
TOWNSHIP OF RUSSELL PUBLIC UTILITIES



2024

**WATER & SANITARY SYSTEMS
ANNUAL OPERATIONS REPORT**

TOWNSHIP OF RUSSELL



DRINKING WATER SYSTEM

Waterworks #260092014

MDWL # 184-101

2024

ANNUAL OPERATIONS REPORT

Township of Russell Annual Operations Report
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Township of Russell

Annual Summary report – 2024

Owner and Operating Authority

The Township of Russell is the Owner and Operating Authority of a drinking Water System that includes:

- Four storage tanks (three elevated towers and one above ground reservoir);
- A distribution network and its associated appurtenances.

Water Source

Treated water is supplied by the City of Ottawa through a connection to its distribution system from Mitch Owens Road and Bank Street to Embrun Reservoir.

Existing Water Works - Distribution System

The water system for Township of Russell is currently a Class 2 distribution system and serves approximately 19,881 people. This number is calculated referencing number of services.

Treated water is pumped from the City of Ottawa through a 450 mm feeder main to the Embrun Reservoir where chlorine and ammonia are added. From there it is pumped to the Embrun Tower and to the Russell Water tower and then to the Marionville booster pumping station and then pumped to the Marionville tower.

The distribution system consists of PVC and Polyethylene pipes ranging from 19 mm (5/8 inch) service connections to a 406 mm (16 inch) piping. Piping in the local distribution networks in the communities of Embrun, Russell and Marionville consist largely of 150 mm, 200 mm, 250 mm, 300 mm and 350 mm PVC pipes. The municipal distribution system also contains fire hydrants, standard service connections, gate valves, valve chambers, isolation and interconnection valves, blow-off points, drain valve chambers, and air release chambers.

Facilities:

- 450mm diameter connection to Russell Feedermain (from City of Ottawa) at Embrun Reservoir site;
- connection to Russell watermain (toward community of Russell) at Embrun Reservoir site;
- connection to Marionville watermain (replacement of modulating control valve by a pipe section, between Marionville Booster Station and Marionville, on MacDonald Road).
- Embrun Reservoir (re-chlorination facility)
- 3 Water Towers (Embrun, Russell, Marionville)
- 695 Hydrants (376 Embrun, 283 Russell, 36 Marionville)
- 856 Isolation valves (472 Embrun, 352 Russell, 32 Marionville)

2024 Capital Improvements, maintenance and studies

In the past year standard maintenance was completed. This includes exercising all isolation valves, flushing all hydrants and performing inspection and upkeep on all hydrants. 10 isolation valves and 4 fire hydrant valves were excavated for replacement or maintenance. 1 Hydrant and 1 valve were replaced due to failure. This is on par with the previous year(2023) which was 9 valves, 4 hydrants and 1 replaced hydrant & hydrant valve. The Embrun water tower's SCADA was upgraded to be similar to the Marionville tower and switch to the new radio system.

Planned Alterations, Extension and Replacements

In 2025 the valve maintenance program will continue with excavations. Expansion of the distribution system is being looked in to for new subdivisions as well as older subdivision not currently serviced. A study is being run looking into expanding capacity of the reservoir. Further leak detection and standpost maintenance is to be pursued to verify and the integrity of the system. Replacement of the storm along Notre-Dame street will coincide with replacement/upgrade of the watermain. Lastly a truck filling station is being looked into to both help reduce water theft and monitor water taking more accurately.

Township of Russell : Water Maintenance 2024
Reservoir, 2024 Maintenance History

Preventative Maintenance	Frequency	Date	Comments
Test run back-up generator	Weekly		
Analyzer Calibration	Bi-Weekly		
Semi Annual Generator Inspection	Semi-Annually		
Alarm Testing	Annually	Oct 24	
Flow Meter Calibration	Annually		
Chart Recorder Calibration	Annually		
Pressure Transmitter Calibration	Annually		
Level Transmitter Calibration	Annually		
Change Genset Oil, oil filter	Annually		
Generator Inspection			
Double Check valve inspection and cert.	Annually		
Inspection of Vents and Top	Annually		
Replace Batteries in Milltronics	Every 3 years		
Chemical Pump Maintenance	Quarterly	Feb 14	Replace tubing on all pumps in service
Chemical Pump Maintenance	Quarterly	May 28	Replace tubing on all pumps in service
Chemical Pump Maintenance	Quarterly	Aug 21	Replace tubing on all pumps in service
Chemical Pump Maintenance	Quarterly	Nov 27	Replace tubing on all pumps in service
Pipe replacement		Oct 10	Replace PVC pipes with stainless steel
Corrective Maintenance			
Cl ₂ Analyzer Maintenance, OFM		Jan 9	Replace probe cap
Radio Replacement		Jan 25	
Cl ₂ Line leak repair		Feb 5	Replace leaking sections
Cl ₂ Analyzer Maintenance, Intermed.		Feb 29	Replace electrolyte
Cl ₂ Analyzer Maintenance, WW		Feb 29	Replace electrolyte
OFM Valve maintenance		Mar 19	Replace "open" solenoid
OFM Valve maintenance		Mar 21	Replace "close" solenoid
Cl ₂ Line leak repair		Mar 26	Replace leaking sections
Cl ₂ Line leak repair		Jun 18	Replace leaking sections
Cl ₂ Line leak repair		July 2	Replace leaking sections
Piping removal		July 12	Remove old WTP inflow piping
Cl ₂ Line leak repair		July 21	Replace leaking sections
Cl ₂ Analyzer Maintenance, Intermed.		July 21	Replace electrolyte
Cl ₂ Line leak repair		July 29	Replace leaking sections
Chemical Pump Maintenance		Sept 6	Replace tubing due to leak in backup pump #2 Cl ₂
High Lift Maintenance, Emb HL1		Sept 11	Replace soft start
Cl ₂ Analyzer Maintenance, WW		Oct 8	Replace electrolyte
Cl ₂ Analyzer Maintenance, OFM		Nov	Replace electrolyte
Cl ₂ Analyzer Maintenance, Intermed.		Dec 9	Replace electrolyte
High Lift Maintenance, Emb HL3		Dec 10	Pump removed for repair
Sampling Pump Maintenance		Dec 16	Repair leak in pump/piping
Cl ₂ Line leak repair		Dec 19	Replace leaking sections

Township of Russell : Water Maintenance 2024

Embrun Water Tower, 2024 Maintenance History

Preventative Maintenance	Frequency	Date	Comments
Analyzer Calibration	Bi-Weekly		
Run Generator,	Weekly		
Alarm Testing	Annually		
Level Transmitter Calibration	Annually		
Pressure Transmitter Calibration	Annually		
Inspection of Vents and Top			
Generator Maintenance			
SCADA Upgrade		Oct 11	Replace SCADA and radio upgrade
Corrective Maintenance			
Cl ₂ Analyzer Maintenance		Nov 26	Replace gel in probe

Embrun Distribution, 2024 Maintenance History

Preventative Maintenance	Frequency	Date	Comments
Hydrant Flushing	Annually		
Hydrant Inspections	Annually		Valve exercise, Grease and Drain
Gate Valve Exercise	Annually		
Fall hydrant inspection	Annually		
Flush New subdivisions	As Needed		
Corrective Maintenance			
Valve 174 Leaking	Frontenac/Louis Riel	Jan 24	Replace bolts, install anode.
Leaking Hydrant H-118 (H-E4085-02)	72 Lacroisee	Jun 25	Replace Hydrant
Leaking hydrant A-34 (A-E1000-44)	1195 Notre-Dame	July 3	Replace bolts, install anode.
Valve 30 Leaking	12 Castlebeau	July 17	Replace bolts, install anode.
Valve 37 leaking	39 Marcel	July 24	Replace bolts, install anode.
Valve 37 inoperative	39 Marcel	Aug 1	Replace valve

Russell Water Tower, 2024 Maintenance History

Preventative Maintenance	Frequency	Date	Comments
Analyzer Calibration	Bi-Weekly		
Run Generator,	Weekly		
Alarm Testing	Annually		
Level Transmitter Calibration	Annually		
Pressure Transmitter Calibration	Annually		
Inspection of Vents and Top	Annually		
Corrective Maintenance			
Cl ₂ Analyzer Maintenance		Nov 4	Replace probe cap

Township of Russell : Water Maintenance 2024

Russell Distribution, 2024 Maintenance History

Preventative Maintenance	Frequency	Date	Comments
Hydrant Flushing	Annually		
Hydrant Inspections	Annually		Valve exercise, Grease and Drain
Gate Valve Exercise	Annually		
Fall hydrant inspection	Annually		
Flush New subdivisions	As Needed		
Corrective Maintenance			
Leaking Hydrant RB-8 (H-R5000-07)	580 Church	May 29	Replace gasket, bolts, install anode
Leaking Valve 164	655 DuParc	June 11	Replace bolts, install anode
Leaking Valve 168	642 DuParc	June 11	Replace bolts, install anode
Leaking Valve 110	20 1 st Ave	Aug 22	Replace bolts, install anode.
Leaking Valve 109	20 1 st Ave	Aug 22	Replace bolts, install anode.
Leaking Valve 105	138 Dunlop	Sept 5	Replace bolts, install anode.
Leaking Valve 36	39 Craig	Oct 25	Replace SS clamps in chamber
Leaking hydrant leg H-R1010-04	1017 North Russell	Nov 20	Excavated but repair deemed unable to be completed at the time, to be rescheduled

Marionville Water Tower, 2024 Maintenance History

Preventative Maintenance	Frequency	Date	Comments
Analyzer Calibration	Bi-Weekly		
Run Generator,	Weekly		
Alarm Testing	Annually	Oct 24	
Level Transmitter Calibration	Annually		
Pressure Transmitter Calibration	Annually		
Inspection of Vents and Top	Annually		
Corrective Maintenance			
Cl ₂ Analyzer Maintenance		Jan 29	Replace gel in probe
Cl ₂ Analyzer Maintenance		Dec 16	Replace gel in probe

Marionville Distribution, 2024 Maintenance History

Preventative Maintenance	Frequency	Date	Comments
Hydrant Flushing	Annually		
Hydrant Inspections	Annually		Valve exercise, Grease and Drain
Gate Valve Exercise	Annually		
Fall hydrant inspection	Annually		
Corrective Maintenance			

Township of Russell : Water Maintenance 2024

Marionville Booster, 2024 Maintenance History

Preventative Maintenance	Frequency	Date	Comments
Alarm Testing	Annually		
Flow Meter calibration	Annually		
Change Genset Oil, oil filter	Annually		
Generator Inspection	Annually		
Corrective Maintenance			
Generator Maintenance		Aug 21	Replace Battery

Ottawa Feedermain, 2024 Maintenance History

Preventative Maintenance	Frequency	Date	Comments
Valve Chamber Inspection	Annually		
Corrective Maintenance			

Ottawa		Calculated				
Month	Days	Consumption (m3)	Ottawa	Embrun	Russell	MV
JAN	31	121,836	362,997	73227	47054	1762
FEB	28	121,312	355,202	72611	46792	1633
MAR	31	119,849	-2.19%	69563	44163	1529
APR	30	122,908	397,110	74043	47445	1802
MAY	31	137,473	394,508	82669	53664	2293
JUN	30	136,729	-0.66%	81630	54121	3380
JUL	31	134,561	422,895	84651	54237	4091
AUG	31	143,177	430,090	84953	62625	4791
SEP	30	145,157	1.67%	79736	64192	4580
OCT	31	137,370	386,270	77160	55105	4121
NOV	30	125,843	379,286	73944	42883	3111
DEC	31	123,057	-1.84%	74692	44079	2520

Quarterly Consumption (m3)						
Reservoir		Houses		w.Flush		M3/day
215,401	Embrun	156,660		157,517	57,884	27%
4,924	MV	4,896		5,679	755	-15%
138,009	Russell	108,231		109,366	28,643	21%
238,342	Embrun	142,935		144,526	93,816	39%
7,475	MV	5,170		7,301	174	2%
155,230	Russell	99,300		100,577	54,653	35%
249,340	Embrun	161,101		162,737	86,603	35%
13,462	MV	5,474		13,012	450	3%
181,054	Russell	108,437		109,457	71,597	40%
225,796	Embrun	146,548		147,785	78,011	35%
9,752	MV	4,948		9,231	521	5%
142,067	Russell	102,093		103,224	38,843	27%
1,580,852		1,045,793		1,070,410	510442.47	1398.5
Total				System wide Loss		32%

Calculated per MOE Procedure D-5-1
TOWNSHIP OF RUSSELL WATER SYSTEM UNCOMMITTED HYDRAULIC RESERVE CAPACITY
As of December 31, 2024

Average Daily Flow		Maximum Day Flow		Maximum Day Peaking Factor		Served Population		Per Capita Average Daily Flow		Source	
2024	4,407 m ³ /d	2024	6,326 m ³ /d	2024	1.44	2024	19,881	2024	0.222 m ³ /cap/d	2024	Township data
2023	4,105 m ³ /d	2023	7,528 m ³ /d	2023	1.83	2023	19,050	2023	0.215 m ³ /cap/d	2023	Township data
2022	3,543 m ³ /d	2022	5,443 m ³ /d	2022	1.54	2022	18,434	2022	0.192 m ³ /cap/d	2022	Township data
2021	3,531 m ³ /d	2021	5,652 m ³ /d	2021	1.60	2021	17,453	2021	0.202 m ³ /cap/d	2021	Township data
2020	3,311 m ³ /d	2020	5,562 m ³ /d	2020	1.68	2020	16,484	2020	0.201 m ³ /cap/d	2020	Township data
Total Served Population as of 2024: 19,881 people											
Average per capita flow for the last five years: 0.207 m ³ /cap/d											
Maximum day flow for the last five years: 7,528 m ³ /d											
Maximum day flow per capita for the last five years: 0.379 m ³ /cap/d											
Maximum day flow peaking factor (five years): 1.83											
Source: Based on Master Plan Average Day Design Criteria											
Based on past 5 years											
Ottawa Supply Agreement											
Based on Master Plan Assumed 2.5 persons per unit											
From Planning Department											
From Planning Department											
From Planning Department											

Cu = 3176 m³/d Uncommitted Reserve Hydraulic Capacity based on available supply from Ottawa

LU No. of Uncommitted Lots Remaining 2.5 persons per lot Based on Master Plan Design Criteria

LU = 2933 Lots

Notes:
1. The actual per capita flows are below the projected per capita flows per the Master Plan and GMP. It is recommended that the Master Plan per capita flows continue to be used for planning.
2. The above calculation is based on the Ottawa supply agreement daily limit. It does not take into account any limitations in the water supply and distribution system.
3. A detailed capacity assessment of the water facilities is recommended to ascertain the true capacity of the infrastructure.

MONTH	EMBRUN TREATED WATER FLOW			MARIONVILLE TREATED WATER FLOW			RUSSELL TREATED WATER FLOW			TOTAL TREATED WATER FLOW		
	AVERAGE DAY (1000 m ³)	MAXIMUM DAY (1000 m ³)	MONTHLY TOTAL (1000 m ³)	AVERAGE DAY (1000 m ³)	MAXIMUM DAY (1000 m ³)	MONTHLY TOTAL (1000 m ³)	AVERAGE DAY (1000 m ³)	MAXIMUM DAY (1000 m ³)	MONTHLY TOTAL (1000 m ³)	AVERAGE DAY (1000 m ³)	MAXIMUM DAY (1000 m ³)	MONTHLY TOTAL (1000 m ³)
JAN	2.406	3.381	74.601	0.057	0.110	1.764	1.562	2.270	48.424	4.025	5.761	124.789
FEB	2.416	3.068	70.070	0.053	0.105	1.549	1.546	1.914	44.828	4.015	5.087	116.447
MAR	2.416	2.981	74.901	0.054	0.112	1.687	1.535	1.818	47.581	4.005	4.911	124.169
APR	2.445	3.123	73.355	0.060	0.117	1.790	1.586	2.185	47.591	4.091	5.425	122.736
MAY	2.710	3.418	84.024	0.074	0.111	2.308	1.753	2.305	54.346	4.538	5.834	140.678
JUN	2.750	3.287	82.500	0.113	0.339	3.376	1.817	2.373	54.516	4.680	5.999	140.392
JUL	2.731	3.410	84.651	0.132	0.393	4.091	1.750	2.119	54.237	4.612	5.922	142.979
AUG	2.740	3.496	84.953	0.155	0.436	4.791	2.020	2.394	62.625	4.915	6.326	152.369
SEP	2.658	3.339	79.736	0.153	0.347	4.580	2.140	2.551	64.192	4.950	6.237	148.508
OCT	2.582	3.196	80.031	0.137	0.351	4.234	1.983	2.338	61.464	4.701	5.885	145.729
NOV	2.540	2.950	76.206	0.105	0.361	3.155	1.580	1.791	47.385	4.225	5.102	126.746
DEC	2.484	3.232	77.011	0.087	0.123	2.684	1.550	1.926	48.064	4.121	5.281	127.759
TOTAL			942.039			36.009			635.253	52.880		1613.301
AVERAGE	2.573			0.098			1.735			4.407		134.442
MAXIMUM		3.496			0.436			2.551			6.326	152.369

CHEMICAL PROCUREMENT						
DATE	PRODUCT	QTY DRUMS	Litres	TOTAL Litres	COST/ Litre	TOTAL COST
2-Apr-24	SODIUM HYPOCHLORITE	13	205	2,665	0.78	2,078.70
18-Jun-24	"	12	205	2,460	0.78	1,918.80
20-Aug-24	"	13	205	2,665	0.78	2,078.70
10-Sep-24	"	13	205	2,665	0.78	2,078.70
19-Nov-24	"	13	205	2,665	0.78	2,078.70
TOTAL		64		13,120		\$10,233.60
DATE	PRODUCT	QTY BAGS	KG/BAG	TOTAL	COST/ KG	TOTAL COST
	SODIUM THIOSULPHATE		25	0	2.28	\$0.00
						\$0.00
						\$0.00
TOTAL		0		0		\$0.00
DATE	PRODUCT	Bags	KG	TOTAL	COST/ bag	TOTAL COST
29-Jan-24	Ammonium Sulfate	16	22.68	363	106.71	\$1,707.36
4-Jul-24		16	22.68	363	106.71	\$1,707.36
3-Oct-24		16	22.68	363	106.71	\$1,707.36
TOTAL		48		726		\$5,122.08

Embrun				
ID	Service Request Type	Issue Address/Location	Date	Resolution
SR-6218	Foul Taste to Water	101 CASTLEBEAU ST	23-Feb	No foul taste, customer had health concerns/questions due to gossip
SR-6233	Debris in Water	71 RADISSON DR	1-Mar	Determined to be internal plumbing/Hot water system
SR-6301	Odour in Water	60 DE LA RIVE DR	5-Apr	No problem found, see SR-6468
SR-6382	Watermain Break	771 NOTRE DAME	1-May	private service broken on private property, operators observed repair
SR-6387	Low Pressure	516 STRASBOURG ST	3-May	Standpost not fully opened, corrected
SR-6392	Low Pressure	91 LA CROISEE ST	6-May	No low pressure determined
SR-6453	Hydrant Repair	47 FORGET ST	15-May	Hydrant leaking, shut off until repaired
SR-6458	Debris in Water	136 ST MALO PL	16-May	Small black particulate, advised to flush plumbing and advise if it persists
SR-6466	Low Pressure	68 - 767 NOTRE DAME ST	21-May	Internal Plumbing / Private main
SR-6468	Odour in Water	60 De La Rive	21-May	Internal Plumbing
SR-6512	Water - Investigation	400 BRUGES ST	31-May	Suspected leak, determined to be auto open hose (internal)
SR-6552	Hydrant Repair	152 HYBRID ST	13-Jun	Inspect hydrant.
SR-6621	Low Pressure	36 RENOIR DR	24-Jun	Internal Plumbing
SR-6652	Water - Investigation	840 NOTRE DAME ST	4-Jul	Internal Plumbing
SR-6701	Low Pressure	902 COLOGNE ST	12-Jul	Internal Plumbing
SR-6808	Valve Repair	51 Marcel st	14-Aug	Repair to yard after valve excavation
SR-6809	Water - Investigation	941 Notre-dame	14-Aug	Leak on internal plumbing side
SR-6818	Low Pressure	24 LA PRAIRIE ST	20-Aug	Internal Plumbing
SR-6989	Water - Investigation	2 MAHEU ST	4-Oct	Hard water concerns
SR-7006	Valve Repair	21 Fleurette	8-Oct	Hydrant Valve paved over by owner, to be exposed
SR-7050	Low Pressure	998 CHABLIS CRES	1-Nov	Issue determined with service line, flushed and deemed clear
SR-7057	Low Pressure	840 COLOGNE ST	5-Nov	leak found under foundation, owner repaired
SR-7058	Water - Investigation	412 CENTENAIRE ST	5-Nov	Leak determined on private side, owner advised
SR-7105	No Water	6B - 767 NOTRE DAME ST	19-Nov	Valve closed on private side, to repair leaking private hydrant

Russell				
ID	Service Request Type	Issue Address/Location	Date	Resolution
SR-6221	Water - Investigation	75 SETTLEMENT LANE	26-Feb	Leaking code from meter, homeowner advised
SR-6290	Odour in Water	469 CHURCH ST	2-Apr	Determined to be internal plumbing/Hot water system
SR-6409	No Water	260 CENTRALPARK BLVD	9-May	Private developer accidentally closed standposts. Advised they are not permitted to do this.
SR-6547	Watermain Break	93 GEORGE ST	13-Jun	Water service broken during construction, repaired
SR-6833	Odour in Water	138 DUNLOP CRES	28-Aug	Inspection done, nothing found
SR-6907	Odour in Water	88 mill	19-Sep	Hot Water only, Internal Plumbing
SR-6916	Foul Taste to Water	987 NORTH RUSSELL RD	24-Sep	Water Quality Concern, bacti's run to confirm and re-assure of safe water
SR-7026	Low Pressure	753 GAMBLE DR	17-Oct	Internal Plumbing
SR-7040	Coloured Water	2 Warner	24-Oct	Determined to be internal plumbing/Hot water system
SR-7053	Low Pressure	716 AZURE ST	1-Nov	Internal Plumbing

Marionville				
ID	Service Request Type	Issue Address/Location	Date	Resolution
SR-6346	Low Pressure	144 Route 500	15-Apr	Internal Plumbing

Annual Summary - Water Distribution Flows							Year: 2024	
Waterworks Name: Township of Russell Distribution							DWS# 260092014	
Month	Ottawa Feedermain Flow (M ³)	Embrun Distribution Flow (M ³)	Russell Distribution Flow (M ³)	Marionville Distribution (M ³)	Days	Daily Average Embrun (M ³)	Daily Average Russell (M ³)	Daily Average Marionville (M ³)
Jan	123,507	74,601	48,424	1,764	31	2,406	1,562	57
Feb	115,498	70,070	44,828	1,549	29	2,416	1,546	53
Mar	123,155	74,901	47,581	1,687	31	2,416	1,535	54
Apr	121,491	73,355	47,591	1,790	30	2,445	1,586	60
May	138,940	84,024	54,346	2,308	31	2,710	1,753	74
Jun	136,876	82,500	54,516	3,376	30	2,750	1,817	113
Jul	138,704	84,651	54,237	4,091	31	2,731	1,750	132
Aug	147,407	84,953	62,625	4,791	31	2,740	2,020	155
Sep	143,979	79,736	64,192	4,580	30	2,658	2,140	153
Oct	141,768	80,031	61,464	4,234	31	2,582	1,983	137
Nov	124,307	76,206	47,385	3,155	30	2,540	1,580	105
Dec	125,626	77,011	48,064	2,684	31	2,484	1,550	87
Total	1,581,258	942,039	635,253	36,009	366	2,573	1,735	98

Annual Summary - Water Distribution Flows

Year: 2024

Waterworks Name: Township of Russell Distribution

DWS# 260092014

Month	Russell Flow M ³	Daily Average M ³	Population	Days	Average Person/Day (M3)	Max Flow M ³
Jan	48,424	1,562	8,454	31	0.185	2270
Feb	44,828	1,546	8,454	29	0.183	1914
Mar	47,581	1,535	8,454	31	0.182	1818
Apr	47,591	1,586	8,454	30	0.188	2185
May	54,346	1,753	8,454	31	0.207	2305
Jun	54,516	1,817	8,454	30	0.215	2373
Jul	54,237	1,750	8,454	31	0.207	2119
Aug	62,625	2,020	8,454	31	0.239	2394
Sep	64,192	2,140	8,454	30	0.253	2551
Oct	61,464	1,983	8,454	31	0.235	2338
Nov	47,385	1,580	8,454	30	0.187	1791
Dec	48,064	1,550	8,454	31	0.18	1926

Month	Embrun Flow M ³	Daily Average M ³	Population	Days	Average Person/Day (M3)	Max Flow M ³
Jan	74,601	2,406	11,003	31	0.219	3381
Feb	70,070	2,416	11,003	29	0.220	3068
Mar	74,901	2,416	11,003	31	0.220	2981
Apr	73,355	2,445	11,003	30	0.222	3123
May	84,024	2,710	11,003	31	0.246	3418
Jun	82,500	2,750	11,003	30	0.250	3287
Jul	84,651	2,731	11,003	31	0.248	3410
Aug	84,953	2,740	11,003	31	0.249	3496
Sep	79,736	2,658	11,003	30	0.242	3339
Oct	80,031	2,582	11,003	31	0.235	3196
Nov	76,206	2,540	11,003	30	0.231	2950
Dec	77,011	2,484	11,003	31	0.23	3232

Annual Summary - Water Distribution Flows**Year: 2024****Waterworks Name: Township of Russell Distribution****DWS# 260092014**

Month	Marionville Distribution M³	Daily Average M³	Population	Days	Average Person/Day (M3)	Max Flow M³
Jan	1,764	57	424	31	0.134	110
Feb	1,549	53	424	29	0.126	105
Mar	1,687	54	424	31	0.128	112
Apr	1,790	60	424	30	0.141	117
May	2,308	74	424	31	0.176	111
Jun	3,376	113	424	30	0.265	339
Jul	4,091	132	424	31	0.311	393
Aug	4,791	155	424	31	0.365	436
Sep	4,580	153	424	30	0.360	347
Oct	4,234	137	424	31	0.322	351
Nov	3,155	105	424	30	0.248	361
Dec	2,684	87	424	31	0.20	123

Annual Summary - Ottawa F.M. In-House Testing
 Waterworks Name: Township of Russell Distribution

Year: 2024
 DWS# 260092014

Ottawa Feedermain	Chlorine Reading								
	T			F			Combined		
	Max	Min	Average	Max	Min	Average	Max	Min	Average
January	1.72	1.39	1.54	0.08	0.02	0.04	1.68	1.36	1.50
February	1.58	1.48	1.52	0.09	0.02	0.04	1.54	1.40	1.48
March	1.62	1.44	1.52	0.09	0.02	0.05	1.59	1.39	1.46
April	1.62	1.44	1.52	0.09	0.01	0.04	1.57	1.41	1.49
May	1.58	1.47	1.51	0.07	0.01	0.04	1.55	1.42	1.48
June	1.52	1.35	1.44	0.06	0.01	0.04	1.47	1.33	1.40
July	1.50	1.27	1.40	0.07	0.00	0.03	1.46	1.27	1.36
August	1.39	1.05	1.19	0.06	0.00	0.03	1.36	1.02	1.16
September	1.64	1.27	1.48	0.08	0.01	0.04	1.59	1.24	1.45
October	1.74	1.30	1.48	0.07	0.02	0.04	1.70	1.27	1.44
November	1.81	1.56	1.69	0.08	0.01	0.05	1.76	1.51	1.64
December	1.78	1.45	1.60	0.12	0.01	0.05	1.75	1.42	1.55

Annual Summary - Reservoir Disinfectant Residual

Year: 2024

Waterworks Name: Township of Russell Distribution

DWS#

260092014

	Reservoir Wet Well Chlorine								
	Total			Free			Combined		
	Max	Min	Average	Max	Min	Average	Max	Min	Average
January	2.13	2.00	2.07	0.06	0.01	0.03	2.10	1.97	2.03
February	2.34	1.99	2.07	0.10	0.01	0.04	2.31	1.89	2.03
March	2.14	1.97	2.06	0.09	0.02	0.05	2.07	1.89	2.01
April	2.17	1.98	2.07	0.08	0.01	0.04	2.12	1.94	2.04
May	2.15	1.99	2.05	0.08	0.02	0.04	2.12	1.94	2.01
June	2.34	1.93	2.13	0.08	0.01	0.04	2.31	1.89	2.09
July	2.48	2.17	2.33	0.08	0.00	0.04	2.47	2.10	2.28
August	2.62	1.98	2.36	0.08	0.00	0.04	2.59	1.95	2.33
September	2.66	2.32	2.49	0.07	0.01	0.04	2.63	2.28	2.45
October	2.60	2.32	2.50	0.07	0.02	0.05	2.58	2.27	2.45
November	2.64	2.34	2.54	0.08	0.01	0.05	2.60	2.26	2.50
December	2.58	2.20	2.39	0.09	0.01	0.06	2.54	2.16	2.33
Total	2.66	1.93	2.26	0.10	0.00	0.04	2.63	1.89	2.21

Annual Summary - Embrun Distribution Disinfectant Residual

Year: 2024

Waterworks Name: Township of Russell Distribution

DWS# 260092014

	Embrun Chlorine								
	Total			Free			Combined		
	Max	Min	Average	Max	Min	Average	Max	Min	Average
January	2.12	1.29	1.84	0.09	0.01	0.05	2.07	1.20	1.79
February	2.14	1.47	1.83	0.08	0.01	0.03	2.11	1.39	1.79
March	2.09	1.11	1.74	0.09	0.01	0.04	2.03	1.06	1.70
April	2.19	1.28	1.87	0.08	0.02	0.04	2.13	1.23	1.83
May	2.12	1.41	1.81	0.10	0.01	0.05	2.06	1.35	1.77
June	2.18	1.14	1.62	0.10	0.01	0.04	2.16	1.10	1.58
July	2.44	0.71	1.72	0.06	0.01	0.02	2.39	0.70	1.69
August	2.52	0.79	1.55	0.10	0.02	0.03	2.47	0.75	1.52
September	2.56	1.18	1.83	0.10	0.02	0.04	2.54	1.15	1.80
October	2.50	0.76	1.56	0.09	0.01	0.04	2.45	0.74	1.53
November	2.66	1.00	2.05	0.11	0.01	0.04	2.62	0.96	2.01
December	2.64	0.67	1.77	0.09	0.01	0.04	2.63	0.62	1.73
Total	2.66	0.67	1.77	0.11	0.01	0.04	2.63	0.62	1.73

Annual Summary - Russell Distribution Disinfectant Residual

Year: 2024

Waterworks Name: Township of Russell Distribution

DWS# 260092014

	Russell Chlorine								
	Total			Free			Combined		
	Max	Min	Average	Max	Min	Average	Max	Min	Average
January	2.19	1.58	1.97	0.09	0.01	0.04	2.18	1.54	1.93
February	2.08	1.88	2.00	0.10	0.01	0.03	2.05	1.82	1.96
March	2.10	1.74	1.97	0.10	0.01	0.05	2.06	1.71	1.92
April	2.15	1.60	1.93	0.09	0.01	0.04	2.12	1.56	1.89
May	2.10	1.54	1.92	0.08	0.01	0.04	2.06	1.48	1.88
June	2.17	1.65	1.92	0.08	0.01	0.04	2.14	1.61	1.88
July	2.36	1.28	1.98	0.09	0.00	0.05	2.28	1.20	1.93
August	2.52	1.44	2.01	0.09	0.01	0.03	2.49	1.39	1.98
September	2.60	1.04	2.19	0.10	0.01	0.04	2.55	1.01	2.15
October	2.50	1.39	2.00	0.09	0.01	0.04	2.46	1.36	1.96
November	2.62	1.91	2.34	0.09	0.01	0.04	2.57	1.89	2.31
December	2.62	1.39	2.24	0.10	0.01	0.06	2.56	1.33	2.18
Total	2.62	1.04	2.04	0.10	0.00	0.04	2.57	1.01	2.00

Annual Summary - Marionville Distribution Disinfectant Residual

Year: 2024

Waterworks Name: Township of Russell Distribution

DWS#

260092014

	Marionville Chlorine								
	Total			Free			Combined		
	Max	Min	Average	Max	Min	Average	Max	Min	Average
January	1.87	0.80	1.48	0.09	0.01	0.04	1.85	0.72	1.45
February	1.76	0.86	1.52	0.08	0.01	0.04	1.71	0.84	1.49
March	1.79	0.98	1.46	0.09	0.01	0.05	1.76	0.93	1.41
April	1.81	0.94	1.51	0.12	0.01	0.04	1.79	0.91	1.47
May	1.83	1.06	1.48	0.07	0.01	0.04	1.80	1.02	1.44
June	1.76	0.56	1.13	0.06	0.01	0.03	1.72	0.52	0.99
July	2.01	0.62	1.15	0.08	0.00	0.03	2.01	0.59	1.12
August	2.05	0.52	1.20	0.07	0.01	0.03	2.01	0.49	1.00
September	1.92	0.56	1.02	0.10	0.01	0.03	1.89	0.43	0.91
October	1.93	0.55	0.97	0.11	0.01	0.04	1.82	0.48	0.93
November	2.07	0.54	1.19	0.12	0.00	0.05	2.04	0.51	1.06
December	2.06	0.85	1.52	0.13	0.01	0.05	2.01	0.80	1.37
Total	2.07	0.52	1.30	0.13	0.00	0.04	2.04	0.43	1.22

Monthly Summary - Ottawa Feedermain, Pumpage
Waterworks Name: Township of Russell Distribution

Year: 2024

DWS# 260092014

	Daily Flow	Litres of	KG of	M3 /1000	Mg/L	Litres of	% of Cl2	KG of Cl2	Mg/L
Jan	M³	Ammonia	Ammonia			Cl2			
1	3167	14.063	0.42	3.17	0.13	20.24	10.10	2.04	0.65
2	4687	21.609	0.65	4.69	0.14	28.81	10.10	2.91	0.62
3	2408	11.662	0.35	2.41	0.15	15.78	10.10	1.59	0.66
4	4259	19.551	0.59	4.26	0.14	25.73	10.30	2.65	0.62
5	4032	18.522	0.56	4.03	0.14	24.35	10.30	2.51	0.62
6	4009	18.865	0.57	4.01	0.14	23.67	10.30	2.44	0.61
7	4229	20.58	0.62	4.23	0.15	26.07	10.30	2.69	0.63
8	4212	20.237	0.61	4.21	0.14	24.70	10.30	2.54	0.60
9	4080	20.237	0.61	4.08	0.15	28.81	10.30	2.97	0.73
10	3712	18.522	0.56	3.71	0.15	24.70	10.30	2.54	0.69
11	3895	18.865	0.57	3.90	0.15	25.04	10.30	2.58	0.66
12	4226	21.266	0.64	4.23	0.15	26.07	10.10	2.63	0.62
13	4409	20.923	0.63	4.41	0.14	25.04	10.10	2.53	0.57
14	4251	20.58	0.62	4.25	0.15	26.07	10.10	2.63	0.62
15	3598	18.522	0.56	3.60	0.15	24.35	10.10	2.46	0.68
16	3799	20.58	0.62	3.80	0.16	26.07	10.10	2.63	0.69
17	4115	20.237	0.61	4.12	0.15	26.75	10.10	2.70	0.66
18	4099	21.266	0.64	4.10	0.16	26.75	10.10	2.70	0.66
19	4504	22.981	0.69	4.50	0.15	30.18	10.10	3.05	0.68
20	2855	14.063	0.42	2.86	0.15	18.18	10.10	1.84	0.64
21	5642	27.097	0.81	5.64	0.14	33.96	10.10	3.43	0.61
22	3015	14.749	0.44	3.02	0.15	18.52	10.10	1.87	0.62
23	3830	19.208	0.58	3.83	0.15	25.38	10.10	2.56	0.67
24	4540	23.324	0.70	4.54	0.15	31.21	10.10	3.15	0.69
25	3837	17.836	0.54	3.84	0.14	26.41	10.10	2.67	0.70
26	3735	21.609	0.65	3.74	0.17	26.07	10.10	2.63	0.70
27	4599	24.01	0.72	4.60	0.16	31.56	10.10	3.19	0.69
28	4038	20.237	0.61	4.04	0.15	27.78	10.10	2.81	0.69
29	3472	17.493	0.52	3.47	0.15	24.70	10.10	2.49	0.72
30	3943	19.894	0.60	3.94	0.15	26.41	10.30	2.72	0.69
31	4310	22.295	0.67	4.31	0.16	29.50	10.30	3.04	0.70

Max	5642								
Average	3984				0.15				0.66
Sum Total		610.88	18.33	123.51		798.85		81.20	

Monthly Summary - Ottawa Feedermain, Pumpage
Waterworks Name: Township of Russell Distribution

Year: 2024

DWS# 260092014

Feb		Daily Flow M³	Litres of Ammonia	KG of Ammonia	M3 /1000	Mg/L	Litres of Cl2	% of Cl2	KG of Cl2	Mg/L
	1	3719	17.84	0.54	3.72	0.14	25.38	10.30	2.61	0.70
	2	3621	18.52	0.56	3.62	0.15	24.70	10.30	2.54	0.70
	3	4202	20.92	0.63	4.20	0.15	29.16	10.30	3.00	0.71
	4	4351	21.95	0.66	4.35	0.15	29.84	10.30	3.07	0.71
	5	3849	18.18	0.55	3.85	0.14	23.67	10.30	2.44	0.63
	6	4185	22.64	0.68	4.19	0.16	32.24	9.80	3.16	0.76
	7	4112	19.89	0.60	4.11	0.15	30.87	9.80	3.03	0.74
	8	3908	18.18	0.55	3.91	0.14	27.44	9.80	2.69	0.69
	9	4174	21.27	0.64	4.17	0.15	30.53	9.80	2.99	0.72
	10	4484	20.92	0.63	4.48	0.14	31.21	9.80	3.06	0.68
	11	3928	19.21	0.58	3.93	0.15	28.13	9.80	2.76	0.70
	12	3714	17.84	0.54	3.71	0.14	25.04	9.80	2.45	0.66
	13	3713	18.52	0.56	3.71	0.15	24.35	9.90	2.41	0.65
	14	4344	21.27	0.64	4.34	0.15	28.13	9.90	2.78	0.64
	15	3637	20.92	0.63	3.64	0.17	30.18	9.90	2.99	0.82
	16	3943	22.98	0.69	3.94	0.17	32.59	9.90	3.23	0.82
	17	4273	20.92	0.63	4.27	0.15	30.53	9.90	3.02	0.71
	18	4730	23.67	0.71	4.73	0.15	32.93	9.90	3.26	0.69
	19	3190	15.09	0.45	3.19	0.14	21.61	9.90	2.14	0.67
	20	3326	16.46	0.49	3.33	0.15	23.67	9.90	2.34	0.70
	21	4231	21.27	0.64	4.23	0.15	29.84	9.50	2.83	0.67
	22	3663	18.18	0.55	3.66	0.15	25.73	9.50	2.44	0.67
	23	4013	20.24	0.61	4.01	0.15	28.81	9.50	2.74	0.68
	24	3558	17.49	0.52	3.56	0.15	25.73	9.50	2.44	0.69
	25	4771	23.32	0.70	4.77	0.15	33.96	9.50	3.23	0.68
	26	4207	20.58	0.62	4.21	0.15	30.53	9.50	2.90	0.69
	27	3343	16.46	0.49	3.34	0.15	23.32	9.50	2.22	0.66
	28	4266	20.58	0.62	4.27	0.14	28.81	9.80	2.82	0.66
	29	4043	19.89	0.60	4.04	0.15	27.78	9.80	2.72	0.67

Max	4771								
Average	3983				0.15				0.70
Sum Total		575.21	17.26	115.50		816.68		80.33	

Monthly Summary - Ottawa Feedermain, Pumpage

Year: 2024

Waterworks Name: Township of Russell Distribution

DWS#

260092014

March		Daily Flow M³	Litres of Ammonia	KG of Ammonia	M3 /1000	Mg/L	Litres of Cl2	% of Cl2	KG of Cl2	Mg/L
	1	3826	18.865	0.57	3.83	0.15	25.73	9.80	2.52	0.66
	2	4204	19.894	0.60	4.20	0.14	27.78	9.80	2.72	0.65
	3	3791	20.58	0.62	3.79	0.16	25.38	9.80	2.49	0.66
	4	4178	18.179	0.55	4.18	0.13	29.50	9.80	2.89	0.69
	5	4388	22.295	0.67	4.39	0.15	31.56	9.80	3.09	0.70
	6	3388	15.778	0.47	3.39	0.14	22.98	9.80	2.25	0.66
	7	3947	20.237	0.61	3.95	0.15	28.47	9.80	2.79	0.71
	8	4016	21.266	0.64	4.02	0.16	29.16	9.50	2.77	0.69
	9	3798	18.522	0.56	3.80	0.15	28.13	9.50	2.67	0.70
	10	3706	17.836	0.54	3.71	0.14	26.41	9.50	2.51	0.68
	11	4193	20.923	0.63	4.19	0.15	29.84	9.50	2.83	0.68
	12	3691	18.179	0.55	3.69	0.15	25.38	9.50	2.41	0.65
	13	3676	17.836	0.54	3.68	0.15	26.41	9.50	2.51	0.68
	14	3885	19.894	0.60	3.89	0.15	28.47	9.50	2.70	0.70
	15	3969	19.551	0.59	3.97	0.15	27.10	9.50	2.57	0.65
	16	4440	23.324	0.70	4.44	0.16	30.87	9.50	2.93	0.66
	17	3199	15.435	0.46	3.20	0.14	23.67	9.50	2.25	0.70
	18	4298	21.609	0.65	4.30	0.15	30.53	9.50	2.90	0.67
	19	3813	18.522	0.56	3.81	0.15	26.41	9.50	2.51	0.66
	20	3712	18.522	0.56	3.71	0.15	26.41	9.50	2.51	0.68
	21	4080	19.894	0.60	4.08	0.15	28.47	9.50	2.70	0.66
	22	4212	20.923	0.63	4.21	0.15	29.16	9.50	2.77	0.66
	23	3519	17.493	0.52	3.52	0.15	24.35	9.40	2.29	0.65
	24	4361	21.609	0.65	4.36	0.15	29.50	9.40	2.77	0.64
	25	4072	20.923	0.63	4.07	0.15	29.84	9.40	2.81	0.69
	26	4061	20.923	0.63	4.06	0.15	30.53	9.40	2.87	0.71
	27	4081	22.295	0.67	4.08	0.16	34.64	9.40	3.26	0.80
	28	3817	20.58	0.62	3.82	0.16	30.18	9.40	2.84	0.74
	29	4298	22.981	0.69	4.30	0.16	33.27	9.40	3.13	0.73
	30	3730	19.551	0.59	3.73	0.16	28.47	9.40	2.68	0.72
	31	4806	25.725	0.77	4.81	0.16	36.36	9.40	3.42	0.71

Max	4806								
Average	3973				0.15				0.68
Sum Total		620.14	18.60	123.16		884.94		84.37	

Monthly Summary - Ottawa Feedermain, Pumpage

Year: 2024

Waterworks Name: Township of Russell Distribution

DWS#

260092014

Apr	Daily Flow M³	Litres of Ammonia	KG of Ammonia	M3 /1000	Mg/L	Litres of Cl2	% of Cl2	KG of Cl2	Mg/L
1	4354	22.98	0.69	4.35	0.16	32.24	9.40	3.03	0.70
2	3574	18.52	0.56	3.57	0.16	27.78	9.40	2.61	0.73
3	3667	19.89	0.60	3.67	0.16	26.75	9.40	2.51	0.69
4	4079	21.27	0.64	4.08	0.16	30.53	9.50	2.90	0.71
5	3501	18.18	0.55	3.50	0.16	25.73	9.50	2.44	0.70
6	4767	25.73	0.77	4.77	0.16	36.36	9.10	3.31	0.69
7	4408	22.98	0.69	4.41	0.16	34.30	9.10	3.12	0.71
8	3411	18.52	0.56	3.41	0.16	26.07	9.10	2.37	0.70
9	4456	23.67	0.71	4.46	0.16	35.67	9.10	3.25	0.73
10	3461	18.52	0.56	3.46	0.16	26.75	9.10	2.43	0.70
11	4110	22.64	0.68	4.11	0.17	31.56	9.10	2.87	0.70
12	4292	21.61	0.65	4.29	0.15	27.44	10.70	2.94	0.68
13	3805	20.92	0.63	3.81	0.16	24.35	10.70	2.61	0.68
14	3862	21.61	0.65	3.86	0.17	25.38	10.70	2.72	0.70
15	4823	25.38	0.76	4.82	0.16	30.53	10.70	3.27	0.68
16	4060	21.95	0.66	4.06	0.16	26.75	10.70	2.86	0.71
17	4099	21.95	0.66	4.10	0.16	27.10	10.70	2.90	0.71
18	3899	20.58	0.62	3.90	0.16	26.07	10.70	2.79	0.72
19	3985	19.89	0.60	3.99	0.15	24.35	10.70	2.61	0.65
20	3664	18.18	0.55	3.66	0.15	22.30	10.70	2.39	0.65
21	4853	24.35	0.73	4.85	0.15	27.78	10.70	2.97	0.61
22	3981	19.89	0.60	3.98	0.15	24.35	10.70	2.61	0.65
23	3621	17.84	0.54	3.62	0.15	22.98	10.20	2.34	0.65
24	4023	19.89	0.60	4.02	0.15	26.41	10.20	2.69	0.67
25	4316	21.61	0.65	4.32	0.15	29.16	10.20	2.97	0.69
26	3740	18.52	0.56	3.74	0.15	24.70	10.20	2.52	0.67
27	5535	26.07	0.78	5.54	0.14	36.70	10.20	3.74	0.68
28	4470	22.98	0.69	4.47	0.15	28.47	10.20	2.90	0.65
29	2671	12.69	0.38	2.67	0.14	17.84	10.20	1.82	0.68
30	4004	22.30	0.67	4.00	0.17	24.01	10.70	2.57	0.64

Max	5535								
Average	4050				0.16				0.68
Sum Total		631.12	18.93	121.49		830.40		83.07	

Monthly Summary - Ottawa Feedermain, Pumpage
Waterworks Name: Township of Russell Distribution

Year: 2024
DWS# 260092014

May		Daily Flow M³	Litres of Ammonia	KG of Ammonia	M3 /1000	Mg/L	Litres of Cl2	% of Cl2	KG of Cl2	Mg/L
	1	4152	20.58	0.62	4.15	0.15	25.04	10.70	2.68	0.65
	2	3805	18.87	0.57	3.81	0.15	23.32	10.70	2.50	0.66
	3	4272	21.27	0.64	4.27	0.15	25.73	10.70	2.75	0.64
	4	4592	22.64	0.68	4.59	0.15	28.47	10.70	3.05	0.66
	5	4350	21.61	0.65	4.35	0.15	27.78	10.70	2.97	0.68
	6	4629	22.98	0.69	4.63	0.15	27.78	10.70	2.97	0.64
	7	4039	20.58	0.62	4.04	0.15	24.70	10.50	2.59	0.64
	8	4544	22.98	0.69	4.54	0.15	28.47	10.50	2.99	0.66
	9	3986	19.55	0.59	3.99	0.15	24.70	10.50	2.59	0.65
	10	4160	22.98	0.69	4.16	0.17	27.78	10.50	2.92	0.70
	11	4390	19.89	0.60	4.39	0.14	27.44	10.50	2.88	0.66
	12	4106	20.24	0.61	4.11	0.15	24.01	10.50	2.52	0.61
	13	4865	24.35	0.73	4.87	0.15	30.87	10.50	3.24	0.67
	14	4054	21.27	0.64	4.05	0.16	24.70	10.30	2.54	0.63
	15	4799	23.67	0.71	4.80	0.15	30.18	10.30	3.11	0.65
	16	3924	19.21	0.58	3.92	0.15	24.70	10.30	2.54	0.65
	17	4976	24.70	0.74	4.98	0.15	31.90	10.30	3.29	0.66
	18	4333	21.95	0.66	4.33	0.15	25.73	10.30	2.65	0.61
	19	5594	28.13	0.84	5.59	0.15	36.02	10.30	3.71	0.66
	20	4889	24.01	0.72	4.89	0.15	30.18	10.80	3.26	0.67
	21	5343	26.75	0.80	5.34	0.15	35.33	10.30	3.64	0.68
	22	4476	23.67	0.71	4.48	0.16	27.44	10.50	2.88	0.64
	23	4544	22.98	0.69	4.54	0.15	27.78	10.50	2.92	0.64
	24	4712	24.35	0.73	4.71	0.16	29.16	10.50	3.06	0.65
	25	4517	21.95	0.66	4.52	0.15	27.78	10.50	2.92	0.65
	26	5315	26.75	0.80	5.32	0.15	31.90	10.50	3.35	0.63
	27	3889	19.21	0.58	3.89	0.15	24.01	10.50	2.52	0.65
	28	4713	23.32	0.70	4.71	0.15	28.47	10.50	2.99	0.63
	29	3980	20.58	0.62	3.98	0.16	30.87	10.20	3.15	0.79
	30	4758	26.07	0.78	4.76	0.16	37.39	10.20	3.81	0.80
	31	4234	22.30	0.67	4.23	0.16	33.61	10.20	3.43	0.81

Max	5594								
Average	4482				0.15				0.67
Sum Total		699.38	20.98	138.94		883.23		92.42	

Monthly Summary - Ottawa Feedermain, Pumpage
Waterworks Name: Township of Russell Distribution

Year: 2024
DWS# 260092014

June	Daily Flow M³	Litres of Ammonia	KG of Ammonia	M3 /1000	Mg/L	Litres of Cl2	% of Cl2	KG of Cl2	Mg/L
1	5408	29.16	0.87	5.41	0.16	42.88	10.20	4.37	0.81
2	4870	25.73	0.77	4.87	0.16	37.73	10.20	3.85	0.79
3	5364	28.47	0.85	5.36	0.16	41.16	10.20	4.20	0.78
4	4474	24.01	0.72	4.47	0.16	37.04	10.20	3.78	0.84
5	4994	26.41	0.79	4.99	0.16	38.07	10.20	3.88	0.78
6	5316	29.16	0.87	5.32	0.16	42.19	10.20	4.30	0.81
7	3467	17.84	0.54	3.47	0.15	24.70	10.20	2.52	0.73
8	4205	22.98	0.69	4.21	0.16	29.50	10.20	3.01	0.72
9	4117	22.30	0.67	4.12	0.16	27.78	10.20	2.83	0.69
10	4187	23.32	0.70	4.19	0.17	28.81	10.20	2.94	0.70
11	4497	27.10	0.81	4.50	0.18	32.93	10.00	3.29	0.73
12	3889	22.98	0.69	3.89	0.18	28.47	10.00	2.85	0.73
13	4781	29.50	0.88	4.78	0.19	36.36	10.00	3.64	0.76
14	3908	17.84	0.54	3.91	0.14	31.21	10.00	3.12	0.80
15	4981	29.16	0.87	4.98	0.18	39.10	10.00	3.91	0.79
16	5365	33.61	1.01	5.37	0.19	42.19	10.00	4.22	0.79
17	4055	25.04	0.75	4.06	0.19	29.50	10.00	2.95	0.73
18	5107	32.93	0.99	5.11	0.19	39.10	9.90	3.87	0.76
19	6131	39.45	1.18	6.13	0.19	55.57	9.90	5.50	0.90
20	4766	29.16	0.87	4.77	0.18	41.16	9.90	4.07	0.85
21	4299	25.73	0.77	4.30	0.18	36.02	9.90	3.57	0.83
22	4373	26.07	0.78	4.37	0.18	34.64	9.80	3.40	0.78
23	4241	28.13	0.84	4.24	0.20	36.36	9.80	3.56	0.84
24	4128	26.07	0.78	4.13	0.19	33.61	9.80	3.29	0.80
25	4446	28.47	0.85	4.45	0.19	37.04	9.80	3.63	0.82
26	4378	28.13	0.84	4.38	0.19	37.39	9.80	3.66	0.84
27	4712	29.50	0.88	4.71	0.19	42.88	9.80	4.20	0.89
28	3972	25.73	0.77	3.97	0.19	34.99	9.60	3.36	0.85
29	4190	24.70	0.74	4.19	0.18	37.04	9.60	3.56	0.85
30	4255	26.07	0.78	4.26	0.18	39.79	9.60	3.82	0.90

Max	6131								
Average	4563				0.18				0.80
Sum Total		804.68	24.14	136.88		1095.20		109.16	

Monthly Summary - Ottawa Feedermain, Pumpage
Waterworks Name: Township of Russell Distribution

Year: 2024

DWS# 260092014

July	Daily Flow M³	Litres of Ammonia	KG of Ammonia	M3 /1000	Mg/L	Litres of Cl2	% of Cl2	KG of Cl2	Mg/L
1	3783	24.35	0.73	3.78	0.19	34.30	9.60	3.29	0.87
2	5013	31.21	0.94	5.01	0.19	44.59	9.60	4.28	0.85
3	4868	30.53	0.92	4.87	0.19	43.56	9.20	4.01	0.82
4	5438	32.24	0.97	5.44	0.18	50.42	9.20	4.64	0.85
5	3930	23.32	0.70	3.93	0.18	38.07	9.20	3.50	0.89
6	4647	29.84	0.90	4.65	0.19	45.28	9.20	4.17	0.90
7	4934	32.24	0.97	4.93	0.20	46.31	9.20	4.26	0.86
8	4079	27.78	0.83	4.08	0.20	41.50	9.20	3.82	0.94
9	4955	33.96	1.02	4.96	0.21	44.25	10.20	4.51	0.91
10	4370	32.24	0.97	4.37	0.22	42.19	10.20	4.30	0.98
11	4197	31.21	0.94	4.20	0.22	41.16	10.20	4.20	1.00
12	3467	27.78	0.83	3.47	0.24	33.61	10.20	3.43	0.99
13	4967	39.45	1.18	4.97	0.24	45.28	10.50	4.75	0.96
14	3703	28.47	0.85	3.70	0.23	36.02	10.50	3.78	1.02
15	4811	36.36	1.09	4.81	0.23	44.59	10.50	4.68	0.97
16	4644	35.33	1.06	4.64	0.23	48.02	10.50	5.04	1.09
17	4577	31.56	0.95	4.58	0.21	46.99	10.50	4.93	1.08
18	3985	27.78	0.83	3.99	0.21	42.53	10.00	4.25	1.07
19	4182	24.35	0.73	4.18	0.17	42.88	10.00	4.29	1.03
20	5272	28.47	0.85	5.27	0.16	56.60	10.00	5.66	1.07
21	3624	17.84	0.54	3.62	0.15	39.10	10.00	3.91	1.08
22	4710	35.33	1.06	4.71	0.23	51.79	10.00	5.18	1.10
23	4766	42.53	1.28	4.77	0.27	50.76	9.80	4.97	1.04
24	4708	43.22	1.30	4.71	0.28	49.39	9.80	4.84	1.03
25	4146	36.70	1.10	4.15	0.27	45.96	9.80	4.50	1.09
26	4309	37.04	1.11	4.31	0.26	46.31	9.80	4.54	1.05
27	4161	32.24	0.97	4.16	0.23	42.53	9.70	4.13	0.99
28	4719	33.61	1.01	4.72	0.21	50.42	9.70	4.89	1.04
29	4535	34.30	1.03	4.54	0.23	49.74	9.70	4.82	1.06
30	4636	34.64	1.04	4.64	0.22	55.91	9.70	5.42	1.17
31	4568	39.45	1.18	4.57	0.26	54.19	9.70	5.26	1.15

Max	5438								
Average	4474				0.22				1.00
Sum Total		995.39	29.86	138.70		1404.24		138.27	

Monthly Summary - Ottawa Feedermain, Pumpage

Year: 2024

Waterworks Name: Township of Russell Distribution

DWS# 260092014

Aug		Daily Flow M³	Litres of Ammonia	KG of Ammonia	M3 /1000	Mg/L	Litres of Cl2	% of Cl2	KG of Cl2	Mg/L
1		4090	28.47	0.85	4.09	0.21	50.42	9.30	4.69	1.15
2		4930	40.13	1.20	4.93	0.24	58.31	9.30	5.42	1.10
3		5790	43.90	1.32	5.79	0.23	71.69	9.30	6.67	1.15
4		4668	34.99	1.05	4.67	0.22	59.34	9.30	5.52	1.18
5		5458	45.62	1.37	5.46	0.25	67.91	9.30	6.32	1.16
6		2786	25.38	0.76	2.79	0.27	37.04	9.30	3.45	1.24
7		5295	49.39	1.48	5.30	0.28	74.09	9.30	6.89	1.30
8		4757	45.62	1.37	4.76	0.29	69.97	8.90	6.23	1.31
9		4806	45.96	1.38	4.81	0.29	71.00	8.90	6.32	1.31
10		4920	46.65	1.40	4.92	0.28	72.72	9.00	6.54	1.33
11		3715	38.07	1.14	3.72	0.31	59.00	9.00	5.31	1.43
12		5111	56.60	1.70	5.11	0.33	90.21	9.00	8.12	1.59
13		4805	55.57	1.67	4.81	0.35	86.78	9.00	7.81	1.63
14		5422	63.46	1.90	5.42	0.35	108.05	8.80	9.51	1.75
15		4561	53.17	1.59	4.56	0.35	86.78	8.80	7.64	1.67
16		5173	54.88	1.65	5.17	0.32	93.30	8.70	8.12	1.57
17		5026	47.33	1.42	5.03	0.28	79.92	8.60	6.87	1.37
18		3690	32.93	0.99	3.69	0.27	56.25	8.60	4.84	1.31
19		5112	48.02	1.44	5.11	0.28	82.32	8.60	7.08	1.38
20		4399	41.85	1.26	4.40	0.29	68.94	8.60	5.93	1.35
21		4542	45.28	1.36	4.54	0.30	66.54	9.80	6.52	1.44
22		4378	51.79	1.55	4.38	0.35	73.06	9.80	7.16	1.64
23		4666	55.91	1.68	4.67	0.36	78.55	10.20	8.01	1.72
24		4699	56.60	1.70	4.70	0.36	76.83	10.20	7.84	1.67
25		4598	54.88	1.65	4.60	0.36	73.40	10.20	7.49	1.63
26		5081	60.03	1.80	5.08	0.35	78.55	10.20	8.01	1.58
27		4977	56.60	1.70	4.98	0.34	72.37	10.20	7.38	1.48
28		4904	57.97	1.74	4.90	0.35	73.06	10.20	7.45	1.52
29		5571	65.17	1.96	5.57	0.35	84.72	10.20	8.64	1.55
30		5393	62.77	1.88	5.39	0.35	81.63	10.00	8.16	1.51
31		4084	40.13	1.20	4.08	0.29	54.54	10.00	5.45	1.34

Max	5790								
Average	4755				0.31				1.43
Sum Total		1505.08	45.15	147.41		2257.28		211.38	

Monthly Summary - Ottawa Feedermain, Pumpage

Year: 2024

Waterworks Name: Township of Russell Distribution

DWS# 260092014

Sept	Daily Flow M³	Litres of Ammonia	KG of Ammonia	M3 /1000	Mg/L	Litres of Cl2	% of Cl2	KG of Cl2	Mg/L
1	4245	45.62	1.37	4.25	0.32	57.28	10.00	5.73	1.35
2	4733	49.74	1.49	4.73	0.32	65.17	10.00	6.52	1.38
3	5064	49.39	1.48	5.06	0.29	64.14	10.00	6.41	1.27
4	4740	45.28	1.36	4.74	0.29	57.62	10.00	5.76	1.22
5	5314	53.17	1.59	5.31	0.30	65.51	10.00	6.55	1.23
6	4418	38.42	1.15	4.42	0.26	53.85	9.50	5.12	1.16
7	4938	41.50	1.25	4.94	0.25	54.19	9.50	5.15	1.04
8	5106	41.50	1.25	5.11	0.24	58.65	9.50	5.57	1.09
9	3448	28.13	0.84	3.45	0.24	39.10	9.50	3.71	1.08
10	4803	38.07	1.14	4.80	0.24	52.48	9.20	4.83	1.01
11	5382	45.96	1.38	5.38	0.26	62.08	9.20	5.71	1.06
12	4156	29.84	0.90	4.16	0.22	47.68	9.20	4.39	1.06
13	4489	37.04	1.11	4.49	0.25	53.51	9.20	4.92	1.10
14	5816	47.68	1.43	5.82	0.25	63.11	9.60	6.06	1.04
15	4251	35.33	1.06	4.25	0.25	50.42	9.60	4.84	1.14
16	5243	43.22	1.30	5.24	0.25	55.22	9.60	5.30	1.01
17	4460	36.36	1.09	4.46	0.24	43.22	9.60	4.15	0.93
18	5705	47.33	1.42	5.71	0.25	62.77	9.40	5.90	1.03
19	4715	39.10	1.17	4.72	0.25	52.48	9.40	4.93	1.05
20	4419	37.73	1.13	4.42	0.26	50.08	9.40	4.71	1.07
21	6217	51.45	1.54	6.22	0.25	72.03	9.30	6.70	1.08
22	5205	43.56	1.31	5.21	0.25	63.80	9.30	5.93	1.14
23	4336	36.36	1.09	4.34	0.25	53.17	9.30	4.94	1.14
24	4504	36.36	1.09	4.50	0.24	55.91	9.30	5.20	1.15
25	4816	37.04	1.11	4.82	0.23	57.62	9.10	5.24	1.09
26	4481	36.70	1.10	4.48	0.25	55.91	9.10	5.09	1.14
27	4614	36.70	1.10	4.61	0.24	58.65	9.10	5.34	1.16
28	4654	38.76	1.16	4.65	0.25	59.00	8.80	5.19	1.12
29	4745	39.79	1.19	4.75	0.25	59.68	8.80	5.25	1.11
30	4962	42.88	1.29	4.96	0.26	64.48	8.80	5.67	1.14

Max	6217								
Average	4799				0.26				1.12
Sum Total		1230.00	36.90	143.98		1708.83		160.83	

Monthly Summary - Ottawa Feedermain, Pumpage
Waterworks Name: Township of Russell Distribution

Year: 2024
DWS# 260092014

Oct	Daily Flow M³	Litres of Ammonia	KG of Ammonia	M3 /1000	Mg/L	Litres of Cl2	% of Cl2	KG of Cl2	Mg/L
1	4860	41.85	1.26	4.86	0.26	66.20	8.80	5.83	1.20
2	4499	38.42	1.15	4.50	0.26	61.40	8.70	5.34	1.19
3	4378	37.39	1.12	4.38	0.26	58.65	8.70	5.10	1.17
4	4235	34.64	1.04	4.24	0.25	55.57	8.70	4.83	1.14
5	5229	42.19	1.27	5.23	0.24	61.40	9.80	6.02	1.15
6	4829	43.56	1.31	4.83	0.27	62.43	9.80	6.12	1.27
7	4325	39.45	1.18	4.33	0.27	56.60	9.80	5.55	1.28
8	4728	42.88	1.29	4.73	0.27	58.65	9.80	5.75	1.22
9	4355	39.45	1.18	4.36	0.27	54.54	9.80	5.34	1.23
10	5242	49.05	1.47	5.24	0.28	63.11	10.30	6.50	1.24
11	3840	34.99	1.05	3.84	0.27	45.62	10.30	4.70	1.22
12	5197	49.39	1.48	5.20	0.29	59.68	10.50	6.27	1.21
13	4830	43.90	1.32	4.83	0.27	56.94	10.50	5.98	1.24
14	4241	37.04	1.11	4.24	0.26	49.05	10.50	5.15	1.21
15	4741	41.16	1.23	4.74	0.26	53.85	10.50	5.65	1.19
16	4498	39.10	1.17	4.50	0.26	52.14	10.50	5.47	1.22
17	4745	41.16	1.23	4.75	0.26	52.14	10.50	5.47	1.15
18	4447	37.04	1.11	4.45	0.25	47.68	10.50	5.01	1.13
19	5519	45.28	1.36	5.52	0.25	55.91	10.50	5.87	1.06
20	4120	34.30	1.03	4.12	0.25	40.13	10.50	4.21	1.02
21	4629	38.42	1.15	4.63	0.25	46.31	10.50	4.86	1.05
22	4896	39.45	1.18	4.90	0.24	49.39	10.30	5.09	1.04
23	4777	38.07	1.14	4.78	0.24	48.71	10.30	5.02	1.05
24	4844	40.13	1.20	4.84	0.25	49.74	10.30	5.12	1.06
25	3532	29.84	0.90	3.53	0.25	36.36	10.30	3.74	1.06
26	4911	40.13	1.20	4.91	0.25	46.65	10.40	4.85	0.99
27	4386	38.07	1.14	4.39	0.26	44.59	10.40	4.64	1.06
28	4285	33.27	1.00	4.29	0.23	43.56	10.40	4.53	1.06
29	4113	34.30	1.03	4.11	0.25	43.90	10.40	4.57	1.11
30	4207	31.56	0.95	4.21	0.23	44.25	10.40	4.60	1.09
31	4330	36.02	1.08	4.33	0.25	43.56	10.20	4.44	1.03

Max	5519								
Average	4573				0.26				1.14
Sum Total		1211.48	36.34	141.77		1608.67		161.63	

Monthly Summary - Ottawa Feedermain, Pumpage
Waterworks Name: Township of Russell Distribution

Year: 2024
DWS# 260092014

Nov	Daily Flow M³	Litres of Ammonia	KG of Ammonia	M3 /1000	Mg/L	Litres of Cl2	% of Cl2	KG of Cl2	Mg/L
1	4365	37.73	1.13	4.37	0.26	48.36	10.20	4.93	1.13
2	4009	34.99	1.05	4.01	0.26	44.59	10.20	4.55	1.13
3	4779	40.82	1.22	4.78	0.26	51.45	10.20	5.25	1.10
4	4672	37.04	1.11	4.67	0.24	50.42	10.20	5.14	1.10
5	4125	34.30	1.03	4.13	0.25	48.36	9.40	4.55	1.10
6	4322	36.70	1.10	4.32	0.25	50.42	9.40	4.74	1.10
7	4451	36.70	1.10	4.45	0.25	51.45	9.40	4.84	1.09
8	3814	30.87	0.93	3.81	0.24	45.62	9.40	4.29	1.12
9	3966	30.53	0.92	3.97	0.23	40.82	9.70	3.96	1.00
10	4469	33.27	1.00	4.47	0.22	44.93	9.70	4.36	0.98
11	4423	31.90	0.96	4.42	0.22	43.90	9.70	4.26	0.96
12	4218	29.84	0.90	4.22	0.21	41.16	9.70	3.99	0.95
13	4357	29.84	0.90	4.36	0.21	40.13	9.70	3.89	0.89
14	3857	25.38	0.76	3.86	0.20	34.64	9.70	3.36	0.87
15	4290	28.81	0.86	4.29	0.20	37.39	9.70	3.63	0.85
16	4581	28.81	0.86	4.58	0.19	40.47	9.70	3.93	0.86
17	4545	29.16	0.87	4.55	0.19	41.16	9.70	3.99	0.88
18	3634	23.67	0.71	3.63	0.20	32.93	9.70	3.19	0.88
19	3728	22.64	0.68	3.73	0.18	30.87	9.70	2.99	0.80
20	4178	22.98	0.69	4.18	0.17	31.21	9.80	3.06	0.73
21	4107	24.70	0.74	4.11	0.18	30.87	9.80	3.03	0.74
22	3902	21.95	0.66	3.90	0.17	27.10	9.80	2.66	0.68
23	4156	23.32	0.70	4.16	0.17	31.21	9.80	3.06	0.74
24	3330	17.49	0.52	3.33	0.16	24.35	9.80	2.39	0.72
25	4423	27.44	0.82	4.42	0.19	33.61	9.80	3.29	0.74
26	4109	19.89	0.60	4.11	0.15	32.93	9.80	3.23	0.79
27	3934	22.64	0.68	3.93	0.17	30.87	9.80	3.03	0.77
28	3776	25.73	0.77	3.78	0.20	37.39	9.70	3.63	0.96
29	3945	24.35	0.73	3.95	0.19	38.07	9.70	3.69	0.94
30	3842	24.35	0.73	3.84	0.19	36.70	9.70	3.56	0.93

Max	4779								
Average	4144				0.21				0.92
Sum Total		857.84	25.74	124.31		1173.40		114.45	

Monthly Summary - Ottawa Feedermain, Pumpage
Waterworks Name: Township of Russell Distribution

Year: 2024

DWS# 260092014

Dec	Daily Flow M³	Litres of Ammonia	KG of Ammonia	M3 /1000	Mg/L	Litres of Cl2	% of Cl2	KG of Cl2	Mg/L
1	4949	31.56	0.95	4.95	0.19	48.02	9.70	4.66	0.94
2	4041	25.38	0.76	4.04	0.19	38.76	9.70	3.76	0.93
3	3562	21.61	0.65	3.56	0.18	30.87	9.70	2.99	0.84
4	3959	24.35	0.73	3.96	0.18	36.02	9.60	3.46	0.87
5	4006	23.32	0.70	4.01	0.17	36.70	9.60	3.52	0.88
6	3873	21.95	0.66	3.87	0.17	34.30	9.60	3.29	0.85
7	3859	21.95	0.66	3.86	0.17	34.30	9.60	3.29	0.85
8	4713	26.41	0.79	4.71	0.17	41.50	9.60	3.98	0.85
9	3697	20.92	0.63	3.70	0.17	32.93	9.60	3.16	0.86
10	4123	23.67	0.71	4.12	0.17	36.36	9.60	3.49	0.85
11	4133	23.32	0.70	4.13	0.17	35.33	10.20	3.60	0.87
12	3922	22.30	0.67	3.92	0.17	32.93	10.20	3.36	0.86
13	4060	23.32	0.70	4.06	0.17	34.99	10.20	3.57	0.88
14	5132	29.84	0.90	5.13	0.17	42.53	10.40	4.42	0.86
15	4115	23.67	0.71	4.12	0.17	33.96	10.40	3.53	0.86
16	3274	18.52	0.56	3.27	0.17	27.10	10.40	2.82	0.86
17	4138	23.67	0.71	4.14	0.17	34.64	10.40	3.60	0.87
18	4273	24.70	0.74	4.27	0.17	33.61	10.40	3.50	0.82
19	3618	21.27	0.64	3.62	0.18	27.78	10.40	2.89	0.80
20	4041	22.98	0.69	4.04	0.17	31.90	10.40	3.32	0.82
21	4289	24.35	0.73	4.29	0.17	32.93	10.50	3.46	0.81
22	4607	26.41	0.79	4.61	0.17	34.64	10.50	3.64	0.79
23	3395	20.24	0.61	3.40	0.18	25.73	10.50	2.70	0.80
24	4186	23.32	0.70	4.19	0.17	31.21	10.50	3.28	0.78
25	3549	20.58	0.62	3.55	0.17	26.75	10.50	2.81	0.79
26	5152	27.10	0.81	5.15	0.16	37.04	10.50	3.89	0.75
27	3093	16.12	0.48	3.09	0.16	22.64	10.50	2.38	0.77
28	4687	25.73	0.77	4.69	0.16	33.96	10.10	3.43	0.73
29	3625	18.52	0.56	3.63	0.15	27.44	10.10	2.77	0.76
30	3945	21.95	0.66	3.95	0.17	30.18	10.10	3.05	0.77
31	3610	17.84	0.54	3.61	0.15	26.07	10.10	2.63	0.73

Max	5152								
Average	4052				0.17				0.83
Sum Total		716.87	21.51	125.63		1033.12		104.26	

Annual Summary - Ottawa Feedermain, Pumpage
Waterworks Name: Township of Russell Distribution

Year: 2024
DWS# 260092014

	Monthly Flow M ³	Litres of Ammonia	KG of Ammonia	M3 /1000	Mg/L	Litres of Cl2	KG of Cl2	Mg/L
January	123,507	611	18.33	123.507	0.15	799	81.20	0.66
February	111,455	555	16.66	111.455	0.15	789	77.61	0.70
March	123,155	620	18.60	123.155	0.15	885	84.37	0.69
April	121,491	631	18.93	121.491	0.16	830	83.07	0.68
May	138,940	699	20.98	138.94	0.15	883	92.42	0.67
June	136,876	805	24.14	136.876	0.18	1095	109.16	0.80
July	138,704	995	29.86	138.704	0.22	1404	138.27	1.00
August	147,407	1505	45.15	147.407	0.31	2257	211.38	1.43
September	143,979	1230	36.90	143.979	0.26	1709	160.83	1.12
October	141,768	1211	36.34	141.768	0.26	1609	161.63	1.14
November	124,307	858	25.74	124.307	0.21	1173	114.45	0.92
December	125,626	717	21.51	125.626	0.17	1033	104.26	0.83
Total	1,577,215	10438	313	1577	0.20	14467	1419	0.90

Annual Summary - Reservoir In-House Testing

Year: 2024

Waterworks Name: Township of Russell Distribution

DWS# 260092014

	Colour			pH		
Reservoir	Max	Min	Average	Max	Min	Average
January	3	0	1	9.23	8.50	8.93
February	5	0	1	9.00	8.22	8.59
March	3	0	1	8.89	8.21	8.62
April	4	0	0	8.88	8.08	8.68
May	3	0	1	9.06	8.53	8.73
June	4	0	1	9.06	8.63	8.92
July	2	0	1	9.08	8.55	8.88
August	3	0	0	8.96	8.45	8.75
September	3	0	1	9.24	8.24	8.81
October	2	0	0	8.92	7.82	8.60
November	2	0	0	8.70	7.90	8.39
December	2	0	0	8.42	7.10	7.95
Total	5	0	1	9.24	7.10	8.65

	Temperature (C°)			Turbidity		
Reservoir	Max	Min	Average	Max	Min	Average
January	10.4	5.0	7.6	0.17	0.06	0.09
February	9.0	4.2	6.6	0.13	0.06	0.08
March	12.2	4.3	7.8	0.15	0.07	0.10
April	12.0	5.3	8.2	0.14	0.03	0.10
May	12.4	7.2	10.1	0.17	0.08	0.11
June	17.9	12.0	14.5	0.25	0.09	0.13
July	19.2	15.3	17.4	0.28	0.08	0.13
August	21.1	18.1	19.5	0.20	0.08	0.12
September	20.2	18.1	19.0	0.18	0.07	0.12
October	19.0	15.7	17.0	0.29	0.08	0.13
November	16.4	12.3	14.2	0.17	0.08	0.12
December	15.5	9.8	12.1	0.28	0.08	0.12
Total	21.1	4.2	12.8	0.29	0.03	0.11

Annual Summary - Embrun Distribution In-House Testing
Waterworks Name: Township of Russell Distribution

Year: 2024

DWS# 260092014

	Colour			pH		
Embrun	Max	Min	Average	Max	Min	Average
January	3	0	1	9.19	8.57	8.85
February	5	0	1	8.89	7.87	8.51
March	4	0	1	8.87	8.00	8.55
April	4	0	1	8.85	8.11	8.65
May	5	0	1	9.00	8.38	8.65
June	3	0	0	9.02	8.55	8.87
July	3	0	0	9.04	8.49	8.83
August	2	0	0	8.89	8.44	8.69
September	4	0	0	9.07	8.57	8.87
October	4	0	1	9.03	8.24	8.67
November	3	0	0	8.69	7.18	8.31
December	3	0	0	8.58	7.00	7.89
Total	5	0	1	9.19	7.00	8.61

	Temperature (C°)			Turbidity		
Embrun	Max	Min	Average	Max	Min	Average
January	12.3	6.3	8.6	0.26	0.08	0.14
February	8.4	6.2	7.2	0.22	0.07	0.12
March	13.2	5.6	7.4	0.25	0.08	0.15
April	13.6	6.8	8.5	0.33	0.08	0.14
May	15.3	8.8	11.3	0.36	0.10	0.15
June	19.5	13.2	15.4	0.21	0.09	0.14
July	20.2	15.9	17.9	0.33	0.10	0.15
August	21.8	18.7	19.7	0.31	0.10	0.16
September	20.5	18.3	19.5	0.24	0.08	0.15
October	20.0	16.1	18.1	0.55	0.09	0.18
November	17.7	12.5	15.3	0.22	0.09	0.15
December	15.7	8.4	12.0	0.30	0.12	0.17
Total	21.8	5.6	13.4	0.55	0.07	0.15

Annual Summary - Russell Distribution In-House Testing

Year: 2024

Waterworks Name: Township of Russell Distribution

DWS# 260092014

	Colour			pH		
Russell	Max	Min	Average	Max	Min	Average
January	4	0	1	9.22	8.65	8.89
February	4	0	1	8.98	8.29	8.58
March	5	0	1	8.88	8.17	8.64
April	3	0	1	8.90	8.51	8.68
May	4	0	1	9.05	8.22	8.65
June	4	0	0	9.04	8.61	8.88
July	4	0	1	9.05	8.71	8.87
August	3	0	0	8.89	8.60	8.73
September	2	0	0	9.15	8.29	8.84
October	4	0	0	9.04	8.10	8.72
November	2	0	0	8.69	7.51	8.31
December	4	0	0	8.58	7.15	7.97
Total	5	0	1	9.22	7.15	8.65

	Temperature (C°)			Turbidity		
Russell	Max	Min	Average	Max	Min	Average
January	10.1	5.7	8.2	0.43	0.08	0.16
February	12.2	5.9	7.1	0.39	0.09	0.16
March	9.4	5.8	7.0	0.32	0.08	0.14
April	11.2	6.3	8.3	0.28	0.09	0.17
May	15.9	7.6	11.3	0.23	0.09	0.15
June	18.8	12.3	15.1	0.35	0.11	0.16
July	20.9	15.9	17.9	0.35	0.10	0.15
August	21.2	18.2	19.8	0.27	0.10	0.17
September	21.7	17.2	19.5	0.28	0.09	0.14
October	20.6	15.9	18.2	0.31	0.09	0.15
November	17.0	13.3	15.2	0.23	0.08	0.14
December	14.6	8.0	12.0	0.23	0.08	0.14
Total	21.7	5.7	13.28	0.4	0.08	0.15

Annual Summary - Marionville Distribution In-House Testing
Waterworks Name: Township of Russell Distribution

Year: 2024
DWS# 260092014

	Colour			pH		
Marionville	Max	Min	Average	Max	Min	Average
January	6	0	2	9.10	8.61	8.82
February	4	0	1	8.82	8.31	8.53
March	4	0	1	8.85	7.88	8.52
April	4	0	1	8.80	8.40	8.56
May	5	0	1	8.86	8.20	8.53
June	4	0	0	8.95	8.11	8.58
July	4	0	1	8.94	8.38	8.69
August	3	0	0	8.86	8.11	8.59
September	3	0	0	9.02	8.15	8.60
October	3	0	1	9.03	8.08	8.61
November	3	0	1	8.70	7.70	8.23
December	4	0	0	8.53	7.29	7.94
Total	6	0	1	9.10	7.29	8.52

	Temperature (C°)			Turbidity		
Marionville	Max	Min	Average	Max	Min	Average
January	9.6	2.3	6.8	0.50	0.11	0.25
February	8.2	2.1	6.3	0.53	0.11	0.20
March	10.1	5.9	7.2	0.41	0.11	0.22
April	11.4	4.4	8.4	0.47	0.11	0.26
May	15.9	8.7	11.8	0.47	0.11	0.23
June	19.2	12.8	15.6	0.35	0.10	0.22
July	19.6	16.4	18.0	0.31	0.11	0.20
August	20.8	17.8	19.0	0.35	0.11	0.21
September	21.6	17.7	18.5	0.38	0.11	0.21
October	19.0	11.4	16.0	0.29	0.09	0.19
November	15.4	6.4	13.0	0.34	0.09	0.20
December	12.8	2.7	9.1	0.43	0.09	0.22
Total	21.6	2.1	12.5	0.53	0.09	0.22

OPTIONAL ANNUAL REPORT

Drinking-Water System Number:	W260092014
Drinking-Water System Name:	Township of Russell Distribution
Drinking-Water System Owner:	Township of Russell
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 1 to December 31, 2024

<u>Complete if your Category is Large Municipal Residential or Small Municipal Residential</u> Does your Drinking-Water System serve more than 10,000 people? Yes ☒ No ☐ Is your annual report available to the public at no charge on a web site on the Internet? Yes ☒ No ☐ www.russell.ca Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection. Township of Russell Public Utilities 851 Route 400 and 717 Notre-Dame St. Embrun ON K0A 1W1	<u>Complete for all other Categories.</u> Number of Designated Facilities served: n/a Did you provide a copy of your annual report to all Designated Facilities you serve? Yes ☐ No ☐ n/a Number of Interested Authorities you report to: n/a Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes ☐ No ☐ n/a
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Note: For the following tables below, additional rows or columns may be added or an appendix may be attached to the report

List all Drinking-Water Systems (if any), which receive all of their drinking water from your system:

Drinking Water System Name	Drinking Water System Number
n/a	

Did you provide a copy of your annual report to all Drinking-Water System owners that are connected to you and to whom you provide all of its drinking water?

Yes ☐ No ☐ n/a

Indicate how you notified system users that your annual report is available, and is free of charge.

- ☒ Public access/notice via the web
☐ Public access/notice via Government Office
☐ Public access/notice via a newspaper
☐ Public access/notice via Public Request
☐ Public access/notice via a Public Library
☐ Public access/notice via other method _____

Describe your Drinking-Water System

Owner and Operating Authority

The Township of Russell is the Owner and Operating Authority of a drinking Water System that includes:

- Four storage tanks (three elevated towers and one above ground reservoir);
- A distribution network and its associated appurtenances.

Water Source

Treated water is supplied by the City of Ottawa through a connection to its distribution system from Mitch Owens Road and Bank Street to Embrun Reservoir.

Existing Water Works - Distribution System

The water system for Township of Russell is currently a Class 2 distribution system and serves approximately 16,484 people.

Treated water is pumped from the City of Ottawa through a 450 mm feeder main to the Embrun Reservoir where chlorine and ammonia are added. From there it is pumped to the Embrun Tower and to the Russell Water tower and then to the Marionville booster pumping station and then pumped to the Marionville tower.

The distribution system consists of PVC and Polyethylene pipes ranging from 19 mm (5/8 inch) service connections to a 406 mm (16 inch) piping. Piping in the local distribution networks in the communities of Embrun, Russell and Marionville consist largely of 150 mm, 200 mm, 250 mm, 300 mm and 350 mm PVC pipes. The municipal distribution system also contains fire hydrants, standard service connections, gate valves, valve chambers, isolation and interconnection valves, blow-off points, drain valve chambers, and air release chambers.

Facilities:

- 450mm diameter connection to Russell Feedermain (from City of Ottawa) at Embrun Reservoir site;
- connection to Russell watermain (toward community of Russell) at Embrun Reservoir site;
- connection to Marionville watermain (replacement of modulating control valve by a pipe section, between Marionville Booster Station and Marionville, on MacDonald Road).
- Embrun Reservoir (re-chlorination facility)

List all water treatment chemicals used over this reporting period

Sodium hypochlorite, Ammonium Sulfate

Were any significant expenses incurred to?

- ☒ Install required equipment
- ☒ Repair required equipment
- ☒ Replace required equipment

Please provide a brief description and a breakdown of monetary expenses incurred

CAPITAL EXPENDITURES

Drinking Water Reservoir Expansion	\$ 2,256.02
Embrun Water Tower – SCADA Upgrade	\$ 75,986.29
Water Valve Repair	\$ 31,205.11
Transfer to Asset management Reserve	\$ 690,047.00

Provide details on the notices submitted in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre

Incident Date	Parameter	AWQI#	Result	Unit of Measure	Corrective Action	Corrective Action Date

Microbiological testing done under the Schedule 10, 11 or 12 of Regulation 170/03, during this reporting period.

	Number of Samples	Range of E.Coli Or Fecal Results (min #)-(max #)	Range of Total Coliform Results (min #)-(max #)	Number of HPC Samples	Range of HPC Results (min #)-(max #)
Distribution					
Embrun	159	0	0	156	0 – 313
Marionville	106	0	0	104	0 – 219
Russell	158	0	0	155	0 – 330



Ontario Drinking-Water Systems Regulation O. Reg. 170/03

Operational testing done under Schedule 7, 8 or 9 of Regulation 170/03 during the period covered by this Annual Report.

	Number of Grab Samples	Range of Results (min #)-(max #)
Turbidity	1462	0.03 – 0.55
Chlorine - Combined	2275	0.43 – 2.63
Fluoride (If the DWS provides fluoridation)	n/a	

***NOTE:** For continuous monitors use 8760 as the number of samples.*

***NOTE:** Record the unit of measure if it is **not** milligrams per litre.*

Summary of additional testing and sampling carried out in accordance with the requirement of an approval, order or other legal instrument. Summary of lead testing under Schedule 15.1 during this reporting period

(applicable to the following drinking water systems; large municipal residential systems, small municipal residential systems, and non-municipal year-round residential systems)

Date of legal instrument issued	Parameter	Date Sampled	Result mg/L	pH
	Alkalinity			
	Embrun	January 15, 2024	125	8.89
	Embrun	January 15, 2024	34	8.92
	Russell	January 15, 2024	35	8.90
	Marionville	January 15, 2024	30	8.92
	Lead			
	Embrun	January 15, 2024	<0.001	8.89
	Embrun	January 15, 2024	<0.001	8.92
	Russell	January 15, 2024	<0.001	8.90
	Marionville	January 15, 2024	<0.001	8.92
	Alkalinity			
	Embrun	July 8, 2024	33	8.89
	Embrun	July 8, 2024	35	8.93
	Russell	July 8, 2024	33	8.92
	Marionville	July 8, 2024	33	8.88
	Lead			
	Embrun	July 8, 2024	<0.001	8.89
	Embrun	July 8, 2024	<0.001	8.93
	Russell	July 8, 2024	<0.001	8.92
	Marionville	July 8, 2024	<0.001	8.88

Summary of Inorganic parameters tested during this reporting period or the most recent sample results



Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Aluminum(Al)	July 24, 2017	0.03	mg/L	NO
Antimony(Sb)	July 4, 2017	<0.0005	mg/L	NO
Arsenic(As)	July 4, 2017	<0.001	mg/L	NO
Barium(Ba)	July 4, 2017	0.01	mg/L	NO
Boron(B)	July 4, 2017	<0.01	mg/L	NO
Cadmium(Cd)	July 4, 2017	<0.0001	mg/L	NO
Calcium(Ca)	July 24, 2017	13	mg/L	NO
Chromium(Cr)	July 4, 2017	<0.001	mg/L	NO
Copper(Cu)	July 24, 2017	<0.001	mg/L	NO
Iron(Fe)	July 24, 2017	<0.03	mg/L	NO
Magnesium	July 24, 2017	3	mg/L	NO
Manganese	July 24, 2017	<0.01	mg/L	NO
Mercury(Hg)	July 4, 2017	<0.0001	mg/L	NO
Selenium(Se)	July 4, 2017	<0.001	mg/L	NO
Sodium(Na)	July 8, 2024	19	mg/L	NO
Uranium(U)	July 4, 2017	<0.001	mg/L	NO
Zinc(Zn)	July 24, 2017	<0.01	mg/L	NO
Fluoride(F)	July 24, 2017	0.57	mg/L	NO
Nitrite :	Oct 2, 2023	<0.10	mg/L	NO
Nitrate:	Oct 2, 2023	0.16	mg/L	NO

For more recent results City of Ottawa test results can be found here:

<https://ottawa.ca/en/residents/water-and-environment/drinking-water/drinking-water-quality-annual-reports-and-test-results>

Summary of Organic parameters sampled during this reporting period or the most recent sample results

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Conductivity	July 24, 2017	187	µS/cm	N/A
Total Dissolved Solids (TDS)	July 24, 2017	120	mg/L	N/A
Hardness as CaCO ₃	July 24, 2017	45	mg/L	NO
Total Kjeldahl Nitrogen	July 24, 2017	0.4	mg/L	NO
Alachlor	July 4, 2017	<0.5	µg/L	NO
Aldrin	July 4, 2017	<0.006	µg/L	NO
Atrazine + N-dealkylated metabolites	July 4, 2017	<0.2	µg/L	NO
Azinphos-methyl	July 4, 2017	<2.0	µg/L	NO
Bendiocarb	July 4, 2017	<2.0	µg/L	NO
Benzene	July 4, 2017	<0.5	µg/L	NO
Benzo(a)pyrene	July 4, 2017	<0.01	µg/L	NO
Bromoxynil	July 4, 2017	<0.5	µg/L	NO



Carbaryl	July 4, 2017	<5	µg/L	NO
Carbofuran	July 4, 2017	<5	µg/L	NO
Carbon Tetrachloride	July 4, 2017	<0.2	µg/L	NO
Chlordane (a)	July 4, 2017	<0.006	µg/L	NO
Chlordane (g)	July 4, 2017	<0.006	µg/L	NO
Chlordane (oxy)	July 4, 2017	<0.006	µg/L	NO
Chlorpyrifos	July 4, 2017	<1.0	µg/L	NO
De-Ethylated atrazine	July 4, 2017	<1.0	µg/L	NO
Diazinon	July 4, 2017	<1.0	µg/L	NO
Dieldrin	July 4, 2017	<0.006	µg/L	NO
Dicamba	July 4, 2017	<1.0	µg/L	NO
1,2-Dichlorobenzene	July 4, 2017	<0.4	µg/L	NO
1,4-Dichlorobenzene	July 4, 2017	<0.4	µg/L	NO
Dichlorodiphenyltrichloroethane (DDT) + metabolites	July 4, 2017	<0.024	µg/L	NO
1,2-Dichloroethane	July 4, 2017	<0.2	µg/L	NO
1,1-Dichloroethylene (vinylidene chloride)	July 4, 2017	<0.5	µg/L	NO
Dichloromethane	July 4, 2017	<4.0	µg/L	NO
2-4 Dichlorophenol	July 4, 2017	<0.5	µg/L	NO
2,4-Dichlorophenoxy acetic acid (2,4-D)	July 4, 2017	<1.0	µg/L	NO
Diclofop-methyl	July 4, 2017	<0.9	µg/L	NO
Dimethoate	July 4, 2017	<2.5	µg/L	NO
Diquat	July 4, 2017	<5	µg/L	NO
Diuron	July 4, 2017	<10	µg/L	NO
Glyphosate	July 4, 2017	<10	µg/L	NO
Haloacetic Acids (Running Average)	Oct 7, 2024	36.45	µg/L	NO
Malathion	July 4, 2017	<5.0	µg/L	NO
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	July 4, 2017	<10.0	µg/L	NO
Metolachlor	July 4, 2017	<1.0	µg/L	NO
Metribuzin	July 4, 2017	<5.0	µg/L	NO
Monochlorobenzene	July 4, 2017	<0.2	µg/L	NO
Nitrosodimethylamine (NDMA)	Oct 7, 2024	0.0069	µg/L	No
Paraquat	July 4, 2017	<1	µg/L	NO
Pentachlorophenol	July 4, 2017	<0.5	µg/L	NO
Phorate	July 4, 2017	<0.5	µg/L	NO
Picloram	July 4, 2017	<5.0	µg/L	NO
Polychlorinated Biphenyls(PCB)	July 4, 2017	<0.1	µg/L	NO
Prometryne	July 4, 2017	<0.25	µg/L	NO
Simazine	July 4, 2017	<1.0	µg/L	NO
SO ₄	July 24, 2017	33	mg/L	NO

THM (NOTE: show latest annual average)	Oct 7, 2024	43.70	µg/L	NO
Embrun	Oct 7, 2024	43.03	µg/L	NO
Marionville	Oct 7, 2024	44.85	µg/L	NO
Russell				
Terbufos	July 4, 2017	<0.4	µg/L	NO
Tetrachloroethylene	July 4, 2017	<0.3	µg/L	NO
2,3,4,6-Tetrachlorophenol	July 4, 2017	<0.5	µg/L	NO
Triallate	July 4, 2017	<1	µg/L	NO
Trichloroethylene	July 4, 2017	0.3	µg/L	NO
2,4,6-Trichlorophenol	July 4, 2017	<0.5	µg/L	NO
Trifluralin	July 4, 2017	<1.0	µg/L	NO
Vinyl Chloride	July 4, 2017	<0.2	µg/L	NO

For more recent results City of Ottawa test results can be found here:

<https://ottawa.ca/en/residents/water-and-environment/drinking-water/drinking-water-quality-annual-reports-and-test-results>

List any Inorganic or Organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards.

Parameter	Result Value	Unit of Measure	Date of Sample
Chloramine (combined)	Max Value: 2.63	mg/L	Jan - Dec
Sodium(Na)	19	mg/L	July 8, 2024

Total Township					
WATER FLOWS AND CONSUMPTION					
2024					
DATE	FLOW (m³)	DAILY AVERAGE (m³)	POPULATION	DAYS	AVERAGE PERSON/DAY (m³)
JAN	124,789	4025	19,881	31	0.202
FEB	116,447	4015	19,881	29	0.202
MAR	124,169	4005	19,881	31	0.201
APR	122,736	4091	19,881	30	0.206
MAY	140,678	4538	19,881	31	0.228
JUNE	140,392	4680	19,881	30	0.235
JULY	142,979	4612	19,881	31	0.232
AUG	152,369	4915	19,881	31	0.247
SEP	148,508	4950	19,881	30	0.249
OCT	145,729	4701	19,881	31	0.236
NOV	126,746	4225	19,881	30	0.213
DEC	127,759	4121	19,881	31	0.207
TOTAL	1,613,301	4,433	19,881	366	0.222
2023	1,498,785	4,103	19,050	365	0.215
2022	1,284,192	3,543	18,434	365	0.191
2021	1,282,600	3,531	17,453	365	0.201
2020	2,285,026	3,634	16,484	366	0.200
2019	1,150,503	3,160	15,456	365	0.204
2018	1,030,259	2,833	14,366	365	0.196
2017	922,696	2,546	13,656	365	0.185
2016	972,983	2,675	13,131	366	0.201
2015	1,003,637	2,758	12,620	365	0.216
2014	917,449	2,505	12,181	365	0.206
2013	889,653	2,437	11,768	365	0.207
2012	921,351	2,512	11,451	366	0.225
2011	917,334	2,527	11,133	365	0.225

TOWNSHIP OF RUSSELL PUBLIC UTILITIES



EMBRUN WATER SYSTEM

Waterworks #220004297

2024 ANNUAL OPERATIONS REPORT

Embrun
Water Capacity Report
January 1, 2025

Water Capacity	
Residential Units	3010 x 3 = 9030
Apartment Units	727 x 2 = 1454
Commercial Units	225 x 1 = 225
Retirement Home w/ kitchen	69 x 1 = 69
Retirement Home no kitchen	126 x 1 = 126
In-Law Suites	1 x 1 = 1
Schools	3 = 98
Total Population Served	11003

Meter Reading from school, divided by 200 school days, divided daily average

NOTE: AVERAGE PERSONS PER HOUSEHOLD = 3.0 (STATISTICS CANADA 2006 CENSUS)
 SCHOOLS POPULATION BASIS: @ 40% RURAL (318 HRS SCHOOL DAY)
 @ 60% URBAN (318 HRS SCHOOL DAY)
 considering actual water meter readings

EMBRUN WATER FLOWS AND CONSUMPTION 2024					
DATE	FLOW (m³)	DAILY AVERAGE (m³)	POPULATION	DAYS	AVERAGE PERSON/DAY (m³)
JAN	74,601	2406	11,003	31	0.219
FEB	70,070	2416	11,003	29	0.220
MAR	74,901	2416	11,003	31	0.220
APR	73,355	2445	11,003	30	0.222
MAY	84,024	2710	11,003	31	0.246
JUNE	82,500	2750	11,003	30	0.250
JULY	84,651	2731	11,003	31	0.248
AUG	84,953	2740	11,003	31	0.249
SEP	79,736	2658	11,003	30	0.242
OCT	80,031	2582	11,003	31	0.235
NOV	76,206	2540	11,003	30	0.231
DEC	77,011	2484	11,003	31	0.226
TOTAL	942,039	2,574	11,003	366	0.234
2023	902,632	2,473	10,491		0.236
2022	798,530	2188	10,136		0.216
2021	776,036	2126	9,583		0.222
2020	717,395	1960	9,068		0.216
2019	689,596	1889	8,517		0.222
2018	628,595	1722	8,034		0.214
2017	566,781	1553	7,530		0.206
2016	610,974	1669	7,227		0.231
2015	667,025	1827	6,916		0.264
2014	590,648	1618	6,717		0.241
2013	555,548	1522	6,629		0.23
2012	574,605	1570	6,590		0.238
2011	576,853	1587	6,548		0.241
2010	589,818	1615	6,490		0.249
2009	639,407	1753	6,589		0.266
2008	653,995	1787	6,423		0.278
2007	650,921	1782	6,155		0.290
2006	611,150	1673	5,861		0.285
2005	607,248	1663	5,497		0.303
2004	589,062	1610	5,145		0.313

ANNUAL SUMMARY - DISTRIBUTION SYSTEM BACTERIOLOGICAL DATA

WATER WORKS NAME:

EMBRUN

YEAR:

2024

SERVICED POPULATION:

LABORATORIES WHICH PERFORMED ANALYSES:

ACCUTEST LABORATORIES

CFU/100 mL

MONTH	TOTAL COLIFORM					E. COLI.			HPC			
	NO. OF SAMPLES COLLECTED	NO. OF SAMPLES SAFE	NO. OF SAMPLES UNSAFE	NO. OF SAMPLES DETERIORATING	NO. OF SAMPLES COLLECTED	NO. OF SAMPLES SAFE	NO. OF SAMPLES UNSAFE	NO. OF SAMPLES COLLECTED	NO. OF SAMPLES SAFE	NO. OF SAMPLES COLLECTED	NO. OF SAMPLES SAFE	NO. OF SAMPLES DETERIORATING
JAN	15	15	0	0	15	15	0	15	15	15	15	6
FEB	12	12	0	0	12	12	0	12	12	12	12	2
MAR	12	12	0	0	12	12	0	12	12	12	12	2
APR	15	15	0	0	15	15	0	15	15	15	15	7
MAY	12	12	0	0	12	12	0	12	12	12	12	9
JUN	12	12	0	0	12	12	0	12	12	12	12	8
JUL	15	15	0	0	15	15	0	15	15	15	15	8
AUG	12	12	0	0	12	12	0	12	12	12	12	8
SEP	15	15	0	0	15	15	0	15	15	15	15	7
OCT	12	12	0	0	12	12	0	12	12	12	12	6
NOV	12	12	0	0	12	12	0	12	12	12	12	4
DEC	15	15	0	0	15	15	0	15	15	12	12	6
TOTAL	159	159	0	0	159	159	0	159	159	156	156	73

CFU = colony forming units

Monthly Summary - Embrun Distribution Flows

Year: 2024

Waterworks Name: Township of Russell Distribution

DWS#

260092014

	Daily Flows					
	Jan	Feb	Mar	Apr	May	Jun
1		2299	2498	2485	2683	3287
2	2634	2329	2594	2083	2387	2904
3	1668	2562	2177	2290	2476	2972
4	2334	2465	2503	2352	2757	2985
5	2444	2527	2424	2417	2766	2887
6	2716	2517	2481	2648	2857	3163
7	2276	2533	2227	2917	2438	2213
8	2687	2275	2419	1911	2540	2471
9	2508	2594	2141	2732	2491	2495
10	2140	2854	2398	2233	2477	2539
11	2437	2388	2438	2576	2458	2715
12	2515	2314	2321	2357	2750	2288
13	2719	2223	2255	2312	2779	2915
14	2460	2710	2247	2525	2552	2523
15	1992	2121	2566	2731	2631	2938
16	2431	2247	2496	2597	2739	2965
17	2627	2840	2263	2406	2895	2371
18	2281	2651	2393	2361	2826	3204
19	2256	2081	2327	2291	3418	3268
20	2172	1805	2408	2473	2947	3193
21	3381	2660	2268	3123	3002	2559
22	2051	2199	2458	2225	2662	2633
23	2265	2329	2295	2151	2734	2789
24	2755	2055	2566	2445	2888	2351
25	2333	3068	2482	2521	2690	2792
26	2473	2315	2500	2306	3052	2570
27	2733	2173	2236	3099	2489	2877
28	2538	2675	2478	2794	2756	2467
29	1853	2261	2544	1545	2397	2554
30	2566		2517	2449	2771	2612
31	2407		2981		2716	
Max	3381	3068	2981	3123	3418	3287
Average	2406	2416	2416	2445	2710	2750

Monthly Summary - Embrun Distribution Flows

Year: 2024

Waterworks Name: Township of Russell Distribution

DWS#

260092014

	Daily Flows					
	Jul	Aug	Sep	Oct	Nov	Dec
1	2381	2697	2463	2871	2469	3232
2	2940	2668	2297	2040	2639	2226
3	3120	3496	3339	2493	2950	2343
4	2985	2766	2574	2460	2722	2555
5	2682	2873	2672	2674	2503	2349
6	2656	1787	2965	2360	2751	2360
7	3169	3022	2714	2564	2708	2306
8	2296	2841	2453	2599	2199	2851
9	3084	2680	2391	2353	2523	2502
10	2558	2785	2393	2885	2582	2428
11	2562	2333	2920	2181	2915	2735
12	2204	2845	2168	3149	2468	2255
13	3410	2684	2690	2598	2720	2398
14	1970	3151	3066	2217	2143	2969
15	3190	2672	2486	2787	2746	2834
16	2543	2720	2915	2643	2870	2032
17	2804	3150	2571	2657	2773	2462
18	2684	2119	3148	2309	2193	2586
19	2665	2879	2480	3196	2222	2268
20	2908	2576	2604	2268	2788	2342
21	2468	2580	3258	2606	2654	2712
22	2778	2493	2792	2777	2413	2922
23	2857	2570	2462	2576	2333	2080
24	2849	2755	2440	2845	2435	2338
25	2289	2632	2786	2054	2642	2464
26	3010	2863	2432	2872	2229	2876
27	2415	3009	2338	2744	2512	2064
28	2691	2762	2489	2517	2448	2657
29	2839	3322	2734	2526	2394	2284
30	2929	2818	2696	2529	2262	2299
31	2715	2405		2681		2282
Max	3410	3496	3339	3196	2950	3232
Average	2731	2740	2658	2582	2540	2484

TOWNSHIP OF RUSSELL PUBLIC UTILITIES



RUSSELL WATER SYSTEM

Waterworks #220004297

2024 ANNUAL OPERATIONS REPORT

Russell
Water Capacity Report
January 1, 2025

Water Capacity	
Residential Units	2411 x 3 = 7233
Apartment Units	358 x 2 = 716
Commercial Units	70 x 1 = 70
Retirement Home w/ kitchen	30 x 1 = 30
Retirement Home no kitchen	102 x 1 = 102
In-Law Suites	1 x 1 = 1
Schools	5 = 302
Total Population Served	8454

Meter Reading from school, divided by 200 school days, divided daily average

NOTE: AVERAGE PERSONS PER HOUSEHOLD = 3.0 (STATISTICS CANADA 2006 CENSUS)
 SCHOOLS POPULATION BASIS: @ 40% RURAL (318 HRS SCHOOL DAY)
 @ 60% URBAN (318 HRS SCHOOL DAY)
 considering actual water meter readings

RUSSELL
WATER FLOWS AND CONSUMPTION
2024

DATE	FLOW (m³)	DAILY AVERAGE (m³)	POPULATION	DAYS	AVERAGE PERSON/DAY (m³)
JAN	48,424	1562	8,454	31	0.185
FEB	44,828	1546	8,454	29	0.183
MAR	47,581	1535	8,454	31	0.182
APR	47,591	1586	8,454	30	0.188
MAY	54,346	1753	8,454	31	0.207
JUNE	54,516	1817	8,454	30	0.215
JULY	54,237	1750	8,454	31	0.207
AUG	62,625	2020	8,454	31	0.239
SEP	64,192	2140	8,454	30	0.253
OCT	61,464	1983	8,454	31	0.235
NOV	47,385	1580	8,454	30	0.187
DEC	48,064	1550	8,454	31	0.183
TOTAL	635,253	1,736	8,454	366	0.205
2023	562,418	1,541	8,169		0.189
2022	453,917	1,244	7,922		0.157
2021	471,469	1,292	7,506		0.172
2020	460,490	1,258	7,052		0.178
2019	436,416	1,196	6,578		0.182
2018	370,212	1,014	5,971		0.170
2017	326,029	893	5,755		0.155
2016	331,034	904	5,546		0.163
2015	309,122	847	5,343		0.159
2014	300,313	823	5,102		0.161
2013	306,600	840	4,776		0.176
2012	319,579	873	4,501		0.194
2011	310,489	849	4,242		0.200
2010	332,343	910	3,898		0.234
2009	370,257	1015	3,910		0.260
2008	387,876	1060	3,718		0.285
2007	392,273	1074	3,642		0.295
2006	384,006	1051	3,636		0.289
2005	403,583	1105	3,621		0.305
2004	381,076	1041	3,579		0.291

ANNUAL SUMMARY - DISTRIBUTION SYSTEM BACTERIOLOGICAL DATA

WATER WORKS NAME:

RUSSELL

YEAR:

2024

SERVICED POPULATION:

LABORATORIES WHICH PERFORMED ANALYSES:

ACCUTEST LABORATORIES

MONTH	TOTAL COLIFORM				E. COLI			HPC		
	NO. OF SAMPLES COLLECTED	NO. OF SAMPLES SAFE	NO. OF SAMPLES UNSAFE	NO. OF SAMPLES DETERIORATING	NO. OF SAMPLES COLLECTED	NO. OF SAMPLES SAFE	NO. OF SAMPLES UNSAFE	NO. OF SAMPLES COLLECTED	NO. OF SAMPLES SAFE	NO. OF SAMPLES DETERIORATING
JAN	15	15	0	0	15	15	0	15	15	7
FEB	12	12	0	0	12	12	0	12	12	7
MAR	12	12	0	0	12	12	0	12	12	2
APR	15	15	0	0	15	15	0	15	15	7
MAY	12	12	0	0	12	12	0	12	12	9
JUN	12	12	0	0	12	12	0	12	12	9
JUL	15	15	0	0	15	15	0	15	15	10
AUG	12	12	0	0	12	12	0	12	12	7
SEP	14	14	0	0	14	14	0	14	14	4
OCT	12	12	0	0	12	12	0	12	12	5
NOV	12	12	0	0	12	12	0	12	12	3
DEC	15	15	0	0	15	15	0	12	12	1
TOTAL	158	158	0	0	158	158	0	155	155	71

Monthly Summary - Russell Distribution Flows

Year: 2024

Waterworks Name: Township of Russell Distribution

DWS#

260092014

	Daily Flows					
	Jan	Feb	Mar	Apr	May	Jun
1		1302	1343	1673	1291	1786
2	2634	1391	1477	1320	1436	1858
3	1668	1566	1687	1476	1584	2001
4	2334	1590	1527	1474	1564	1950
5	2444	1441	1695	1434	1723	1977
6	2716	1593	1038	1612	1585	2080
7	2276	1505	1530	1523	1655	1229
8	2687	1496	1520	1465	1870	1530
9	2508	1492	1499	1665	1324	1732
10	2140	1579	1176	1170	1625	1376
11	2437	1291	1818	1525	1620	1772
12	2515	1617	1401	1598	1513	1561
13	2719	1398	1263	1571	1858	1668
14	2460	1503	1398	1379	1552	1422
15	1992	1479	1557	1903	1816	1846
16	2431	1438	1643	1498	1258	2151
17	2627	1503	1103	1578	1793	1591
18	2281	1914	1800	1426	1532	1856
19	2256	1096	1416	1399	2156	2373
20	2172	1498	1305	1309	1879	1632
21	3381	1543	1598	1756	2305	1687
22	2051	1385	1533	1566	1638	1656
23	2265	1486	1372	1455	1584	1373
24	2755	1381	1666	1505	1681	1688
25	2333	1789	1539	1501	1664	1453
26	2473	1652	1488	1499	2127	1764
27	2733	1287	1495	2185	1638	1629
28	2538	1457	1465	1505	1652	1455
29	1853	1607	1694	1267	1528	1245
30	2566		1097	1564	2015	1799
31	2407		1751		1572	
Max	2270	1914	1818	2185	2305	2373
Average	1505	1492	1480	1527	1679	1705

Monthly Summary - Russell Distribution Flows

Year: 2024

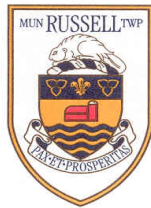
Waterworks Name: Township of Russell Distribution

DWS#

260092014

	Daily Flows					
	Jul	Aug	Sep	Oct	Nov	Dec
1	1270	1429	1733	2125	1495	1663
2	1975	1877	2103	2062	1486	1613
3	1697	2192	1744	1932	1627	1283
4	1894	1733	1934	1721	1791	1315
5	1344	2331	2288	2086	1527	1520
6	1826	1175	1683	2338	1492	1366
7	1606	1877	2006	1606	1525	1387
8	1619	1909	2325	2149	1553	1738
9	1755	1972	1545	1675	1157	1194
10	1673	2028	1791	2152	1786	1635
11	1558	1288	2275	1679	1393	1296
12	1145	1864	1807	1896	1565	1421
13	1669	1991	1894	2057	1498	1502
14	1693	1943	2165	2008	1562	1889
15	1546	1751	1917	1671	1466	1249
16	1594	2235	2208	2007	1429	1342
17	1710	1779	1866	1818	1739	1541
18	1365	1444	2188	2030	1488	1774
19	1519	2328	2168	1859	1199	1027
20	2119	1536	1795	1767	1483	1434
21	1123	1932	2551	1885	1276	1567
22	1679	1595	2204	1954	1372	1581
23	1884	1951	1843	1868	1687	1359
24	1738	1941	1955	1909	958	1660
25	1605	1806	1906	1692	1613	1134
26	1378	1916	1851	1552	1516	1926
27	1318	2089	2078	1648	1397	1213
28	1912	2050	1630	1670	1311	1688
29	1578	1872	2172	1426	1492	1415
30	1719	2394	1987	1527	1347	1549
31	1635	1606		1461		1099
Max	2119	2394	2551	2338	1791	1926
Average	1618	1866	1987	1846	1474	1464

TOWNSHIP OF RUSSELL PUBLIC UTILITIES



MARIONVILLE WATER SYSTEM

Waterworks #220004297

2024 ANNUAL OPERATIONS REPORT

Marionville Water Capacity Report January 1, 2025

Water Capacity	
Residential Units	127 x 3 = 381
Apartment Units	3 x 2 = 6
Commercial Units	1 x 1 = 1
Retirement Home w/ kitchen	22 x 1 = 22
Retirement Home no kitchen	x 1 = 0
In-Law Suites	x 1 = 0
Schools	1 = 14
Total Population Serviced	424

Meter Reading from school, divided by 200 school days, divided daily average

NOTE: AVERAGE PERSONS PER HOUSEHOLD = 3.01 (STATISTICS CANADA 2006 CENSUS)
SCHOOLS POPULATION BASIS: @ 40% RURAL / 3181 HR SCHOOL DAY)
@ 60% URBAN / 3181 HR SCHOOL DAY)
considering actual water meter readings

MARIONVILLE
WATER FLOWS AND CONSUMPTION
2024

DATE	FLOW (m³)	DAILY AVERAGE (m³)	POPULATION	DAYS	AVERAGE PERSON/DAY (m³)
JAN	1,764	57	424	31	0.134
FEB	1,549	53	424	29	0.126
MAR	1,687	54	424	31	0.128
APR	1,790	60	424	30	0.141
MAY	2,308	74	424	31	0.176
JUNE	3,376	113	424	30	0.265
JULY	4,091	132	424	31	0.311
AUG	4,791	155	424	31	0.365
SEP	4,580	153	424	30	0.360
OCT	4,234	137	424	31	0.322
NOV	3,155	105	424	30	0.248
DEC	2,684	87	424	31	0.204
TOTAL	36,009	98	424	366	0.232
2023	33,735	92	390		0.237
2022	31,745	87	376		0.231
2021	35,095	96	364		0.264
2020	27,635	76	364		0.207
2019	24,491	67	361		0.186
2018	31,452	86	361		0.239
2017	29,886	82	361		0.227
2016	30,975	85	358		0.236
2015	27,490	75	361		0.209
2014	26,488	73	362		0.200
2013	27,505	75	363		0.208
2012	27,167	74	360		0.206
2011	29,992	81	343		0.235
2010	54,031	147	341		0.431
2009	35,455	97	341		0.284
2008	40,520	111	341		0.325
2007	37,221	102	352		0.289
2006	34,084	94	349		0.270
2005	33,011	90	349		0.259
2004	28,662	78	349		0.225

ANNUAL SUMMARY - DISTRIBUTION SYSTEM BACTERIOLOGICAL DATA

WATER WORKS NAME:

MARIONVILLE

YEAR:

2024

SERVICED POPULATION:

LABORATORIES WHICH PERFORMED ANALYSES:

ACCUTEST LABORATORIES

ct/100 mL

MONTH	TOTAL COLIFORM				E. COLI			HPC		
	NO. OF SAMPLES COLLECTED	NO. OF SAMPLES SAFE	NO. OF SAMPLES UNSAFE	NO. OF SAMPLES DETERIORATING	NO. OF SAMPLES COLLECTED	NO. OF SAMPLES SAFE	NO. OF SAMPLES UNSAFE	NO. OF SAMPLES COLLECTED	NO. OF SAMPLES SAFE	NO. OF SAMPLES DETERIORATING
JAN	10	10	0	0	10	10	0	10	10	2
FEB	8	8	0	0	8	8	0	8	8	2
MAR	8	8	0	0	8	8	0	8	8	2
APR	10	10	0	0	10	10	0	10	10	5
MAY	8	8	0	0	8	8	0	8	8	4
JUN	8	8	0	0	8	8	0	8	8	5
JUL	10	10	0	0	10	10	0	10	10	7
AUG	8	8	0	0	8	8	0	8	8	5
SEP	10	10	0	0	10	10	0	10	10	4
OCT	8	8	0	0	8	8	0	8	8	3
NOV	8	8	0	0	8	8	0	8	8	1
DEC	10	10	0	0	10	10	0	8	8	0
TOTAL	106	106	0	0	106	106	0	104	104	40

Monthly Summary - Marionville Distribution Flows
Waterworks Name: Township of Russell Distribution

Year: 2024

DWS#

260092014

	Daily Flows					
	Jan	Feb	Mar	Apr	May	Jun
1		1	72	103	94	84
2	2634	97	75	82	0	98
3	1668	84	0	0	103	89
4	2334	77	112	84	87	87
5	2444	8	84	81	92	85
6	2716	71	0	12	86	90
7	2276	59	102	92	0	78
8	2687	78	0	0	110	84
9	2508	0	2	97	105	0
10	2140	98	111	52	83	96
11	2437	85	0	43	2	104
12	2515	0	98	85	106	0
13	2719	74	18	1	95	109
14	2460	90	74	98	0	105
15	1992	0	84	99	111	224
16	2431	77	0	0	98	87
17	2627	0	88	84	85	98
18	2281	77	0	107	86	209
19	2256	78	100	0	88	339
20	2172	64	0	86	87	91
21	3381	0	103	0	85	71
22	2051	85	89	111	88	89
23	2265	0	10	0	83	90
24	2755	105	99	82	94	81
25	2333	0	0	117	87	267
26	2473	88	80	0	94	87
27	2733	73	91	93	0	96
28	2538	80	0	88	90	81
29	1853	0	108	93	85	271
30	2566		87	0	84	86
31	2407		0		0	
Max	110	105	112	117	111	339
Average	57	53	54	60	74	113

Monthly Summary - Marionville Distribution Flows
Waterworks Name: Township of Russell Distribution

Year: 2024
DWS#

260092014

	Daily Flows					
	Jul	Aug	Sep	Oct	Nov	Dec
1	103	79	63	113	109	69
2	83	279	114	121	98	112
3	150	211	113	128	138	92
4	393	109	328	96	194	93
5	31	112	184	331	0	90
6	141	0	82	136	123	95
7	113	390	113	15	91	116
8	188	89	107	127	108	96
9	123	108	0	106	361	27
10	112	110	347	91	91	123
11	96	86	102	135	110	101
12	83	358	129	247	126	112
13	99	86	132	112	104	106
14	89	436	235	95	102	98
15	91	98	93	130	55	50
16	289	85	87	93	39	76
17	103	120	128	91	111	91
18	103	84	205	128	95	104
19	83	85	90	351	121	106
20	124	292	129	121	92	86
21	88	115	333	9	95	2
22	193	243	199	130	103	96
23	117	106	96	212	116	93
24	117	113	115	89	0	108
25	117	86	131	21	117	0
26	0	117	234	288	91	116
27	393	112	108	94	104	108
28	185	119	343	97	111	110
29	105	340	104	97	106	0
30	85	136	136	123	44	107
31	94	87		307		101
Max	393	436	347	351	361	123
Average	132	155	153	137	105	87

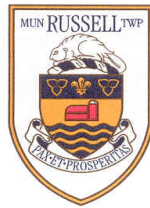
TOWNSHIP OF RUSSELL PUBLIC UTILITIES



2024

SANITARY SYSTEMS ANNUAL OPERATIONS REPORT

TOWNSHIP OF RUSSELL PUBLIC UTILITIES



EMBRUN SANITARY SEWER SYSTEM

WORKS #120002004

2024 ANNUAL OPERATIONS REPORT

Embrun Sanitary Capacity Report January 1, 2025

Water Capacity	
Residential Units	2911 x 3 = 8733
Apartment Units	718 x 2 = 1436
Commercial Units	223 x 1 = 223
Retirement Home w/ kitchen	69 x 1 = 69
Retirement Home no kitchen	126 x 1 = 126
In-Law Suites	1 x 1 = 1
Schools	3 = 98
Total Population Served	10686

Meter Reading from school, divided by 200 school days, divided daily average

NOTE: AVERAGE PERSONS PER HOUSEHOLD = 3.0 (STATISTICS CANADA 2006 CENSUS)
SCHOOLS POPULATION BASIS: @ 40% RURAL (318 HR SCHOOL DAY)
@ 60% URBAN (318 HR SCHOOL DAY)

Calculated per MOE Procedure D-5-1
TOWNSHIP OF RUSSELL - EMBRUN WASTEWATER SYSTEM UNCOMMITTED HYDRAULIC RESERVE CAPACITY
As of December 31, 2024

Average Daily Flow		Serviced Population		Per Capita Flow		Source:
2024	2,242 m ³ /d	2024	10,686	2024	0.210 m ³ /cap/d	Provided by Township
2023	2,217 m ³ /d	2023	10,157	2023	0.218 m ³ /cap/d	Provided by Township
2022	2,038 m ³ /d	2022	9,814	2022	0.208 m ³ /cap/d	Provided by Township
2021	1,980 m ³ /d	2021	9,267	2021	0.214 m ³ /cap/d	Provided by Township
2020	1,897 m ³ /d	2020	8,760	2020	0.217 m ³ /cap/d	Provided by Township

Total Serviced Population as of 2024: 10,686
Average per capita flow for the last five years: 0.213 m³/cap/d

Average Calculated Daily Flow		Source:	
ADF	0.213 m ³ /cap/d	X	10,686 =
D _c	Design Capacity (rated)		2278.16 m ³ /d
D _{c1}	Hydraulic Restrictions Capacity		3865 m ³ /d
Cr	Design Capacity(DC) - Av. Daily Flow (ADF)		3,271 m ³ /d
P	Existing Residential Population Connected		1587 m ³ /d
H	No. of Connected Residential Units		10,686
			3,854
F	Average Daily Flow Per Capita		0.213 m ³ /cap/d
L	No. of Committed Approved Lots		774 Lots

$$Cu = Cr - \frac{L \cdot F \cdot P}{H}$$

Cu =	1130 m ³ /d	Uncommitted Reserve Hydraulic Capacity
------	------------------------	--

LU No. of Uncommitted Lots Remaining

$$LU = \frac{Cu}{P \cdot F}$$

LU	1911 Lots
----	-----------

Uncommitted Reserve Hydraulic Capacity & Uncommitted Lots considering hydraulic restriction capacity specified in 2024 Master Plan

Cu = 536 m³/d
LU = 906 Lots

Notes:

- The actual per capita flows are below the projected per capita flows per the Master Plan and GMP. It is recommended that the Master Plan per capita flows continue to be used for planning.
- The above calculation is based on the rated capacity reported. It does not take into account any limitations in the wastewater collection and treatment system. As part of the Master Plan, CIMA+ completed a preliminary capacity assessment of the Embrun WWTP. The plant was determined to be hydraulically limited. Based on the capacity assessment, operational challenges at the Embrun WWTP, due to storage limitations, are expected when influent flows reach approximately 3,271 m³/d (~85% of the ECA rated capacity). 80% of the ECA rated capacity is typically when the planning and design phase of upgrades to WWTPs is triggered. A detailed capacity assessment is recommended to confirm the rated capacity of the lagoon facility.

2024 Master Plan Average Daily Flow		Source:	
ADF	0.250 m ³ /cap/d	X	10,686 =
D _c	Design Capacity (rated)		2671.5 m ³ /d
Cr	Design Capacity(DC) - Av. Daily Flow (DF)		3865 m ³ /d
P	Existing Residential Population Connected		1194 m ³ /d
H	No. of Connected Residential Units		10,686
			3854
F	Average Daily Flow Per Capita		0.250 m ³ /cap/d
L	No. of Committed Approved Lots		774 Lots

$$Cu = Cr - \frac{L \cdot F \cdot P}{H}$$

Cu =	657 m ³ /d	Uncommitted Reserve Hydraulic Capacity
------	-----------------------	--

PPU 2.5 persons per unit
LU No. of Uncommitted Lots Remaining

$$LU = \frac{Cu}{PPU \cdot F}$$

LU	1052 Lots
----	-----------

Water Allocation Spreadsheet Provided by Planning Department

EMBRUN SANITARY FLOWS AND CONSUMPTION 2024					
DATE	MONTHLY FLOW (m³)	DAILY AVERAGE (m³)	POPULATION	DAYS	AVERAGE
					PERSON/DAY (m³)
JAN	66,540	2,146	10,686	31	0.201
FEB	67,110	2,314	10,686	28	0.217
MAR	79,548	2,566	10,686	31	0.240
APR	75,812	2,527	10,686	30	0.236
MAY	69,168	2,231	10,686	31	0.209
JUNE	72,938	2,431	10,686	30	0.228
JULY	75,265	2,428	10,686	31	0.227
AUG	74,381	2,399	10,686	31	0.225
SEP	58,711	1,957	10,686	30	0.183
OCT	56,113	1,810	10,686	31	0.169
NOV	56,980	1,899	10,686	30	0.178
DEC	68,615	2,213	10,686	31	0.207
AVG m³	68,432				
TOTAL m³	821,181	2,250	10,686	365	0.211
YEAR	TOTAL YEARLY m³	AVERAGE MONTHLY m³	AVERAGE DAILY	POP	AVERAGE SEWAGE PERSON/DAY (m³)
2023	809,175	67,431	2,217	10,157	0.218
2022	743,729	61,977	2,038	9,814	0.208
2021	721,808	60,151	1,978	9,267	0.213
2020	693,783	57,815	1,901	8,760	0.217
2019	656,487	54,707	1,799	7,981	0.225
2018	646,655	53,888	1,772	7,497	0.236
2017	699,070	58,253	1,915	6,988	0.274
2016	576,819	46,068	1,577	6,720	0.235
2015	552,799	46,067	1,513	6,390	0.237
2014	502,926	43,614	1,435	6,260	0.229
2013	542,911	54,291	1,489	6,203	0.24
2012	494,058	41,171	1,350	6,195	0.220
2011	533,413	44,451	1,460	6,129	0.238
2010	615,075	51,256	1,685	6,131	0.275
2009	667,471	55,623	1,828	6,131	0.298
2008	738,338	61,528	2,018	5,965	0.338

EMBRUN SEWAGE TREATMENT SYSTEM 2024 ANNUAL PERFORMANCE REPORT

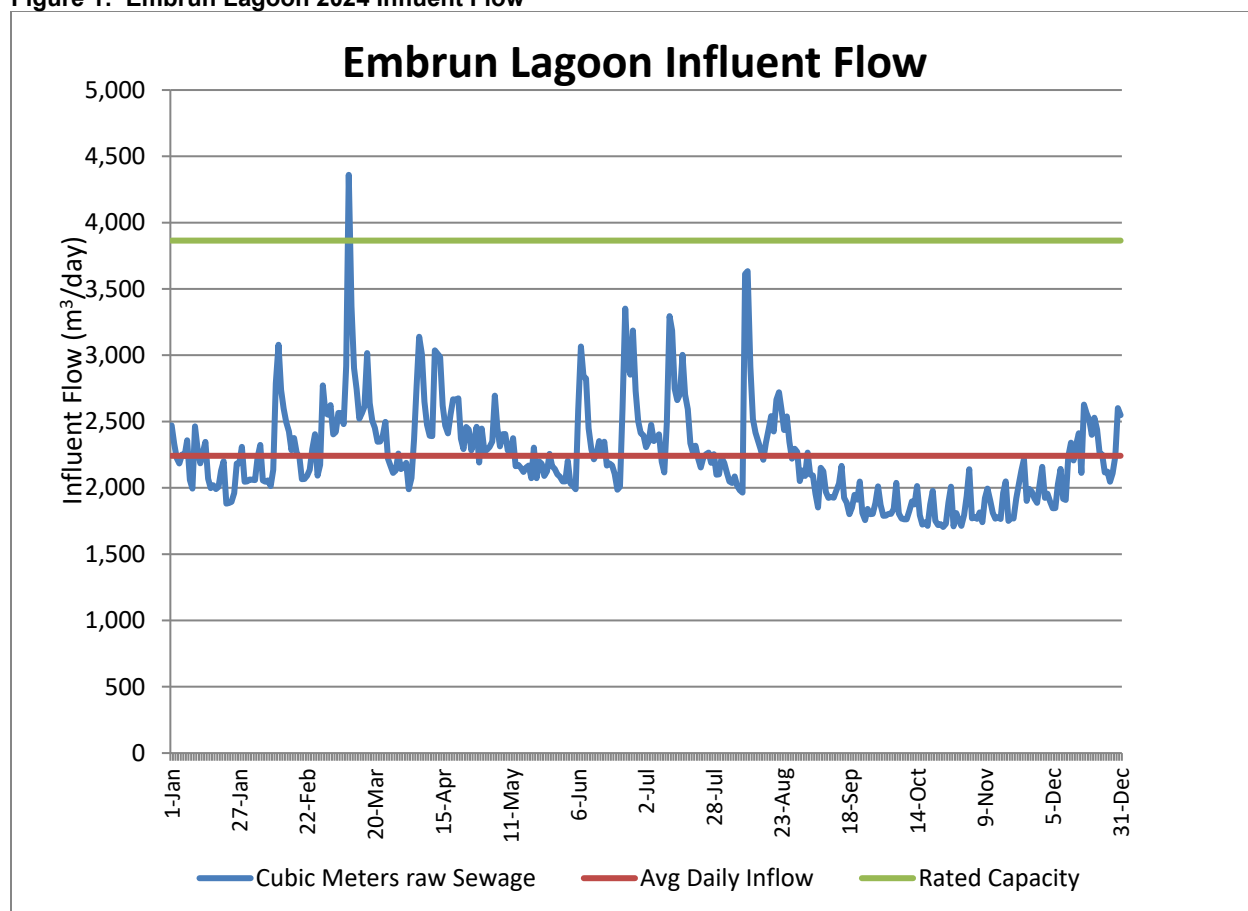
Executive Summary

The Embrun Sewage Treatment System provides sewage treatment for the community of Embrun in the Township of Russell. The sewage treatment system operated under the authority of Environmental Compliance Approval (ECA) #2449-BNYJZC issued on December 16, 2022, ECA 5774-CFZNL3, this returned operations to a seasonal discharge.

The Embrun Sewage Treatment System currently consists of an eight cell lagoon treatment facility that operates to receive an annual average day influent flow not exceeding 3,865 cubic meters and is discharged twice a year in the Spring and Fall. These 2 discharge windows are defined by the MECP as Spring being May 1st to October 31st (183 days) and Fall being November 1st to April 30th.

In 2024 the annual average daily inflow of raw sewage was 2,242 m³/day (Figure 1) representing 58% of the rated capacity (3,865 m³/day). The peak day flow of 4,361 m³/day occurred on March 10, 2024 as a result of a rainfall event and snow melt.

Figure 1: Embrun Lagoon 2024 Influent Flow



The ECA effluent compliance limits were not met for both the spring and fall treated effluent discharge events. Spring saw an average concentration exceedance of Ammonia though no exceedance of average loading. Fall saw a continuance of the Ammonia concentration

EMBRUN SEWAGE TREATMENT SYSTEM 2024 ANNUAL PERFORMANCE REPORT

exceedance.

Table 1 describes the ECA spring discharge effluent quality limits and the actual final effluent quality.

Table 1: ECA Spring Discharge Effluent Quality Limits and 2024 Actual Quality

	ECA Limits	Actual
Discharge volume	773,000 m ³	495,756 m ³
Discharge period		April 2 - Apr 30
Dilution ratio (river flow : effluent flow)		54 to 264 avg. 116.7:1
cBiochemical Oxygen Demand	30 mg/L	7.88 mg/L
	14,873 kg	3,845 kg
Suspended solids	30 mg/L	11.03 mg/L
	14,873 kg	5,363 kg
Total phosphorous	0.56 mg/L	0.16 mg/L
	278 Kg (790kg/year)	81 kg
Total Ammonia + Ammonia N	10 mg/L	12.36 mg/L
	4,958 kg	6,125 kg
Hydrogen Sulphide	0.1 mg/L	0.00 mg/L
		0 kg
pH	6.0 to 9.5	7.87 to 8.31 avg: 8.04
Dissolved Oxygen	>2.0 mg/L	9.76 mg/L

The spring discharge volume was the final effluent produced by the sewage treatment system after processing raw sewage received from October 18, 2024 to April 2, 2024. When a discharge event begins, raw sewage is diverted to isolated cells that are not to be discharged. This avoids the risk of influent sewage short-circuiting to the discharge. The fall 2024 discharge event began on October 1 and was completed on October 28, 2024.

The spring discharge profile and accumulated discharge volume are shown in **Figure 2**.

EMBRUN SEWAGE TREATMENT SYSTEM 2024 ANNUAL PERFORMANCE REPORT

Figure 2: Embrun Lagoon 2024 Spring Discharge

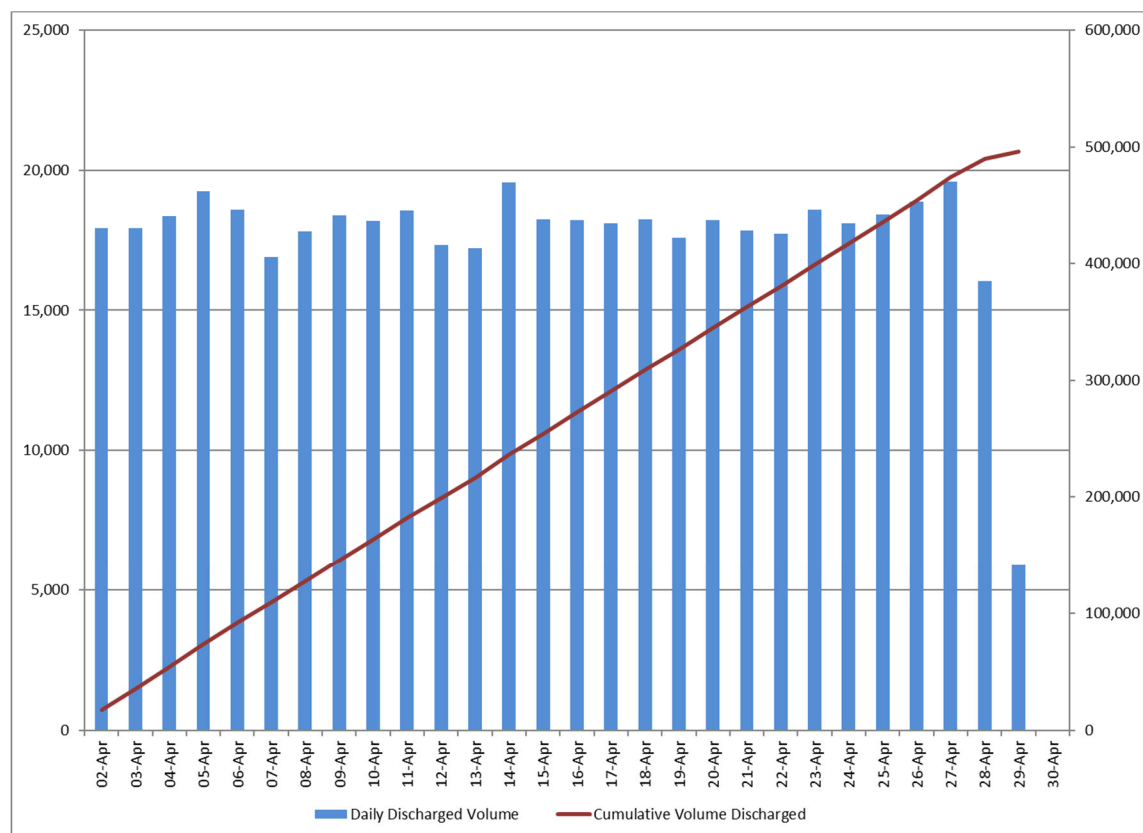


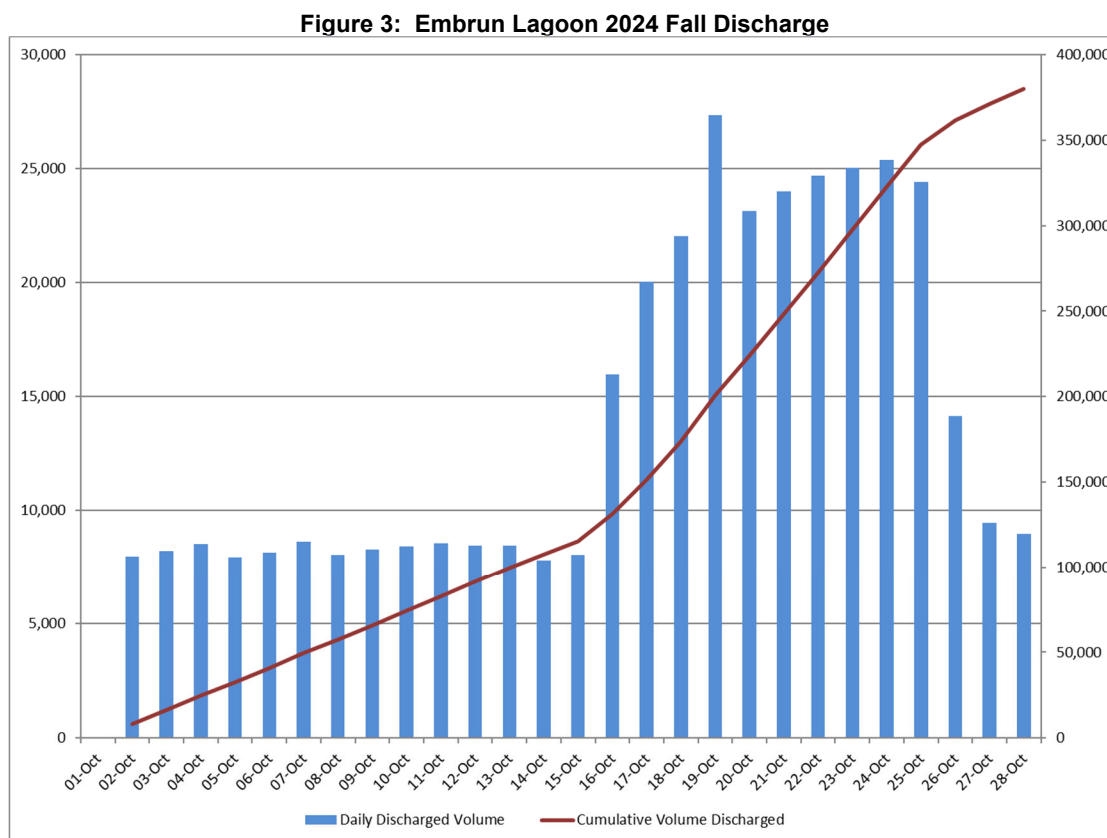
Table 2 describes the ECA fall discharge effluent quality limits and the actual final effluent quality.

Table 2: ECA Fall Discharge Effluent Quality Limits and 2024 Actual Quality

	ECA Limits	Actual
Discharge volume	637,725 m³	380,105 m³ Seasonal Total
Discharge period		Oct 1 – Oct 28
Dilution ratio (river flow : effluent flow)		6.4:1 to 83.6:1 avg 53.2:1
cBiochemical Oxygen Demand	30 mg/L	13.67 mg/L
	23,190 kg	1,528 kg
Suspended solids	30 mg/L	29.66 mg/L
	11,403 kg	11,274 kg
Total phosphorous	0.56 mg/L	0.47 mg/L
	213 Kg	49 kg
Total Ammonia + Ammonia N	2 mg/L	2.14 mg/L
	760 kg	725 kg
Hydrogen Sulphide	Non-detect	0.0 mg/L
pH	6.0 to 9.5	7.44 to 8.44 with an avg. 7.89
Dissolved Oxygen	>2.0 mg/L	9.6 mg/L

EMBRUN SEWAGE TREATMENT SYSTEM 2024 ANNUAL PERFORMANCE REPORT

The fall discharge volume was the final effluent produced by the sewage treatment system after processing raw sewage received from March 29, 2024 to October 18, 2024. The fall discharge profile and accumulated discharge volume are shown in **Figure 3**.



During both the spring and fall discharge events a sample of the final effluent was collected and acute lethality tests were performed using the samples. The spring and fall discharge had a zero mortality in both rainbow trout exposed to 100% concentration for 96 hours and 0% mortality in *Daphnia Magna* exposed for 48 hours.

The 2024 complaint log listed five (5) complaints related to the Embrun sewage collection and treatment system. Township staff responded to these complaints, assessed the source of the problem, and initiated corrective action.

EMBRUN SEWAGE TREATMENT SYSTEM 2024 ANNUAL PERFORMANCE REPORT

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EMBRUN SEWAGE TREATMENT SYSTEM 2024 ANNUAL PERFORMANCE REPORT

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EMBRUN SEWAGE TREATMENT SYSTEM 2024 ANNUAL PERFORMANCE REPORT

1.0 Sewage Treatment System Overview

The Embrun sewage treatment system consists of nine (9) pumping stations, a chemical addition system, an eight (8) cell lagoon treatment system and a hydrograph controlled effluent release system.

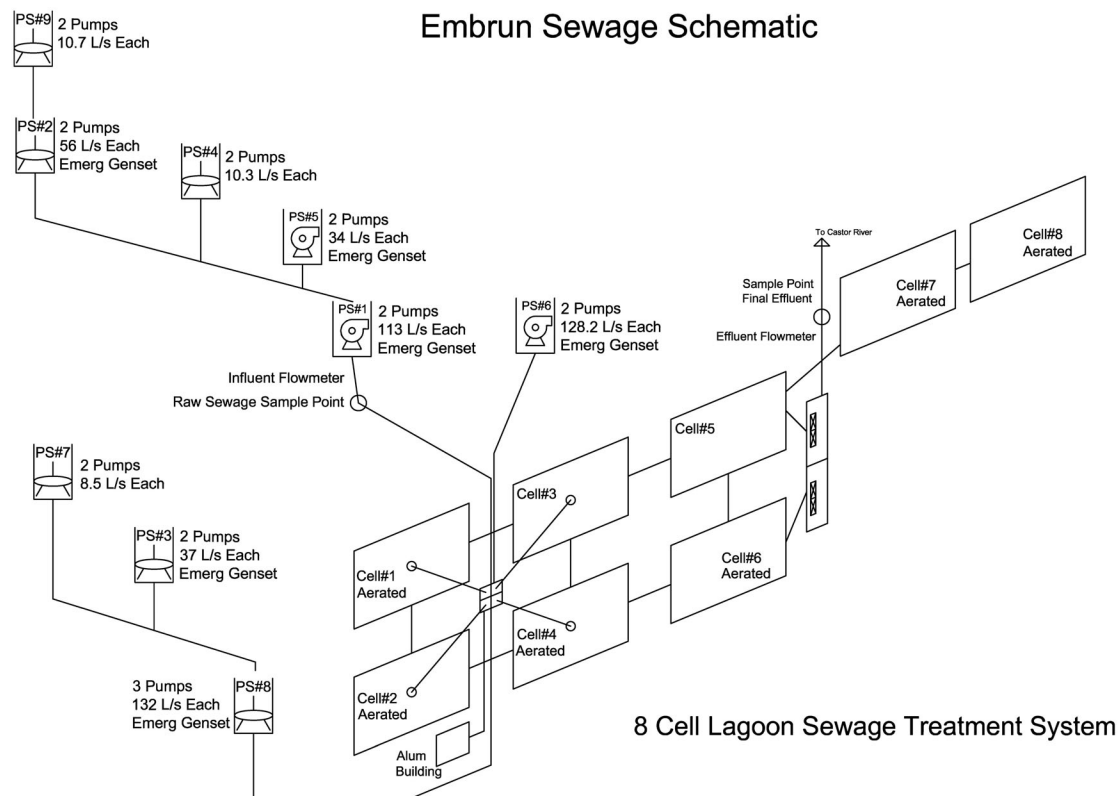
Pump stations 2, 4, & 5 all discharge to trunk sewers that convey sewage to pump station 1 whereas pump stations 7 and 3 discharge to trunk sewers to convey sewage to pump station 8. Pump station 9 discharges to a trunk sewer that conveys sewage to pump station 2. Pump stations 1, 6 and 8 pump all collected sewage directly to the lagoon treatment system. Alum is continuously injected into the sewage lagoon influent flow to aid in phosphorous removal. The pump discharge flows are metered and the meter readings are used to report the treatment system influent flow rates. Six of the eight lagoon cells are aerated. Treated effluent is discharged to the Castor River. The effluent flow is continuously monitored during discharge and a sampling program is in place to ensure chemical and physical parameters are met for discharge.

The sewage treatment system operates under the authority of ECA 5774-CFZNL3. The Sewage collection system is now operated under ECA# 184-W601 which is the new combined ECA that includes the collection systems for both the villages of Embrun and Russell.

Figure 4 is a schematic that outlines the sewage collection and treatment system. The schematic includes details that illustrate the location of the treatment system influent and effluent flow measurement devices, as well it also identifies the raw sewage influent and treated effluent sample points.

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Figure 4: Embrun Sewage Collection and Treatment System



1.1 OPERATIONS AND MONITORING

Grab samples of raw sewage are collected once per month from station number 1 and analyzed for the parameters prescribed by the ECA. The samples are analyzed to determine conductivity and pH, as well as the concentrations of carbonaceous biochemical oxygen demand (cBOD₅), total suspended solids (TSS), ammonia–nitrogen (N-NH₃), nitrite-nitrogen (N-NO₂), nitrate-nitrogen (N-NO₃), total Kjeldahl nitrogen (TKN), reactive phosphorous (RP) and total phosphorous (TP). No tBOD₅ tests were done on the lagoon influent in 2024.

In advance of treated effluent discharge events, grab samples of the lagoon contents are collected from various locations throughout the lagoon treatment system and analyzed for the same suite of parameters listed for raw sewage analysis. Temperature, dissolved oxygen (DO) and hydrogen sulfide (H₂S) concentrations of the lagoon contents are also determined. The results from the analytical work are used to confirm the suitability of the treated effluent for release to the Castor River.

During the final effluent discharge events grab samples of the final effluent are collected and analyzed. The final effluent is analyzed for the same suite of parameters as are the lagoon

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contents prior to discharge (pH, conductivity, cBOD₅, TSS, N-NH₃, N-NO₂, N-NO₃, TKN, RP, TP, DO, pH, temperature and H₂S). The effluent is sampled at the beginning of each discharge event, at the end of each discharge event, and, as a minimum, at 25%, 50% and 75% of the total lagoon draw down.

The Castor River is also sampled upstream and downstream during the discharge events and analyzed for the same suite of parameters (pH, conductivity, cBOD₅, TSS, N-NH₃, N-NO₂, NNO₃, TKN, RP, TP, DO, temperature, and H₂S).

Flow measurement data is collected by the sewage treatment SCADA system and verified by regular inspections by operating staff. Flow measurement of the raw sewage influent is accomplished using a magnetic flow meter located in the discharge piping of pump station 1, 6 and 8. The flow from the pump stations is conveyed directly to the lagoon treatment system and is the treatment system influent flow. The final effluent discharge flow is measured using a Parshall flume in combination with an ultrasonic level sensing device. The collected flow measurements and the results from the analytical work performed on all the collected samples are used to verify the effectiveness of the sewage collection and treatment system and compliance with the terms and conditions of the ECA.

The ECA effluent compliance limits were not met for the spring treated effluent discharge event, an exceedance of N-NH₃ (Ammonia) concentration, this was reported to the MECP. As well the ECA effluent compliance limits were not met for the fall treated effluent discharge event, an exceedance was tracked for N-NH₃ (Ammonia). In the appendices of this report are tables of data that have been compiled and used to track and evaluate the performance of the sewage treatment system.

Table 3: Spring Final Effluent Characteristics and Sewage Treatment Removal Efficiencies

	Limits		Objectives	Results				
	Con. (mg/L)	Mass (kg)		Effluent Conc. (mg/L)	Effluent Mass (kg/day)	Total Effluent Mass(kg)	Influent Mass (kg)	Mass Removed
cBOD	30	23,190	20	7.88	132.58	3,845	55,629	92.8%
TSS	30	23,190	20	11.03	184.94	5,363	68,698	92.2%
TP	0.56	433	0.5	0.16	2.78	81	2,893	97.1%
	(790 kg/year)							
N-NH ₃	10	7,730	5	12.40	211.2	6,125	21,334	70.1%
H ₂ S	0.1	0	0.1	0			n/a	
DO(min)	>2.0	544		9.8				
Flow	773,000 m ³			495,756 m ³				

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Table 4: Fall Final Effluent Characteristics and Sewage Treatment Removal Efficiencies

	Limits		Objectives	Results				
	Con. (mg/L)	Mass (kg)		Effluent Conc. (mg/L)	Effluent Mass (kg/day)	Total Effluent Mass(kg)	Influent Mass (kg)	Mass Removed
cBOD	30	19,132	20	11.73	191.11	5,351	383,672	98.6%
TSS	30	19,132	20	29.66	444.97	11,274	230,852	95.2%
TP	0.56	357	0.5	0.43	6.61	185.1	13,897	98.7%
	790 kg/year							
N-NH ₃	2	1,275	1	2.14	25.9	725	131,419	99.4%
H ₂ S	0	0		0			n/a	
DO(min)	>2.0	36		9.58				
Flow	637,725 m ³			380,105 m ³				

The sewage collection and treatment system performed relatively reliably and there were no environmental spills or sewage bypasses that occurred in 2024.

During both the spring and fall discharge events, samples of the final effluent were collected and acute lethality tests were performed. The samples were collected on April 22, 2024 and October 15, 2024. The spring and fall samples had a 0% toxicity for both the rainbow trout and Daphnia Magna despite the elevated ammonia concentration.

Analytical results from Castor River samples taken during the spring and fall discharge events are included in Appendix D.

The quantity of sludge generated in 2024 by the sewage treatment system is based on 60 grams of sludge generated per capita day. The estimated quantity of sludge generated in 2024 is 234,023 kg dry solids. Assuming a 2% growth in population, the amount of sewage likely to be generated in 2024 will be approximately 238,710 kg of dry solid. As well approximately 10,620 m³ were removed through desludging from cell 1. The total estimated amount of sludge in Embrun Lagoon as of the end of 2024 is calculated to be 57,573 m³, this represents 6.6% of the total volume of the lagoon (It is estimated that 50kg of sludge use 1 m³ of space in the lagoon).

1.1.1 Public Complaints

There were thirteen (13) public complaints related to the operation of the sewage collection and treatment system in 2024. **Table 6** summarizes the nature of the complaints and the action taken to resolve the concerns expressed by the public.

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Table 5: 2024 Public Complaint Summary

Date 2024	Address	Complaint	Action Taken*
Feb 8	Embrun Lagoon	Excess odour	Quarry suspected cause
Mar 3	127 Raidsson	Sewage backup	Storm backup
Apr 15	831 Notre-Dame	Sewage backup	Internal Plumbing
May 30	1122 Notre-Dame	Sewage backup	Storm backup
June 27	337 Belfort	Sewage backup	Storm Backup
June 27	52 Louis Riel	Sewage backup	Storm Backup
June 27	127 Radisson	Sewage backup	Internal Plumbing
June 27	56 La Prairie	Sewage backup	Internal Plumbing
July 4	100 LaCroisee	Sewage backup	Internal Plumbing
Sept 3	856 Notre-Dame	Sewage backup	Internal Plumbing
Dec 2	699 Notre-Dame	Sewage backup	Internal Plumbing
Dec 9	966 A Notre-Dame	Sewage backup	Internal Plumbing
Dec 16	32 Loiselle	Sewage backup	Internal Plumbing

1.1.2 2024 Capital Improvements and Studies

Desludging was undertaken of cell number 1 in the lagoon, as well as some repairs to the aeration system..No other major changes to the collection system in 2024 beyond the addition of new roads.

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1.1.3 Planned Alterations, Extension and Replacements

A wastewater QMS is still in development. Replacement of the obsolete parts of the radio SCADA system will continue.

1.1.4 2024 Maintenance Activities Summary

In 2024 all trunk sewers were flushed and cleaned using contracted services. **Tables 7** through **Table 17** summarize the routine and corrective maintenance activities performed by Township staff and contracted service providers on the collection and treatment facilities.

Table 6 : Pump Station 1, 2024 Maintenance History

Preventative Maintenance	Frequency	Date	Comments
Back-Up Generator checks	Weekly		
SCADA system checks	Weekly		
Building sump optn/level checks	Weekly		
Building lights, HVAC, etc..	Weekly		
Wet Well / Dry Well Inspection	Weekly		
Meter Readings	Weekly		
Totalizer Readings	Monthly		
Test Run Backup Generator	Weekly		Auto test by SCADA
Change Genset Oil, oil & fuel filter	Annually		
Grease Pumps 1 & 2	Annually		
Instrument and Alarm Test Calibration	Annually	23 Oct	
Regular Genset Service/Inspection	Annually		
Gas Detector Calibration	Semi-Annually		
Gas Detector Calibration	Semi-Annually		
Corrective Maintenance			
Clean Wet Well		23 Jan	
Pump #1 Maintenance		14 Mar	Clean rag from impeller
Clean Wet Well + basket		17 Aril	
Pump #1 Maintenance		3 Jun	Clean rag from impeller
Pump #2 Maintenance		6 Jun	Clean rag from impeller
Air Release Maintenance		19 June	Pump #2, unseize control bolt
Clean Wet Well + basket		25 July	
Pump Maintenance		25 July	Clean rag from impellers
Generator Maintenance		23 Aug	Replace battery
Generator Maintenance		11 Sept	Replace fuses in ECM and battery charger
Generator Maintenance		20 Sept	Replace battery
Clean Wet Well + basket		2 Oct	
Generator Maintenance		5 Nov	Install transfer switch for portable power

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Pump #1 Maintenance		10 Nov	Clean rag from impeller

Table 7 : Pump Station 2, 2024 Maintenance History

Preventative Maintenance	Frequency	Date	Comments
Backup Generator Checks	Weekly		
SCADA System checks	Weekly		
Building Lights, HVAC, etc.	Weekly		
Wet well inspection	Weekly		
Meter Readings	Weekly		
Test run backup generator	Weekly		Auto Test by SCADA
Regular Genset service/ inspection	Annually		
Change genset oil, oil & fuel filter	Annually		
Instrument calibration	Annually		
Alarm Test	Annually	18 Oct	
Change battery in Milltronics	Every 3 years		
Calibrate Gas Monitor	Semi-Annually		
Calibrate Gas Monitor	Semi-Annually		
Corrective Maintenance			
Clean Wet Well		25 July	

Table 8 : Pump Station 3, 2024 Maintenance History

Preventative Maintenance	Frequency	Date	Comments
Backup Generator Checks	Weekly		
SCADA System checks	Weekly		
Building Lights, HVAC, etc.	Weekly		
Wet well inspection	Weekly		
Meter Readings	Weekly		
Test run backup generator	Weekly		Auto Test by SCADA
Regular Genset service/ inspection	Annually		
Change genset oil, oil & fuel filter	Annually		
Instrument & Alarm test/calibration	Annually	18 Oct	
Change battery in Milltronics	Every 3 years		
Calibrate Gas Monitor	Semi-Annually		
Calibrate Gas Monitor	Semi-Annually		
Corrective Maintenance			
Generator Maintenance		1 Feb	Coolant leak repair
Clean Wet Well		17 Apr	
Clean Basket		9 May	
Clean Wet Well + basket		9 July	

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Clean Wet Well + basket		30 July	
Clean Wet Well + basket		22 Aug	
Clean Wet Well + basket		26 Sept	
Clean Wet Well + basket		5 Nov	
Clean Wet Well + basket		18 Dec	

Table 9 : Pump Station 4, 2024 Maintenance History

Preventative Maintenance	Frequency	Date	Comments
UPS System checks	Weekly		
SCADA system checks	Weekly		
Wet well inspection	Weekly		
Meter Readings	Weekly		
Instrument & Alarm Test Calibration	Annually		
Change battery in Milltronics	Every 3 years		
SCADA Upgrade		27 Aug	Replace panel and radio
Corrective Maintenance			
Clean Wet Well		6 Mar	
Clean Wet Well + basket		9 July	
Pump #1 Maintenance		30 Oct	Raise pump to remove rags

Table 10 : Pump Station 5, 2024 Maintenance History

Preventative Maintenance	Frequency	Date	Comments
Pump Engine Drive Checks	Weekly		
SCADA System checks	Weekly		
Building Lights, HVAC, etc.	Weekly		
Wet well inspection	Weekly		
Meter Readings	Weekly		
Test run pump engine drive	Weekly		Performed Manually
Pump engine inspection	Semi-Annual		
Engine Inspection, Change pump engine oil & oil filter	Annually		
Instrument & Alarm test/calibration	Annually		
Double Check Valve inspection	Annually		
Corrective Maintenance			
Clean Wet Well + basket		8 Feb	
Clean Wet Well		6 Mar	
Pressure Level Sensor Maintenance		15 Apr	Rebuild sensor housing
Clean Wet Well + basket		17 Apr	
Clean Wet Well + basket		9 Jun	
Clean Wet Well + basket		9 July	

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Clean Wet Well + basket		30 July	
Clean Wet Well + basket		22 Aug	
Clean Wet Well + basket		26 Sept	
SCADA Maintenance		6 Nov	Replace UPS
P#1 Maintenance		25 Nov	Remove rags from impeller
Clean Wet Well + basket		18 Dec	

Table 11 : Pump Station 6, 2024 Maintenance History

Preventative Maintenance	Frequency	Date	Comments
UPS System checks	Weekly		
SCADA system checks	Weekly		
Wet well inspection	Weekly		
Meter Readings	Weekly		
Regular Genset service/ Load test	Annually		
Regular Genset service/ inspection	Annually		
Instrument and Alarm test calibration	Annually		
Flowmeter Calibration	Annually	19 Sept	
Corrective Maintenance			

Table 12 : Pump Station 7, 2024 Maintenance History

Preventative Maintenance	Frequency	Date	Comments
UPS System checks	Weekly		
SCADA system checks	Weekly		
Wet well inspection	Weekly		
Meter Readings	Weekly		
Instrument and Alarm test calibration	Annually	22 Oct	
Pump Maintenance			Pump/SCADA Optimization
Corrective Maintenance			
Clean Wet Well		6 Mar	

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Table 13 : Pump Station 8, 2024 Maintenance History

Preventative Maintenance	Frequency	Date	Comments
UPS System checks	Weekly		
SCADA system checks	Weekly		
Wet well inspection	Weekly		
Meter Readings	Weekly		
Instrument and Alarm test calibration	Annually	23 Oct	
Flowmeter Calibration	Annually	19 Sept	
Double Check Valve Inspection	Annually		
Regular Genset service/ inspection	Annually		
Generator Oil Change/Inspection	Annually		
Corrective Maintenance			
Clean Wet Well		24 Jan	
P#2 Replacement		8 Mar	
P#2 Maintenance		11 Mar	Seal wire conduits for Pump #2
P#2 Maintenance		13 Mar	Repair fault in pump, wires backwards
Clean Wet Well + basket		17 Apr	
Clean Wet Well + basket		9 July	
Clean incoming line		22 Aug	
Clean Wet Well + basket		26 Sept	
Clean Wet Well + basket		2 Oct	

Table 14 : Pump Station 9, 2024 Maintenance History

Preventative Maintenance	Frequency	Date	Comments
UPS System checks	Weekly		
SCADA system checks	Weekly	17 Oct	
Wet well inspection	Weekly		
Meter Readings	Weekly		
Instrument & Alarm Test Calibration	Annually		
Change battery in Milltronics	Every 3 years		
Corrective Maintenance			
Pump #2 Maintenance		30 Jan	Pump lifted to allow removal of rags
Clean Wet Well		6 Mar	
Pump #2 Maintenance		6 May	Pump lifted to allow removal of rags
Pump #2 Maintenance		11 June	Change Drive
Pump #2 Maintenance		19 June	Pump lifted to allow removal of rags
SCADA Maintenance		19 Sept	Replace UPS

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Table 15 : Alum Building, 2024 Maintenance History

Preventative Maintenance	Frequency	Date	Comments
Building Lights, HVAC, etc.	Weekly		
Meter Readings	Weekly		
UPS System checks	Weekly		
Instrument and Alarm test calibration	Annually		
Install Portable Eye wash			
Corrective Maintenance			
Clean Wet Well		30 July	RV Station
Clean Wet Well		5 Nov	

Table 16 : Blower Building #1, 2024 Maintenance History

Preventative Maintenance	Frequency	Date	Comments
Building Lights, HVAC, etc.			
Meter Readings	Weekly		
Oil Change Blower 1,2,&3		9 Jan	
Oil Change Blower 1,2,&3		11 July	
Replace Air Filters			
Instrument and Alarm test calibration	Annually		
Corrective Maintenance			
Air line Repair		25 Mar	Repair Elbow at center air line Cell 1
Blower #1 Maintenance		30 July	Blower #1. Replace phase protector and fuse
Blower #2 Maintenance		4 Oct	Replace belt

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Table 17 : Blower Building #2, 2024 Maintenance History

Preventative Maintenance	Frequency	Date	Comments
Building Lights, HVAC, etc.			
Meter Readings	Weekly		
Oil Change Blower 4&5		9 Jan	
Oil Change Blower 4&5		11 July	
Blower Air Filter Change		3 Jan	
Blower Air Filter Change		11 July	
Instrument and Alarm test calibration	Annually	18 Oct	
Corrective Maintenance			
SCADA Maintenance		8 Sept	Replace UPS

Table 18 : Kiosk Building, 2024 Maintenance History

Preventative Maintenance	Frequency	Date	Comments
Building Lights, HVAC, etc.	Weekly		
SCADA system, UPS check	Weekly		
Meter Readings	Weekly		
Valve & Chamber inspection	Weekly		
Instrument and Alarm test calibration	Annually	17 Oct	
Calibrated River Level Monitor	Annually	19 Sept	
Flow Meter calibration	Annually	19 Sept	
Change battery in Milltronics	Every 3 years		
Corrective Maintenance			
SCADA Maintenance		10 July	Replace UPS
ROTORK Maintenance		4 Nov	Replace batteries in controllers 1-4

Date Jan-24	Inflow m3/day	BOD5 mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	Cond µg/L	pH	TBOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day
1	2,471																		
2	2,332																		
3	2,224	72	3.2	33	0.1	0.1	45.8	4.9	272	1250	7.45	160.128	7.1168	73.392	0.2224	0.2224	101.859	10.8976	604.928
4	2,184																		
5	2,251																		
6	2,240																		
7	2,359																		
8	2,059																		
9	1,994																		
10	2,463																		
11	2,295																		
12	2,185																		
13	2,266																		
14	2,347																		
15	2,069																		
16	1,998																		
17	2,020																		
18	1,991																		
19	2,007																		
20	2,129																		
21	2,201																		
22	1,881																		
23	1,886																		
24	1,894																		
25	1,960																		
26	2,183																		
27	2,185																		
28	2,309																		
29	2,046																		
30	2,048																		
31	2,063																		
Total	66,540																		
Average	2,146	72	3.20	33.0	0.10	0.10	46	4.9	272	1,250	7.45	160.13	7.12	73.39	0.22	0.22	101.86	10.90	604.93
Max	2,471	72	3.20	33.0	0.10	0.10	46	4.9	272	1,250	7.45	160.13	7.12	73.39	0.22	0.22	101.86	10.90	604.93
Min	1,881	72	3.20	33.0	0.10	0.10	46	4.9	272	1,250	7.45	160.13	7.12	73.39	0.22	0.22	101.86	10.90	604.93

Date Feb-24	Inflow m3/day	BOD5 mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	Cond µg/L	pH	TBOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day
1	2,060																		
2	2,058																		
3	2,227																		
4	2,323																		
5	2,056																		
6	2,046																		
7	2,056																		
8	2,014																		
9	2,135																		
10	2,787																		
11	3,079																		
12	2,739	70	2.52	33	0.1	0.1	44	4.08	154	1340	7.4	191.73	6.90228	90.387	0.2739	0.2739	120.516	11.1751	421.806
13	2,597																		
14	2,496																		
15	2,425																		
16	2,284																		
17	2,375																		
18	2,260																		
19	2,238																		
20	2,065																		
21	2,067																		
22	2,092																		
23	2,137																		
24	2,292																		
25	2,404																		
26	2,092																		
27	2,173																		
28	2,772																		
29	2,761																		
Total	67,110																		
Average	2,314	70	2.52	33.0	0.10	0.10	44	4.1	154	1,340	7.40	191.73	6.90	90.39	0.27	0.27	120.52	11.18	421.81
Max	3,079	70	2.52	33.0	0.10	0.10	44	4.1	154	1,340	7.40	191.73	6.90	90.39	0.27	0.27	120.52	11.18	421.81
Min	2,014	70	2.52	33.0	0.10	0.10	44	4.1	154	1,340	7.40	191.73	6.90	90.39	0.27	0.27	120.52	11.18	421.81

Date Mar-24	Inflow m3/day	BOD5 mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	Cond µg/L	pH	TBOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day
1	2,565																		
2	2,552																		
3	2,624																		
4	2,403	224	2.91	30.7	0.10	0.10	38.7	4.01	106	1090	7.40	538.272	6.99273	73.7721	0.2403	0.2403	92.9961	9.63603	254.718
5	2,421																		
6	2,565																		
7	2,564																		
8	2,480																		
9	2,918																		
10	4,361																		
11	3,370																		
12	2,903																		
13	2,745																		
14	2,521																		
15	2,563																		
16	2,612																		
17	3,016																		
18	2,638																		
19	2,506																		
20	2,453																		
21	2,348																		
22	2,349																		
23	2,389																		
24	2,497																		
25	2,220	122	9.95	118	10	10	146	11.6	51	2380	7.84	270.84	22.089	261.96	22.2	22.2	324.12	25.752	113.22
26	2,166																		
27	2,112																		
28	2,132																		
29	2,258																		
30	2,141																		
31	2,156																		
Total	79,548																		
Average	2,566	173	6.43	74.4	5.05	5.05	92.35	7.8	79	1,735	7.62	404.56	14.54	167.87	11.22	11.22	208.56	17.69	183.97
Max	4,361	224	9.95	118.0	10.00	10.00	146	11.6	106	2,380	7.84	538.27	22.09	261.96	22.20	22.20	324.12	25.75	254.72
Min	2,112	122	2.91	30.7	0.10	0.10	39	4.0	51	1,090	7.40	270.84	6.99	73.77	0.24	0.24	93.00	9.64	113.22

Date	Inflow m3/day	BOD5 mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	Cond µg/L	pH	TBOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day
1	2,188																		
2	1,989																		
3	2,074																		
4	2,363																		
5	2,765																		
6	3,139																		
7	3,008																		
8	2,649	77	1.78	21.8	0.1	0.1	30	2.5	97	1240	7.38	203.973	4.71522	57.7482	0.2649	0.2649	79.47	6.6225	256.953
9	2,476																		
10	2,392																		
11	2,390																		
12	3,037																		
13	3,012																		
14	2,987																		
15	2,620																		
16	2,469																		
17	2,411																		
18	2,551																		
19	2,667																		
20	2,664																		
21	2,675																		
22	2,370																		
23	2,292																		
24	2,459																		
25	2,439																		
26	2,282																		
27	2,346																		
28	2,460																		
29	2,191	203	23.7	235	1	1	234	27.5	252	2870	7.15	444.773	51.9267	514.885	2.191	2.191	512.694	60.2525	552.132
30	2,447																		
Total	75,812																		
Average	2,527	140	12.74	128.4	0.55	0.55	132.00	15.0	175	2,055	7.27	324.37	28.32	286.32	1.23	1.23	296.08	33.44	404.54
Max	3,139	203	23.70	235.0	1.00	1.00	234	27.5	252	2,870	7.38	444.77	51.93	514.89	2.19	2.19	512.69	60.25	552.13
Min	1,989	77	1.78	21.8	0.10	0.10	30	2.5	97	1,240	7.15	203.97	4.72	57.75	0.26	0.26	79.47	6.62	256.95

Date May-24	Inflow m3/day	BOD5 mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	Cond µg/L	pH	TBOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day
1	2,273																		
2	2,287																		
3	2,308																		
4	2,349																		
5	2,695																		
6	2,449																		
7	2,313																		
8	2,404																		
9	2,405																		
10	2,281																		
11	2,270																		
12	2,374																		
13	2,163	270	3.01	36.8	0.1	0.1	65.8	4.75	165	1190	7.47	584.01	6.51063	79.5984	0.2163	0.2163	142.325	10.2743	356.895
14	2,173																		
15	2,150																		
16	2,120																		
17	2,152																		
18	2,168																		
19	2,072																		
20	2,303																		
21	2,072																		
22	2,199																		
23	2,181																		
24	2,090																		
25	2,124																		
26	2,256																		
27	2,164	433	59.6	776	1	27.3	740	65	255	6420	7.44	937.012	128.9744	1679.264	2.164	59.0772	1601.36	140.66	551.82
28	2,141																		
29	2,101																		
30	2,083																		
31	2,048																		
Total	69,168																		
Average	2,231	352	31.31	406.4	0.55	13.70	402.90	34.9	210	3,805.00	7.46	760.51	67.74	879.43	1.19	29.65	871.84	75.47	454.36
Max	2,695	433	59.60	776.0	1.00	27.30	740	65.0	255	6,420	7.47	937.01	128.97	1,679.26	2.16	59.08	1,601.36	140.66	551.82
Min	2,048	270	3.01	36.8	0.10	0.10	66	4.8	165	1,190	7.44	584.01	6.51	79.60	0.22	0.22	142.33	10.27	356.90

Date	Inflow m3/day	BOD5 mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	Cond µg/L	pH	TBOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day
1	2,048																		
2	2,204																		
3	2,034	194	3.27	25.6	0.1	0.1	46.2	4.91	130	1040	7.02	394.596	6.65118	52.0704	0.2034	0.2034	93.9708	9.98694	264.42
4	2,014																		
5	1,989																		
6	2,585																		
7	3,065																		
8	2,841																		
9	2,824																		
10	2,449	2190	59.3	632	10	13	792	71.1	248	6040	7.06	5363.31	145.2257	1547.768	24.49	31.837	1939.61	174.124	607.352
11	2,292																		
12	2,215																		
13	2,253																		
14	2,352																		
15	2,255																		
16	2,348																		
17	2,168																		
18	2,184																		
19	2,169																		
20	2,105																		
21	1,986																		
22	2,009																		
23	2,596																		
24	3,351																		
25	2,919																		
26	2,853																		
27	3,186																		
28	2,730																		
29	2,502																		
30	2,412																		
Total	72,938																		
Average	2,431	1,192	31.29	328.8	5.05	6.55	419.10	38.0	189	3,540.00	7.04	2,878.95	75.94	799.92	12.35	16.02	1,016.79	92.06	435.89
Max	3,351	2,190	59.30	632.0	10.00	13.00	792	71.1	248	6,040	7.06	5,363.31	145.23	1,547.77	24.49	31.84	1,939.61	174.12	607.35
Min	1,986	194	3.27	25.6	0.10	0.10	46	4.9	130	1,040	7.02	394.60	6.65	52.07	0.20	0.20	93.97	9.99	264.42

Date	Inflow m3/day	BOD5 mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	Cond µg/L	pH	TBOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day
Jul-24																			
1	2,396																		
2	2,307	202	3.2	34.8	0.1	0.1	35.2	4.63	182	1090	7.12	466.0	7.4	80.3	0.2	0.2	81.2	10.7	419.9
3	2,347	3670	51.4	603	10	10	743	70.8	716	6770	7.35	8466.7	118.6	1391.1	23.1	23.1	1714.1	163.3	1651.8
4	2,475																		
5	2,352																		
6	2,377																		
7	2,403																		
8	2,197																		
9	2,116																		
10	2,491																		
11	3,295																		
12	3,185																		
13	2,747																		
14	2,661																		
15	2,706																		
16	3,003																		
17	2,704																		
18	2,592																		
19	2,337																		
20	2,266																		
21	2,317																		
22	2,220																		
23	2,154																		
24	2,227																		
25	2,253																		
26	2,266																		
27	2,189																		
28	2,253																		
29	2,099																		
30	2,102																		
31	2,228																		
Total	75,265																		
Average	2,428	1,936	27.30	318.9	5.05	5.05	389.10	37.7	449	3,930	7.24	4,466.35	62.98	735.70	11.65	11.65	897.65	87.01	1,035.84
Max	3,295	3,670	51.40	603.0	10.00	10.00	743	70.8	716	6,770	7.35	8,466.69	118.58	1,391.12	23.07	23.07	1,714.10	163.34	1,651.81
Min	2,099	202	3.20	34.8	0.10	0.10	35	4.6	182	1,090	7.12	466.01	7.38	80.28	0.23	0.23	81.21	10.68	419.87

Date Aug-24	Inflow m3/day	BOD5 mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	Cond µg/L	pH	TBOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day
1	2,187																		
2	2,115																		
3	2,049																		
4	2,036																		
5	2,086																		
6	2,013																		
7	1,982																		
8	1,964																		
9	3,612																		
10	3,634																		
11	2,915																		
12	2,519	146	2.36	26.5	0.1	0.1	31.3	3.32	326	1130	7.14	367.774	5.94484	66.7535	0.2519	0.2519	78.8447	8.36308	821.194
13	2,416	1900	58.5	778	10	10	799	79.9	3210	6560	7.36	4786.1	147.3615	1959.782	25.19	25.19	2012.68	201.268	8085.99
14	2,354																		
15	2,287																		
16	2,211																		
17	2,338																		
18	2,440																		
19	2,541																		
20	2,425																		
21	2,665																		
22	2,720																		
23	2,586																		
24	2,436																		
25	2,538																		
26	2,346																		
27	2,220																		
28	2,294																		
29	2,270																		
30	2,051																		
31	2,131																		
Total	74,381																		
Average	2,399	1,023	30.43	402.3	5.05	5.05	415.15	41.6	1,768	3,845	7.25	2,576.94	76.65	1,013.27	12.72	12.72	1,045.76	104.82	4,453.59
Max	3,634	1,900	58.50	778.0	10.00	10.00	799	79.9	3,210	6,560	7.36	4,786.10	147.36	1,959.78	25.19	25.19	2,012.68	201.27	8,085.99
Min	1,964	146	2.36	26.5	0.10	0.10	31	3.3	326	1,130	7.14	367.77	5.94	66.75	0.25	0.25	78.84	8.36	821.19

Date Sep-24	Inflow m3/day	BOD5 mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	Cond µg/L	pH	TBOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day
1	2,090																		
2	2,266																		
3	2,100																		
4	2,093	173	6.2	66.4	0.1	0.1	78.9	7.85	315	1200	7.22	362.089	12.9766	138.9752	0.2093	0.2093	165.138	16.4301	659.295
5	1,956	1200	38.1	477	10	10	559	49.2	516	4550	7.68	2511.6	79.7433	998.361	20.93	20.93	1169.99	102.976	1079.988
6	1,852																		
7	2,151																		
8	2,125																		
9	1,969																		
10	1,924																		
11	1,931																		
12	1,925																		
13	1,978																		
14	2,033																		
15	2,165																		
16	1,924																		
17	1,888																		
18	1,801																		
19	1,851																		
20	1,947																		
21	1,911																		
22	2,047																		
23	1,811																		
24	1,757																		
25	1,841																		
26	1,801																		
27	1,804																		
28	1,888																		
29	2,011																		
30	1,871																		
Total	58,711																		
Average	1,957	687	22.15	271.7	5.05	5.05	318.95	28.53	416	2,875	7.45	1,437	46.36	568.67	10.57	10.57	667.56	59.70	869.64
Max	2,266	1,200	38.10	477.0	10.00	10.00	559	49.2	516	4,550	7.68	2,512	79.74	998.36	20.93	20.93	1,169.99	102.98	1,079.99
Min	1,757	173	6.20	66.4	0.10	0.10	79	7.9	315	1,200	7.22	362	12.98	138.98	0.21	0.21	165.14	16.43	659.30

Date Oct-24	Inflow m3/day	BOD5 mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	Cond µg/L	pH	TBOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day
1	1,789																		
2	1,790																		
3	1,804																		
4	1,803																		
5	1,840																		
6	2,038																		
7	1,806	332	4.12	47	0.14	0.1	56.3	6.21	372	897	6.91	599.592	7.44072	84.882	0.25284	0.1806	101.678	11.2153	671.832
8	1,768																		
9	1,762																		
10	1,763	1460	52.9	513	1	1	556	59.7	322	4460	7.1	2573.98	93.2627	904.419	1.763	1.763	980.228	105.251	567.686
11	1,828																		
12	1,898																		
13	1,875																		
14	2,014																		
15	1,794																		
16	1,723																		
17	1,739																		
18	1,713																		
19	1,875																		
20	1,977																		
21	1,752																		
22	1,719																		
23	1,726																		
24	1,705																		
25	1,729																		
26	1,889																		
27	2,009																		
28	1,710																		
29	1,809																		
30	1,753																		
31	1,713																		
Total	56,113																		
Average	1,810	896	28.51	280.00	0.57	0.55	306.15	33.0	347	2,678.50	7.01	1,586.79	50.35	494.65	1.01	0.97	540.95	58.23	619.76
Max	2,038	1,460	52.90	513.0	1.00	1.00	556	59.7	372	4,460	7.10	2,573.98	93.26	904.42	1.76	1.76	980.23	105.25	671.83
Min	1,705	332	4.12	47.0	0.14	0.10	56	6.2	322	897	6.91	599.59	7.44	84.88	0.25	0.18	101.68	11.22	567.69

Date Nov-24	Inflow m3/day	BOD5 mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	Cond µg/L	pH	TBOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day
1	1,795																		
2	1,938																		
3	2,140																		
4	1,770	259	4.21	43.4	0.12	0.1	66.4	5.34	198	888	7.09	458.43	7.4517	76.818	0.2124	0.177	117.528	9.4518	350.46
5	1,780	2742	89.1	736	1	1	1000	96.5	796	7090	7.05	4853.34	157.707	1302.72	1.77	1.77	1770	170.805	1408.92
6	1,766																		
7	1,814																		
8	1,741																		
9	1,922																		
10	1,994																		
11	1,905																		
12	1,812																		
13	1,767																		
14	1,780																		
15	1,765																		
16	1,962																		
17	2,049																		
18	1,750																		
19	1,773																		
20	1,768																		
21	1,921																		
22	2,028																		
23	2,130																		
24	2,216																		
25	1,901																		
26	1,992																		
27	1,971																		
28	1,918																		
29	1,887																		
30	2,025																		
Total	56,980	24,144																	
Average	1,899	1,501	46.66	389.70	0.56	0.55	533.20	50.9	497	3,989	7.07	2,655.89	82.58	689.77	0.99	0.97	943.76	90.13	879.69
Max	2,216	2,742	89.10	736.0	1.00	1.00	1,000	96.5	796	7,090	7.09	4,853.34	157.71	1,302.72	1.77	1.77	1,770.00	170.81	1,408.92
Min	1,741	259	4.21	43.4	0.12	0.10	66	5.3	198	888	7.05	458.43	7.45	76.82	0.21	0.18	117.53	9.45	350.46

Date Dec-24	Inflow m3/day	BOD5 mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	Cond µg/L	pH	TBOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day
1	2,158																		
2	1,924																		
3	1,955																		
4	1,898																		
5	1,846																		
6	1,847																		
7	2,026																		
8	2,142																		
9	1,917	302	3.5	44.1	0.11	0.1	55	6.03	226	1050	6.95	578.934	6.7095	84.5397	0.21087	0.1917	105.435	11.5595	433.242
10	1,908																		
11	2,235																		
12	2,341																		
13	2,207																		
14	2,325																		
15	2,412																		
16	2,112																		
17	2,627																		
18	2,564																		
19	2,513																		
20	2,399																		
21	2,529																		
22	2,439																		
23	2,260																		
24	2,251																		
25	2,116																		
26	2,122																		
27	2,046																		
28	2,109																		
29	2,238																		
30	2,601																		
31	2,548																		
Total	68,615	9,781																	
Average	2,213	302	3.50	44.1	0.11	0.10	55	6.0	226	1,050	6.95	578.93	6.71	84.54	0.21	0.19	105.44	11.56	433.24
Max	2,627	302	3.50	44.1	0.11	0.10	55	6.0	226	1,050	6.95	578.93	6.71	84.54	0.21	0.19	105.44	11.56	433.24
Min	1,846	302	3.50	44.1	0.11	0.10	55	6.0	226	1,050	6.95	578.93	6.71	84.54	0.21	0.19	105.44	11.56	433.24

INFLUENT CHARACTERIZATION

Test Dates	Inflow m3/day	BOD5 mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	Cond µg/L	pH	TBOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day
10-10-2023	1,897	273	29.755	191.1	5.05	5.06	330.8	37.1	431	3270	7.42	509.03	55.58	356.88	9.43	9.44	617.93	69.38	805.11
20-11-2023	2,003	191	3.85	42.4	0.10	0.11	52.7	5.4	192	916	7.21	368.82	7.43	81.87	0.19	0.21	101.76	10.35	370.75
04-12-2023	2,420	187	3.36	45.0	0.10	0.11	45.5	4.7	145	1,060	7.07	410.84	7.38	98.87	0.22	0.24	99.96	10.39	318.57
03-01-2024	2,146	72	3.20	33.0	0.10	0.10	45.8	4.9	272	1,250	7.45	160.13	7.12	73.39	0.22	0.22	101.86	10.90	604.93
12-02-2024	2,314	70	2.52	33.0	0.10	0.10	44.0	4.1	154	1,340	7.40	191.73	6.90	90.39	0.27	0.27	120.52	11.18	421.81
04-03-2024	2,566	173	6.43	74.4	5.05	5.05	92.4	7.8	79	1,735	7.62	404.56	14.54	167.87	11.22	11.22	208.56	17.69	183.97
08-04-2024	2,527	140	12.74	128.4	0.55	0.55	132.0	15.0	175	2,055	7.27	324.37	28.32	286.32	1.23	1.23	296.08	33.44	404.54
13-05-2024	2,231	352	31.31	406.4	0.55	13.70	402.9	34.9	210	3,805	7.46	760.51	67.74	879.43	1.19	29.65	871.84	75.47	454.36
03-06-2024	2,431	1,192	31.29	328.8	5.05	6.55	419.1	38.0	189	3,540	7.04	2,878.95	75.94	799.92	12.35	16.02	1,016.79	92.06	435.89
02-07-2024	2,428	1,936	27.30	318.9	5.05	5.05	389.1	37.7	449	3,930	7.24	4,466.35	62.98	735.70	11.65	11.65	897.65	87.01	1,035.84
12-08-2024	2,399	1,023	30.43	402.3	5.05	5.05	415.2	41.6	1,768	3,845	7.25	2,576.94	76.65	1,013.27	12.72	12.72	1,045.76	104.82	4,453.59
04-09-2024	1,957	687	22.15	271.7	5.05	5.05	319.0	28.5	416	2,875	7.45	1,436.84	46.36	568.67	10.57	10.57	667.56	59.70	869.64
07-10-2024	1,810	896	28.51	280.0	0.57	0.55	306.2	33.0	347	2,679	7.01	1,586.79	50.35	494.65	1.01	0.97	540.95	58.23	619.76
04-11-2024	1,899	1,501	46.66	389.7	0.56	0.55	533.2	50.9	497	3,989	7.07	2,655.89	82.58	689.77	0.99	0.97	943.76	90.13	879.69
09-12-2024	2,213	302	3.50	44.1	0.11	0.10	55.0	6.0	226	1,050	6.95	578.93	6.71	84.54	0.21	0.19	105.44	11.56	433.24
Total Characteristics																			
Average	2,216	600	19	199	2.2	3.2	239	23	370	2,489	7.26	1,287	40	428	4.9	7.0	509	49	819
Max	4,361	1,936	47	406	5.1	13.7	533	51	1,768	3,989	7.62	4,466	83	1,013	13	30	1,046	105	4,454
Min	1,705	70	3	33	0.1	0.1	44	4	79	916	6.95	160	6.71	73	0.19	0.19	100	10	184
STD DEV	250.675	584	14	149	2.4	3.9	176	17	407	1,195	0.20	1,295	30	333	5	9	378	36	1,034
% of Avg	11.31%	97.36%	76.49%	74.88%	109.56%	121.15%	73.64%	72.06%	110.15%	48.01%	2.78%	100.56%	74.61%	77.74%	112.06%	121.28%	74.32%	72.27%	126.16%
2024 Characteristics																			
Average	2,242	695	20.50	225.9	2.32	3.53	262.8	25.2	398	2674	7.27	1502	43.85	490.3	5.30	7.97	568.1	54.3	900
Max	4,361	1936	46.66	406.4	5.05	13.70	533.2	50.9	1768	3989	7.62	4466	82.58	1013.3	12.72	29.65	1045.8	104.8	4454
Min	1,705	70	2.52	33.0	0.10	0.10	44.0	4.1	79	1050	6.95	160	6.71	73.4	0.21	0.19	101.9	10.9	184
2024 Total	821,181																		

SPRING 2024 DISCHARGE LOADING

Loading Calculated by Monthly Influent Volumes

	Influent Stored (m3)	Monthly Influent Characteristics							Loadings								
		BOD5 mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	BOD5 kg/mo	React P kg/mo	N-NH3 kg/mo	N-NO2 kg/mo	N-NO3 kg/mo	TKN kg/mo	TP kg/mo	TSS kg/mo
Oct-23	26,816	273	29,755	191.1	5.05	5.055	330.8	37.14	431	7307	798	5123	135.4	135.6	8871	996	11558
Nov-23	60,093	191	3.85	42.4	0.10	0.11	52.7	5.4	192	11478	231	2548	6.0	6.6	3167	322	11538
Dec-23	75,031	187	3.36	45.0	0.10	0.11	45.5	4.7	145	14031	252	3376	7.5	8.3	3414	355	10879
Jan-24	66,540	72	3.20	33.0	0.10	0.10	45.8	4.9	272	4791	213	2196	6.7	6.7	3048	326	18099
Feb-24	67,110	70	2.52	33.0	0.10	0.10	44.0	4.1	154	4698	169	2215	6.7	6.7	2953	274	10335
Mar-24	75,251	173	6.43	74.4	5.05	5.05	92.4	7.8	79	13018	484	5595	380.0	380.0	6949	587	5907
Apr-24	2,188	140	12.74	128.4	0.55	0.55	132.0	15.0	175	306	28	281	1.2	1.2	289	33	382
Totals	344,025									55,629	2,175	21,334	544	545	28,690	2,893	68,698

Loading Calculated by Average Day Mass

	Days of Influent Stored	Daily Loading Characteristics							Loadings								
		BOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day	BOD5 kg/mo	React P kg/mo	N-NH3 kg/mo	N-NO2 kg/mo	N-NO3 kg/mo	TKN kg/mo	TP kg/mo	TSS kg/mo
Oct-23	14	509	55.58	356.9	9.43	9.44	617.9	69.4	805	7126.4	778	4996	132.1	132.2	8651	971	11272
Nov-23	30	369	7.43	81.9	0.19	0.21	101.8	10.4	371	11065	223	2456	5.8	6.4	3053	311	11123
Dec-23	31	411	7.38	98.9	0.22	0.24	100.0	10.4	319	12736	229	3065	6.8	7.5	3099	322	9876
Jan-24	31	160	7.12	73.4	0.22	0.22	101.9	10.9	605	4964	221	2275	6.9	6.9	3158	338	18753
Feb-24	28	192	6.90	90.4	0.27	0.27	120.5	11.2	422	5368	193	2531	7.7	7.7	3374	313	11811
Mar-24	29	405	14.54	167.9	11.22	11.22	208.6	17.7	184	11732	422	4868	325.4	325.4	6048	513	5335
Apr-24	1	324	28.32	286.3	1.23	1.23	296.1	33.4	405	324	28	286	1.2	1.2	296	33	405
Totals	164									53,316	2,094	20,478	486	487	27,679	2,801	68,573

Δ Totals (kg)	2313	81	856	57.7	57.8	1011	92	125
% Difference	4.2%	3.7%	4.0%	10.6%	10.6%	3.5%	3.2%	0.2%

2023 Spring Discharge: March 29 to April 30

2023 Fall Discharge: Oct 18 to Nov 7

2024 Spring Discharge: April 2 to April 30

Assume that each release includes influent from the first day of the previous release up to the first day of the current release.

FALL 2024 DISCHARGE LOADING

Loading Calculated by Monthly Influent Volumes

	Influent Stored (m3)	Monthly Influent Characteristics							Loadings								
		BOD5 mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	BOD5 kg/mo	React P kg/mo	N-NH3 kg/mo	N-NO2 kg/mo	N-NO3 kg/mo	TKN kg/mo	TP kg/mo	TSS kg/mo
Mar-24	0	173	6.43	74.4	5.05	5.05	92.4	7.8	79	0	0	0	0.0	0.0	0	0	0
Apr-24	73,624	140	12.74	128.4	0.55	0.55	132.0	15.0	175	10307	938	9453	40.5	40.5	9718	1104	12847
May-24	69,168	352	31.31	406.4	0.55	13.70	402.9	34.9	210	24313	2165	28110	38.0	947.6	27868	2412	14525
Jun-24	72,938	1,192	31.29	328.8	5.05	6.55	419.1	38.0	189	86942	2282	23982	368.3	477.7	30568	2772	13785
Jul-24	75,265	1,936	27.30	318.9	5.05	5.05	389.1	37.7	449	145713	2055	24002	380.1	380.1	29286	2839	33794
Aug-24	74,381	1,023	30.43	402.3	5.05	5.05	415.2	41.6	1,768	76092	2263	29920	375.6	375.6	30879	3095	131506
Sep-24	58,711	687	22.15	271.7	5.05	5.05	319.0	28.5	416	40305	1300	15952	296.5	296.5	18726	1675	24394
Oct-24	0	896	28.51	280.0	0.57	0.55	306.2	33.0	347	0	0	0	0.0	0.0	0	0	0
Nov-24		1,501	46.66	389.7	0.56	0.55	533.2	50.9	497	0	0	0	0.0	0.0	0	0	0
Totals	424,087									383,672	11,004	131,419	1,499	2,518	147,045	13,897	230,852

Loading Calculated by Average Day Mass

	Days of Influent Stored	Daily Loading Characteristics								Loadings							
		BOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day	BOD5 kg/mo	React P kg/mo	N-NH3 kg/mo	N-NO2 kg/mo	N-NO3 kg/mo	TKN kg/mo	TP kg/mo	TSS kg/mo
March-24	0	405	14.54	167.9	11.22	11.22	208.6	17.7	184	0	0	0	0.0	0.0	0	0	0
Apr-24	29	324	28.32	286.3	1.23	1.23	296.1	33.4	405	9407	821	8303	35.6	35.6	8586	970	11732
May-24	31	761	67.74	879.4	1.19	29.65	871.8	75.5	454	23576	2100	27262	36.9	919.0	27027	2339	14085
Jun-24	30	2,879	75.94	799.9	12.35	16.02	1,016.8	92.1	436	86369	2278	23998	370.4	480.6	30504	2762	13077
Jul-24	31	4,466	62.98	735.7	11.65	11.65	897.7	87.0	1,036	138457	1952	22807	361.2	361.2	27827	2697	32111
Aug-24	31	2,577	76.65	1,013.3	12.72	12.72	1,045.8	104.8	4,454	79885	2376	31411	394.3	394.3	32419	3249	138061
Sep-24	30	1,437	46.36	568.7	10.57	10.57	667.6	59.7	870	43105	1391	17060	317.1	317.1	20027	1791	26089
Oct-24	0	1,587	50.35	494.7	1.01	0.97	541.0	58.2	620	0	0	0	0.0	0.0	0	0	0
Nov-24		2,656	82.58	689.8	0.99	0.97	943.8	90.1	880	0	0	0	0.0	0.0	0	0	0
Totals	182									380,799	10,919	130,841	1,516	2,508	146,390	13,808	235,155
		△ Totals (kg)		2,873		85		578		16.4		10.2		655		88	
		% Difference		0.7%		0.8%		0.4%		1.1%		0.4%		0.4%		0.6%	

2023 Fall Discharge: Oct 18 to Nov 7
2024 Spring Discharge: April 2 to April 30
2024 Fall Discharge: Oct 1 to Oct 28
Assume that each release includes influent from the first day of the previous release up to the first day of the current release.

Spring 2024 Pre-Discharge

Test Date	Cell Number	CBOD mg/L	Cond. µs/cm	React. P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	pH	TKN mg/L	TP mg/L	TSS mg/L	H2S mg/L	DO mg/L	Temp C°
2024-02-27	2	24	1260	0.01	38.5	0.1	0.1	7.64	50.9	0.451	31	0.0	4.59	7.9
	3	24	1170	0.196	31.1	0.10	0.10	7.95	42.2	0.715	39	0.0	14.26	7.9
	4	24	1250	0.02	39.4	0.10	0.10	7.82	52.7	0.531	22	0.0	12.23	6.1
	5	17	1040	0.056	20	0.10	0.54	7.94	25.6	0.355	16	0.0	12.09	6.3
	6	21	1130	0.286	30.3	0.10	0.20	8.03	38.6	0.726	25	0.0	13.9	3.3
	7	12	954	0.01	3.42	0.10	2.64	8.18	6.17	0.11	9	0.0	13	4.7
	8	14	907	0.139	0.053	0.10	1.11	8.54	2.79	0.373	11	0.0	14.05	3.5

Test Date	Cell Number	CBOD mg/L	Cond. µs/cm	React. P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	pH	TKN mg/L	TP mg/L	TSS mg/L	H2S mg/L	DO mg/L	Temp C°	Alkalinity
2024-03-11	4				31					0.483				3.2	205
	5				14.8					0.296				4.2	167
	6				27.1					0.674				3.2	211
	7				1.86					0.076				4.5	129

Test Date	Cell Number	CBOD mg/L	Cond. µs/cm	React. P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	pH	TKN mg/L	TP mg/L	TSS mg/L	H2S mg/L	DO mg/L	Temp C°	Alkalinity
2024-03-18	3				26.5					0.579				5.1	198
	4				31.6					0.617				5.1	206
	5				14					0.265				5.2	160
	6				26.5					0.71				4.8	205
	7				0.843					0.073				5	127

Test Date	Cell Number	CBOD mg/L	Cond. µs/cm	React. P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	pH	TKN mg/L	TP mg/L	TSS mg/L	H2S mg/L	DO mg/L	Temp C°
2024-03-25	3				24.7					0.5				2.8
	5				12.1					0.197				2.4
	6				25.6					0.624				

Fall 2024 Pre-Discharge

Test Date	Cell Number	CBOD mg/L	Cond. µs/cm	React. P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	pH	TKN mg/L	TP mg/L	TSS mg/L	H2S mg/L	DO mg/L	Temp C°
2024-09-04	2													
	3	14	844	0.014	0.178	0.42	0.25		8.09	0.802	66			
	4	12	925	0.013	1.65	9.06	3.82		15.7	1.08	94			
	5	2	849	0.888	0.423	0.10	0.10		3.77	1.25	22			
	6	1	892	0.352	2.29	0.10	0.10		6	0.77	44			
	7	1	757	1.25	0.043	0.1	0.1		1.83	1.51	5			
	8	1	635	1.3	0.043	0.10	0.10		1.69	1.44	12			

Test Date	Cell Number	CBOD mg/L	Cond. µs/cm	React. P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	pH	TKN mg/L	TP mg/L	TSS mg/L	H2S mg/L	DO mg/L	Temp C°
2024-09-16	3									0.707				
	4				2.16					0.561				
	5									1				
	6				1.88					1.4				
	7									0.827				
	8									1.26				

Test Date	Cell Number	CBOD mg/L	Cond. µs/cm	React. P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	pH	TKN mg/L	TP mg/L	TSS mg/L	H2S mg/L	DO mg/L	Temp C°
2024-09-26	5				0.823					0.661				
	6				1.39					0.336				
	7				0.387					0.957				
	8				0.075					1.61				

Date	Discharge m ³ /day	CBOD mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	Cond µg/L	pH on-site	TBOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day
2-Apr-24		8	0.01	11.60	0.10	2.76	13.8	0.122	11	884	8.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-Apr-24	17,928	6	0.010	12.40	0.10	2.57	15.1	0.130	11	884	8.21	107.57	0.18	222.31	1.79	46.07	270.71	2.32	188.24
4-Apr-24	17,935	6	0.010	12.40	0.10	2.57	15.1	0.130	11	884	8.21	107.61	0.18	222.39	1.79	46.09	270.82	2.32	188.32
5-Apr-24	18,370	6	0.010	12.40	0.10	2.57	15.1	0.130	11	884	8.21	110.22	0.18	227.79	1.84	47.21	277.39	2.38	192.89
6-Apr-24	19,262	6	0.010	12.40	0.10	2.57	15.1	0.130	11	884	8.21	115.57	0.19	238.85	1.93	49.50	290.86	2.49	202.25
7-Apr-24	18,590	6	0.010	12.40	0.10	2.57	15.10	0.130	11	884	8.21	111.54	0.19	230.52	1.86	47.78	280.71	2.41	195.20
8-Apr-24	16,898	4	0.010	13.20	0.10	2.38	16.4	0.137	10	883	8.11	67.59	0.17	223.05	1.69	40.22	277.13	2.32	168.98
9-Apr-24	17,830	6	0.010	11.95	0.10	2.28	15.10	0.140	9	877	8.05	106.88	0.18	213.07	1.78	40.65	269.23	2.50	151.56
10-Apr-24	18,380	6	0.010	11.95	0.10	2.28	15.1	0.140	8.5	876.5	8.05	110.28	0.18	219.64	1.84	41.91	277.54	2.57	156.23
11-Apr-24	18,178	8	0.010	10.70	0.10	2.18	13.8	0.143	7	870	7.98	145.42	0.18	194.50	1.82	39.63	250.86	2.60	127.25
12-Apr-24	18,552	9	0.010	12.30	0.11	1.78	15.1	0.141	9	865	8.00	157.69	0.19	228.19	1.95	32.93	280.14	2.61	166.97
13-Apr-24	17,341	9	0.010	12.30	0.11	1.78	15.10	0.141	9	865	8.00	147.40	0.17	213.29	1.82	30.78	261.85	2.44	156.07
14-Apr-24	17,222	9	0.010	12.30	0.11	1.78	15.1	0.141	9	865	8.00	146.39	0.17	211.83	1.81	30.57	260.05	2.42	155.00
15-Apr-24	19,576	9	0.010	12.30	0.11	1.78	15.1	0.141	9	865	8.00	166.40	0.20	240.78	2.06	34.75	295.60	2.75	176.18
16-Apr-24	18,241	9	0.010	13.90	0.11	1.37	16.4	0.138	11	860	8.01	164.17	0.18	253.55	2.01	24.99	299.15	2.52	200.65
17-Apr-24	18,220	8	0.010	12.65	0.11	1.39	15.9	0.146	11	865	7.96	145.76	0.18	230.48	1.91	25.23	288.79	2.66	200.42
18-Apr-24	18,098	8	0.010	12.65	0.11	1.39	15.9	0.15	11	865	7.96	144.78	0.18	228.94	1.90	25.07	286.85	2.64	199.08
19-Apr-24	18,242	7	0.010	11.40	0.10	1.40	15.3	0.15	11	870	7.90	127.69	0.18	207.96	1.82	25.54	279.10	2.81	200.66
20-Apr-24	17,599	8	0.015	11.85	0.10	1.12	16.0	0.17	11	874	7.89	131.99	0.26	208.55	1.76	19.62	281.58	2.92	184.79
21-Apr-24	18,214	8	0.015	11.85	0.10	1.12	16.0	0.17	11	874	7.89	136.61	0.27	215.84	1.82	20.31	291.42	3.02	191.25
22-Apr-24	17,848	8	0.02	11.85	0.10	1.12	16.0	0.17	11	874	7.87	133.86	0.27	211.50	1.78	19.90	285.57	2.96	187.40
23-Apr-24	17,739	8	0.015	11.85	0.10	1.115	16.0	0.17	10.5	874	7.96	133.04	0.27	210.21	1.77	19.78	283.82	2.94	186.26
24-Apr-24	18,576	8	0.015	11.85	0.10	1.115	16.0	0.17	10.5	874	7.96	139.32	0.28	220.13	1.86	20.71	297.22	3.08	195.05
25-Apr-24	18,115	8	0.02	12.3	0.1	0.83	16.7	0.18	10	877	8.04	144.92	0.36	222.81	1.81	15.04	302.52	3.22	181.15
26-Apr-24	18,432	11	0.03	13.0	0.10	0.66	18.0	0.24	15	883	8.06	193.54	0.55	239.62	1.84	12.17	330.85	4.51	276.48
27-Apr-24	18,870	11	0.03	13.0	0.10	0.66	18.0	0.24	15	883	8.06	198.14	0.57	245.31	1.89	12.45	338.72	4.61	283.05
28-Apr-24	19,587	11	0.03	13.0	0.1	0.66	18.0	0.24	15	883	8.06	205.66	0.59	254.63	1.96	12.93	351.59	4.79	293.81
29-Apr-24	16,034	11	0.030	13.0	0.10	0.66	18.0	0.24	15	883	8.06	168.36	0.48	208.44	1.60	10.58	287.81	3.92	240.51
30-Apr-24	5,879	13	0.040	13.7	0.10	0.49	19.2	0.31	20	888	8.08	76.43	0.24	80.54	0.59	2.88	112.88	1.83	117.58
Total	495,756											3845	7	6125	50	795	7881	81	5363
Average	17,706	7.88	0.02	12.36	0.10	1.6174	15.90	0.16	11.03	875.52	8.04	132.58	0.25	211.20	1.73	27.42	271.75	2.78	184.94
Max	19,587	13	0.04	13.90	0.11	2.76	19.2	0.31	20	888	8.31	205.66	0.59	254.63	2.06	49.50	351.59	4.79	293.81
Min	5,879	4	0.01	10.70	0.10	0.49	13.8	0.12	7	860	7.87	67.59	0.17	80.54	0.59	2.88	112.88	1.83	117.58

Note: Values in orange *italics* are averages of the preceding and following test values

Date	Discharge m³	CBOD mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	Cond µg/L	pH on site	TBOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day
1-Oct-24		4	0.261	0.52	0.10	0.12	3.01	0.06	22	887	7.99	0	0	0	0	0	0	0	0
2-Oct-24	7,975	6.0	0.155	0.58	0.10	0.295	3.545	0.248	21.0	876	7.72	47.85	1.23	4.59	0.80	2.35	28.27	1.98	167.48
3-Oct-24	8,209	6.0	0.155	0.58	0.10	0.295	3.545	0.248	21.0	876	7.72	49.25	1.27	4.72	0.82	2.42	29.10	2.04	172.39
4-Oct-24	8,520	6.0	0.155	0.58	0.10	0.30	3.545	0.248	21.0	876	7.72	51.12	1.32	4.90	0.85	2.51	30.20	2.11	178.92
5-Oct-24	7,946	6.0	0.155	0.58	0.10	0.30	3.545	0.248	21.0	876	7.72	47.68	1.23	4.57	0.79	2.34	28.17	1.97	166.87
6-Oct-24	8,157	6.0	0.155	0.58	0.10	0.30	3.545	0.248	21.0	876	7.72	48.94	1.26	4.69	0.82	2.41	28.92	2.02	171.30
7-Oct-24	8,623	6.0	0.155	0.58	0.10	0.30	3.545	0.248	21.0	876	7.72	51.74	1.33	4.96	0.86	2.54	30.57	2.14	181.08
8-Oct-24	8,024	6.0	0.155	0.58	0.10	0.30	3.545	0.248	21.0	876	7.72	48.14	1.24	4.61	0.80	2.37	28.45	1.99	168.50
9-Oct-24	8,268	6.0	0.155	0.58	0.10	0.30	3.545	0.248	21.0	876	7.72	49.61	1.28	4.75	0.83	2.44	29.31	2.05	173.63
10-Oct-24	8,430	6.0	0.155	0.58	0.10	0.295	3.545	0.248	21.0	876	7.72	50.58	1.30	4.85	0.84	2.49	29.88	2.09	177.03
11-Oct-24	8,553	8	0.05	0.63	0.10	0.47	4.08	0.441	20	864	7.44	68.42	0.41	5.36	0.86	4.02	34.90	3.77	171.06
12-Oct-24	8,440	8.5	0.031	0.96	0.10	0.455	4.58	0.460	20.5	855	7.45	71.74	0.26	8.09	0.84	3.84	38.61	3.88	173.02
13-Oct-24	8,442	8.5	0.031	0.96	0.10	0.455	4.58	0.460	20.5	855	7.45	71.76	0.26	8.09	0.84	3.84	38.62	3.88	173.06
14-Oct-24	7,796	8.5	0.031	0.96	0.10	0.455	4.58	0.460	20.5	855	7.45	66.27	0.24	7.47	0.78	3.55	35.67	3.58	159.82
15-Oct-24	8,049	8.5	0.031	0.96	0.10	0.455	4.58	0.460	20.5	855	7.46	68.42	0.25	7.71	0.80	3.66	36.82	3.70	165.00
16-Oct-24	15,979	8.5	0.031	0.96	0.10	0.455	4.58	0.460	20.5	855	7.54	135.82	0.50	15.32	1.60	7.27	73.10	7.34	327.57
17-Oct-24	20,051	8.5	0.031	0.96	0.10	0.455	4.575	0.460	20.5	855	7.54	170.43	0.62	19.22	2.01	9.12	91.73	9.21	411.05
18-Oct-24	22,045	9	0.01	1.29	0.10	0.44	5.07	0.478	21	846	7.62	198.41	0.31	28.44	2.20	9.70	111.77	10.54	482.95
19-Oct-24	27,334	7.5	0.012	1.44	0.10	0.435	5.34	0.523	24.5	843	7.80	205.01	0.33	39.22	2.73	11.89	145.96	14.30	669.68
20-Oct-24	23,136	7.5	0.012	1.44	0.10	0.435	5.34	0.523	24.5	843	7.80	173.52	0.28	33.20	2.31	10.06	123.55	12.10	566.83
21-Oct-24	24,008	6	0.01	1.58	0.10	0.43	5.61	0.568	28	840	7.98	144.05	0.24	37.93	2.40	10.32	134.68	13.64	672.22
22-Oct-24	24,702	22.0	0.016	2.53	0.12	0.485	7.1	0.581	43.0	848	8.14	543.44	0.38	62.37	2.96	11.98	175.38	14.34	1062.19
23-Oct-24	25,052	22.0	0.016	2.53	0.12	0.485	7.1	0.581	43.0	848	8.14	551.14	0.39	63.26	3.01	12.15	177.87	14.54	1077.24
24-Oct-24	25,393	38	0.02	3.47	0.14	0.54	8.59	0.593	58	856	8.30	964.93	0.53	88.11	3.56	13.71	218.13	15.06	1472.79
25-Oct-24	24,412	27.5	0.016	4.40	0.16	0.6	10.095	0.639	58.5	855	8.37	671.33	0.38	107.41	3.78	14.65	246.44	15.59	1428.10
26-Oct-24	14,156	27.5	0.016	4.40	0.16	0.6	10.095	0.639	58.5	855	8.37	389.29	0.22	62.29	2.19	8.49	142.90	9.04	828.13
27-Oct-24	9,447	27.5	0.016	4.40	0.16	0.6	10.095	0.639	58.5	855	8.37	259.79	0.15	41.57	1.46	5.67	95.37	6.03	552.65
28-Oct-24	8,958	17	0.01	5.33	0.17	0.66	11.6	0.684	59	853	8.44	152.29	0.09	47.75	1.52	5.91	103.91	6.13	528.52
Total	380,105																		
Average	14,078	11.73	0.07	1.60	0.11	0.42	5.45	0.43	29.66	861	7.82	535.10	0.62	725.45	43.29	172	2288	185.05	12459.1
Max	27,334	38	0.26	5.33	0.17	0.66	11.60	0.68	59	887	8.44	964.93	1.33	107.41	3.78	14.65	246.44	15.59	1472.79
Min	7,796	4	0.01	0.52	0.10	0.12	3.01	0.06	20	840	7.44	47.68	0.09	4.57	0.78	2.34	28.17	1.97	159.82

Note: Values in orange *italics* are averages of the preceding and following test values

SPRING 2024 DISCHARGE COMPLIANCE AND EFFICIENCIES

	Effluent Limits		Effluent Objectives		Actual Discharge Ave.		% of Conc. Objective	% of Mass Limits
	Concentrations mg/L	Mass Kg	Concentrations mg/L	Mass Kg	Concentrations mg/L	Mass Kg		
CBOD	30	23,190	20	9,915	7.88	3,845	38.8%	16.6%
TSS	30	23,190	20	9,915	11.03	5,363	54.1%	23.1%
TP	0.56	433	0.5	248	0.16	81	32.5%	18.6%
N-NH3	10.0	7,730	5	2,479	12.36	6,125	158.5%	79.2%
H2S	0	0	0	0	0.00	0.00		
DO(min)	>2.0	992			9.76	4,838		-
pH	6.0 - 9.5		6.5 - 8.5		7.87 to 8.31 with an avg. 8.04			
In-River Dilution	17.3 - 115		-	-	Max 264.05 Min 53.96 Average 116.7		High Dilution range	

Removal Efficiencies

	Effluent Mass total kg	By Monthly Influent Volume		By Average Daily Mass	
		Influent Mass kg	Removal eff.	Influent Mass kg	Removal eff.
CBOD	3,845	55,629	93.1%	53,316	92.8%
TSS	5,363	68,698	92.2%	68,573	92.2%
TP	81	2,893	97.2%	2,801	97.1%
N-NH3	6,125	21,334	71.3%	20,478	70.1%

FALL 2024 DISCHARGE COMPLIANCE AND EFFICIENCIES

	Effluent Limits		Effluent Objectives		Actual Discharge Ave.		% of Conc. Objective	% of Mass Limits
	Concentrations mg/L	Mass Kg	Concentrations mg/L	Mass Kg	Concentrations mg/L	Mass Kg		
CBOD	30	19,132	20	7,602	11.73	5,351	70.4%	28.0%
TSS	30	19,132	20	7,602	29.66	11,274	148.3%	58.9%
TP	0.56	357	0.50	190	0.43	185	97.4%	51.8%
N-NH3	2.00	1,275	1	638	2.14	725	113.8%	56.9%
H2S	0	0			0.00	0.00	0.0%	0.0%
DO(min)	>2.0	760	-	-	9.58	3,640		-
pH	6.0 - 9.5		6.5 - 8.5		7.44 to 8.44 with an avg. 7.82		High Dilution range	
In-River Dilution	12.1:1 Oct - 7.9:1 Nov		-		Max 83.65 Min 6.4 Average 53.9			

Removal Efficiencies

	Effluent Mass total kg	By Monthly Influent Mass kg		By Average Daily Mass	
		Influent Mass kg	Removal eff.	Influent Mass kg	Removal eff.
CBOD	5,351	383,672	98.6%	380,799	98.6%
TSS	11,274	230,852	95.1%	235,155	95.2%
TP	185.1	13,897	98.7%	13808	98.7%
N-NH3	725	131,419	99.4%	130841	99.4%

SPRING 2024 DISCHARGE												
Date	Time	Meter Reading	Discharge Flow L/s	Total m3	River Flow m3/s	Dilution in River	Lagoon DO mg/L	U/S River DO mg/L	D/S River DO mg/L	Effluent H2S mg/L	Effluent Quality	Lagoon Temp °C
2-Apr-24	8:40 AM	15682749	202.2		10.91	54.0	10.6	10.32	10.58	0.00		8.3
3-Apr-24	8:28 AM	15700677	208.4	17,928	11.46	55.0						
4-Apr-24	8:12 AM	15718612	189	35,863	13.98	74.0						
5-Apr-24	8:25 AM	15736982	208.2	54,233	30.02	144.2						
6-Apr-24	9:55 AM	15756244	201.6	73,495	51.29	254.4						
7-Apr-24	10:30 AM	15774834	200.9	92,085	43.72	217.6						
8-Apr-24	8:48 AM	15791732	207.7	108,983	34.34	165.3	11.28	9.9	10.5	0.00		9.1
9-Apr-24	8:21 AM	15809562	214.59	126,813	28.81	134.3						
10-Apr-24	8:32 AM	15827942	207.9	145,193	22.94	110.3						
11-Apr-24	8:36 AM	15846120	207.5	163,371	20.87	100.6	9.47	9.53	10.22	0.00		11.7
12-Apr-24	8:55 AM	15864672	206.1	181,923	30.62	148.6						
13-Apr-24	7:47 AM	15882013	193.6	199,264	51.12	264.0						
14-Apr-24	6:34 AM	15899235	243.9	216,486	40.73	167.0						
15-Apr-24	8:25 AM	15918811	196.5	236,062	31.89	162.3						
16-Apr-24	8:31 AM	15937052	220.3	254,303	24.55	111.4	10.2	9.56	10.31	0.00		9.8
17-Apr-24	8:36 AM	15955272	221.4	272,523	19.20	86.7						
18-Apr-24	8:32 AM	15973370	211.8	290,621	21.00	99.2						
19-Apr-24	8:40 AM	15991612	234.1	308,863	24.46	104.5	9.56	9.83	10.25	0.00		9
20-Apr-24	8:05 AM	16009211	208.51	326,462	21.66	103.9						
21-Apr-24	8:30 AM	16027425	207.1	344,676	21.55	104.06						
22-Apr-24	8:21 AM	16045273	206.4	362,524	15.52	75.19	9.46			0.00		
23-Apr-24	7:53 AM	16063012	205.8	380,263	16.18	78.62						
24-Apr-24	8:24 AM	16081588	208.7	398,839	16.79	80.45						
25-Apr-24	8:27 AM	16099703	211.5	416,954	18.91	89.41	9.14	10.44	11.27	0.00		8.8
26-Apr-24	8:51 AM	16118135	207.2	435,386	13.82	66.70						
27-Apr-24	9:56 AM	16137005	206.7	454,256	14.32	69.28						
28-Apr-24	12:11 PM	16156592	212.4	473,843	13.81	65.02						
29-Apr-24	9:12 AM	16172626	209.8	489,877	16.88	80.46	8.36	10.31	9.24	0.00		11
30-Apr-24	8:16 AM	16178505		495,756	18.21							
Total	671.60		495,756									
Average		209.3	17705.6			116.66	9.76	9.98	10.34	0.00		9.67
Max		243.9	19587			264.0	11.28	10.44	11.27	0		11.7
Min		189	5879			54.0	8.36	9.53	9.24	0		8.3

SPRING 2024 DISCHARGE - RIVER WATER QUALITY

Location	Date	CBOD mg/L	Cond. µS/cm	React P. mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	pH on-site	TKN mg/L	TP mg/L	TSS mg/L	DO mg/L	Temp °C
U/S	2-Apr	5	776	0.01	0.055	0.10	2.4	7.63	1.04	0.042		12	10.32
	8-Apr	2	613	0.1	0.182	0.10	5.03	7.47	1.07	0.054		13	9.9
	11-Apr	5	680	0.1	0.138	0.10	3.95	7.82	0.981	0.047		12	9.53
	16-Apr	6	646	0.01	0.077	0.10	4.34	7.68	0.996	0.04		15	9.56
	19-Apr	3	693	0.01	0.115	0.10	3.86	7.78	0.961	0.03		7	9.83
	25-Apr	5	702	0.01	0.094	0.10	3.24	8.03	0.948	0.037		7	10.44
D/S	30-Apr	6	719	0.01	0.071	0.10	2.79	8.03	0.8	0.051		6	10.31
	2-Apr	5	775	0.01	0.034	0.10	2.43	8.04	0.771	0.034		13	10.58
	8-Apr	1	616	0.1	0.238	0.1	4.89	7.61	1.15	0.055		21	10.5
	11-Apr	5	681	0.1	0.342	0.1	4.02	7.93	1.24	0.062		14	10.22
	16-Apr	6	656	0.01	0.243	0.1	4.4	7.79	1.23	0.035		13	10.31
	19-Apr	3	699	0.01	0.259	0.1	4.01	7.9	1.18	0.041		8	10.25
	25-Apr	5	705	0.012	0.348	0.1	3	8.16	1.28	0.034		8	11.27
	30-Apr	4	732	0.01	0.191	0.1	2.97	8.18	1.04	0.05		12	9.24

Toxicity			
Date	Species	Test Length	Mortality
22-Apr	Daphnia Magna	48 hr	0
	Rainbow Trout	96 hr	0

Annual Performance Report 2024

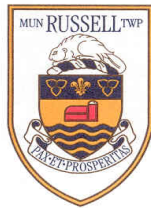
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FALL 2024 DISCHARGE - RIVER WATER QUALITY

Location	Date	CBOD mg/L	Cond. µs/cm	React P. mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	pH on site	TKN mg/L	TP mg/L	TSS mg/L	DO mg/L	Temp °C
U/S	1-Oct	1	1020	0.064	0.03	0.1	0.1	7.59	0.79	0.519	8	8.51	18.6
	11-Oct	1	1020	0.063	0.063	0.1	0.27	7.64	0.774	0.107	12	7.97	12.2
	18-Oct	3	963	0.075	0.07	0.1	0.19	7.8	1.04	0.143	13	9.26	9.1
	21-Oct	1	965	0.069	0.101	0.1	0.11	8.06	0.688	0.132	7	9	11.1
	24-Oct	7	946	0.015	0.073	0.1	0.1	7.78	0.804	0.087	12	8.88	10.5
	28-Oct	1	942	0.014	0.113	0.1	0.13	7.88	1.47	0.082	10	9.07	8.5
D/S	1-Oct	1	965	0.015	0.046	0.1	0.1	7.22	0.734	0.076	13	11.88	18.7
	11-Oct	1	1030	0.046	0.079	0.1	0.22	7.54	1.15	0.151	14	8.19	11.8
	18-Oct	6	943	0.047	0.231	0.1	0.29	7.65	3.56	0.289	17	9.84	8.7
	21-Oct	3	954	0.029	0.422	0.1	0.026	8.25	1.78	0.234	9	10.1	11.5
	24-Oct	5	930	0.019	0.532	0.1	0.33	8.2	2.54	0.2	30	9.43	10.8
	28-Oct	5	913	0.01	0.853	0.1	0.32	8.17	2.64	0.195	24	10	8

Toxicity			
Date	Species	Test Length	Mortality
15-Oct	Daphnia Magna	48 hr	0
	Rainbow Trout	96 hr	0

TOWNSHIP OF RUSSELL PUBLIC UTILITIES



RUSSELL SANITARY SEWER SYSTEM WORKS #110001514

2024 ANNUAL OPERATIONS REPORT

Russell
Sanitary Capacity Report
January 1, 2025

Water Capacity	
Residential Units	2123 x 3 = 6369
Apartment Units	357 x 2 = 714
Commercial Units	67 x 1 = 67
Retirement Home w/ kitchen	30 x 1 = 30
Retirement Home no kitchen	102 x 1 = 102
In-Law Suites	0 x 1 = 0
Schools	5 = 302
Total Population Served	7584

Meter Reading from school, divided by 200 school days, divided daily average

NOTE: AVERAGE PERSONS PER HOUSEHOLD = 3.0 (STATISTICS CANADA 2006 CENSUS)
SCHOOLS POPULATION BASIS: @ 40% RURAL (318 HRS SCHOOL DAY)
@ 60% URBAN (318 HRS SCHOOL DAY)

Calculated per MOE Procedure D-5-1
TOWNSHIP OF RUSSELL - RUSSELL WASTEWATER SYSTEM UNCOMMITTED HYDRAULIC RESERVE CAPACITY
As of December 31, 2024

Average Daily Flow		Serviced Population		Per Capita Flow		Source:
2024	1,495 m³/d	2024	7,584	2024	0.197 m³/cap/d	Provided by Township
2023	1,470 m³/d	2023	7,205	2023	0.204 m³/cap/d	Provided by Township
2022	1,309 m³/d	2022	6,954	2022	0.188 m³/cap/d	Provided by Township
2021	1,308 m³/d	2021	6,536	2021	0.200 m³/cap/d	Provided by Township
2020	1,210 m³/d	2020	6,092	2020	0.199 m³/cap/d	Provided by Township
Total Serviced Population as of 2024:		7,584 people				
Average per capita flow for the last five years:		0.198 m³/cap/d				
Average Calculated Daily Flow		Design Capacity (Rated)		Design Capacity Before TPM Plan is required		Source:
ADF	0.198 m³/cap/d X	7,584 =	1498.8 m³/d			Based on five-year historical average
D _c	Design Capacity (Rated)		2,675 m³/d			2024 Master Plan (See Note 2)
D _{c1}	Hydraulic Restrictions Capacity		2,110 m³/d			
D _{c2}	Maximum Operating Capacity before TPM		2,000 m³/d			
D _{c3}	Design Capacity Before TPM Plan is required		1,700 m³/d			
Cr	Design Capacity (Dc) - Av. Daily Flow (ADF)		1,176 m³/d			From Planning Department
P	Existing Residential Population Connected		7,584 people			
H	No. of Connected Residential Units		2,550 lots			
F	Average Daily Flow Per Capita		0.198 m³/cap/d			
L	No. of Committed Approved Lots		231 Lots			Water Allocation Spreadsheet Provided by Planning Department
$Cu = Cr - \frac{L \cdot F \cdot P}{H}$		$Cu = 1041 \text{ m}^3/\text{d}$		Uncommitted Reserve Hydraulic Capacity		
Cu =	1041 m³/d	Uncommitted Reserve Hydraulic Capacity				
LU	No. of Uncommitted Lots Remaining	Based on Master Plan Design Criteria				
$LU = \frac{Cu}{PPU \cdot P}$		$LU = \frac{Cu}{PPU \cdot P}$				
LU	1770 Lots					
Uncommitted Reserve Hydraulic Capacity & Uncommitted Lots considering hydraulic restriction capacity specified in 2024 Master Plan						
Cu =		476 m³/d				
LU =		809 Lots				
Uncommitted Reserve Hydraulic Capacity & Uncommitted Lots considering maximum operating capacity specified in 2012 ECA						
Cu =		366 m³/d				
LU =		622 Lots				
Uncommitted Reserve Hydraulic Capacity & Uncommitted Lots before TPM needs to be implemented with South Nation Conservation						
Cu =		66 m³/d				
LU =		112 Lots				

2024 Master Plan Average Daily Flow		Source:	
ADF	0.250 m³/d/c X	7,584 =	1896 m³/d
D _c	Design Capacity		2,675 m³/d
Cr	Design Capacity (Dc) - Av. Daily Flow (ADF)		779 m³/d
P	Existing Residential Population Connected		7,584 people
H	No. of Connected Residential Units		2,550 lots
F	Average Daily Flow Per Capita		0.250 m³/cap/d
L	No. of Committed Approved Lots		231 Lots
$Cu = Cr - \frac{L \cdot F \cdot P}{H}$		Water Allocation Spreadsheet Provided by Planning Department	
Cu =	608 m³/d	Uncommitted Reserve Hydraulic Capacity	
PPU	2.5 persons per unit	Based on Master Plan Design Criteria	
LU	No. of Uncommitted Lots Remaining	$LU = \frac{Cu}{PPU \cdot P}$	
LU	972 Lots		

Notes:

- The actual per capita flows are below the projected per capita flows per the Master Plan and GMP. It is recommended that the Master Plan per capita flows continue to be used for planning.
- The above calculation is based on the rated capacity reported. It does not take into account any limitations in the wastewater collection and treatment system. As part of the Master Plan, CIMA+ completed a preliminary capacity assessment of the Russell WWTP. The plant was determined to be hydraulically limited. Based on the capacity assessment, operational challenges at the Russell WWTP, due to storage limitations, are expected when influent flows reach approximately 2,110 m³/d (~80% of the ECA rated capacity). This is also typically when the planning and design phase of upgrades to WWTPs is triggered. A detailed capacity assessment is recommended to confirm the rated capacity of the lagoon facility.
- Consultation with South Nation Conservation is recommended to eliminate restriction on Russell Lagoon ECA. According to reserve capacity calculation, minimal additional development should be approved in Russell until restriction in ECA is removed.

RUSSELL SANITARY FLOWS AND CONSUMPTION 2024					
DATE	MONTHLY FLOW (m³)	DAILY AVERAGE (m³)	POPULATION	DAYS	AVERAGE PERSON/DAY
					(m³)
JAN	45,304	1,461	7,584	31	0.193
FEB	45,332	1,563	7,584	28	0.206
MAR	54,202	1,748	7,584	31	0.231
APR	53,198	1,773	7,584	30	0.234
MAY	48,091	1,551	7,584	31	0.205
JUNE	46,568	1,552	7,584	30	0.205
JULY	45,782	1,477	7,584	31	0.195
AUG	47,361	1,528	7,584	31	0.201
SEP	40,409	1,347	7,584	30	0.178
OCT	38,501	1,242	7,584	31	0.164
NOV	37,232	1,241	7,584	30	0.164
DEC	45,266	1,460	7,584	31	0.193
AVG m³	45,604				
TOTAL m³	547,246	1,499	7,584	365	0.198
YEAR	TOTAL YEARLY m³	AVERAGE MONTHLY m³	AVERAGE DAILY	POP	AVERAGE SEWAGE PERSON/DAY (m³)
2023	538,120	44,843	1,474	7,205	0.205
2022	473,042	39,420	1,296	6,954	0.186
2021	476,952	39,746	1,303	6,536	0.199
2020	443,070	36,923	1,211	6,092	0.199
2019	416,199	34,683	1,140	5,606	0.203
2018	409,537	34,128	1,122	5,036	0.223
2017	431,706	35,976	1,183	4,796	0.247
2016	340,451	28,371	930	4,565	0.204
2015	311,705	26,761	880	4,364	0.202
2014	330,212	27,518	905	4,127	0.209
2013	331,131	27,594	908	3,867	0.235
2012	281,839	23,487	770	3,592	0.246
2011	323,301	26,842	886	3,137	0.282
2010	320,809	26,734	879	2,993	0.294
2009	333,982	27,832	915	2,984	0.307
2008	375,908	31,326	1,027	2,792	0.368

RUSSELL SEWAGE TREATMENT SYSTEM 2024 ANNUAL PERFORMANCE REPORT

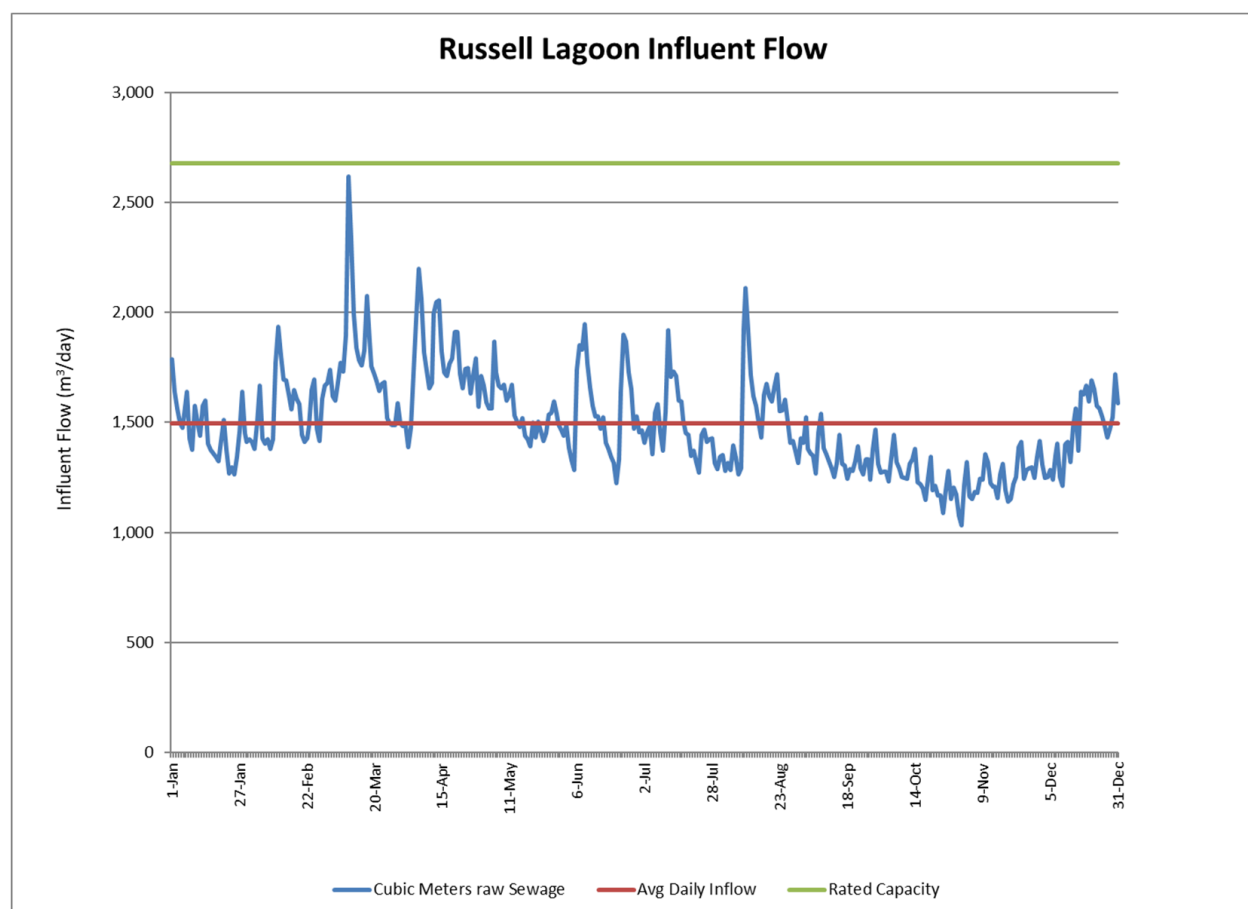
Executive Summary

The Russell Sewage Treatment System provides sewage treatment for the community of Russell in the Township of Russell. The sewage treatment system operates under the authority of Environmental Compliance Approval (ECA) number 3202-9XMPMQ issued August 21, 2015.

The Russell Sewage Treatment System currently consists of a five cell lagoon treatment facility that operates to receive an annual average day influent flow of 2,675 cubic meters and typically releases treated effluent twice annually. The annual releases must occur between January 1 and April 30 (Though the cells must be substantially free of ice cover) and between October 1 and December 15. There are no prescribed limits written into the ECA for either the spring or fall discharge volumes.

In 2024 the annual average day flow of raw sewage was 1,495 m³/day (**Figure 1**) representing 56% of the design annual average day flow (2,675 m³/day). The peak day flow of 3,306 m³/day occurred on March 10, 2024 and was a result of rainfall and snowmelt.

Figure 1: Russell Lagoon 2024 Influent Flow



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The ECA effluent compliance limits were met for the fall effluent discharge event. **Table 2** describes the ECA fall discharge effluent quality limits and compares those limits to the actual effluent quality characteristics of the 2024 fall discharge.

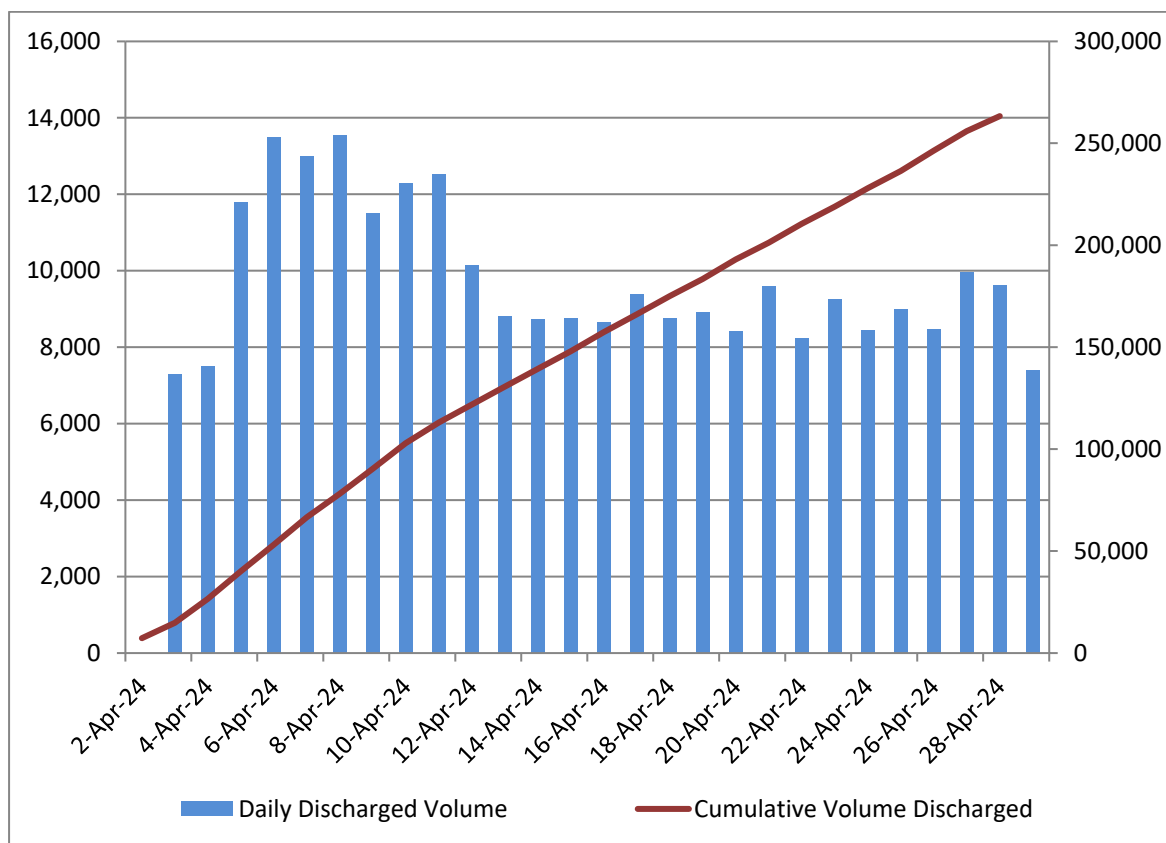
Table 1: ECA Spring Discharge Effluent Quality Limits and 2024 Actual Quality

Parameter	ECA Limits	Actual
Discharge volume	n/a	263,319 m ³
Discharge period	Mar 15 – Apr 30	Apr 2 – Apr 29
Dilution ratio (river flow : effluent flow)*	67:1	109.7:1
cBiochemical Oxygen Demand	30.0 mg/L	6.6 mg/L
Suspended solids	30.0 mg/L	3.3 mg/L
Total phosphorous	0.50 mg/L	0.09 mg/L
Total Ammonia Nitrogen	10.0 mg/L	8.49 mg/L
Hydrogen Sulphide	Non-detectable	0.0 mg/L
pH	6.0 to 9.5	7.48 – 8.17 ;avg. 7.83
Un-Ionized Ammonia	µg/L	102.97 µg/L

*Dilution Ratio is a ECA Objective, not a limit

The spring discharge volume was the final effluent produced by the sewage treatment system after processing raw sewage received from October 2, 2023 to April 2, 2024. The spring discharge profile and accumulated discharge volume are shown in **Figure 2**.

Figure 2: Russell Lagoon 2024 Spring Discharge



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Table 2 describes the ECA fall discharge effluent quality limits and the actual final effluent quality.

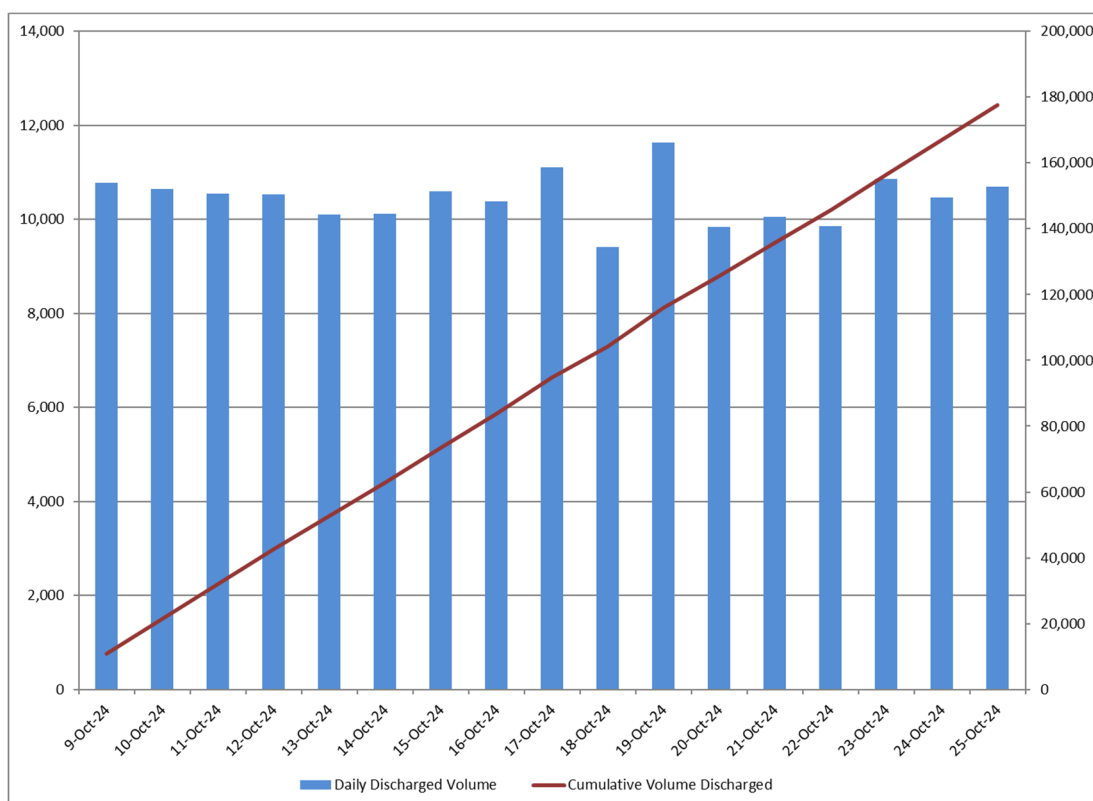
Table 2: ECA Fall Discharge Effluent Quality Limits and 2024 Actual Quality

Parameter	ECA Limits	Actual
Discharge volume	n/a	177,639 m ³
Discharge period	Oct 1 – Dec 15	Oct 8 – Oct 25
Dilution ratio (river flow : effluent flow)*	>13:1	26.4:1
cBiochemical Oxygen Demand	30.0 mg/L	2.14
Suspended solids	30.0 mg/L	4.14
Total phosphorous	0.5 mg/L	0.35
Total Ammonia Nitrogen	2.0 mg/L	0.64
Hydrogen Sulphide	Non-detectable	0.0 mg/L
pH	6.0 to 9.5	6.88 – 7.89 ;avg. 7.40
Un-Ionized Ammonia	µg/L	0.49 µg/L

*Dilution Ratio is a ECA Objective, not a limit

The fall discharge volume was the final effluent produced by the sewage treatment system after processing raw sewage received from April 2, 2024 to October 8, 2024. The fall discharge profile and accumulated discharge volume are shown in **Figure 3**.

Figure 3: Embrun Lagoon 2024 Fall Discharge



RUSSELL SEWAGE TREATMENT SYSTEM 2024 ANNUAL PERFORMANCE REPORT

During both the spring and fall discharge events a sample of the final effluent was collected and acute lethality tests were performed using the samples. For both samples zero mortality was observed when *Daphnia magna* were exposed to 100% final effluent for 48 hours. Also for both samples zero mortality was observed when rainbow trout were exposed to 100% final effluent for 96 hours.

There were four (4) public complaints related to the Russell sewage collection and treatment system logged in 2024. Staff responded to the complaints in a timely manner. Complaints were only for backup/blockages.

RUSSELL SEWAGE TREATMENT SYSTEM 2024 ANNUAL PERFORMANCE REPORT

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**RUSSELL SEWAGE TREATMENT SYSTEM
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Appendix B	2024 Discharge Summary
Appendix C	2024 Removal Efficiencies
Appendix D	2024 Effluent Discharge

RUSSELL SEWAGE TREATMENT SYSTEM 2024 ANNUAL PERFORMANCE REPORT

1.0 Sewage Treatment System Overview

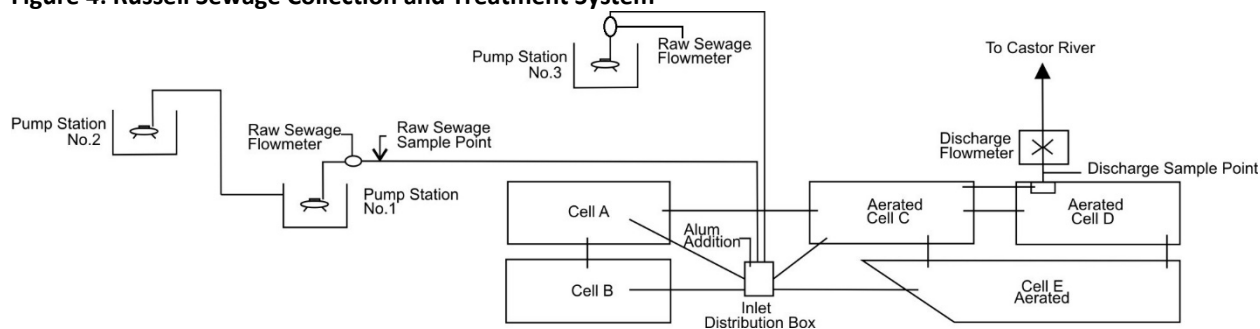
The Russell sewage treatment facility currently consists of three pumping stations and a five cell waste stabilization pond, an outlet chamber and an outfall pipe to the Castor River. The Phase 1 *Proposed Works* were completed in 2010 including a chemical addition system for phosphorous removal and an automatic effluent discharge control system.

Pump station 2 pumps sewage collected by a gravity system from a residential community to pump station 1. Pump station 1 receives sewage collected by gravity and from pump station 2 and then pumps the collected sewage to the lagoon treatment system. Pump station 3 collects sewage collected by gravity from a residential community and then pumps the collected sewage to the lagoon treatment system. The discharge flows from pump station 1 and 3 are metered and readings from the meter are used to report the treatment system influent flow rates. Alum is continuously injected into the sewage lagoon influent flow to aid in phosphorous removal. Treated effluent can be discharged to the Castor River twice a year: between January 1 and April 30 provided the cells are substantially free of ice cover, and between October 1 and December 15. The rate of the treated effluent discharge is proportional to the Castor River flow rate and is controlled to achieve prescribed dilution ratios.

The sewage treatment system operates under the authority of the Amended ECA No. 3202-9XMPMQ which was issued August 21, 2015.

Figure 4 is a schematic that outlines the sewage collection and treatment system. The schematic includes details that illustrate the location of the treatment system influent and effluent flow measurement devices. The schematic also identifies the raw sewage influent and treated effluent sample points.

Figure 4: Russell Sewage Collection and Treatment System



1.1 OPERATIONS AND MONITORING

Composite samples of raw sewage are collected once per month and analyzed for the parameters prescribed by the C of A or ECA with the exception of the influent tBOD₅. Influent samples were instead analyzed for CBOD₅. The samples were also analyzed to determine conductivity and pH, as well as the concentrations of total suspended solids (TSS), total ammonia-nitrogen (N-NH₃), nitrite-nitrogen (N-NO₂), nitrate-nitrogen (N-NO₃), total Kjeldahl nitrogen (TKN), reactive phosphorous (RP) and total phosphorous (TP).

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In advance of treated effluent discharge events, grab samples of the lagoon contents are collected from various locations throughout the lagoon treatment system and analyzed for the same suite of parameters listed for raw sewage analysis. The results from the analytical work are used to confirm the suitability of the treated effluent for release to the Castor River and to calculate the contaminant removal efficiencies of the lagoon system.

During the final effluent discharge events composite samples of the final effluent are collected and analyzed. The final effluent is sampled at least three times per week and analyzed for the required parameters (CBOD₅, TSS, TP, N-NH₃, H₂S, pH, and temperature). Additional readings of conductivity, RP, N-NO₂, N-NO₃, TKN, and DO are also taken during the sampling events. The Castor River is sampled upstream and downstream of the discharge during the events and analyzed for the same suite of parameters (CBOD₅, conductivity, RP, N-NH₃, N-NO₂, N-NO₃, pH, TKN, TP, DO, temperature, and H₂S) as was the lagoon final effluent.

Flow measurement data is collected by the sewage treatment SCADA system and verified by regular inspections by operating staff. Flow measurement of the raw sewage influent is accomplished using a magnetic flow meter located in the discharge piping of pump station 1. The flow from pump station 1 and 3 is conveyed directly to the lagoon treatment system and is the treatment system influent flow.

The final effluent discharge flow is measured using a flow meter. The collected flow measurements and the results from the analytical work performed on all the collected samples were used to verify the effectiveness of the sewage collection and treatment system and compliance with the terms and conditions of the ECA's.

The ECA effluent compliance limits were met for the spring and fall treated effluent discharge events. In the appendices of this report are tables of data that have been compiled and used to track and evaluate the performance of the sewage treatment system.

To ensure compliance with the performance criteria stipulated in the ECA the sewage treatment system was operated to meet the concentration objectives prescribed in the Terms and Conditions - Part 6. **Table 4** and **Table 5** describe the contaminant removal efficiencies of the sewage treatment system and provides for comparisons of the ECA concentration objectives and limits to 2024 actual conditions.

Table 3: Spring Final Effluent Characteristics and Sewage Treatment Removal Efficiencies

	Limits		Objectives		Results			
	Con. (mg/L)		Con. (mg/L)		Effluent Conc. (mg/L)	Effluent Mass (kg)	Influent Mass (kg)	Mass Removed
cBOD	30.0		20.0		6.57	1,754	30,784	94.3%
TSS	30.0		20.0		3.34	853	70,366	98.8%
TP	0.5	365/year	0.4		0.09	24	1,610	98.5%
N-NH ₃ -N	10.0		5.0		8.49	2,267	10,915	79.2%
H ₂ S	0.00				0.00			
pH	6.0-9.5		6.5-8.5		7.48 to 8.17 with an avg. 7.83			
In-River Dilution	67:1				65.7 to 249.1, avg. 109.7			

RUSSELL SEWAGE TREATMENT SYSTEM 2024 ANNUAL PERFORMANCE REPORT

Table 4: Fall Final Effluent Characteristics and Sewage Treatment Removal Efficiencies

	Limits		Objectives		Results			
	Con. (mg/L)		Con. (mg/L)		Effluent Conc. (mg/L)	Effluent Mass (kg)	Influent Mass (kg)	Mass Removed
cBOD	30.0		20.0		2.14	392	65,340	99.4%
TSS	30.0		20.0		4.14	754	67,513	98.9%
TP	0.50	365/year	<0.50		0.35	59 (83 total)	1,781	96.7%
N-NH ₃ -N	2		1		0.64	121	13,436	99.1%
H ₂ S	0		0		0	0	n/a	
pH	6.0 - 9.5		6.5 – 8.5		6.88 to 7.89 with an avg. 7.40			
In-River Dilution	>13:1				11.5 to 32.5, avg. 26.4:1			

The quantity of sludge generated in 2024 by the sewage treatment system is based on 60 grams of sludge generated per capita day. The estimated quantity of sludge generated in 2024 is 166,090 kg dry solids. With an estimated population growth of 2%, it is expected the sludge generated in 2025 will be approximately 169,418 kg of dry solids. As of the end of 2024 this leaves approximately 27,317 m³ of sludge, which represents a loss of 4.1%.

Effluent temperature, pH, and N-NH₃ readings were taken at the time of the spring and fall discharge sample collections, pH and temperature were taken on site while N-NH₃ were determined by a certified lab. These results were used to determine the un-ionized ammonia concentration of the final effluent as per “Ontario’s Provincial Water Quality Objectives” (July 1994). The final effluent un-ionized ammonia during the spring discharge event ranged from 64.87µg/L to 233.03 µg/L, averaging over the course of the discharge 102.97µg/L. The final effluent un-ionized ammonia during the fall discharge event ranged from 0.21µg/L to 11.67µg/L with an average of 0.49 µg/L. This is well under the 20µg/L objective. Total phosphor discharged over the course of the year was 83 kg, which is well under the annual limit of 365 kg/year (22.7%) as established by the ECA.

During both the spring and fall discharge events samples of the final effluent were collected and acute lethality tests were performed. The samples were collected on April 22, 2024 and October 25, 2024. Zero mortality was observed when *Daphnia magna* were exposed for 48 hours to 100% final effluent from both samples. Zero mortality was also observed for both samples when rainbow trout were exposed to 100% final effluent for 96 hours.

Analytical results from Castor River samples taken during the spring and fall discharge events are included in Appendix D.

¹ Dry solids have been calculated assuming three people per connection and 60g of solids accumulated per person per day. 2024 predicted dry solids = 365 days * 60 g/capita/day * (7,584 population)

RUSSELL SEWAGE TREATMENT SYSTEM 2024 ANNUAL PERFORMANCE REPORT

1.1.1 Public Complaints

There were four (4) public complaints related to the operation of the sewage collection and treatment system in 2024. Details of the complaint is summarized in **Table 6**.

Table 5: 2024 Public Complaint Summary

Date 2024	Address	Complaint	Action Taken
Feb 27	979 North Russell	Sanitary Blockage	Hydrovac main to clear
May 23	91 Settlement Lane	Sanitary Blockage	Lateral/Internal Blockage
Sept 3	209 Grace	Sanitary Blockage	Internal Plumbing
Oct 15	524 Junction	Sanitary Blockage	Internal Plumbing

*For more information refer to specific ticket ID#

1.1.2 Alterations, Extension and Replacements in 2024

No major changes to the collection system in 2024 beyond the addition of new roads.

1.1.3 Alterations, Extension and Replacements Planned for 2025

Construction of the three new subdivisions (Solidex, South West Park and Russell Trails) will continue. Construction will include a new sewage pumping station, number four, in the subdivision along Church st (South West Park). Work on a sanitary quality management system(QMS) will continue this year as well as an operations and maintenance manual to be implemented when complete.

1.1.4 2024 Maintenance Activities Summary

In 2024 all trunk sewers were meant to be flushed and cleaned using contracted services. The following tables summarize the routine and corrective maintenance activities performed by Township staff and contracted service providers on the collection and treatment facilities.

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Table 6 : Pump Station 1, 2024 Maintenance History

Preventative Maintenance	Frequency	Date	Comments
Back-Up Generator checks	Weekly		
Building Lights & HVAC	Weekly		
SCADA & UPS checks	Weekly		
Wet/Dry well inspection	Weekly		
Meter Readings	Weekly		
Test run back-up generator	Weekly		
Alarm Test and Flowmeter Calibration	Annually	19 Sept	
Generator Inspection, change generator oil and fuel filter	Annually		
Double Check Valve certification	Annually		
Replace Milltronics Battery	Every 3 Years		
Corrective Maintenance			
Clean Basket		15 Jan	
Clean Wet and grit chamber		23 Jan	
Clean Basket		6 Mar	
Clean Basket, Wet Well and Grit Chamber		17 Apr	
Clean Basket		18 July	
Clean Basket and Wet Well		25 July	
Clean Basket, Wet Well and Grit Chamber		26 Sept	
Pump Replacement		1 Oct	Replace Pump 2 temporarily to allow for removal and repair
Clean Basket, Wet Well and Grit Chamber		18 Dec	

Table 7 : Pump Station 2, 2024 Maintenance History

Preventative Maintenance	Frequency	Date	Comments
Pump Back-up Engine Drive Checks	Weekly		
Building Lights & HVAC	Weekly		
SCADA & UPS checks	Weekly		
Wet/Dry well inspection	Weekly		
Meter Readings	Weekly		
Test run pump engine drive	2/month		
Pump Engine service	Annual		
Instrument and Alarm test calibration	Annually		
Double Check Valve certification	Annually		
Replace Milltronics Battery	Every 3 Years		
Corrective Maintenance			
Clean Wet Well		6 Mar	
Radio Maintenance		30 Sept	Replace radio transmitter

**RUSSELL SEWAGE TREATMENT SYSTEM
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Table 8 : Pump Station 3, 2024 Maintenance History

Preventative Maintenance	Frequency	Date	Comments
Pump Back-up Engine Drive Checks	Weekly		
Building Lights & HVAC	Weekly		
SCADA & UPS checks	Weekly		
Wet well inspection	Weekly		
Meter Readings	Weekly		
Test run back-up generator	Weekly		Automated by SCADA
Generator Inspection, change generator oil and fuel filter	Annually		
Generator Annual Inspection	Annually		
Instrument and Alarm test calibration	Annually	22 Oct	
Flowmeter Calibration	Annually	19 Sept	
Double Check Valve certification	Annually		
Replace Milltronics Battery	Every 3 Years	19 Jan	
Corrective Maintenance			
Transfer Switch Maintenance		8 Jan	Replace burned out components
Clean Wet Well		8 Feb	
Float Maintenance		8 Feb	Removed Float (Low level)
Float Maintenance		9 Feb	Install replacement float
Inlet Pipe Maintenance		4 Mar	Repair sump in inlet
Clear Floats		7 Apr	Rag buld up
Clean Wet Well		17 Apr	
Clean Floats		8 May	Rag Build up
Wet Well Maintenance		14 June	Install Basket
Clean wet well and basket		9 July	
Clean Wet Well and basket		2 Oct	
Generator Maintenance		18 Nov	Remove leaking Sensor
Clean Wet Well and basket		18 Dec	

Table 9 : Alum Building, 2024 Maintenance History

Preventative Maintenance	Frequency	Date	Comments
Building Lights, HVAC, etc.	Weekly		
Meter Readings	Weekly		
Alum Line Flush	Weekly/Monthly		Weekly during winter, monthly during other months
Instrument and Alarm test calibration	Annually	22 Oct	

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Corrective Maintenance			

Table 10 : Blower Building, 2024 Maintenance History

Preventative Maintenance	Frequency	Date	Comments
Building Lights, HVAC, etc.	Weekly		
Meter Readings	Weekly		
Oil Change	1000 hrs	Apr 19	
Oil change	1000 hrs	4 Nov	
Grease Blower	Annually		1,2,3
Instrument and Alarm test calibration	Annually		
Clean Blower Air Filter			
Corrective Maintenance			
Blower Maintenance		28 Feb	Replace blower #2 belt
Air Line Maintenance		20 Mar	Repair leaking air line, cell A
Blower Maintenance		5 Apr	Grease motors

Table 10 : Kiosk Building, 2024 Maintenance History

Preventative Maintenance	Frequency	Date	Comments
Building Lights, HVAC, etc.	Weekly		
SCADA system, UPS check	Weekly		
Meter Readings	Weekly		
Valve & Chamber inspection	Weekly		
Flow Meter calibration	Annually		
Instrument and Alarm test calibration	Annually		
Flowmeter Calibration	Annually		
Corrective Maintenance			

Table 11 : Monitoring Equipment Calibration and Maintenance Summary

	Device	Calibrated by	Calibration Date	Calibration Technique

Date Jan-24	Inflow m3/day	BOD5 mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	Cond µg/L	pH	TBOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day
1	1,786																		
2	1,638																		
3	1,563	76	0.01	69.2	0.1	0.1	97.8	11.5	528	1310	6.92	118.788	0.01563	108.1596	0.1563	0.1563	152.861	17.9745	825.264
4	1,501																		
5	1,476																		
6	1,540																		
7	1,638																		
8	1,428																		
9	1,376																		
10	1,574																		
11	1,503																		
12	1,439																		
13	1,576																		
14	1,598																		
15	1,405																		
16	1,374																		
17	1,361																		
18	1,344																		
19	1,325																		
20	1,418																		
21	1,510																		
22	1,375																		
23	1,266																		
24	1,295																		
25	1,265																		
26	1,344																		
27	1,458																		
28	1,641																		
29	1,453																		
30	1,411																		
31	1,423																		
Total	45,304																		
Average	1,461	76	0.01	69.2	0.10	0.10	98	11.5	528	1,310	6.92	118.79	0.02	108.16	0.16	0.16	152.86	17.97	825.26
Max	1,786	76	0.01	69.2	0.10	0.10	98	11.5	528	1,310	6.92	118.79	0.02	108.16	0.16	0.16	152.86	17.97	825.26
Min	1,265	76	0.01	69.2	0.10	0.10	98	11.5	528	1,310	6.92	118.79	0.02	108.16	0.16	0.16	152.86	17.97	825.26

Date Feb-24	Inflow m3/day	BOD5 mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	Cond µg/L	pH	TBOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day
1	1,412																		
2	1,380																		
3	1,500																		
4	1,665																		
5	1,427																		
6	1,404																		
7	1,424																		
8	1,380																		
9	1,424																		
10	1,771																		
11	1,934																		
12	1,805	69	5.07	49.6	0.1	0.1	66.9	7.09	281	1410	7.72	124.545	9.15135	89.528	0.1805	0.1805	120.755	12.7975	507.205
13	1,694																		
14	1,692																		
15	1,627																		
16	1,561																		
17	1,648																		
18	1,607																		
19	1,583																		
20	1,445																		
21	1,410																		
22	1,429																		
23	1,485																		
24	1,647																		
25	1,693																		
26	1,473																		
27	1,415																		
28	1,608																		
29	1,789																		
Total	45,332																		
Average	1,563	69	5.07	49.6	0.10	0.10	67	7.1	281	1,410	7.72	124.55	9.15	89.53	0.18	0.18	120.75	12.80	507.21
Max	1,934	69	5.07	49.6	0.10	0.10	67	7.1	281	1,410	7.72	124.55	9.15	89.53	0.18	0.18	120.75	12.80	507.21
Min	1,380	69	5.07	49.6	0.10	0.10	67	7.1	281	1,410	7.72	124.55	9.15	89.53	0.18	0.18	120.75	12.80	507.21

Date Mar-24	Inflow m3/day	BOD5 mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	Cond µg/L	pH	TBOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day
1	1,665																		
2	1,679																		
3	1,738																		
4	1,621	114	0.338	28.1	0.10	0.39	39.5	3.76	130	1490	7.36	184.794	0.547898	45.5501	0.1621	0.63219	64.0295	6.09496	210.73
5	1,599																		
6	1,684																		
7	1,770																		
8	1,729																		
9	1,894																		
10	2,619																		
11	2,338																		
12	1,994																		
13	1,839																		
14	1,782																		
15	1,759																		
16	1,825																		
17	2,074																		
18	1,873																		
19	1,754																		
20	1,722																		
21	1,685																		
22	1,644																		
23	1,676																		
24	1,683																		
25	1,520																		
26	1,497																		
27	1,486																		
28	1,486																		
29	1,587																		
30	1,497																		
31	1,483																		
Total	54,202																		
Average	1,748	114	0.34	28.1	0.10	0.39	40	3.8	130	1,490	7.36	184.79	0.55	45.55	0.16	0.63	64.03	6.09	210.73
Max	2,619	114	0.34	28.1	0.10	0.39	40	3.8	130	1,490	7.36	184.79	0.55	45.55	0.16	0.63	64.03	6.09	210.73
Min	1,483	114	0.34	28.1	0.10	0.39	40	3.8	130	1,490	7.36	184.79	0.55	45.55	0.16	0.63	64.03	6.09	210.73

Date Apr-24	Inflow m3/day	BOD5 mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	Cond µg/L	pH	TBOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day
1	1,486																		
2	1,388																		
3	1,474																		
4	1,721																		
5	1,966																		
6	2,197																		
7	2,062																		
8	1,820	76	0.265	21.3	0.1	0.1	32.3	2.74	110	1500	7.48	138.32	0.4823	38.766	0.182	0.182	58.786	4.9868	200.2
9	1,733																		
10	1,656																		
11	1,680																		
12	1,994																		
13	2,047																		
14	2,055																		
15	1,822																		
16	1,725																		
17	1,711																		
18	1,767																		
19	1,790																		
20	1,909																		
21	1,912																		
22	1,719																		
23	1,654																		
24	1,742																		
25	1,746																		
26	1,633																		
27	1,716																		
28	1,792																		
29	1,572																		
30	1,709																		
Total	53,198																		
Average	1,773	76	0.27	21.3	0.10	0.10	32	2.7	110	1,500	7.48	138.32	0.48	38.77	0.18	0.18	58.79	4.99	200.20
Max	2,197	76	0.27	21.3	0.10	0.10	32	2.7	110	1,500	7.48	138.32	0.48	38.77	0.18	0.18	58.79	4.99	200.20
Min	1,388	76	0.27	21.3	0.10	0.10	32	2.7	110	1,500	7.48	138.32	0.48	38.77	0.18	0.18	58.79	4.99	200.20

Date May-24	Inflow m3/day	BOD5 mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	Cond µg/L	pH	TBOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day
1	1,668																		
2	1,593																		
3	1,565																		
4	1,562																		
5	1,867																		
6	1,725																		
7	1,666																		
8	1,654																		
9	1,669																		
10	1,599																		
11	1,622																		
12	1,672																		
13	1,533	147	3.99	47.8	0.1	0.1	65.3	6.22	144	1470	7.84	225.351	6.11667	73.2774	0.1533	0.1533	100.105	9.53526	220.752
14	1,504																		
15	1,481																		
16	1,521																		
17	1,440																		
18	1,422																		
19	1,393																		
20	1,501																		
21	1,432																		
22	1,504																		
23	1,461																		
24	1,416																		
25	1,450																		
26	1,536																		
27	1,544																		
28	1,596																		
29	1,538																		
30	1,491																		
31	1,466																		
Total	48,091																		
Average	1,551	147	3.99	47.8	0.10	0.10	65	6.2	144	1,470	7.84	225.35	6.12	73.28	0.15	0.15	100.10	9.54	220.75
Max	1,867	147	3.99	47.8	0.10	0.10	65	6.2	144	1,470	7.84	225.35	6.12	73.28	0.15	0.15	100.10	9.54	220.75
Min	1,393	147	3.99	47.8	0.10	0.10	65	6.2	144	1,470	7.84	225.35	6.12	73.28	0.15	0.15	100.10	9.54	220.75

Date Jun-24	Inflow m3/day	BOD5 mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	Cond µg/L	pH	TBOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day
1	1,440																		
2	1,486																		
3	1,382	183	4.99	60.8	0.1	0.1	72.6	7.14	250	1350	7.61	252.906	6.89618	84.0256	0.1382	0.1382	100.333	9.86748	345.5
4	1,329																		
5	1,285																		
6	1,738																		
7	1,849																		
8	1,830																		
9	1,946																		
10	1,768																		
11	1,660																		
12	1,577																		
13	1,526																		
14	1,527																		
15	1,473																		
16	1,523																		
17	1,407																		
18	1,380																		
19	1,342																		
20	1,315																		
21	1,224																		
22	1,330																		
23	1,638																		
24	1,897																		
25	1,868																		
26	1,726																		
27	1,649																		
28	1,472																		
29	1,526																		
30	1,455																		
Total	46,568	183	4.99	60.8	0.10	0.10	73	7.1	250	1,350	7.61	252.91	6.90	84.03	0.14	0.14	100.33	9.87	345.50
Average	1,552	183	4.99	60.8	0.10	0.10	73	7.1	250	1,350	7.61	252.91	6.90	84.03	0.14	0.14	100.33	9.87	345.50
Max	1,946	183	4.99	60.8	0.10	0.10	73	7.1	250	1,350	7.61	252.91	6.90	84.03	0.14	0.14	100.33	9.87	345.50
Min	1,224	183	4.99	60.8	0.10	0.10	73	7.1	250	1,350	7.61	252.91	6.90	84.03	0.14	0.14	100.33	9.87	345.50

Date Jul-24	Inflow m3/day	BOD5 mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	Cond µg/L	pH	TBOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day
1	1,462																		
2	1,409	300	6.27	71.3	0.1	0.12	81.2	9.5	389	1230	7.35	422.7	8.8	100.5	0.1	0.2	114.4	13.4	548.1
3	1,457																		
4	1,485																		
5	1,357																		
6	1,545																		
7	1,585																		
8	1,455																		
9	1,372																		
10	1,547																		
11	1,919																		
12	1,708																		
13	1,731																		
14	1,711																		
15	1,599																		
16	1,597																		
17	1,510																		
18	1,453																		
19	1,443																		
20	1,349																		
21	1,373																		
22	1,318																		
23	1,272																		
24	1,444																		
25	1,467																		
26	1,412																		
27	1,425																		
28	1,427																		
29	1,317																		
30	1,289																		
31	1,344																		
Total	45,782																		
Average	1,477	300	6.27	71.3	0.10	0.12	81	9.5	389	1,230	7.35	422.70	8.83	100.46	0.14	0.17	114.41	13.39	548.10
Max	1,919	300	6.27	71.3	0.10	0.12	81	9.5	389	1,230	7.35	422.70	8.83	100.46	0.14	0.17	114.41	13.39	548.10
Min	1,272	300	6.27	71.3	0.10	0.12	81	9.5	389	1,230	7.35	422.70	8.83	100.46	0.14	0.17	114.41	13.39	548.10

Date Aug-24	Inflow m3/day	BOD5 mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	Cond µg/L	pH	TBOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day
1	1,352																		
2	1,279																		
3	1,316																		
4	1,282																		
5	1,395																		
6	1,341																		
7	1,262																		
8	1,291																		
9	1,925																		
10	2,110																		
11	1,920																		
12	1,715	457	3.35	32.2	0.1	0.1	36.9	4.34	311	1170	7.31	783.755	5.74525	55.223	0.1715	0.1715	63.2835	7.4431	533.365
13	1,621																		
14	1,576																		
15	1,498																		
16	1,430																		
17	1,622																		
18	1,675																		
19	1,621																		
20	1,596																		
21	1,662																		
22	1,719																		
23	1,551																		
24	1,557																		
25	1,602																		
26	1,508																		
27	1,408																		
28	1,415																		
29	1,368																		
30	1,315																		
31	1,429																		
Total	47,361																		
Average	1,528	457	3.35	32.2	0.10	0.10	37	4.3	311	1,170	7.31	783.76	5.75	55.22	0.17	0.17	63.28	7.44	533.37
Max	2,110	457	3.35	32.2	0.10	0.10	37	4.3	311	1,170	7.31	783.76	5.75	55.22	0.17	0.17	63.28	7.44	533.37
Min	1,262	457	3.35	32.2	0.10	0.10	37	4.3	311	1,170	7.31	783.76	5.75	55.22	0.17	0.17	63.28	7.44	533.37

Date Sep-24	Inflow m3/day	BOD5 mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	Cond µg/L	pH	TBOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day
1	1,408																		
2	1,525																		
3	1,379	240	5.38	53.9	0.1	0.1	78.6	8.32	246	1190	7.04	330.96	7.41902	74.3281	0.1379	0.1379	108.389	11.4733	339.234
4	1,359																		
5	1,349																		
6	1,266																		
7	1,455																		
8	1,538																		
9	1,385																		
10	1,357																		
11	1,323																		
12	1,293																		
13	1,251																		
14	1,316																		
15	1,444																		
16	1,312																		
17	1,303																		
18	1,244																		
19	1,286																		
20	1,281																		
21	1,325																		
22	1,391																		
23	1,290																		
24	1,264																		
25	1,330																		
26	1,332																		
27	1,240																		
28	1,381																		
29	1,469																		
30	1,313																		
Total	40,409																		
Average	1,347	240	5.38	53.9	0.10	0.10	79	8.3	246	1,190	7.04	330.96	7.42	74.33	0.14	0.14	108.39	11.47	339.23
Max	1,538	240	5.38	53.9	0.10	0.10	79	8.3	246	1,190	7.04	330.96	7.42	74.33	0.14	0.14	108.39	11.47	339.23
Min	1,240	240	5.38	53.9	0.10	0.10	79	8.3	246	1,190	7.04	330.96	7.42	74.33	0.14	0.14	108.39	11.47	339.23

Date Oct-24	Inflow m3/day	BOD5 mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	Cond µg/L	pH	TBOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day
1	1,270																		
2	1,277																		
3	1,275																		
4	1,231																		
5	1,338																		
6	1,445																		
7	1,321	81	2.36	25.9	0.1	0.1	27.9	3.36	85	1080	7.26	107.001	3.11756	34.2139	0.1321	0.1321	36.8559	4.43856	112.285
8	1,293																		
9	1,251																		
10	1,248																		
11	1,242																		
12	1,310																		
13	1,331																		
14	1,380																		
15	1,226																		
16	1,221																		
17	1,201																		
18	1,149																		
19	1,251																		
20	1,343																		
21	1,193																		
22	1,210																		
23	1,166																		
24	1,169																		
25	1,090																		
26	1,191																		
27	1,279																		
28	1,151																		
29	1,203																		
30	1,170																		
31	1,076																		
Total	38,501																		
Average	1,242	81	2.36	25.9	0.10	0.10	28	3.4	85	1,080	7.26	107.00	3.12	34.21	0.13	0.13	36.86	4.44	112.29
Max	1,445	81	2.36	25.9	0.10	0.10	28	3.4	85	1,080	7.26	107.00	3.12	34.21	0.13	0.13	36.86	4.44	112.29
Min	1,076	81	2.36	25.9	0.10	0.10	28	3.4	85	1,080	7.26	107.00	3.12	34.21	0.13	0.13	36.86	4.44	112.29

Date Nov-24	Inflow m3/day	BOD5 mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	Cond µg/L	pH	TBOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day
1	1,032																		
2	1,215																		
3	1,319																		
4	1,165	296	0.263	51.6	0.1	0.1	64.2	7.88	396	964	6.92	344.84	0.306395	60.114	0.1165	0.1165	74.793	9.1802	461.34
5	1,151																		
6	1,184																		
7	1,181																		
8	1,242																		
9	1,240																		
10	1,355																		
11	1,319																		
12	1,224																		
13	1,209																		
14	1,206																		
15	1,156																		
16	1,263																		
17	1,311																		
18	1,191																		
19	1,142																		
20	1,152																		
21	1,220																		
22	1,252																		
23	1,387																		
24	1,410																		
25	1,245																		
26	1,285																		
27	1,290																		
28	1,296																		
29	1,247																		
30	1,343																		
Total	37,232																		
Average	1,241	296	0.26	51.6	0.10	0.10	64	7.9	396	964	6.92	344.84	0.31	60.11	0.12	0.12	74.79	9.18	461.34
Max	1,410	296	0.26	51.6	0.10	0.10	64	7.9	396	964	6.92	344.84	0.31	60.11	0.12	0.12	74.79	9.18	461.34
Min	1,032	296	0.26	51.6	0.10	0.10	64	7.9	396	964	6.92	344.84	0.31	60.11	0.12	0.12	74.79	9.18	461.34

Date Dec-24	Inflow m3/day	BOD5 mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	Cond µg/L	pH	TBOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day
1	1,417																		
2	1,308																		
3	1,248																		
4	1,251																		
5	1,282																		
6	1,240																		
7	1,351																		
8	1,404																		
9	1,252	206	2.9	38.7	0.14	0.1	49.7	5.07	253	1100	7.16	257.912	3.6308	48.4524	0.17528	0.1252	62.2244	6.34764	316.756
10	1,210																		
11	1,398																		
12	1,413																		
13	1,321																		
14	1,478																		
15	1,562																		
16	1,373																		
17	1,640																		
18	1,627																		
19	1,665																		
20	1,596																		
21	1,691																		
22	1,651																		
23	1,577																		
24	1,565																		
25	1,529																		
26	1,485																		
27	1,432																		
28	1,470																		
29	1,525																		
30	1,718																		
31	1,587																		
Total	45,266																		
Average	1,460	206	2.90	38.7	0.14	0.10	50	5.1	253	1,100	7.16	257.91	3.63	48.45	0.18	0.13	62.22	6.35	316.76
Max	1,718	206	2.90	38.7	0.14	0.10	50	5.1	253	1,100	7.16	257.91	3.63	48.45	0.18	0.13	62.22	6.35	316.76
Min	1,210	206	2.90	38.7	0.14	0.10	50	5.1	253	1,100	7.16	257.91	3.63	48.45	0.18	0.13	62.22	6.35	316.76

INFLUENT CHARACTERIZATION

Test Dates	Inflow m3/day	BOD5 mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	Cond µg/L	pH	TBOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day
10-10-2023	1,263	62	2.64	22.3	0.1	0.1	41.6	3.77	133	1470	7.56	79.11	3.37	28.45	0.13	0.13	53.08	4.81	169.71
20-11-2023	1,305	319	4.68	42.10	0.10	0.10	62.60	6.55	311	1,150	7.42	408.32	5.99	53.89	0.13	0.13	80.13	8.38	398.08
04-12-2023	1,625	61	0.31	29.40	0.10	0.10	33.20	3.18	184	1,420	7.20	88.08	0.45	42.45	0.14	0.14	47.94	4.59	265.70
03-01-2024	1,461	76	0.01	69.20	0.10	0.10	97.80	11.50	528	1,310	6.92	118.79	0.02	108.16	0.16	0.16	152.86	17.97	825.26
12-02-2024	1,563	69	5.07	49.60	0.10	0.10	66.90	7.09	281	1,410	7.72	124.55	9.15	89.53	0.18	0.18	120.75	12.80	507.21
04-03-2024	1,748	114	0.34	28.10	0.10	0.39	39.50	3.76	130	1,490	7.36	184.79	0.55	45.55	0.16	0.63	64.03	6.09	210.73
08-04-2024	1,773	76	0.27	21.30	0.10	0.10	32.30	2.74	110	1,500	7.48	138.32	0.48	38.77	0.18	0.18	58.79	4.99	200.20
13-05-2024	1,551	147	3.99	47.80	0.10	0.10	65.30	6.22	144	1,470	7.84	225.35	6.12	73.28	0.15	0.15	100.10	9.54	220.75
03-06-2024	1,552	183	4.99	60.80	0.10	0.10	72.60	7.14	250	1,350	7.61	252.91	6.90	84.03	0.14	0.14	100.33	9.87	345.50
02-07-2024	1,477	300	6.27	71.30	0.10	0.12	81.20	9.50	389	1,230	7.35	422.70	8.83	100.46	0.14	0.17	114.41	13.39	548.10
12-08-2024	1,528	457	3.35	32.20	0.10	0.10	36.90	4.34	311	1,170	7.31	783.76	5.75	55.22	0.17	0.17	63.28	7.44	533.37
04-09-2024	1,347	240	5.38	53.90	0.10	0.10	78.60	8.32	246	1,190	7.04	330.96	7.42	74.33	0.14	0.14	108.39	11.47	339.23
07-10-2024	1,242	81	2.36	25.90	0.10	0.10	27.90	3.36	85	1,080	7.26	107.00	3.12	34.21	0.13	0.13	36.86	4.44	112.29
04-11-2024	1,241	296	0.26	51.60	0.10	0.10	64.20	7.88	396	964	6.92	344.84	0.31	60.11	0.12	0.12	74.79	9.18	461.34
09-12-2024	1,460	206	2.90	38.70	0.14	0.10	49.70	5.07	253	1,100	7.16	257.91	3.63	48.45	0.18	0.13	62.22	6.35	316.76
Total Characteristics																			
Average	1,491	187.50	2.87	44.42	0.10	0.12	57.76	6.19	258.43	1,273.86	7.33	270.59	4.19	64.89	0.15	0.18	84.64	9.04	377.46
Max	2,619	457	6.27	71.30	0.14	0.39	97.80	11.50	528	1,500	7.84	783.76	9.15	108.16	0.18	0.63	152.86	17.97	825.26
Min	1,032	61	0.01	21.30	0.10	0.10	27.90	2.74	85	964	6.92	88.08	0.02	34.21	0.12	0.12	36.86	4.44	112.29
STD DEV	166.3442	121.14	2.27	16.03	0.01	0.08	21.46	2.60	124.71	171.47	0.28	185.31	3.38	23.66	0.02	0.13	32.46	3.88	186.26
% of Avg	11.16%	64.61%	79.06%	36.09%	10.39%	63.27%	37.16%	42.02%	48.26%	13.46%	3.77%	68.48%	80.54%	36.47%	13.66%	71.36%	38.35%	42.97%	49.34%
2024 Characteristics																			
Average	1,495	187	2.93	45.9	0.10	0.13	59.4	6.4	260	1272	7.33	274	4.36	67.7	0.15	0.19	88.1	9.5	385
Max	2,619	457	6.27	71.3	0.14	0.39	97.8	11.5	528	1500	7.84	784	9.15	108.2	0.18	0.63	152.9	18.0	825
Min	1,032	69	0.01	21.3	0.10	0.10	27.9	2.7	85	964	6.92	107	0.02	34.2	0.12	0.12	36.9	4.4	112
2024 Total	547,246																		

SPRING 2024 DISCHARGE LOADING																	
Loading Calculated by Monthly Influent Volumes		Influent Stored (m3)	Monthly Influent Characteristics								Loadings						
			BOD5 mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	BOD5 kg/mo	React P kg/mo	N-NH3 kg/mo	N-NO2 kg/mo	N-NO3 kg/mo	TKN kg/mo	TP kg/mo
	Oct-23	37,840	62	3	22	0.10	0.10	42	4	133	2,346	100	844	3.8	1,574	143	5,033
	Nov-23	39,150	319	5	42	0.10	0.10	63	7	311	12,489	183	1,648	3.9	2,451	256	12,176
	Dec-23	50,375	61	0	29	0.10	0.10	33	3	184	3,073	16	1,481	5.0	1,672	160	9,269
	Jan-24	45,304	76	0	69	0.10	0.10	98	12	528	3,443	0	3,135	4.5	4,431	521	23,921
	Feb-24	45,332	69	5	50	0.10	0.10	67	7	281	3,128	230	2,248	4.5	3,033	321	12,738
	Mar-24	54,202	114	0	28	0.10	0.39	40	4	130	6,179	18	1,523	5.4	2,141	204	7,046
	Apr-24	1,665	76	0	21	0	0	32	3	110	127	0	35	0.2	54	5	183
	May-24																
Totals		272,203									30,784	548	10,915	27.4	43.1	1,610	70,366

Loading Calculated by Average Day Mass																	
Loading Calculated by Average Day Mass	Days of Influent Stored	Daily Loading Characteristics								Loadings							
		BOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day	BOD5 kg/mo	React P kg/mo	N-NH3 kg/mo	N-NO2 kg/mo	N-NO3 kg/mo	TKN kg/mo	TP kg/mo	TSS kg/mo
	Oct-23	30	79	3	28	0.13	0.13	53	5	170	2373	101	854	3.8	1592	144	5091
	Nov-23	30	408	6	54	0.13	0.13	80	8	398	12250	180	1617	3.8	2404	252	11942
	Dec-23	31	88	0	42	0.14	0.14	48	5	266	2731	14	1316	4.5	1486	142	8237
	Jan-24	31	119	0	108	0.16	0.16	153	18	825	3682	0	3353	4.8	4739	557	25583
	Feb-24	29	125	9	90	0.18	0.18	121	13	507	3612	265	2596	5.2	3502	371	14709
	Mar-24	29	185	1	46	0.16	0.63	64	6	211	5359	16	1321	4.7	1857	177	6111
	Apr-24	1	138	0	39	0.18	0.18	59	5	200	138	0	39	0.2	59	5	200
	May-24																
Totals	181									30,145	577	11,095	27.1	40.7	15,639	1,648	71,874
		Δ Totals (kg)		639		-29		-180		0.3		-1.7%		2.4		-38	
		% Difference		2.1%		-5.3%		-1.7%		1.0%		-1.8%		5.5%		-2.4%	

2023 Spring Discharge: March 29 to April 30
2023 Fall Discharge: Oct 2 to Oct 24
2024 Spring Discharge: April 2 to April 29
Assume that each release includes influent from the first day of the previous release up to the first day of the current release.

FALL 2024 DISCHARGE LOADING

Loading Calculated by Monthly Influent Volumes

	Influent Stored (m3)	Monthly Influent Characteristics							Loadings								
		CBOD mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	CBOD kg/mo	React P kg/mo	N-NH3 kg/mo	N-NO2 kg/mo	N-NO3 kg/mo	TKN kg/mo	TP kg/mo	TSS kg/mo
Mar-24	0	114	0	28.10	0.10	0	40	4	130	0	0	0	0.0	0.0	0	0	0
Apr-24	51,712	76	0	21.30	0.10	0	32	3	110	3,930	14	1,101	5.2	5.2	1,670	142	5,688
May-24	48,091	147	4	47.80	0.10	0	65	6	144	7,069	192	2,299	4.8	4.8	3,140	299	6,925
Jun-24	46,568	183	5	60.80	0.10	0	73	7	250	8,522	232	2,831	4.7	4.7	3,381	332	11,642
Jul-24	45,782	300	6	71.30	0.10	0	81	10	389	13,735	287	3,264	4.6	5.5	3,717	435	17,809
Aug-24	47,361	457	3	32.20	0.10	0	37	4	311	21,644	159	1,525	4.7	4.7	1,748	206	14,729
Sep-24	40,409	240	5	53.90	0.10	0	79	8	246	9,698	217	2,178	4.0	4.0	3,176	336	9,941
Oct-24	9,157	81	2	25.90	0.10	0	28	3	85	742	22	237	0.9	0.9	255	31	778
Nov-24		296	0	51.60	0.10	0	64	8	396	0	0	0	0.0	0.0	0	0	0
Totals	289,080									65,340	1,123	13,436	28.9	29.8	17,088	1,781	67,513

Loading Calculated by Average Day Mass

	Days of Influent Stored	Daily Loading Characteristics							Loadings								
		CBOD kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day	CBOD kg/mo	React P kg/mo	N-NH3 kg/mo	N-NO2 kg/mo	N-NO3 kg/mo	TKN kg/mo	TP kg/mo	TSS kg/mo
Mar-24	0	185	1	45.55	0.16	0.63	64	6	211	0	0	0	0.0	0.0	0	0	0
Apr-24	29	138	0	38.77	0.18	0.18	59	5	200	4,011	14	1,124	5.3	5.3	1,705	145	5,806
May-24	31	225	6	73.28	0.15	0.15	100	10	221	6,986	190	2,272	4.8	4.8	3,103	296	6,843
Jun-24	30	253	7	84.03	0.14	0.14	100	10	346	7,587	207	2,521	4.1	4.1	3,010	296	10,365
Jul-24	31	423	9	100.46	0.14	0.17	114	13	548	13,104	274	3,114	4.4	5.2	3,547	415	16,991
Aug-24	31	784	6	55.22	0.17	0.17	63	7	533	24,296	178	1,712	5.3	5.3	1,962	231	16,534
Sep-24	30	331	7	74.33	0.14	0.14	108	11	339	9,929	223	2,230	4.1	4.1	3,252	344	10,177
Oct-24	7	107	3	34.21	0.13	0.13	37	4	112	749	22	239	0.9	0.9	258	31	786
Nov-24		345	0	60.11	0.12	0.12	75	9	461	0	0	0	0.0	0.0	0	0	0
Totals	189									66,662	1,107	13,212	28.9	29.8	16,836	1,757	67,503

Δ Totals (kg)	1,322	16	224	0.0	0.0	252	24	10
% Difference	2.0%	1.4%	1.7%	0.0%	0.1%	1.5%	1.3%	0.0%

2023 Fall Discharge: Oct 2 to Oct 24
2024 Spring Discharge: April 2 to April 29
2024 Fall Discharge: Oct 8 to Oct 25
Assume that each release includes influent from the first day of the previous release up to the first day of the current release.

Township of Russell
Russell Sewage Treatment System
Appendix B – 2024 Discharge Summary

Annual Performance Report 2024
Spring 2024 Pre-Discharge

Test Date	Cell Number	CBOD mg/L	Cond. µs/cm	React. P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	pH	TKN mg/L	TP mg/L	TSS mg/L	H2S mg/L	DO mg/L	Temp C°
2024-02-27	A	23	994	0.23	15.60	0.10	0.1	7.89	23.4	0.774	34	0.0	9.61	5
	B	23	1240	0.01	41.20	0.10	0.1	7.38	46	0.353	30	0	4.03	4.2
	C	23	1150	0.01	29.80	0.10	0.59	7.93	34.3	0.391	29	0.0	12.81	4.5
	D	17	1060	0.01	14.80	0.10	0.68	7.9	19.6	0.209	15	0.0	12.88	4.8
	E	23	1240	0.01	37.90	0.10	0.1	7.63	46.6	0.367	23	0.0	9.99	4.9

Test Date	Cell Number	CBOD mg/L	Cond. µs/cm	React. P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	pH	TKN mg/L	TP mg/L	TSS mg/L	H2S mg/L	DO mg/L	Temp C°
2024-03-11	A				9.17					0.373				
	C				22.3					0.316				
	D				13					0.208				

Test Date	Cell Number	CBOD mg/L	Cond. µs/cm	React. P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	pH	TKN mg/L	TP mg/L	TSS mg/L	H2S mg/L	DO mg/L	Temp C°
2024-03-18	A				9.05					0.312				
	C				22.1					0.3				
	D				13.5					0.179				

Test Date	Cell Number	CBOD mg/L	Cond. µs/cm	React. P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	pH	TKN mg/L	TP mg/L	TSS mg/L	H2S mg/L	DO mg/L	Temp C°
2024-03-25	C				19.7					0.345				
	D				11.9					0.108				

Fall 2024 Pre-Discharge

Test Date	Cell Number	CBOD mg/L	Cond. $\mu\text{s/cm}$	React. P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	pH	TKN mg/L	TP mg/L	TSS mg/L	H2S mg/L	DO mg/L	Temp C°
2024-09-03	A	1	871	0.033	0.266	0.1	0.1	9.42	7.7	0.526	58	0	15.23	23.2
	B	20	971	0.023	10	0.1	0.1	8.86	19	0.612	48	0	19.31	23.1
	C	2	806	0.285	0.059	0.1	0.1	9.38	1.71	0.36	2	0	13.57	22.3
	D	1	643	0.628	0.06	0.1	0.1	9.38	1.57	0.684	2	0	11.08	22.9
	E	11	1030	0.018	16.6	0.1	0.1	8.05	22	0.25	20	0	7.69	21.7

Test Date	Cell Number	CBOD mg/L	Cond. $\mu\text{s/cm}$	React. P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	pH	TKN mg/L	TP mg/L	TSS mg/L	H2S mg/L	DO mg/L	Temp C°
2024-09-16	D									1.26				

Annual Performance Report 2024

Date	Discharge m³/day	CBOD mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	Cond µg/L	pH	TBOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day
2-Apr-24		8	0.010	9.60	0.10	2.29	12.00	0.110	9	868	7.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-Apr-24	7,291	4	0.010	10.30	0.10	2.64	12.90	0.072	2	867	7.58	29.16	0.07	75.10	0.73	19.25	94.05	0.52	14.58
4-Apr-24	7,490	4	0.055	10.04	0.10	2.65	12.90	0.072	3	853	7.66	29.96	0.41	75.20	0.75	19.81	96.62	0.54	22.47
5-Apr-24	11,786	4	0.100	9.8	0.10	2.65	12.90	0.1	4	838	7.74	47.14	1.18	115.27	1.18	31.23	152.04	0.85	47.14
6-Apr-24	13,494	6	0.055	9.99	0.10	2.65	13.3	0.074	5	845	7.72	80.96	0.74	134.81	1.35	35.69	178.80	1.00	60.72
7-Apr-24	13,002	6	0.055	9.99	0.10	2.65	13.3	0.074	5	845	7.72	78.01	0.72	129.89	1.30	34.39	172.28	0.96	58.51
8-Apr-24	13,544		0.010	10.20	0.10	2.64	13.6	0.076	5	852	7.69	108.35	0.14	138.15	1.35	35.76	184.20	1.03	67.72
9-Apr-24	11,491	10	0.010	10.35	0.10	2.44	13.10	0.084	4	844	7.68	109.16	0.11	118.93	1.15	27.98	150.53	0.96	45.96
10-Apr-24	12,277	11	0.010	10.50	0.10	2.23	12.60	0.091	3	836	7.66	135.05	0.12	128.91	1.23	27.38	154.69	1.12	36.83
11-Apr-24	12,521	10	0.010	10.30	0.10	1.96	12.45	0.110	4	831	7.57	118.95	0.13	128.97	1.25	24.54	155.89	1.37	43.82
12-Apr-24	10,124	8	0.010	10.10	0.10	1.69	12.30	0.128	4	826	7.48	80.99	0.10	102.25	1.01	17.11	124.53	1.30	40.50
13-Apr-24	8,815	7	0.010	9.71	0.10	1.68	11.90	0.112	4	827	7.56	61.71	0.08815	85.55	0.8815	14.809	104.899	0.9829	30.853
14-Apr-24	8,737	7	0.01	9.71	0.10	1.68	11.90	0.112	4	827	7.56	61.16	0.08737	84.793	0.8737	14.678	103.97	0.9742	30.58
15-Apr-24	8,749	6	0.010	9.31	0.10	1.67	11.50	0.095	3	827	7.64	52.49	0.08749	81.453	0.8749	14.611	100.614	0.8312	26.247
16-Apr-24	8,637	8	0.01	9.07	0.10	1.64	11.15	0.09	3	810	7.74	69.10	0.08637	78.294	0.8637	14.165	96.3026	0.7341	21.593
17-Apr-24	9,376	10	0.010	8.82	0.10	1.61	10.80	0.075	2	793	7.84	93.76	0.09376	82.696	0.9376	15.095	101.281	0.7032	18.752
18-Apr-24	8,758	6	0.01	8.72	0.12	1.71	11.30	0.09	3	798	7.99	48.17	0.08758	76.326	1.00717	14.976	98.9654	0.7795	21.895
19-Apr-24	8,906	1	0.010	8.61	0.13	1.81	11.80	0.103	3	802	8.13	8.91	0.08906	76.681	1.15778	16.12	105.091	0.9173	26.718
20-Apr-24	8,424	4	0.01	8.04	0.12	1.87	11.65	0.110	3	799	8.09	33.70	0.08424	67.729	1.01088	15.711	98.1396	0.9224	21.06
21-Apr-24	9,600	4	0.01	8.04	0.12	1.87	11.65	0.110	2.50	799.00	8.09	38.40	0.08226	61.448	1.152	17.904	111.84	1.0512	24
22-Apr-24	8,226	7	0.01	7.47	0.11	1.92	11.50	0.116	2	796	8.05	57.58	0.08226	61.448	1.152	17.904	94.599	0.9542	16.452
23-Apr-24	9,243	7	0.02	6.90	0.12	2.06	10.18	0.104	4	788	8.06	60.08	0.14327	63.777	1.06295	19.041	94.0475	0.9613	32.351
24-Apr-24	8,425	6	0.021	6.33	0.12	2.20	8.9	0.092	5	779	8.06	50.55	0.17693	53.33	1.011	18.535	74.5613	0.7751	42.125
25-Apr-24	8,985	6	0.02	5.93	0.13	2.27	8.46	0.075	4	777	8.01	53.91	0.17521	53.236	1.12313	20.351	76.0131	0.6739	31.448
26-Apr-24	8,462	6	0.02	5.52	0.13	2.33	8.07	0.058	2	775	7.96	50.77	0.15232	48.71	1.10006	19.716	68.2883	0.4908	16.924
27-Apr-24	9,959	7	0.02	4.98	0.13	1.74	6.77	0.079	2	770	8.07	69.71	0.20438	49.546	1.24488	17.279	67.4224	0.7818	19.918
28-Apr-24	9,618	7	0.02	4.98	0.13	1.74	6.77	0.079	2	775	8.07	67.33	0.20198	47.85	1.20225	16.687	65.1139	0.755	19.236
29-Apr-24	7,379	8	0.024	4.43	0.12	1.14	5.47	0.099	2	775	8.17	59.03	0.1771	32.689	0.88548	8.4121	40.3631	0.7305	14.758

Note: Values in *orange italics* are averages of the preceeding and following test values

Date	Discharge m³/day	CBOD mg/L	React P mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	TKN mg/L	TP mg/L	TSS mg/L	Cond µg/L	pH	TBOD5 kg/day	React P kg/day	N-NH3 kg/day	N-NO2 kg/day	N-NO3 kg/day	TKN kg/day	TP kg/day	TSS kg/day
8-Oct-24		1	0.645	0.096	0.10	0.10	1.31	0.739	2	688	6.88	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9-Oct-24	10,778	1	0.649	0.087	0.10	0.10	1.39	0.706	2	696	6.96	10,778	6.995	0.938	1.078	1.078	14.981	7.609	21.556
10-Oct-24	10,651	1	0.614	0.1155	0.1	0.1	1.4	0.647	2	703.5	7.155	10,651	6.540	1.230	1.065	1.065	14.911	6.891	21.302
11-Oct-24	10,553	1	0.579	0.144	0.1	0.1	1.41	0.588	2	711	7.35	10,553	6.110	1.520	1.055	1.055	14.880	6.205	21.106
12-Oct-24	10,533	1.5	0.4615	0.1385	0.1	0.1	1.68	0.4865	2	739	7.425	15,800	4.861	1.459	1.053	1.053	17.695	5.124	21.066
13-Oct-24	10,105	1.5	0.4615	0.1385	0.1	0.1	1.68	0.4865	2	739	7.425	15,158	4.663	1.400	1.011	1.011	16.976	4.916	20.210
14-Oct-24	10,117	1.5	0.4615	0.1385	0.1	0.1	1.68	0.4865	2	739	7.425	15,176	4.669	1.401	1.012	1.012	16.997	4.922	20.234
15-Oct-24	10,597	2	0.344	0.133	0.10	0.10	1.95	0.385	2	767	7.50	21,194	3.645	1.409	1.060	1.060	20.664	4.080	21.194
16-Oct-24	10,374	3	0.239	0.103	0.1	0.11	1.34	0.29	2	800	7.44	31,122	2.479	1.069	1.037	1.141	13.901	3.008	20.748
17-Oct-24	11,112	3	0.196	0.0785	0.10	0.18	1.465	0.268	8	829.5	7.56	33,336	2.178	0.872	1.111	2.000	16.279	2.978	88.896
18-Oct-24	9,418	3	0.153	0.054	0.10	0.25	1.59	0.246	14	859	7.67	28,254	1.441	0.509	0.942	2.355	14.975	2.317	131.852
19-Oct-24	11,637	2.5	0.0955	0.203	0.11	0.27	1.825	0.174	8	857	7.78	29,093	1.111	2.362	1.280	3.142	21.238	2.025	93.096
20-Oct-24	9,842	2.5	0.0955	0.203	0.11	0.27	1.825	0.174	8	857	7.78	24,605	0.940	1.998	1.083	2.657	17.962	1.713	78.736
21-Oct-24	10,046	2	0.038	0.352	0.12	0.29	2.06	0.102	2	855	7.89	20,092	0.382	3.536	1.206	2.913	20.695	1.025	20.092
22-Oct-24	9,860	1.5	0.024	1.091	0.155	0.285	2.795	0.123	3	878	7.625	14,790	0.237	10.757	1.528	2.810	27.559	1.213	29.580
23-Oct-24	10,858	1	0.01	1.83	0.19	0.28	3.53	0.144	4	901	7.36	10,86	0.10858	19,870.14	2.06302	3.04024	38.32874	1.563552	43.432
24-Oct-24	10,469	3.5	0.01	2.835	0.145	0.21	4.72	0.15	4.5	924.5	7.135	36.64	0.10	29.68	1.52	2.20	49.41	1.57	47.11
25-Oct-24	10,689	6	0.01	3.84	0.1	0.14	5.91	0.156	5	948	6.91	64.13	0.10689	41,045.76	1.0689	1.49646	63.17199	1.667484	53.445
Total	177,639											392	47	121	20	31	401	59	754
Average	10,449	2.14	0.28	0.643	0.11	0.17	2.20	0.35	4.14	805.1	7.40	21.79	2.59	6.73	1.12	1.73	22.26	3.27	41.87
Max	11,637	6	0.65	3.84	0.19	0.29	5.91	0.74	14	948	7.89	64.13	6.99	41.05	2.06	3.14	63.17	7.61	131.85
Min	9,418	1	0.01	0.05	0.10	0.10	1.31	0.10	2	688	6.88	10.55	0.10	0.51	0.94	1.01	13.90	1.02	20.09

Note: Values in orange italics are averages of the preceding and following test values

SPRING 2024 DISCHARGE COMPLIANCE AND EFFICIENCIES

	Effluent Limits		Effluent Objectives		Actual Discharge Ave.		% of Conc. Objective	% of Mass Limits
	Concentrations mg/L	Mass Kg	Concentrations mg/L	Mass Kg	Concentrations mg/L	Mass Kg		
CBOD	30	7,900	20	5,266	6.57	1754	33.3%	22.2%
TSS	30	7,900	20	5,266	3.34	853	16.2%	10.8%
TP	0.50	132	0.40	105	0.09	24	22.5%	18.0%
N-NH3	10	2,633	5	1,317	8.49	2267	172.2%	86.1%
H2S	0	0	0	0	0.00	0.00	0.0%	0.0%
DO(min)	-	-	-	-	-	-	n/a	-
pH	6.0 - 9.5		6.5 - 8.5		7.48 to 8.17 with an avg. 7.83		High Dilution range	
In-River Dilution	67:1		-		Max 249.07 Min 65.72 Average 109.7			

Removal Efficiencies

	Effluent Mass total kg	By Monthly Influent Volume		By Average Daily Mass	
		Influent Mass kg	Removal eff.	Influent Mass kg	Removal eff.
CBOD	1754	30784	94.3%	30145	94.2%
TSS	853	70366	98.8%	71874	98.8%
TP	24	1610	98.5%	1648	98.6%
N-NH3	2267	10915	79.2%	11095	79.6%

FALL 2024 DISCHARGE COMPLIANCE AND EFFICIENCIES

	Effluent Limits		Effluent Objectives		Actual Discharge Ave.		% of Conc. Objective	% of Mass Limits
	Concentrations mg/L	Mass Kg	Concentrations mg/L	Mass Kg	Concentrations mg/L	Mass Kg		
CBOD	30	5,329	20	3,553	2.14	392	11.0%	7.4%
TSS	30	5,329	20	3,553	4.14	754	21.2%	14.1%
TP	0.5	89	<0.5	87	0.35	59	67.6%	66.2%
N-NH3	2	355	1	178	0.64	121	68.1%	34.1%
H2S	0	0	0	0	0.00	0.00	0.0%	0.0%
DO(min)	-	-	-	-	-	-	n/a	-
pH	6.0 - 9.5	-	6.5 - 8.5	-	6.88 to 7.89 with an avg. 7.4	-	-	-
In-River Dilution	13:1	-	-	-	Max 32.53 Min 11.55 Average 26.4	-	High Dilution range	-

Removal Efficiencies

	Effluent Mass total kg	By Monthly Influent Mass kg		Removal eff.	By Average Daily Mass	
		Influent Mass kg	Removal eff.		Influent Mass kg	Removal eff.
CBOD	392	65340	99.4%	99.4%	66662	99.4%
TSS	754	67513	98.9%	98.9%	67503	98.9%
TP	59	1781	96.7%	96.7%	1757	96.7%
N-NH3	121	13436	99.1%	99.1%	13212	99.1%

Township of Russell

Russell Sewage Treatment System

Annual Performance Report 2024

SPRING 2024 DISCHARGE

SPRING 2024 DISCHARGE - RIVER WATER QUALITY

Location	Date	CBOD mg/L	Cond. µS/cm	React P. mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	pH	TKN mg/L	TP mg/L	TSS mg/L	DO mg/L	Temp °C
U/S	2-Apr	5	799	0.01	0.029	0.10	1.31	8.36	0.815	0.048	16	11.31	8.4
	15-Apr	4	653	0.01	0.032	0.10	2.8	8.22	0.82	0.034	8	10.63	8.3
	29-Apr	5	730	0.011	0.027	0.10	1.66	8.68	0.416	0.035	2	10.61	12.6
D/S	2-Apr	3	773	0.01	0.042	0.10	1.39	8.42	0.646	0.02	7	10.6	8.5
	15-Apr	4	645	0.01	0.112	0.10	2.9	8.2	0.909	0.041	9	10.15	9.1
	29-Apr	5	731	0.01	0.07	0.10	1.72	8.58	0.58	0.036	2	9.83	12.6

Toxicity			
Date	Species	Test Length	Mortality
22-Apr	Daphnia Magna	48 hr	0
	Rainbow Trout	96 hr	0

Effluent Un-Ionized Ammonia Calculation				
Date	Temp. °C	pH	N-NH3 mg/L	Un-Ionized NH3(µg/L)
2-Apr-24	8.9	7.60	9.6	64.87
3-Apr-24	9.8	7.58	10.3	71.33
5-Apr-24	5.9	7.74	9.78	71.75
8-Apr-24	9.3	7.69	10.2	87.35
10-Apr-24	12.3	7.66	10.5	105.86
12-Apr-24	12.9	7.48	10.1	70.67
15-Apr-24	10.9	7.64	9.31	80.54
17-Apr-24	12.1	7.84	8.82	131.87
19-Apr-24	11.3	8.13	8.61	233.03
22-Apr-24	8.5	8.05	7.47	136.23
24-Apr-24	10.5	8.06	6.33	137.76
26-Apr-24	10.5	7.96	5.52	95.85
29-Apr-24	13.5	8.17	4.43	154.50
				0.00
				0.00

FALL 2024 DISCHARGE

Date	Time	Meter Reading	Discharge Flow L/s	m3/d	Total m3	River Flow L/s	Dilution in River	Lagoon DO mg/L	U/S River DO mg/L	D/S River DO mg/L	Effluent H2S mg/L	Effluent Quality	Temp °C
8-Oct-24	8:03 AM	4746446	125	10,778	10,778	3600	28.80	9.61	10.09	8.88	0.00		15.5
9-Oct-24		4757224	124	10,778	10,778	3815	30.77	9.42			0.00		14.5
10-Oct-24		4767875	120.2	10,651	21,429	3910	32.53						
11-Oct-24		4778428	121	10,553	31,982	3790	31.32	9.64			0.00		12.7
12-Oct-24		4788961	122.9	10,533	42,515	2090	17.01						
13-Oct-24		4799066	123.2	10,105	52,620	3635	29.50						
14-Oct-24		4809183	122.6	10,117	62,737	3600	29.36						
15-Oct-24		4819780	120.5	10,597	73,334	3810	31.62	10.61			0.00		10.6
16-Oct-24		4830154	124.8	10,374	83,708	3900	31.25	10.76			0.00		9.3
17-Oct-24		4841266	122.9	11,112	94,820	2835	23.07						
18-Oct-24		4850684	124.5	9,418	104,238	3780	30.36	11.18			0.00		9.3
19-Oct-24		4862321	124.4	11,637	115,875	3690	29.66						
20-Oct-24		4872163	88.8	9,842	125,717	1060	11.94						
21-Oct-24		4882209	119.8	10,046	135,763	1560	13.02	9.79	10.85	10.55	0.00		13.1
22-Oct-24		4892069	125	9,860	145,623	3960	31.68						
23-Oct-24		4902927	122.5	10,858	156,481	3975	32.45	7.49			0.00		15.3
24-Oct-24		4913396	125.5	10,469	166,950	3780	30.12						
25-Oct-24	10:31 AM	4924085	34.2	10,689	177,639	395	11.55	5.25	10.51	9.28	0.00		9.3
Total	410.47 hrs			177,639									
Average		116,211	10,449				26.44	9.31	10.48333	9.57	0		12.18
Max		125.5	11,637				32.53	11.18	10.85	10.55	0		15.5
Min		34.2	9,418				11.55	5.25	10.09	8.88	0		9.3

FALL 2024 DISCHARGE - RIVER WATER QUALITY

Location	Date	CBOD mg/L	Cond. µs/cm	React P. mg/L	N-NH3 mg/L	N-NO2 mg/L	N-NO3 mg/L	pH	TKN mg/L	TP mg/L	TSS mg/L	DO mg/L	Temp °C
U/S	08-Oct	1	961	0.024	0.02	0.1	0.1	7.53	0.558	0.036	2	10.09	12.5
	21-Oct	1	946	0.01	0.02	0.1	0.1	7.89	0.618	0.033	2	10.85	11.1
	25-Oct	1	951	0.022	0.03	0.1	0.1	7.64	0.757	0.054	5	10.51	10.4
D/S	08-Oct	1	941	0.029	0.05	0.1	0.1	7.64	0.665	0.066	14	8.88	13.6
	21-Oct	1	909	0.014	0.111	0.1	0.1	8.09	1.39	0.099	13	10.55	11.3
	25-Oct	1	959	0.01	0.0526	0.1	0.11	7.77	1.16	0.085	16	9.28	10.7

Toxicity		
Date	Species	Test Leng Mortality
15-Oct	Daphnia Magna	48 hr 0
	Rainbow Trout	96 hr 0

Effluent Un-Ionized Ammonia Calculation				
Date	Temp. °C	pH	N-NH3 mg/L	Un-Ionized NH3(µg/L)
8-Oct-24	15.5	6.88	0.096	0.21
9-Oct-24	14.5	6.96	0.087	0.21
11-Oct-24	12.7	7.35	0.144	0.74
15-Oct-24	10.6	7.50	0.133	0.82
16-Oct-24	9.3	7.44	0.103	0.50
18-Oct-24	9.3	7.67	0.054	0.44
21-Oct-24	13.1	7.89	0.352	6.36
23-Oct-24	15.3	7.36	1.83	11.67
25-Oct-24	9.3	6.91	3.84	5.50
				0.00
				0.00
				0.00