Total-1 - m³																		
Max IH						0.369	0.438	0.722	0.725	0.659	0.509	0.467					0.725	
Mean IH						0.369	0.374	0.496	0.626	0.571	0.446	0.374			0.481			
Min IH						0.369	0.286	0.378	0.527	0.458	0.352	0.313						0.286
Total IH						369	11586	14870	19405	17696	13385	11601	88912					

Health & Safety Work Order Summary by Facility

Start Date: 2019-10-01

End Date: 2019-10-31

Hub: Lambton

Cluster	ORG ID	Facility ID	Health and Safety					Closure Rate		
			Initiated	Approved	Completed	Total Labor Hrs	Total Cost \$	Target	Actual	Variance
LAWSS (133000)	Lambton Area Water Treatment	5544, East Lambton Distribution (5544-WDEL)	0	0	0	0.00	0.00	85.00%	100.00%	-15.00%
		5544, East Lambton PS (5544-WPEL)	0	0	0	0.00	0.00	85.00%	100.00%	-15.00%
		5544, Forrest Standpipe (5544-WDFS)	0	0	0	0.00	0.00	85.00%	100.00%	-15.00%
		5544, Indian Road Tower (5544-WDIR)	0	0	0	0.00	0.00	85.00%	100.00%	-15.00%
		5544, Lambton Area RMS (5544-WWLA)	0	0	0	0.00	0.00	85.00%	100.00%	-15.00%
		5544, Lambton Area WTP (5544-WTLA)	5	5	5	7.00	268.29	85.00%	100.00%	-15.00%
		5544, Port Lambton Standpipe (5544-WDPL)	0	0	0	0.00	0.00	85.00%	100.00%	-15.00%
		5544, Watford Standpipe (5544-WDWF)	0	0	0	0.00	0.00	85.00%	100.00%	-15.00%
		5544, West Lambton Booster Stn (5544-WPWL)	0	0	0	0.00	0.00	85.00%	100.00%	-15.00%
		5544, West ST.Claire Distribution (5544-WDWS)	0	0	0	0.00	0.00	85.00%	100.00%	-15.00%
		Lambton Area Water Treatment Plant (5544)	0	0	0	0.00	0.00	85.00%	100.00%	-15.00%
		Total			5	5	5	7.00	268.29	85.00%

Key Column	Colour	Meaning
Init		No Work Orders initialized
Closed		Closure Rate between 20-50%
Closed		Closure Rate less than 20%

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Health & Safety Work Order Summary by Facility

Start Date: 2019-01-01

End Date: 2019-10-31

Hub: Lambton

Cluster	ORG ID	Facility ID	Health and Safety					Closure Rate		
			Initiated	Approved	Completed	Total Labor Hrs	Total Cost \$	Target	Actual	Variance
LAWSS (133000)	Lambton Area Water Treatment	5544, East Lambton Distribution (5544-WDEL)	0	0	0	0.00	0.00	85.00%	100.00%	-15.00%
		5544, East Lambton PS (5544-WPEL)	0	0	0	0.00	0.00	85.00%	100.00%	-15.00%
		5544, Forrest Standpipe (5544-WDFS)	0	0	0	0.00	0.00	85.00%	100.00%	-15.00%
		5544, Indian Road Tower (5544-WDIR)	0	0	0	0.00	0.00	85.00%	100.00%	-15.00%
		5544, Lambton Area RMS (5544-WWLA)	0	0	0	0.00	0.00	85.00%	100.00%	-15.00%
		5544, Lambton Area WTP (5544-WTLA)	39	39	39	73.00	2994.89	85.00%	100.00%	-15.00%
		5544, Port Lambton Standpipe (5544-WDPL)	0	0	0	0.00	0.00	85.00%	100.00%	-15.00%
		5544, Watford Standpipe (5544-WDWF)	0	0	0	0.00	0.00	85.00%	100.00%	-15.00%
		5544, West Lambton Booster Stn (5544-WPWL)	0	0	0	0.00	0.00	85.00%	100.00%	-15.00%
		5544, West ST.Clair Distribution (5544-WDWS)	0	0	0	0.00	0.00	85.00%	100.00%	-15.00%
		Lambton Area Water Treatment Plant (5544)	4	4	4	11.75	575.37	85.00%	100.00%	-15.00%
		Total	43	43	43	84.75	3570.26	85.00%	100.00%	-15.00%

Key Column	Colour	Meaning
Init		No Work Orders initialized
Closed		Closure Rate between 20-50%
Closed		Closure Rate less than 20%

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Work Order Summary by Facility

Start Date: 2019-10-01
End Date: 2019-10-31
Hub: Lambton

Key Col	Colour	Meaning
Init		No Work Orders initialized
Closed		Closure Rate between 20-50%
Closed		Closure Rate less than 20%

			Corrective Maintenance					Emergency Maintenance					Call Back				
			Init	Approved	Completed	Total Labor Hrs	Total Cost \$	Init	Approved	Completed	Total Labor Hrs	Total Cost \$	Init	Approved	Completed	Total Labor Hrs	Total Cost \$
LAWSS (133000)	Lambton Area Water Treatment Plant (5544)	5544, East Lambton Distribution (5544-WDEL)	1	1	1	7.5	292.15	1	1	1	26.75	1090.31	0	0	0	0	0
		5544, East Lambton PS (5544-WPEL)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		5544, Lambton Area RMS (5544-WWLA)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		5544, Lambton Area WTP (5544-WTLA)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		5544, West Lambton Booster Stn (5544-WPWL)	1	1	1	7	296.94	0	0	0	0	0	0	0	0	0	0
		5544, West ST.Clair Distribution (5544-WDWS)	1	1	0	3	127.26	0	0	0	0	0	0	0	0	0	0
		Lambton Area Water Treatment Plant (5544)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total			3	3	2	17.5	716.35	1	1	1	26.75	1090.31	0	0	0	0.00	0.00

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Work Order Summary by Facility

Start Date: 2019-10-01
End Date: 2019-10-31
Hub: Lambton

Key Col	Colour	Meaning
Init		No Work Orders initialized
Closed		Closure Rate between 20-50%
Closed		Closure Rate less than 20%

			Preventive Maintenance					Operational					Capital/Project Work					Closure Rate		
			Init	Approved	Completed	Total Labor Hrs	Total Cost \$	Init	Approved	Completed	Total Labor Hrs	Total Cost \$	Init	Approved	Completed	Total Labor Hrs	Total Cost \$	Target	Actual	Variance
LAWSS (133000)	Lambton Area Water Treatment Plant (5544)	5544, East Lambton Distribution (5544-WDEL)	0	0	0	0	0	4	4	4	8.75	397.27	0	0	0	0	0	85%	100%	-15.0%
		5544, East Lambton PS (5544-WPEL)	4	4	4	9.25	461.2	2	2	2	10.25	539.36	0	0	0	0	0	85%	100%	-15.0%
		5544, Lambton Area RMS (5544-WWLA)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85%	100%	-15.0%
		5544, Lambton Area WTP (5544-WTLA)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85%	100%	-15.0%
		5544, West Lambton Booster Stn (5544-WPWL)	2	2	2	3.5	136.68	2	2	2	3	108.24	0	0	0	0	0	85%	100%	-15.0%
		5544, West ST.Clair Distribution (5544-WDWS)	55	55	44	82.25	3431.11	12	12	12	1633.5	42125.32	2	2	0	23	1133.83	85%	82.35%	2.647%
		Lambton Area Water Treatment Plant (5544)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85%	100%	-15.0%
Grand Total			61	61	50	95	4028.99	20	20	20	1655.5	43170.19	2	2	0	23	1133.83	85%	100%	-15.0%

Work Order Summary by Facility

Start Date: 2019-01-01
End Date: 2019-10-31
Hub: Lambton

Key Col	Colour	Meaning
Init		No Work Orders initialized
Closed		Closure Rate between 20-50%
Closed		Closure Rate less than 20%

			Corrective Maintenance					Emergency Maintenance					Call Back				
			Init	Approved	Completed	Total Labor Hrs	Total Cost \$	Init	Approved	Completed	Total Labor Hrs	Total Cost \$	Init	Approved	Completed	Total Labor Hrs	Total Cost \$
LAWSS (133000)	Lambton Area Water Treatment Plant (5544)	5544, East Lambton Distribution (5544-WDEL)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		5544, East Lambton PS (5544-WPEL)	15	15	14	130	5960.09	6	6	5	39.25	1759.59	0	0	0	0	0
		5544, Lambton Area RMS (5544-WWLA)	6	6	5	35	1710.25	0	0	0	0	0	0	0	0	0	0
		5544, Lambton Area WTP (5544-WTLA)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		5544, West Lambton Booster Stn (5544-WPWL)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		5544, West ST.Clair Distribution (5544-WDWS)	9	9	9	77	3225.48	0	0	0	0	0	1	1	1	15	662.4
		Lambton Area Water Treatment Plant (5544)	42	42	36	325	16800.78	1	1	1	1	46.68	4	4	4	36	1505.9
Grand Total			72	72	64	567	27696.6	7	7	6	40.25	1806.27	5	5	5	51.00	2168.30

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Work Order Summary by Facility

Start Date: 2019-01-01
End Date: 2019-10-31
Hub: Lambton

Key Col	Colour	Meaning
Init		No Work Orders initialized
Closed		Closure Rate between 20-50%
Closed		Closure Rate less than 20%

			Preventive Maintenance					Operational					Capital/Project Work					Closure Rate		
			Init	Approved	Completed	Total Labor Hrs	Total Cost \$	Init	Approved	Completed	Total Labor Hrs	Total Cost \$	Init	Approved	Completed	Total Labor Hrs	Total Cost \$	Target	Actual	Variance
LAWSS (133000)	Lambton Area Water Treatment Plant (5544)	5544, East Lambton Distribution (5544-WDEL)	0	0	0	0	0	0	0	0	0	1	1	1	0	1795.2	85%	100%	-15.0%	
		5544, East Lambton PS (5544-WPEL)	9	9	6	17	1006.35	42	42	42	118	5187.03	5	5	1	36.25	22466.15	85%	93.05%	-8.05%
		5544, Lambton Area RMS (5544-WWLA)	54	54	54	113	5563.38	21	21	21	87.75	4149.56	0	0	0	0	0	85%	98.76%	-13.7%
		5544, Lambton Area WTP (5544-WTLA)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85%	100%	-15.0%
		5544, West Lambton Booster Stn (5544-WPWL)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85%	100%	-15.0%
		5544, West ST.Clair Distribution (5544-WDWS)	24	24	24	44.25	2011.52	20	20	20	32.25	1288.98	1	1	1	27.25	22007.7	85%	100%	-15.0%
		Lambton Area Water Treatment Plant (5544)	366	366	345	1321.5	69493.66	124	124	122	16171.25	420765.1	7	7	3	165.75	53733.4	85%	94.59%	-9.59%
Grand Total			453	453	429	1495.75	78074.91	207	207	205	16409.25	431390.7	14	14	6	229.25	100002.5	85%	100%	-15.0%