EPCOR Water Services

Edmonton, Alberta

2023

Annual Wastewater System Report

Submitted to:

The Province of Alberta

Alberta Environment and Protected Areas (AEPA)

As per requirements of:

Approval to Operate No. 639-03-07

February 2024

Executive Summary

The following report contains two parts, Part I: Wastewater Treatment Plant and Part II: Wastewater Collection System, in order to meet the requirements of Approval to Operate No. 639-03-07.

The 2023 Annual Wastewater Treatment Plant Report is separated into an Annual Wastewater Treatment Report, an Annual Air Pollution Control System Report, an Annual Ambient Air Report, and a summary of contraventions reported, as outlined in the Approval to Operate.

The 2023 Annual Wastewater Collection System Report includes a summary of completed projects and planned major rehabilitation projects, the interconnection control strategy, and storm and CSO volumes and loadings in addition to other requirements outlined in the Approval to Operate.

Part I: Wastewater Treatment Plant Report

EPCOR Water Services

Gold Bar Wastewater Treatment Plant

Edmonton, Alberta

2023

Annual Wastewater Treatment Plant Report

Submitted to:

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Alberta Environment and Protected Areas (AEPA)

As per requirements of:

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Acronyms

AAAQO	Alberta Ambient Air Quality Objectives
AEPA	Alberta Environment and Protected Areas
AQMS	Air Quality Monitoring Station
CBBRF	Clover Bar Biosolids Recycling Facility
CBOD	Carbonaceous Biological Oxygen Demand
CSO	Combined Sewer Overflow
EPE	Enhanced Primary Effluent
EPEPS	Enhanced Primary Effluent Pumping Station
EPT	Enhanced Primary Treatment
FE	Final Effluent
FEC	Final Effluent Combined
GBWWTP	Gold Bar Wastewater Treatment Plant
H_2S	Hydrogen Sulfide
HSE	Health, Safety, and Environment
ISO	International Organization for Standardization
ML	Megalitres
MLD	Megalitres per Day
MLSS	Mixed Liquor Suspended Solids
NH_3-N	Ammonia-Nitrogen
NSR	North Saskatchewan River
ORP	Oxidation-Reduction Potential
PE	Primary Effluent
SOP	Standard Operating Procedure
TKN	Total Kjeldahl Nitrogen
TP	Total Phosphorus
TSS	Total Suspended Solids
UV	Ultraviolet
WELP	Wastewater Effluent Limit Performance
WWTP	Wastewater Treatment Plant

2023 Overview

The Gold Bar Wastewater Treatment Plant (WWTP) located on the banks of the North Saskatchewan River in Edmonton, Alberta maintains the ISO 14001:2015 (Environmental Management System) and the ISO 45001:2018 (Occupational Health and Safety Management System) certificates for its Integrated Management System.

Notable events in 2023 include construction/rehabilitation on Digester 4, Scrubbers 5 and 6, Secondary 2 inDENSE, Square 1 Gas Room Expansion, Operations Centre, Maintenance Hygiene Facilities, access stairs to the site on the South side of the plant, Lagoon Cell 3W berm repairs and Secondary 6-8 Return Activated Sludge pump replacement. Acid cleaning a section of the sludge transfer lines was completed. Design progressed for the flare expansion project and for odour control improvements on Primary Clarifiers 5-8 and the Diversion Structure. The meteorological assessment of the Ambient Air Quality Monitoring Station (AQMS) was completed and the first full year of data was collected and analyzed. In 2023, there were several exceedances of the *Alberta Ambient Air Quality Objectives* (AAAQO) for H_2S. The majority of the exceedances occurred in September and October when there was less precipitation to flush the collection system, but the temperature remained warm. There were no exceedances for NO_2 or SO_2.

The true dry weather flow in 2023 was 279 MLD. 2023 hosted a larger number of significant wet weather events (18) compared to the previous year (6 in 2022) which resulted in an increased number of secondary bypasses (45). The plant performed very well with a WWTP Effluent Limit Performance (WELP) index of 19.1%.

2023 Annual Wastewater Treatment Report

Gold Bar WWTP Performance

The Gold Bar WWTP final effluent discharge limits of Approval to Operate 639-03-07 are listed in Table 1 and the monitoring requirements are outlined in Table 2.

Table 1: Limits for Treated Wastewater (Approval to Operate Table 5-1)

Parameter	Limit
$CBOD_5$	≤ 20 mg/L monthly arithmetic mean of daily composite samples
TSS	≤ 20 mg/L monthly arithmetic mean of daily composite samples
Total Phosphorus	≤ 1.0 mg/L monthly arithmetic mean of daily composite samples
Total Ammonia-nitrogen (December 1 to May 31)	≤ 10 mg/L monthly arithmetic mean of daily composite samples
Total Ammonia-nitrogen (June 1 to November 30)	≤ 5 mg/L monthly arithmetic mean of daily composite samples
E. Coli	≤ 126 per 100 mL/monthly geometric mean
pH	6.5-8.5

Table 2: Monitoring - Wastewater System (Approval to Operate Table 6-1)

Parameter	Frequency (Minimum)	Sample Type	Sampling Location
UNTREATED WASTEWATER			
pH BOD_5 TSS Total Phosphorus Total Ammonia-nitrogen	Once per day	Composite	Untreated wastewater entering the wastewater treatment plant
Volume of Flow	Continuous, recorded daily	Calculated	Untreated wastewater entering the wastewater treatment plant
TREATED WASTEWATER			
pH BOD_5 TSS Total Phosphorus Total Ammonia-nitrogen	Once per day	Composite	Wastewater treated plant effluent prior to release to the North Saskatchewan River
E. Coli	Once per day	Grab	After ultraviolet (UV) disinfection
Acute Toxicity	Monthly	Grab	Wastewater treatment plant effluent prior to release to the North Saskatchewan River
Chronic Toxicity	Quarterly	Grab	Wastewater treatment plant effluent prior to release to the North Saskatchewan River
Volume	Continuous, recorded daily	Calculated	Wastewater treatment plant effluent prior to release to the North Saskatchewan River
Volume	Continuous, recorded daily	Calculated	Reuse water transmission main

WASTEWATER TREATMENT PLANT BYPASS			
Release Volume	Continuous during bypass event, recorded daily	Calculated	Primary and secondary treatment bypass of wastewater at the wastewater treatment plant
pH BOD_5 TSS Total Phosphorus Total Ammonia-nitrogen	Any bypass event lasting > 2 hours	Composite	
E. Coli	Any bypass event lasting > 2 hours	Grab	
SLUDGE DISPOSAL			
Sludge Volume	Total volume	Estimated	Prior to leaving the wastewater treatment plant
Sludge Mass	Total mass	Estimated	Amount of sludge being disposed of as per the *Biosolids Management Plan*
CSO OUTFALLS AND UNAUTHORIZED RELEASE			
Release Volume	Total volume during each discharge event	Continuous during discharge event	Rat Creek CSO outfall; Hardisty-Capilano CSO outfall; Highlands CSO outfall; Cromdale CSO outfall; Strathearn CSO outfall; and unauthorized release point
pH BOD_5 TSS Total Phosphorus Total Ammonia-nitrogen *E. Coli*	Each discharge event	Composite	Rat Creek CSO outfall
		Grab	Unauthorized release point
The amount of any substance other than wastewater or storm water that is spilled or discharged accidentally or intentionally into the wastewater collection system	Each event	Estimated volume or mass	Unauthorized release point

Table 3 summarizes the monthly minimum, mean, and maximum values for parameters in Table 1 from January 1 to December 31, 2023. All analytical data in the table were developed on 24-hour composite samples collected using autosamplers at the sampling location specified in Table 2. The discrete samples for *Escherichia coli* (*E. coli*) determinations were collected at random times each day. On May 26, 2023, there was a higher than usual *E. coli* sample result for Outfall 10, as noted in the May 2023 Plant Performance Report and a second sample was analyzed. There was also a variance to the 24-hour untreated wastewater composite samples for June 18, 2023 as noted in the July 2023 Plant Performance Report, but all sampling requirements were still met. Appendix A contains the monthly Plant Performance Reports.

Table 3: 2023 Gold Bar WWTP Performance

Month		Flows (ML)							pH				TSS (mg/L)					BOD$_5$ (mg/L)				CBOD$_5$ (mg/L)		TP (mg P/L)					NH$_3$ (mg N/L)					TKN (mg N/L)				NO$_2$+NO$_3$ (mg N/L)				Chloride (mg/L)				*E. coli* Counts/100 mL				Total Digested Sludge (ML)
		Raw	Outfall 30	MPW	Outfall 20	EPEPS	Outfall 10		Raw	Outfall 30	Outfall 20	Outfall 10	Raw	Outfall 30	Outfall 20	EPEPS	Outfall 10	Raw	Outfall 30	Outfall 20	EPEPS	Outfall 10		Raw	Outfall 30	Outfall 20	EPEPS	Outfall 10		Raw	Outfall 30	Outfall 20	EPEPS	Outfall 10		Raw	Outfall 30	Outfall 20	Outfall 10	Raw	Outfall 30	Outfall 20	Outfall 10	Raw	Outfall 30	Outfall 20	Outfall 10	
							FEC	FE				FEC					FEC					FEC	FE					FEC	FE					FEC	FE				FEC				FEC					
January	Avg/Geomean	271.4	1.9	11.5	0.0	0.0	258.1	258.1	7.6	7.5	---	7.5	394	137	---	---	2.8	2.8	342	143	---	---	2.3	2.3	7.67	2.95	---	---	0.24	0.24	36.0	28.9	---	---	1.51	1.51	61.0	33.2	---	3.2	< 0.01	0.21	---	9.10	125	469	---	137	2.0	0.8	---	3.1	66.9
	Min	254.6	0.0	9.7	0.0	0.0	242.2	242.2	7.3	7.3	---	7.4	304	106	---	---	1.8	1.8	293	141	---	---	< 2	< 2	5.97	1.80	---	---	0.19	0.19	24.4	28.5	---	---	0.53	0.53	44.0	21.8	---	2.1	< 0.01	0.11	---	6.48	84.4	376	---	102	1.6	0.7	---	1	
	Max	368.1	55.9	12.6	0.0	0.0	300.6	300.6	7.7	7.7	---	7.8	480	168	---	---	4.6	4.6	406	144	---	---	3	3	9.18	4.10	---	---	0.30	0.30	44.7	29.2	---	---	2.94	2.94	68.8	44.5	---	4.8	0.01	0.31	---	11.0	409	561	---	347	2.4	1.1	---	8	
February	Avg/Geomean	268.1	0.0	11.2	0.0	0.0	256.9	256.9	7.5	---	---	7.6	311	---	---	---	3.3	3.3	307	---	---	---	2.4	2.4	7.03	---	---	---	0.22	0.22	36.8	---	---	---	2.29	2.29	58.7	---	---	4.0	0.05	---	---	8.24	133	---	---	150	2.5	---	---	5.1	63.2
	Min	250.2	0.0	9.6	0.0	0.0	238.9	238.9	7.3	---	---	7.4	244	---	---	---	2.1	2.1	241	---	---	---	< 2	< 2	6.23	---	---	---	0.19	0.19	18.4	---	---	---	0.88	0.88	49.1	---	---	2.6	< 0.01	---	---	6.18	82.9	---	---	91.3	2.2	---	---	1	
	Max	281.2	0.0	12.5	0.0	0.0	270.6	270.6	7.7	---	---	7.7	460	---	---	---	9.2	9.2	381	---	---	---	3	3	7.95	---	---	---	0.29	0.29	42.4	---	---	---	3.43	3.43	66.2	---	---	5.0	0.16	---	---	10.5	313	---	---	304	3.0	---	---	100	
March	Avg/Geomean	284.3	10.4	11.9	0.0	0.0	262.0	262.0	7.4	7.6	---	7.6	309	81	---	---	3.8	3.8	314	132	---	---	2.6	2.6	6.81	4.56	---	---	0.27	0.27	33.5	31.5	---	---	2.68	2.68	55.2	44.8	---	4.6	0.01	0.17	---	5.61	115	191	---	122	1.8	1.8	---	4.3	67.1
	Min	259.6	0.0	10.6	0.0	0.0	247.5	247.5	7.3	7.4	---	7.5	248	57	---	---	1.6	1.6	159	101	---	---	< 2	< 2	1.18	3.66	---	---	0.15	0.15	26.2	26.4	---	---	1.05	1.05	32.6	37.1	---	2.9	< 0.01	0.01	---	3.20	83.6	119	---	96.4	1.5	0.6	---	2	
	Max	349.6	57.5	12.5	0.0	0.0	284.1	284.1	7.6	7.7	---	7.7	400	121	---	---	10.0	10.0	402	161	---	---	5	5	10.00	6.09	---	---	0.82	0.82	39.8	42.4	---	---	5.83	5.83	81.9	55.2	---	8.2	0.02	0.71	---	9.04	199	397	---	190	2.1	2.7	---	14	
April	Avg/Geomean	275.6	5.6	10.5	0.0	0.0	259.5	259.5	7.4	7.5	---	7.5	309	175	---	---	9.4	9.4	317	169	---	---	3.5	3.5	7.81	5.94	---	---	0.47	0.47	39.2	31.9	---	---	5.06	5.06	56.2	40.6	---	7.2	0.01	0.11	---	7.27	88.4	132	---	95.4	1.8	1.1	---	8.8	69.2
	Min	252.7	0.0	9.0	0.0	0.0	243.4	243.4	7.3	7.3	---	7.2	208	120	---	---	3.1	3.1	239	130	---	---	2	2	6.73	5.07	---	---	0.21	0.21	25.8	24.6	---	---	2.27	2.27	45.1	29.6	---	3.9	< 0.01	0.04	---	3.47	71.4	115	---	79.2	1.8	0.4	---	3	
	Max	390.2	112.5	12.1	0.0	0.0	283.0	283.0	7.6	7.8	---	7.7	493	316	---	---	65.0	65.0	370	276	---	---	14	14	9.1	7.84	---	---	2.86	2.86	53.6	37.9	---	---	8.02	8.02	67	51.9	---	11.1	0.01	0.21	---	10.7	144	164	---	123	1.8	2.3	---	21	
May	Avg/Geomean	294.8	18.3	10.0	0.0	0.0	266.5	266.5	7.4	7.6	7.3	7.6	380	118	426	---	6.5	6.5	331	122	111	---	3.0	3.0	7.78	4.18	3.94	---	0.37	0.37	34.4	25.7	12.8	---	2.61	2.61	49.5	31.5	23.0	4.2	< 0.02	0.25	0.03	7.86	82.3	74.6	56.8	89.9	2.8	1.0	0.7	8.4	76.5
	Min	249.4	0.0	7.2	0.0	0.0	239.3	239.3	7.3	7.3	7.2	7.4	284	38	200	---	3.1	3.1	244	64	97	---	< 2	2	5.51	3.08	2.94	---	0.23	0.23	20.7	20.8	12.3	---	0.86	0.86	31.3	24.6	20.4	2.0	< 0.01	0.02	0.02	4.25	56.8	61.9	53.2	77.4	2.7	0.2	0.7	1	
	Max	499.3	223.0	10.9	1.0	0.0	314.4	314.4	7.6	7.8	7.4	7.7	1,070	420	652	---	20.0	20.0	424	182	124	---	5	5	9.46	5.48	4.94	---	0.97	0.97	42.1	34.1	13.3	---	6.24	6.24	61.4	42.3	25.5	7.7	< 0.05	0.54	0.03	10.9	94.1	100	60.4	96.0	2.9	3.0	1.4	270	
June	Avg/Geomean	414.5	107.8	11.0	0.0	0.0	295.6	295.6	7.5	7.6	7.4	7.5	307	72	67	---	4.5	4.5	246	80	33	---	2.4	2.4	6.56	3.39	7.71	---	0.31	0.31	27.3	21.3	7.1	---	1.41	1.41	41.2	26.1	8.9	2.8	< 0.01	1.38	1.35	9.36	77.9	71.5	21.8	86.0	1.8	1.0	1	7.6	65.0
	Min	268.1	0.0	9.8	0.0	0.0	257.9	257.9	7.2	7.1	7.4	7.3	178	34	53	---	2.7	2.7	88	27	24	---	< 2	< 2	1.99	1.85	1.26	---	0.18	0.18	7.9	8.9	5.6	---	0.06	0.06	12.9	13.5	6.7	1.0	< 0.01	0.01	0.52	3.01	31.2	44.3	20.6	46.7	1.5	0.5	0.4	2	
	Max	1,122.5	789.0	13.0	0.4	0.0	345.5	345.5	7.7	8.0	7.5	7.7	488	121	81	---	7.3	7.3	378	315	42	---	4	4	9.44	7.29	2.16	---	0.47	0.47	38.2	38.7	8.6	---	3.45	3.45	64.4	48.3	11.0	4.8	< 0.01	7.61	2.18	11.7	103.0	107	22.9	110.0	2.1	2.0	0.7	27	
July	Avg/Geomean	355.9	46.0	11.8	0.0	0.0	298.1	298.1	7.5	7.7	---	7.5	296	77	---	---	3.4	3.4	248	109	---	---	< 2	< 2	6.69	4.15	---	---	0.25	0.25	26.7	27.0	---	---	0.98	0.98	39.2	31.3	---	2.2	0.10	0.26	---	9.94	78.2	74.4	---	87.9	2.1	1.3	---	7.2	67.7
	Min	265.5	0.0	9.9	0.0	0.0	253.6	253.6	7.3	7.3	---	7.4	184	34	---	---	2.0	2.0	101	34	---	---	< 2	< 2	2.53	1.46	---	---	0.09	0.09	9.5	12.9	---	---	0.11	0.11	11.8	15.7	---	1.2	< 0.01	0.02	---	5.01	36.1	38.4	---	65.0	1.6	0.2	---	2	
	Max	906.1	564.6	12.6	0.0	0.0	351.2	351.2	7.8	8.0	---	7.7	512	202	---	---	6.6	6.6	375	366	---	---	< 2	< 2	8.76	10.20	---	---	0.59	0.59	35.0	43.9	---	---	3.01	3.01	51.5	57.1	---	4.3	0.38	0.95	---	12.9	98.2	94	---	100	2.8	7.5	---	22	
August	Avg/Geomean	355.5	37.5	10.7	0.0	0.0	307.4	307.4	7.6	7.7	---	7.6	268	75	---	---	3.3	3.3	235	77	---	---	2.0	2.0	6.44	3.13	---	---	0.26	0.26	25.7	17.3	---	---	0.62	0.62	37.6	21.7	---	1.8	< 0.01	0.25	---	9.81	82.3	59.2	---	89.4	4.6	1.2	1	7.1	64.4
	Min	272.8	0.0	2.6	0.0	0.0	261.9	261.9	7.4	7.5	---	7.4	120	28	---	---	1.9	1.9	116	24	---	---	< 2	< 2	2.92	2.04	---	---	0.18	0.18	8.6	11.8	---	---	0.18	0.18	14.7	12.8	---	1.1	< 0.01	0.05	---	4.58	39.0	42.2	---	56.8	4.2	0.7	1	2	
	Max	874.5	528.8	12.7	0.0	0.0	372.9	372.9	7.8	8.0	---	7.8	420	156	---	---	6.6	6.6	368	249	---	---	3	3	8.50	5.96	---	---	0.73	0.73	33.0	22.9	---	---	1.58	1.58	48.5	35.9	---	2.8	< 0.01	0.59	---	12.9	103	95.5	---	104	5.1	5.1	1	22	
September	Avg/Geomean	290.5	2.3	11.3	0.0	0.0	276.8	276.8	7.5	7.4	---	7.6	289	75	---	---	3.7	3.7	286	154	---	---	2.3	2.3	7.56	7.03	---	---	0.27	0.27	35.3	29.9	---	---	1.19	1.19	47.0	37.6	---	2.3	0.07	0.09	---	11.14	84.2	77.7	---	93.0	4.3	2.6	---	5.4	73.8
	Min	274.9	0.0	10.7	0.0	0.0	264.2	264.2	7.4	6.7	---	7.5	236	45	---	---	2.6	2.6	186	75	---	---	< 2	< 2	6.30	3.82	---	---	0.22	0.22	28.1	19.2	---	---	0.55	0.55	39.2	25.5	---	1.7	< 0.01	0.02	---	8.67	77.3	60.0	---	81.3	3.1	1.7	---	2	
	Max	356.3	55.2	12.2	0.0	0.0	309.4	309.4	7.6	7.8	---	7.7	440	126	---	---	8.8	8.8	368	196	---	---	3	3	8.80	9.19	---	---	0.45	0.45	40.5	38.5	---	---	3.00	3.00	54.4	45.6	---	4.3	0.25	0.16	---	12.6	92.2	86.9	---	106	6.0	6.0	---	9	
October	Avg/Geomean	272.2	0.0	11.7	0.0	0.0	260.5	260.5	7.5	---	---	7.6	312	---	---	---	3.7	3.7	311	---	---	---	3	3	8.18	---	---	---	0.30	0.30	38.0	---	---	---	1.60	1.60	50.5	---	---	2.7	< 0.01	---	---	10.7	82.7	---	---	96.3	3.0	---	---	5	
	Min	259.7	0.0	10.8	0.0	0.0	248.3	248.3	7.3	---	---	7.3	268	---	---	---	2.8	2.8	260	---	---	---	< 2	< 2	7.39	---	---	---	0.24	0.24	34.8	---	---	---	0.56	0.56	45.3	---	---	1.7	< 0.01	---	---	8.58	75.7	---	---	75.9	2.6	---	---	2	72.9
	Max	291.4	0.0	13.0	0.0	0.0	280.6	280.6	7.6	---	---	7.8	356	---	---	---	5.0	5.0	361	---	---	---	3	3	9.26	---	---	---	0.48	0.48	41.7	---	---	---	3.42	3.42	57.4	---	---	4.6	< 0.01	---	---	13.5	92.1	---	---	96.0	3.4	---	---	13	
November	Avg/Geomean	268.3	0.0	11.1	0.0	0.0	257.2	257.2	7.5	---	---	7.4	322	---	---	---	3.5	3.5	295	---	---	---	2.3	2.3	8.37	---	---	---	0.27	0.27	35.1	---	---	---	1.45	1.45	51.0	---	---	2.7	0.01	---	---	9.49	83.4	---	---	87.8	4.3	---	---	5.1	
	Min	262.0	0.0	10.0	0.0	0.0	251.0	251.0	7.3	---	---	7.2	277	---	---	---	2.5	2.5	191	---	---	---	< 2	2	3.65	---	---	---	0.19	0.19	30.3	---	---	---	0.56	0.56	38.3	---	---	1.7	< 0.01	---	---	6.38	73.3	---	---	78.8	2.8	---	---	1	70.3
	Max	282.5	0.0	12.2	0.0	0.0	270.9	270.9	7.6	---	---	7.7	604	---	---	---	4.9	4.9	357	---	---	---	3	3	9.68	---	---	---	0.31	0.31	37.9	---	---	---	2.57	2.57	61.1	---	---	3.8	0.01	---	---	12.6	91.8	---	---	95.8	6.6	---	---	13	
December	Avg/Geomean	266.4	0.0	10.9	0.0	0.0	255.5	255.5	7.5	---	---	7.5	311	---	---	---	4.6	4.6	324	---	---	---	3.1	3.1	8.13	---	---	---	0.31	0.31	38.5	---	---	---	2.89	2.89	51.9	---	---	4.0	0.01	---	---	8.60	92.8	---	---	102	2.4	---	---	10.3	
	Min	245.7	0.0	10.6	0.0	0.0	234.8	234.8	7.4	---	---	7.5	231	---	---	---	3.4	3.4	249	---	---	---	2	2	7.04	---	---	---	0.24	0.24	31.7	---	---	---	0.96	0.96	42.5	---	---	2.1	< 0.01	---	---	6.38	73.0	---	---	81.0	2.0	---	---	5	72.7
	Max	277.1	0.0	11.6	0.0	0.0	266.3	266.3	7.6	---	---	7.7	372	---	---	---	7.5	7.5	356	---	---	---	4	4	9.02	---	---	---	0.41	0.41	45.5	---	---	---	5.88	5.88	59.9	---	---	6.5	0.01	---	---	12.5	213	---	---	190	2.8	---	---	28	
Annual Volume (ML)		110,088	7,009	4,064	2	0	99,016	99,016																																											829.7
2023	Avg	301	24.2	11.1	0.00	0.00	272	274	7.5	7.6	7.4	7.5	311	83	247	---	4.0	4.0	290	112	72	---	2.5	2.5	7.40	4.63	5.83	---	0.30	0.30	33.1	26.4	10.0	---	2.07	2.07	48.9	33.4	16.0	3.0	0.03	0.34	0.69	9.16	94	144	39	103					
2022	Avg	288	16.3	11.2	0.00	0.00	260	260	7.5	7.5	---	7.5	345	93	---	---	3.9	3.9	298	108	---	---	2.7	2.7	6.95	3.70	---	---	0.26	0.26	33.6	27.2	---	---	1.73	1.73	54.5	36.9	---	3.4	0.03	0.56	---	9.16	105	175	---	111					

PBP – Plant Bypass
TBP – Total Bypass Plant (including plant and secondary)
SEC – Secondary Bypass Plant

EPE - Enhanced Primary Effluent
EPT – Enhanced Primary Treatment

Outfall 10 - Combined, UV-disinfected (FEC + EPE)
Outfall 20 – Combined Bypass (RAW + PE + EPE)
Outfall 30 - Combined Bypass (RAW + Screened + PE + EPE)

FEC – Final Effluent, Combined
RAW – Influent
BOD_5 – 5-day Biological Oxygen Demand

$CBOD_5$ – 5-day Inhibited BOD

TSS – Total Suspended Solids
TP – Total Phosphorus
NH_3-N – Ammonia as nitrogen

MPW – Membrane Product Water
ns – No sample
Avg/Geomean –Geomean for E.coli; Avg for others

Table 4 summarizes the reclaimed water quality sample data from January 1 to December 31, 2023. All parameters except *E. coli* were developed on daily 24-hour composite samples of the recycled water. The *E. coli* testing was conducted on discrete samples collected on a daily basis.

Table 4: 2023 Reclaimed Water Quality

Month		Flow (ML)	Total Alkalinity (mg CaCO3/L)	Ammonia (mg N/L)	Biochemical Oxygen Demand (mg/L)	Chemical Oxygen Demand (mg/L)	Chloride (mg Cl/L)	Conductivity (mS/cm)	*E. coli* (Counts/100 mL)	pH	Total Suspended Solids (mg/L)	Total Organic Carbon (mg/L)	Total Phosphorus (mg P/L)	Total Dissolved Solids (mg/L)	Turbidity (NTU)
January	Avg	11.5	141	0.46	<2	30	141	1003	<1	7.9	<1.0	8.6	0.11	588	0.18
	Min	9.7	135	0.04	<2	22	101	852	<1	7.9	<1.0	8.1	0.07	507	0.14
	Max	12.6	143	2.66	<2	50	366	1560	<1	8.0	<1.0	9.4	0.16	912	0.28
February	Avg	11.2	145	1.47	<2	30	152	1046	<1	7.9	<1.0	9.0	0.09	608	0.22
	Min	9.6	143	0.36	<2	20	94	843	<1	7.9	<1.0	8.4	0.07	508	0.15
	Max	12.5	146	3.36	<2	38	307	1540	<1	8.1	<1.0	9.7	0.12	861	0.31
March	Avg	11.9	157	1.57	<2	31	123	970	<1	8.0	<1.0	9.3	0.09	566	0.22
	Min	10.6	147	0.27	<2	21	99	873	<1	7.9	<1.0	7.8	0.06	501	0.17
	Max	12.5	165	5.79	3	50	197	1230	<1	8.2	<1.0	11.4	0.22	696	0.30
April	Avg	10.5	140	1.74	<2	30	98.7	879	<1	8.0	<1.0	9.0	0.09	519	0.23
	Min	9.0	125	0.27	<2	20	83.4	820	<1	7.9	<1.0	8.5	0.05	475	0.16
	Max	12.1	149	3.80	<2	42	129	944	<1	8.1	<1.0	9.9	0.13	549	0.43
May	Avg	10.0	137	0.52	<2	32	96	898	<1	8.0	<1.0	10.0	0.11	557	0.24
	Min	7.2	125	0.05	<2	22	84	749	<1	7.9	<1.0	9.3	0.08	459	0.15
	Max	10.9	163	2.13	<2	48	105	942	<1	8.1	1.2	11.1	0.14	616	0.38
June	Avg	11.0	142	0.16	<2	30	92.0	963	<1	7.9	<1.0	9.1	0.08	623	0.20
	Min	9.8	114	0.05	<2	<20	52.0	567	<1	7.8	<1.0	6.4	0.05	334	0.16
	Max	13.0	156	0.65	<2	52	117	1280	<1	8.0	<1.0	10.0	0.17	861	0.32
July	Avg	11.8	146	0.16	<2	32	93.7	1014	<1	7.9	<1.0	9.5	0.10	662	0.20
	Min	9.9	127	0.05	<2	<20	71.1	749	<1	7.7	<1.0	8.0	0.03	470	0.10
	Max	12.6	177	0.48	<2	41	105	1130	<1	8.0	<1.0	10.5	0.14	797	0.35
August	Avg	10.7	170	0.12	<2	26	94.9	1069	<1	7.9	<1.0	8.7	0.12	691	0.13
	Min	2.6	162	0.06	<2	20	58.0	759	<1	7.8	<1.0	7.7	0.07	472	0.08
	Max	12.7	184	0.42	<2	48	109	1180	<1	8.1	<1.0	9.6	0.47	844	0.26
September	Avg	11.3	154	0.13	3	35	101.0	1020	<1	7.9	1.6	10.2	0.08	642	0.69
	Min	10.7	145	0.06	<2	24	90.6	913	<1	7.8	<1.0	9.5	0.05	575	0.16
	Max	12.2	163	0.36	5	43	120	1160	<1	8.0	3.3	11.0	0.11	713	1.6
October	Avg	11.7	151	0.23	3	33	94.1	930	<1	7.8	1.5	9.5	0.09	573	0.82
	Min	10.8	144	0.07	<2	26	85.0	870	<1	7.7	<1.0	8.8	0.06	535	0.34
	Max	13.0	160	0.60	3	43	100	970	<1	7.9	3.2	10.5	0.12	594	1.3
November	Avg	11.1	149	0.31	2	32	95.2	900	<1	7.8	1.1	9.4	0.09	544	0.51
	Min	10.0	141	0.09	<2	20	84.0	823	<1	7.5	<1.0	8.9	0.03	476	0.31
	Max	12.2	156	0.75	4	49	110.0	952	<1	8.1	1.8	10.2	0.14	589	0.76
December	Avg	10.9	149	1.62	3	33	107	930	<1	7.9	1.1	9.7	0.10	569	0.38
	Min	10.6	123	0.26	<2	27	84.3	816	<1	7.8	<1.0	8.8	0.07	505	0.25
	Max	11.6	166	3.68	3	49	201	1250	<1	8.2	1.7	10.2	0.14	724	0.57
Annual Summary	Avg	11.1	148	0.71	3	31	107	969	<1	7.9	1.3	9.3	0.10	595	0.34
	Min	2.6	114	0.04	<2	<20	52	567	<1	7.5	<1.0	6.4	0.03	334	0.08
	Max	13.0	184	5.79	5	52	366	1560	<1	8.2	3.3	11.4	0.47	912	1.60

Table 5 summarizes the effluent chronic and acute toxicity testing. Both acute and chronic toxicity tests were carried out by contract laboratories in accordance with the Environment Canada Biological Test Methods (Environment Canada 1990 and 1992). The acute testing included 48-hour Rainbow Trout static toxicity, 48-hour static toxicity using *Daphnia magna* and 15-minute Microtox tests using luminescence bacteria. Seven-day *Ceriodaphnia dubia*, *Fathead minnows* and three-day P. Subcapitata survival and reproductive impairment tests were used to determine chronic toxicity. No effluent toxic events were observed in 2023.

Table 5: 2023 Effluent Toxicity

Dates	Quarter	Microtox	Daphnia Magna	Rainbow Trout	Ceriodaphnia Dubia	Fathead Minnows	Pseudokirchneriella				
					Survival	Survival					
		% of Control	LC_{50} (% vol/vol)[1]	LC_{50} (% vol/vol)	LC_{50} (% vol/vol)	LC_{50} (% vol/vol)	IC_{25} (% vol/vol)[2]	NOEL (%)[3]	LOEL (%)[4]	TOEL (%)[5]	Toxic Units(TU)[6]
1/10/2023	1	>82	>100	>100							
2/15/2023		>91	>100	>100	>100	>100	>95.2	<1.5	1.5	NA	>66.7
3/14/2023		>91	>100	>100							
4/18/2023	2	>91	>100	>100							
5/9/2023		>91	>100	>100	>100	>100	>91	2.8	5.7	3.995	35.7
6/6/2023		>91	>100	>100							
7/4/2023	3	>91	>100	>100							
8/8/2023		>91	>100	>100	>100	>100	>91	2.8	5.7	3.995	35.7
9/5/2023		>91	>100	>100							
10/10/2023	4	>91	>100	>100							
11/7/2023		>91	>100	>100	>100*	>100	>91	2.8	5.7	3.995	35.7
12/5/2023		>91	>100	>100							

[1]LC_{50} - % effluent concentration at which there is a 50% mortality of test organisms; [2]IC_{25} - % effluent concentration at which there is a 25% reduction in growth or reproduction of test organisms; [3]NOEL - the concentration at which there was no observed effect level; [4]LOEL - the concentration at which you start seeing the lowest observable effect; [5]TOEL = NOEL/LOEL; [6]TU - the ratio of the concentration observed divided by the concentration for 50% inhibition. *Collection date 11/21/2023.

Table 6 summarizes the proficiency testing of the Gold Bar WWTP Laboratory. It includes the Laboratory z-scores achieved from analyzing proficiency testing (PT) samples for constituents required by the Approval to Operate. The 2023 PT samples were provided by the Canadian Association for Laboratory Accreditation (CALA). A PT scores greater than or equal to 70 or z-scores less than or equal to 3.000 are considered acceptable for CALA PT.

Table 6: 2023 Summary of Gold Bar Wastewater Proficiency Testing

Study	Date	pH		BOD		C-BOD		TSS		NH3-N		TP		*E.coli*	
		PT Score	Avg. z-score	PT Score	Avg. z-score	PT Score	Avg. z-score	PT Score	Avg. z-score	PT Score	Avg. z-score	PT Score	Avg. z-score	PT Score	Avg. z-score
PTC	Mar-23	96	0.3	97	-0.33	94	-0.32	97	0.15	96	-0.27	99	0.10	92	0.01
PTC	Oct-23	95	0.0	93	-0.45	88	-0.78	98	0.14	91	0.09	97	0.16	92	-0.41

pH by manual meter; NH3-N by AA3; TP by AA3; E.coli by MF

In 2023, a total of 110,088 million litres (ML) of wastewater was conveyed to the plant. Secondary treatment and UV disinfection was provided to 99,016 ML (89.9%) of the total raw influent flow with 4,064 ML (3.7%) of reclaimed water provided to industrial customers.

Assessment of Annual Monitoring Results

The Gold Bar WWTP Effluent Limit Performance (WELP) index for 2023 was 19.1% (Figure 1). The 2023 index was slightly lower than the five-year average of 19.7% due to a continued focus on sustaining system reliability with maintenance and capital work and maximizing the number of process tanks/equipment in service. Additionally, there was good performance of Ostara Nutrient Recovery Facility for supernatant treatment. Figure 2 shows the annual WELP from 2005 to 2023, including the five-year average.

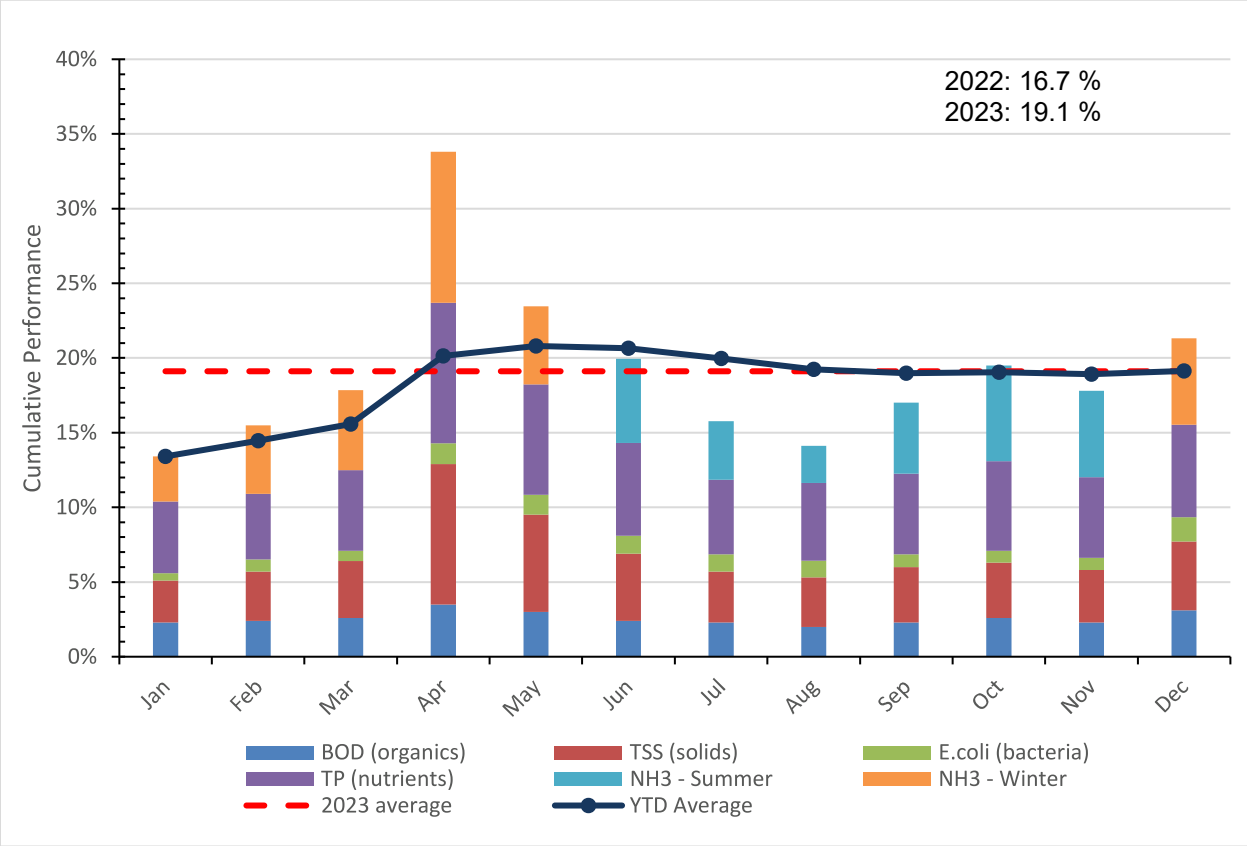

Figure 1: 2023 Monthly Gold Bar WWTP Wastewater Effluent Limit Performance (WELP) Index

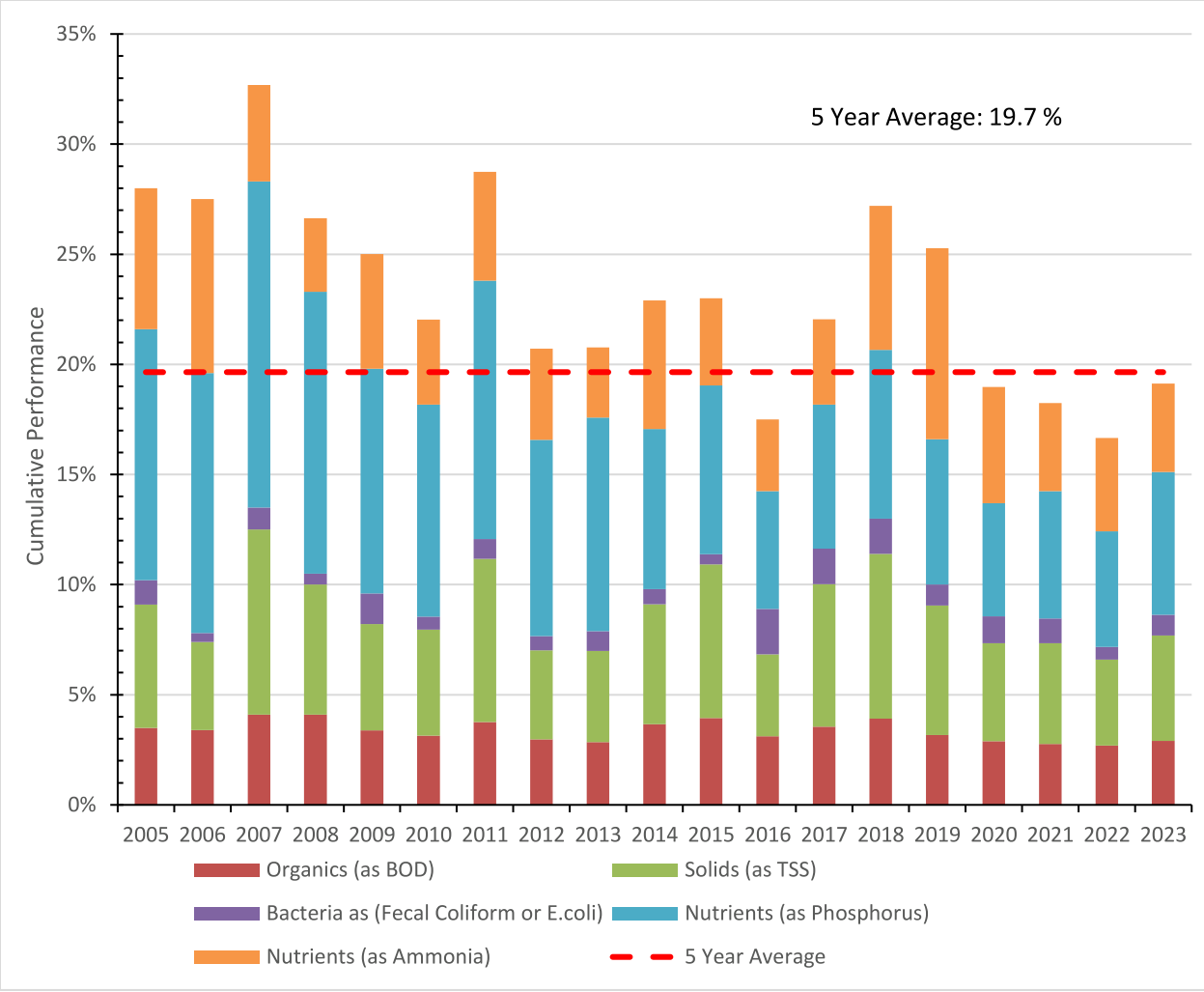

Figure 2: Gold Bar WWTP Wastewater Effluent Limit Performance (WELP Index) 2005-2023

For 2023, all of the monthly limits for Approval to Operate discharge parameters (Table 1) were met.

Chemicals Added to the Wastewater Treatment Process

As per Section 6 of the Operations Plan, the following chemicals are used in the wastewater treatment process:

- Secondary Alum
- EPT Alum
- EPT Polymer
- DAF Polymer
- Membrane Bleach
- Ostara Magnesium Chloride
- Ostara Caustic

Daily and monthly consumption of these chemicals is summarized in Appendix B.

Names of Supervising Operators

Table 7 lists all certified wastewater treatment operators, their level of certification, and their positions at Gold Bar WWTP as of December 2023. Supervising operators are also listed in the Operations Monthly Summaries in Appendix C.

Table 7: List of Certified Wastewater Treatment Operators (as of December 2023)

Name	Title	Wastewater Treatment Certification Level
Grossell, Ken M	Manager, Operations	IV
Schneider, Brian P	WWTP Operator Foreman	IV
Jones, Kira I	WWTP HEI Coordinator	IV
Kwan, Tom	WWTP Operator Foreman	IV
Espinosa, Diego F	WWTP Operator Foreman	IV
Lekamwasam, Janaka	WWTP Operator Foreman	IV
Nunes, Michael	WWTP Operator Foreman	IV
Penner, Jody	WWTP Lead Operator	IV
Sanche, Dagny	WWTP Training Coordinator	IV
Sandouga, Sam	WWTP Lead Operator	IV
Baker, Cole	WWTP Operator Foreman	IV
Nieuwenhuis, Andrew	WWTP Lead Operator	IV
Kelly, Adam	WWTP Operator	IV
Jama, Yusuf	WWTP Operator	IV
Omeragic, Armen	WWTP Operator	IV
Barrett, Jeremy L	Manager, Process Risk & Integration	III
Li, Bing (Frank)	WWTP Operator	III
Budden, Curt	WWTP Operator Foreman	III
Rindero, Billy	WWTP Operator Foreman	III
Hahn, Kevin	WWTP Operator Foreman	III
Holden, Derek	WWTP Operator	III
Jordan, Bradley	WWTP Lead Operator	III
Vogelgesang, Ryan	WWTP Operator	III
Diletzoy, Kyle	WWTP Lead Operator	III
Rees, Emma	WWTP Operator	III
Downey, Anthony	WWTP Operator	III
Paglicauan, Jermine	WWTP Operator	III
Ozimko, Michael	WWTP Operator	II
Price, Jeremy	WWTP Operator	II
Cousins, Kenzie	Operations Engineer	II
Gordon, Allan	Manager, Operations Support & Training	II
Furber, Brandyn	WWTP Operator	I
Marling, Connor	WWTP Operator	I

Uncommitted Hydraulic Reserve Capacity

In 2023, Gold Bar WWTP received a total dry weather volume of 103,080 ML. This volume is the sum total of Outfall 10 effluent (99,016 ML) and membrane reclaimed water (4,064 ML). Outfall 10 effluent also includes wet weather flow that did not result in secondary bypass and any additional wet weather flow that had secondary treatment during secondary bypass events.

The average dry weather flow in 2023 was 282 million litres per day (MLD). However, the true dry weather flow was lower than 282 MLD and was approximately 279 MLD. The true dry weather average flow excludes additional flow to the plant during snow melt or rainfall, but includes inflow and infiltration (I&I). The total true dry weather volume was approximately 101,771 ML.

Based on 310 MLD of average secondary treatment capacity and a true dry weather average flow of 279 MLD, the uncommitted hydraulic reserve capacity for secondary treatment in 2023 was 31 MLD.

Wet Weather Summary

In 2023, Gold Bar WWTP had 65 days of secondary and primary plant bypasses. The total volume of secondary bypass was 7,009 ML. In addition, the total primary bypass volume was 366 ML.

There were 18 significant wet weather events with inflows to the plant greater than 1,200 MLD, 14 of which resulted in a main plant bypass. The plant received a peak flow rate of approximately 1,933 MLD on August 9, 2023, which is the second highest peak flow on record. The record peak flow of 2,298 MLD occurred on June 28, 2022.

Summary of Operational Issues

Key operational activities, issues, and remedial actions are outlined in the Operations Monthly Summaries in Appendix C.

2023 Annual Air Pollution Control System Report

Table 8 and Table 9 describe the air pollution control system and ambient air monitoring limits and monitoring requirements. Note Scrubber 5 and Scrubber 6 were excluded from the report as they were not yet operational in 2023.

Table 8: Air Pollution Control System Operating Limits (Approval to Operate Table 5-2)

Air Pollution Control System	Monitoring Location	Parameter	Limit
East scrubber-scrubber 1; West scrubber-scrubber 2; EPT scrubber-scrubber 3; Fermenter scrubber-scrubber 4	Blowdown recirculation line before chemical makeup of each wet scrubber	pH	≥ 8.0
		ORP	≥ 300 mV
N/A	Ambient air monitoring station	H_2S, NO_2, and SO_2	After ambient air monitoring station commissioned: Meet the latest *Alberta Ambient Air Quality Objectives*

Table 9: Monitoring and Reporting - Air Pollution Control Systems and Ambient Air (Approval to Operate Table 6-2)

Source	Parameter	Frequency	Method of Monitoring	Sample Location
Carbon scrubber for grit recovery facility, during operation seasons	Temperature	Continuous	Online temperature transmitter, record daily average	Influent air stream
	Differential air pressure	Continuous	Online differential air pressure gauge, record daily average	Influent and effluent air stream
Carbon scrubber for grit recovery facility, during operation seasons; Carbon scrubber for screening building 2/3; Carbon scrubber for grit building 2	H_2S	Continuous, effective July 1, 2020	Online H_2S sensor, record daily average	Effluent air stream of each carbon scrubber
	H_2S	Annually	Manual stack survey, as per the latest *Alberta Stack Sampling Code*	Effluent air stream of each carbon scrubber
Carbon scrubber for Clover Bar biosolids dewatering building	H_2S	Weekly	Portable low range H_2S analyzer, as per the manufacturer's specifications, grab sample	Effluent air stream of the carbon scrubber
	H_2S	Annually	Manual stack survey, as per the latest *Alberta Stack Sampling Code*	Effluent air stream of the carbon scrubber
East scrubber-scrubber 1; West scrubber-scrubber 2; EPT scrubber-scrubber 3; Fermenter scrubber-scrubber 4	pH	Continuous	Online pH sensor, record daily average	Recirculation blowdown line, before addition of chemical makeup of each wet scrubber
	ORP	Continuous	Online ORP sensor, record daily average	
East scrubber-scrubber 1; West scrubber-scrubber 2; EPT scrubber-scrubber 3;	H_2S	Continuous, effective July 1, 2020	Online H_2S sensor, record daily average	Influent air stream of each wet scrubber

Fermenter scrubber-scrubber 4	H_2S	Continuous, effective July 1, 2020	Online H_2S sensor, record daily average	Effluent air stream of each wet scrubber
	H_2S	Annually	Manual stack survey, as per the latest *Alberta Stack Sampling Code*	Effluent air stream of each wet scrubber
Ambient air	H_2S, NO_2, and SO_2	After ambient air monitoring station commissioned: Continuous	*Air Monitoring Directives*, as amended, record 1-hour average and 24-hour average	Ambient air monitoring station
	Temperature			
	Wind speed			
	Wind direction			
Public odour complaints	N/A	When occurring	Document when Gold Bar Wastewater Treatment Plant is alleged and confirmed to be odour source	N/A

Summary of Air Pollution Control System Monitoring

Table 10 and Table 11 contain a monthly summary of the air pollution control system monitoring data. The data is split into two tables for ease of viewing. Appendix D contains the daily air pollution control system data.

Table 10: Air Pollution Control System Report - Part I

Month		East Scrubber				Fermenter Scrubber				West Scrubber				EPT Scrubber			
		pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)
January	Avg	9.8	669.8	0.0	6.9	9.8	670.0	26.6	6913.5	9.9	659.6	2.9	6.3	9.8	682.3	2.3	495.9
February	Avg	9.7	670.8	0.0	0.0	9.8	669.3	17.1	3320.9	9.8	668.9	4.3	0.0	9.8	685.9	2.9	1036.9
March	Avg	9.5	670.1	0.0	0.0	9.8	669.9	13.6	2354.9	9.8	669.3	3.0	0.0	9.8	683.0	3.1	1173.0
April	Avg	9.5	669.3	0.0	2.4	9.8	669.9	4.1	1112.4	9.8	669.3	2.8	2.3	9.8	679.8	3.1	1622.0
May	Avg	9.5	671.7	0.1	5.3	9.8	670.1	5.8	1929.6	9.8	664.8	4.1	6.8	9.7	671.0	1.9	1045.4
June	Avg	9.5	670.7	0.2	0.0	9.8	666.8	5.8	1182.7	9.8	667.2	3.5	8.6	9.8	677.7	1.4	842.7
July	Avg	9.5	670.5	0.0	2.4	9.8	669.5	13.5	4150.6	9.8	666.4	4.9	0.0	9.8	667.6	2.5	2065.9
August	Avg	9.5	669.9	0.2	0.0	9.8	669.8	18.3	3444.7	9.8	661.4	7.7	0.0	9.8	654.8	2.4	1321.3
September	Avg	9.5	670.1	0.6	0.3	9.8	670.1	27.8	6444.1	9.8	654.1	10.8	8.5	9.8	664.0	4.6	2394.0
October	Avg	9.5	670.3	0.2	3.2	9.8	669.6	20.8	3574.7	9.8	665.1	8.8	6.3	9.8	659.9	4.9	2759.5
November	Avg	9.5	669.9	0.0	0.4	9.8	669.9	9.6	1787.5	9.8	666.5	5.0	0.0	9.8	667.7	3.7	2051.8
December	Avg	9.5	670.3	0.0	2.3	9.8	669.8	11.8	3615.2	9.8	662.4	3.1	2.2	9.8	662.3	9.6	2235.3

Table 11: Air Pollution Control System Report - Part II

Month		Grit 6/7 Building Scrubber	Screen 4-8 Building Scrubber	Dewatering Facility Scrubber
		H_2S Out (ppb)	H_2S Out (ppb)	H_2S Out (ppb)
January	Avg	0.0	373.9	N/A
February	Avg	0.0	309.4	N/A
March	Avg	0.0	64.3	N/A
April	Avg	4.8	144.2	N/A
May	Avg	0.0	988.4	N/A
June	Avg	0.0	1078.3	N/A
July	Avg	2.0	645.1	N/A
August	Avg	0.0	161.2	N/A
September	Avg	0.4	683.4	N/A
October	Avg	2.2	1010.3	N/A
November	Avg	0.0	703.8	N/A
December	Avg	0.1	250.5	N/A

The annual manual stack survey was submitted to AEPA on July 28, 2023.

Assessment of Monitoring Results

For each scrubber, the daily average ORP and pH was maintained above 300 mV and 8, respectively throughout the year in 2023, with the exception of the EPT Scrubber ORP on August 23, 2023. The daily average ORP for the EPT Scrubber on August 23, 2023 was 243.1 mV. The contravention was reported to AEPA (Ref #418703). Refer to Table 12, Summary of Scrubber Operational Issues for more information.

Chemicals Consumed by Scrubbers

As per Section 6 of the Operations Plan, sodium hypochlorite (bleach) and caustic soda are used in the scrubbers for oxidization of H_2S and pH control, respectively. Daily and monthly consumption of these chemicals is summarized in Appendix E.

Summary of Air Pollution Control System Operational Issues

Table 12 is a summary of operational issues encountered by each air pollution control system, and the remedial actions taken to resolve the issues. A priority in 2023 was to keep the EPT Scrubber operating optimally until Scrubber 5 and 6 are completed and it can be taken offline for cleaning and media replacement. This involved several shutdowns of the EPT Scrubber to clean/replace the recirculation pump, lines, and nozzles in order to maintain the recirculation flow in the scrubber. No H_2S exceedances occurred at the Air Quality Monitoring Station (AQMS) during scrubber outages.

Table 12: Summary of Scrubber Operational Issues

Scrubber Name	Date/Time of Shutdown	Date/Time Returned to Service	Total Time Shutdown (hr)	Fence Line H2S Readings Taken?	Operational Issue	Actions Taken
EPT	1/9/2023 6:02	1/10/2023 16:31	34.5	Yes	Planned shutdown for maintenance repairs.	Replaced recirculation pump, inspected pump suction/discharge lines, cleaned discharge line, installed patch on blower suction line, inspected blower fan belts, replaced spray bar header, replaced leaking fittings on bleach system, and replaced gasket on recirculation piping.
Fermenter	1/15/2023 8:13	1/15/2023 9:53	1.7	No - shutdown less than 2 hours	Recirculation pump phase loss.	Called in E/I Maintenance to repair.
Fermenter	1/16/2023 6:48	1/16/2023 8:40	1.9	No - shutdown less than 2 hours	Drop in recirculation flow rate.	Replaced nozzles.
West	1/23/2023 5:30	1/24/2023 14:19	32.8	Yes	Planned shutdown for project work.	Tie in of ducting for future redundancy to Scrubber 5 and 6.
East	2/23/2023 19:00	2/23/2023 19:35	0.6	No - shutdown less than 2 hours	Accumulation of ice on fan causing vibration.	Shut off blower to remove ice from fan blades.
East	2/24/2023 21:10	2/24/2023 21:27	0.3	No - shutdown less than 2 hours	Foaming in scrubber tower.	Drained and refilled tower.
EPT	2/27/2023 6:59	2/27/2023 15:27	8.5	Yes	Planned shutdown for maintenance.	Cleaned nozzles and replaced recirculation pump.
EPT	3/6/2023 13:04	3/6/2023 14:34	1.5	No - shutdown less than 2 hours	Bleach pump allowing reverse flow through it.	Bleach pump replaced.
EPT	3/7/2023 13:52	3/7/2023 14:36	0.7	No - shutdown less than 2 hours	Blower off for Mechanical Maintenance.	Installed new temporary tarps around Exhaust Fan 60022 to seal up ducting.
Screen Building	3/8/2023 8:17	3/8/2023 11:53	3.6	Yes	Media requires replacement. Planned shutdown to replace.	Replaced SXL media.
Fermenter	3/19/2023 1:51	3/19/2023 5:39	2.9	No - 7 intermittent shutdowns, each less than 2 hours	Blower tripping on VFD fault due to heat sync over temp.	Attempted to bypass VFD. Called E/I Maintenance to repair.

EPT	3/28/2023 10:06	3/28/2023 11:00	0.9	No - shutdown less than 2 hours	Duct work measurements required.	Shut down for 1 hour to take measurements.
East	4/12/2023 20:45	4/13/2023 8:19	4.9	No - 12 intermittent shutdowns, each less than 2 hours	Foaming in scrubber tower.	Flushing of scrubber tower (intermittent).
East	4/14/2023 0:33	4/14/2023 1:36	1.0	No - shutdown less than 2 hours	Foaming in scrubber tower.	Investigated ducting. Closed ducting on Grit 3 effluent side. Flushed scrubber tower and returned to service.
West	4/19/2023 6:58	4/19/2023 8:52	1.9	Yes	Bleach system leaking in multiple locations.	Leaks repaired.
East	5/9/2023 7:04	5/9/2023 14:51	7.8	Yes	Planned shutdown for maintenance.	Cleaned drain lines, nozzles, windows, and pump. Inspected blower belts.
GRF	5/9/2023 4:53	5/9/2023 23:05	18.2	No - system not operating	Exhaust fan tripped.	Restarted fan.
Fermenter, East, West, EPT	5/10/2023 6:57	5/10/2023 7:37	0.7	No - shutdown less than 2 hours	Planned power outage.	Planned power outage to switch power feeder.
GRF	5/10/2023 7:20	5/10/2023 18:35	11.3	No - system not operating	Planned power outage.	Restarted fan.
West	5/17/2023 7:46	5/17/2023 11:29	3.7	Yes	Planned shutdown for project work.	Tied in water to new Scrubbers, 5 and 6.
EPT	5/17/2023 7:02	5/18/2023 15:40	32.6	Yes	Planned shutdown Project work and maintenance.	Planned shutdown to remove booster fan and replace with ducting. Tied in water to new Scrubbers, 5 and 6.
EPT	5/31/2023 0:58	5/31/2023 4:19	3.3	Yes	Bleach pump diaphragm failure.	Maintenance repaired bleach pump.
East, Fermenter	6/5/2023 8:02	6/5/2023 15:34	7.5	Yes	Planned shutdown for maintenance repairs.	Installed new fan bearings and belts on Fermenter Scrubber blower and cleaned drain/overflow lines.
Fermenter	6/21/2023 9:38	6/21/2023 11:25	1.8	No - shutdown less than 2 hours	Planned shutdown for maintenance.	Maintenance on recirculation pump.
East	7/1/2023 14:28	7/1/2023 16:17	1.8	No - shutdown less than 2 hours	Foaming in scrubber tower.	Drained and refilled tower.
East	7/1/2023 23:14	7/2/2023 0:03	0.8	No - shutdown less than 2 hours	Scrubber tower filled with foam.	Drained and refilled tower.
GRF	7/14/2023 16:07	7/21/2023 14:45	166.6	No - system not operating until July 21 @ 13:45	Power outage for work on Substation 2.	Fan not restarted after power outage. Restarted fan.
EPT	7/18/2023 7:43	7/18/2023 13:31	5.8	Yes	Planned shutdown for maintenance.	Removed flow switch on recirculation line and cleaned nozzles.
EPT	7/19/2023 12:52	7/19/2023 15:22	2.5	No - shutdown length was noted as less than 2 hours	Bleach pump back pressure valve failure.	Back pressure valve on bleach pump replaced.

Fermenter	7/25/2023 7:14	7/25/2023 11:36	4.4	Yes	Planned shutdown for maintenance.	Repaired broken bolts on instrument air flange on discharge plenum, cleaned bleach pump calibration tubes, repaired leaks on bleach pump skid, and replaced fan and transformer on blower VFD.
West	8/15/2023 7:25	8/15/2023 10:37	3.2	Yes	Planned shutdown for maintenance.	Replaced recirculation pump.
EPT	8/23/2023 5:38	8/23/2023 7:35	1.9	Yes	Low ORP starting at 00:00 on August 23. Bleach pump not building pressure.	Troubleshooting bleach pump operation. Mechanical maintenance called in to repair. Daily average ORP not met. AEPA Ref #418703.
East, Fermenter, West, EPT	9/12/2023 6:47	9/12/2023 8:19	1.5	No - shutdown less than 2 hours	Power switch.	Restarted scrubbers after power switch.
West	9/23/2023 17:24	9/23/2023 19:02	1.6	No - shutdown less than 2 hours	ORP dropped.	Shut off scrubber to troubleshoot. Ran bleach pump in manual for night shift. Maintenance called in to replace tubing on bleach pump.
West	9/26/2023 14:53	9/26/2023 15:53	1.0	No - shutdown less than 2 hours	PCP-65318 tube failure.	Shut off scrubber while PCP-65317 was repaired.
EPT	9/29/2023 0:20	9/29/2023 2:03	1.7	Yes	H2S inlet to 50 ppm, ORP dropped - Scrubber remained operational.	Verified bleach pump was working. H2S slug passed, ORP returned to normal.
EPT	10/24/2023 6:40	10/24/2023 16:23	9.7	Yes	Planned shutdown due to low recirculation flow. Nozzles plugged.	Nozzle cleaning/repairs.
East, Fermenter	10/26/2023 8:00	10/26/2023 9:37	1.6	No - shutdown less than 2 hours	Planned shutdown.	Planned shutdown for utility water tie-in.
Fermenter	11/9/2023 15:12	11/9/2023 16:13	1.0	No - shutdown less than 2 hours	Trouble with both bleach pumps.	Maintenance repaired bleach pumps.
East	11/28/2023 7:32	11/28/2023 15:21	7.8	Yes	Low recirculation flow. Planned shutdown.	Replaced automatic louvres with manual. Replaced nozzles. Added vibration monitor to Blower. Inspect/replace recirculation pump. Replace leaking suction valve on Caustic Pump PDP-65323.
EPT	12/12/2023 6:42	12/12/2023 15:31	8.8	Yes	Planned shutdown to replace ducting.	Corrective action from EPT ducting collapse in May 2023. Included maintenance activities with shutdown (camera upstream and downstream of recirculation pump and replace nozzles).
EPT	12/19/2023 6:41	12/19/2023 15:20	8.7	Yes	Nozzles plugged after previous shutdown.	Replaced nozzles.

2023 Annual Ambient Air Report

Summary of Ambient Air Monitoring

The ambient air quality monitoring station (AQMS) was commissioned as of June 30, 2022. For 2023, all ambient air monitoring was completed using the AQMS. Table 13 shows the monthly summary of results from the AQMS including H_2S, NO_2, SO_2, temperature, wind speed, and wind direction. The table shows the results of the 1-hour average data for 2023.

Table 13: Summary of Ambient Air Monitoring Results - Ambient Air Quality Monitoring Station

Month	Parameter	Min	Avg	Max
January	SO_2 (ppbv)	0.2	2.2	23.5
	NO_2 (ppbv)	1.9	22.8	52.7
	H_2S (ppbv)	0.0	0.6	9.7
	Wind Speed (m/s)	0.0	1.3	4.4
	Wind Direction (°)	-	216.6	-
	Temperature (°C)	-33.5	-15.1	-1.1
February	SO_2 (ppbv)	0.2	3.0	26.1
	NO_2 (ppbv)	2.0	15.9	54.8
	H_2S (ppbv)	0.0	0.5	5.3
	Wind Speed (m/s)	0.1	1.4	6.7
	Wind Direction (°)	-	203.1	-
	Temperature (°C)	-27.9	-7.1	7.7
March	SO_2 (ppbv)	0.3	3.8	26.7
	NO_2 (ppbv)	1.2	13.6	56.4
	H_2S (ppbv)	0.0	0.4	6.7
	Wind Speed (m/s)	0.0	1.4	4.7
	Wind Direction (°)	-	176.8	-
	Temperature (°C)	-19.1	-5.8	11.5
April	SO_2 (ppbv)	0.3	2.4	32.2
	NO_2 (ppbv)	0.8	7.6	33.8
	H_2S (ppbv)	0.0	0.6	13.5
	Wind Speed (m/s)	0.0	1.8	6.6
	Wind Direction (°)	-	179.5	-
	Temperature (°C)	-4.7	6.2	24.0
May	SO_2 (ppbv)	0.2	2.4	26.4
	NO_2 (ppbv)	1.2	7.1	28.5
	H_2S (ppbv)	0.0	1.2	18.9
	Wind Speed (m/s)	0.0	1.7	5.1
	Wind Direction (°)	-	169.2	-
	Temperature (°C)	4.1	17.0	31.1
June	SO_2 (ppbv)	0.3	1.7	18.1
	NO_2 (ppbv)	0.9	5.8	28.1
	H_2S (ppbv)	0.0	0.9	13.6
	Wind Speed (m/s)	0.1	1.4	4.3
	Wind Direction (°)	-	199.0	-
	Temperature (°C)	5.2	18.2	30.6

July	SO_2 (ppbv)	0.3	1.9	28.2
	NO_2 (ppbv)	0.9	5.5	20.7
	H_2S (ppbv)	0.0	1.6	20.4
	Wind Speed (m/s)	0.0	1.5	5.9
	Wind Direction (°)	-	201.7	-
	Temperature (°C)	8.4	18.4	30.1
August	SO_2 (ppbv)	0.4	1.5	15.8
	NO_2 (ppbv)	0.7	5.5	23.6
	H_2S (ppbv)	0.0	1.4	22.4
	Wind Speed (m/s)	0.0	1.4	6.1
	Wind Direction (°)	-	210.9	-
	Temperature (°C)	6.4	18.0	32.5
September	SO_2 (ppbv)	0.0	1.5	23.8
	NO_2 (ppbv)	0.0	8.0	27.2
	H_2S (ppbv)	0.0	2.6	37.3
	Wind Speed (m/s)	0.0	1.2	4.5
	Wind Direction (°)	-	213.6	-
	Temperature (°C)	0.1	13.5	26.0
October	SO_2 (ppbv)	0.0	1.8	39.0
	NO_2 (ppbv)	0.0	9.1	31.9
	H_2S (ppbv)	0.1	3.3	62.9
	Wind Speed (m/s)	0.0	1.5	5.7
	Wind Direction (°)	-	215.8	-
	Temperature (°C)	-8.3	6.0	25.1
November	SO_2 (ppbv)	0.1	1.6	32.2
	NO_2 (ppbv)	0.0	16.7	40.3
	H_2S (ppbv)	0.2	1.6	41.7
	Wind Speed (m/s)	0.1	1.3	5.4
	Wind Direction (°)	-	223.7	-
	Temperature (°C)	-10.2	0.6	14.2
December	SO_2 (ppbv)	0.3	1.3	24.2
	NO_2 (ppbv)	1.2	19.6	40.9
	H_2S (ppbv)	0.3	1.3	16.7
	Wind Speed (m/s)	0.0	0.9	5.2
	Wind Direction (°)	-	228.5	-
	Temperature (°C)	-12.0	-2.2	9.3

Assessment of Monitoring Results

Table 14 shows an assessment of the monthly results from the AQMS for H_2S, NO_2, and SO_2, as compared to the *Alberta Ambient Air Quality Objectives* (AAAQO). In 2023, there were a total of 178 1-hour H_2S exceedances and 35 24-hour H_2S exceedances of the AAAQO. There were no 1-hour or 24-hour exceedances for NO_2 or SO_2. The majority of the H_2S exceedances occurred in September and October when there was less precipitation to flush the collection system, but the temperatures remained warm. The exceedances tended to occur in the evenings and nights when the temperatures dipped and there was less wind. A similar trend was observed in 2022.

Table 14: Assessment of Results of Ambient Air Monitoring

Month	Parameter	1-hour AAAQO	# of 1-hour Exceedances	24-hour AAAQO	# of 24-hour Exceedances
January	H_2S (ppbv)	10	0	3.0	0
	NO_2 (ppbv)	159	0	N/A	N/A
	SO_2 (ppbv)	172	0	48.0	0
February	H_2S (ppbv)	10	0	3.0	0
	NO_2 (ppbv)	159	0	N/A	N/A
	SO_2 (ppbv)	172	0	48.0	0
March	H_2S (ppbv)	10	0	3.0	0
	NO_2 (ppbv)	159	0	N/A	N/A
	SO_2 (ppbv)	172	0	48.0	0
April	H_2S (ppbv)	10	3	3.0	0
	NO_2 (ppbv)	159	0	N/A	N/A
	SO_2 (ppbv)	172	0	48.0	0
May	H_2S (ppbv)	10	10	3.0	2
	NO_2 (ppbv)	159	0	N/A	N/A
	SO_2 (ppbv)	172	0	48.0	0
June	H_2S (ppbv)	10	1	3.0	0
	NO_2 (ppbv)	159	0	N/A	N/A
	SO_2 (ppbv)	172	0	48.0	0
July	H_2S (ppbv)	10	13	3.0	4
	NO_2 (ppbv)	159	0	N/A	N/A
	SO_2 (ppbv)	172	0	48.0	0
August	H_2S (ppbv)	10	13	3.0	1
	NO_2 (ppbv)	159	0	N/A	N/A
	SO_2 (ppbv)	172	0	48.0	0
September	H_2S (ppbv)	10	47	3.0	13
	NO_2 (ppbv)	159	0	N/A	N/A
	SO_2 (ppbv)	172	0	48.0	0
October	H_2S (ppbv)	10	69	3.0	10
	NO_2 (ppbv)	159	0	N/A	N/A
	SO_2 (ppbv)	172	0	48.0	0
November	H_2S (ppbv)	10	13	3.0	3
	NO_2 (ppbv)	159	0	N/A	N/A
	SO_2 (ppbv)	172	0	48.0	0
December	H_2S (ppbv)	10	9	3.0	2
	NO_2 (ppbv)	159	0	N/A	N/A
	SO_2 (ppbv)	172	0	48.0	0

There were also no exceedances of the 30-day objective for SO_2 (11 ppbv), the annual objective for SO_2 (8.0 ppbv), or for the annual objective for NO_2 (24 ppbv).

Summary of Public Odour Complaints

Table 15 shows the number of odour complaints received within the Gold Bar WWTP Odour Response Boundaries and number of complaints where Gold Bar WWTP is the confirmed source of odour based on wind direction, scrubber operation, corroboration with odour model software, ambient H_2S monitoring results, and plant operations/maintenance. These odour complaints occurred at times where higher levels of H_2S were observed at the AQMS.

Table 15: Summary of Gold Bar WWTP Odour Complaints

Month	Number of Odour Complaints	Number of Complaints where Gold Bar WWTP is the Confirmed Source of Odour
January	0	0
February	0	0
March	1	0
April	0	0
May	0	0
June	0	0
July	0	0
August	1	0
September	3	1
October	5	2
November	0	0
December	0	0
Total	**10**	**3**

Appendix F contains a detailed list of odour complaints including the steps taken to identify the odour sources and remedial actions taken to resolve the odour issues.

2023 Summary of Contraventions and Notifications to AEPA

Table 16 summarized the contraventions to Approval to Operate 639-03-07. There were three contraventions in 2023.

Table 16: Summary of Contraventions

Date	Summary of Contravention	AEPA Reference Number
Sept 1, 2023 14:00 AEPA Operator: Rebekah	AEPA 24-hour hotline was called to report a contravention to the approval section 5.2. EPT scrubber daily average ORP dropped to 243 mV, below the approval limit of 300 mV on August 23, 2023. There were no customer impacts or complaints reported related to this event. 7-day letter required due September 8, 2023.	418703
Oct 12, 2023 16:45 AEPA Operator: Kurtis	AEPA was notified via the 24-hour hotline of the vehicle collision that occurred at about 9 AM on Oct. 12 between an EPCOR truck transporting sanitary grit to the Ryley Landfill and another vehicle. Due to the collision, the EPCOR truck crashed into the ditch and 11.5 cubic years (1 bin) of sanitary grit was released in the NE corner of the intersection of HWY14 and HWY834. The grit was in a bag that split open and there was also a small amount of engine and hydraulic oil released as a result of the collision. There were no impacts to waterways or wildlife, but it was not known if there was any water in the ditch at the time of the collision. The highway was closed for an investigation. The EPCOR employee and the driver of the other vehicle (member of the public) were transported to hospital with injuries. There are no immediate concerns for the inert grit material to spread further at site. The grit material is contained and clean-up is being planned now and will take place either tonight or tomorrow. Why was this reported so late in the day? – I don't have this information. Two EPCOR teams have been responding and we have been focusing on the medical treatment of the injured employee and the clean-up of the spill.	420685
Oct 13, 2023 15:45 AEPA Operator: Kurtis	Kurtis from AEPA called Trina Manning at 3:45 PM to get the clean-up details for the spill that occurred on HWY 14. Trina relayed the information that GFL was on site by 9:30 AM on Oct. 13 to start the clean-up. AEPA heard about this spill from another agency (maybe RCMP, but Kurtis wasn't sure) AEPA has all the information needed and Kurtis has no concerns about the timing of our initial call.	420685
Nov 2, 2023	On behalf of EPCOR, SLR Consulting (Canada) Ltd. reported to AEPA the failure of the NOx gas analyzer at the Gold Bar Park Road Air Quality Monitoring Station. 7-day letter was submitted by SLR on November 8, at which time, the analyzer had been repaired.	421570

Table 17 summarizes the notifications to AEPA under Approval to Operate 639-03-07 as per the 2023 Operations Plan. There were 20 notifications in 2023.

Table 17: Summary of Notifications to AEPA

Date	Summary of Notifications	AEPA Reference Number
Jan 9, 2023 09:50 AEPA Operator: Jason	AEPA was notified via the 24-hour hotline of an outage of the EPT Scrubber taking place 01/09/2023 at 06:45 for tie-in of ducting for the new scrubber project. The scrubber is planned to be back online by 18:00 on 01/10/2023. Additional fence line monitoring for H2S will take place during the outage.	408426
Jan 19, 2023 13:13 AEPA Operator: Dave	AEPA was notified via the 24-hour hotline of an outage of the West Scrubber taking place 01/23/2023 at 05:00 for tie-in of ducting for the new scrubber project. The scrubber is planned to be back online by 18:00 on 01/24/2023. Additional fence line monitoring for H2S will take place during the outage.	408820
Feb 23, 2023 10:17 AEPA Operator: Darren	AEPA was notified via the 24-hour hotline of an outage of the EPT Scrubber taking place 02/27/2023 at 07:00 to replace the scrubber nozzles and inspect recirculation pump. The scrubber is planned to be back online by 15:00 on 02/27/2023. Additional fence line monitoring for H2S will take place during the outage, as weather permits.	409856
Mar 7, 2023 14:21 AEPA Operator: Rebekah	AEPA was notified via the 24-hour hotline of a planned outage of the screen building carbon scrubber taking place 03/08/2023 at 08:00 to replace the carbon media. The scrubber is planned to be back online by 17:00 on 03/08/2023. Additional fence line monitoring for H2S will take place during the outage, as weather permits.	410305
Apr 24, 2023 12:57 AEPA Operator: Iona	AEPA 24-hour hotline was notified of a planned UV outage for less than 60 minutes starting at 7:15 am April 27, 2023 to support maintenance on the electrical system. Noted that UV outages are scheduled during low flow to minimize impact on downstream users and the environment.	412026
May 3, 2023 15:02 AEPA Operator: Erin	A tracer dye study will be conducted at the Gold Bar Wastewater Treatment Plant on Secondary Clarifiers 1, 2 and 3 to evaluate the hydraulic retention times of the clarifiers. A total of six tests will take place from May 8 to May 25, 2023 using Rhodamine WT. It is not expected to see any residual dye in the plant effluent. This is a notification only – there is no contravention to our Approval to Operate and no 7-day letter is required.	412423
May 5, 2023 11:50 AEPA Operator: Iona	AEPA was notified via the 24-hour hotline of a planned outage of the East Scrubber taking place 05/9/2023 at 07:00 for equipment maintenance. The scrubber is planned to be back online by 15:00 on 05/9/2023. Additional fence line monitoring for H2S will take place during the outage, as weather permits.	412547
May 9, 2023 14:48 AEPA Operator: Steven	AEPA was notified via the 24-hour hotline of a planned outage of the UV disinfection process to take place between 7am and 8am on May 10, 2023. The duration of UV outage will be less than 25 minutes. This planned outage is so the plant can switch from our backup power feed to our primary feed. UV outages are planned to take place during low flow conditions to minimize impacts to the river and downstream users.	412765

May 15, 2023 14:30 AEPA Operator: Darren	AEPA was notified via the 24-hour hotline of 2 planned odour scrubber outages to begin on 05/17/2023 for planned maintenance. The EPT scrubber outage will begin 05/17/2023 at 07:00 and be complete by 17:00 on 05/18/2023. The west scrubber outage will begin 05/17/2023 at 08:00 and be complete by 14:00 on 05/17/2023. Additional fence line monitoring for H2S will take place during the outage. Work had been planned on dry weather days to reduce the risk of odours associated with high flows.	413065
June 2, 2023 09:20 AEPA Operator: Dave	AEPA was notified via the 24-hour hotline of an 8 hour outage of the East and Fermenter Scrubbers taking place 06/05/2023 at 08:00 for planned maintenance. The scrubber is planned to be back online by 16:00 on 06/05/2023. Additional fence line monitoring for H2S will take place during the outage.	414137
June 12, 2023 09:50 AEPA Operator: Steven	AEPA 24-hour hotline was notified of a planned UV outage on June 14, 2023 starting at 12:01 am and to be completed by 10:00am (less than 10 hours duration) for electrical maintenance on the UV system. Noted that UV outages are scheduled during low flow to minimize impact on downstream users and the environment.	414673
July 17, 2023 12:20 AEPA Operator: Taryn	AEPA was notified via the 24-hour hotline of a 6 hour outage of EPT Scrubber taking place 07/18/2023 at 07:30 for planned maintenance. The scrubber is planned to be back online by 13:30 on 07/18/2023. Additional fence line monitoring for H2S will take place during the outage.	416503
July 24, 2023 12:35 AEPA Operator: Steven	AEPA was notified via the 24-hour hotline of a 6 hour outage of Fermenter Scrubber taking place 07/25/2023 at 07:30 for planned maintenance. The scrubber is planned to be back online by 13:30 on 07/25/2023. Additional fence line monitoring for H2S will take place during the outage, also work done during cooler part of the day to help mitigate potential odours.	416886
Aug 14, 2023 10:53 AEPA Operator: Natasha	AEPA was notified via the 24-hour hotline of a 5 hour outage of West Scrubber taking place 08/15/2023 at 07:30 for planned maintenance. The scrubber is planned to be back online by 12:30 on 08/15/2023. Additional fence line monitoring for H2S will take place during the outage, also work done during cooler part of the day to help mitigate potential odours.	417777
Sept 18, 2023 11:00 AEPA Operator: Jason	AEPA was notified via the 24-hour hotline of a temporary reduction in target treatment capacity from 1200 MLD to 900 MLD for conventional and enhanced primary wastewater flows for corrective maintenance work. Reduction to start today September 18th at 11:00 and target is to restore to 1200 MLD by 23:59 on September 22nd 2023. This is due to grit tank #7 being taken out of service for corrective maintenance. This work has been scheduled during forecasted dry weather and at a time in the season when the plant is less likely to receive flows greater than 900 MLD.	419567

Sept 22, 2023 10:15 AEPA Operator: Dave	AEPA was notified via the 24-hour hotline to provide an update on REF 419567, originally phoned in on September 18th. The revised target date to restore the target treatment capacity for conventional and enhanced primary wastewater flows to 1200 MLD from 900 MLD is September 29th, 2023 by 23:59. AEPA will be notified if it can be restored earlier.	419567
Sept 28, 2023 19:25 AEPA Operator: Rebekah	AEPA was notified via the 24-hour hotline to provide an update on REF 419567, originally phoned in on September 18th. The revised target date to restore the target treatment capacity for conventional and enhanced primary wastewater flows to 1200 MLD from 900 MLD is Monday October 2, 2023 by 23:59. AEPA will be notified if it can be restored earlier.	419567
Oct 23, 2023 13:05 AEPA Operator: Raymond	AEPA was notified via the 24-hour hotline of planned outage of EPT Scrubber taking place 10/24/2023 starting at 6:30 for planned maintenance. The scrubber is planned to be back online by 16:00 on 10/24/2023. Additional fence line monitoring for H2S will take place during the outage. Outage is also scheduled on dry days to minimize odour issues.	421133
Nov 21, 2023 08:28 AEPA Operator: Erin	AEPA 24-hour hotline was notified of a planned UV outage from 0700 to 0800 on November 22, 2023 to support maintenance on the electrical transformer system. Noted that UV outages are scheduled during low flow to minimize impact on downstream users and the environment.	422229
Nov 27, 2023 09:52 AEPA Operator: Jason	AEPA was notified via the 24-hour hotline of planned outage of EAST Scrubber taking place 11/28/2023 starting at 7:00 for planned maintenance. The scrubber is planned to be back online by 17:00 on 11/28/2023. Additional fence line monitoring for H2S will take place during the outage. Outage is also scheduled on dry, cool days to minimize potential odour issues.	422412
Dec 11, 2023 09:55 AEPA Operator: Rebekah	AEPA was notified via the 24-hour hotline of planned outage of EPT Scrubber taking place 12/12/2023 starting at 7:00 for planned maintenance. The scrubber is planned to be back online by 19:00 on 12/12/2023. Additional fence line monitoring for H2S will take place during the outage. Outage is also scheduled on dry, cool days to minimize potential odour issues.	422919
Dec 18, 2023 10:05 AEPA Operator: Natasha	AEPA was notified via the 24-hour hotline of planned outage of EPT Scrubber taking place 12/19/2023 starting at 7:30 for planned maintenance. The scrubber is planned to be back online by 14:30 on 12/19/2023. Additional fence line monitoring for H2S will take place during the outage. Outage is also scheduled on dry, cool days to minimize potential odour issues.	423126

2023 Biosolids Program Summary

In 2023, the biosolids management program was able to remove 19,059 dry tonnes (DT) of biosolids from the Clover Bar Lagoons for beneficial reuse. Biosolids production from Gold Bar and Arrow Utilities (previously Alberta Capital Region Wastewater Commission) was 26,717 DT, which increased the storage inventory by 7,658 DT.

Table 18: Summary of Biosolids Program

Beneficial Application Use Method	Application Weight Removed from Lagoons (dry tonnes)	Application Volume (m^3)
Nutri-Gold (dewatered material)	5,181	22,530
Nutri-Gold (thickened material)	3,561	57,452
Agricultural Land Application (3rd party)	6,372	106,177
Non-Agricultural Land Application	3,945	16,959
Total	19,059	266,938

Appendices G, H, and I contain summaries of the Nutri-Gold, third party agricultural, and non-agricultural land application programs, respectively.

Part II: Wastewater Collection System Report

EPCOR Water Services

Edmonton, Alberta

2023

Annual Wastewater Collection System Report

Submitted to:

The Province of Alberta

Alberta Environment and Protected Areas (AEPA)

As per requirements of:

Approval to Operate No. 639-03-07

February 2024

Appendices

Appendix A – Monthly Plant Performance Reports

Appendix A - Monthly Plant Performance Reports

Gold Bar Wastewater Treatment Plant
Plant Performance Report
January 2023

Digested Sludge: Total Monthly Volume (ML)	66.9

Volume of Flow (ML)

DATE	Peak Flow (MLD)	Influent INFs	Influent RAW	Effluent Non UV Disinfected OUTFALL 30	Effluent Non UV Disinfected OUTFALL 20	Effluent Non UV Disinfected MPW	Effluent UV Disinfected EPEPS	Effluent UV Disinfected OUTFALL 10 FEC	Effluent UV Disinfected OUTFALL 10 FE
Sun-01	334.9	0.0	254.6	0.0	0.0	12.4	0.0	242.2	242.2
Mon-02	342.2	0.0	263.4	0.0	0.0	12.3	0.0	251.1	251.1
Tue-03	317.3	0.0	269.9	0.0	0.0	12.3	0.0	257.6	257.6
Wed-04	326.6	0.0	267.6	0.0	0.0	12.4	0.0	255.2	255.2
Thu-05	322.3	0.0	266.6	0.0	0.0	12.6	0.0	254.0	254.0
Fri-06	336.1	0.0	266.8	0.0	0.0	12.0	0.0	254.8	254.8
Sat-07	325.8	0.0	263.5	0.0	0.0	11.5	0.0	252.0	252.0
Sun-08	357.0	0.0	266.1	0.0	0.0	10.8	0.0	255.3	255.3
Mon-09	333.5	0.0	271.9	0.0	0.0	10.8	0.0	261.1	261.1
Tue-10	330.5	0.0	263.4	0.0	0.0	10.4	0.0	253.0	253.0
Wed-11	332.5	0.0	267.9	0.0	0.0	11.7	0.0	256.2	256.2
Thu-12	328.2	0.0	266.0	0.0	0.0	12.1	0.0	253.9	253.9
Fri-13	327.5	0.0	267.5	0.0	0.0	10.8	0.0	256.7	256.7
Sat-14	338.2	0.0	268.1	0.0	0.0	10.4	0.0	257.7	257.7
Sun-15	342.4	0.0	265.9	0.0	0.0	11.7	0.0	254.2	254.2
Mon-16	331.9	0.0	267.9	0.0	0.0	11.7	0.0	256.2	256.2
Tue-17	330.7	0.0	263.4	0.0	0.0	11.3	0.0	252.1	252.1
Wed-18	327.2	0.0	266.3	0.0	0.0	10.6	0.0	255.7	255.7
Thu-19	326.9	0.0	264.6	0.0	0.0	11.4	0.0	253.2	253.2
Fri-20	332.3	0.0	266.1	0.0	0.0	11.8	0.0	254.3	254.3
Sat-21	402.1	0.0	275.8	0.0	0.0	11.2	0.0	264.6	264.6
Sun-22	415.5	0.0	285.6	0.0	0.0	11.8	0.0	273.8	273.8
Mon-23	328.7	0.0	269.7	0.0	0.0	12.0	0.0	257.7	257.7
Tue-24	322.5	0.0	266.8	0.0	0.0	12.0	0.0	254.8	254.8
Wed-25	391.7	0.0	268.9	0.0	0.0	11.7	0.0	257.2	257.2
Thu-26	570.3	0.0	368.1	55.9	0.0	11.6	0.0	300.6	300.6
Fri-27	401.8	0.0	289.8	3.0	0.0	11.2	0.0	275.6	275.6
Sat-28	444.2	0.0	266.6	0.0	0.0	11.7	0.0	254.9	254.9
Sun-29	330.0	0.0	267.7	0.0	0.0	9.7	0.0	258.0	258.0
Mon-30	340.5	0.0	271.4	0.0	0.0	10.4	0.0	261.0	261.0
Tue-31	353.1	0.0	265.9	0.0	0.0	11.0	0.0	254.9	254.9
Average	353.0	0.0	271.4	1.9	0.0	11.5	0.0	258.1	258.1
Minimum	317.3	0.0	254.6	0.0	0.0	9.7	0.0	242.2	242.2
Maximum	570.3	0.0	368.1	55.9	0.0	12.6	0.0	300.6	300.6
GeoMean	---	---	---	---	---	---	---	---	---
TOTAL	---	0	8,414	59	0	355	0	8,000	8,000

Liquid Stream Quality

DATE	pH@25°C RAW	pH OUTFALL 30	pH OUTFALL 20	pH OUTFALL 10 FEC	TSS (mg/L) RAW	TSS OUTFALL 30	TSS OUTFALL 20	TSS EPEPS	TSS OUTFALL 10 FEC	TSS OUTFALL 10 FE
Sun-01	7.6			7.6	428				2.5	2.5
Mon-02	7.6			7.6	403				2.7	2.7
Tue-03	7.7			7.5	400				2.7	2.7
Wed-04	7.6			7.5	397				2.6	2.6
Thu-05	7.5			7.6	443				3.3	3.3
Fri-06	7.5			7.5	428				3.2	3.2
Sat-07	7.7			7.5	420				2.1	2.1
Sun-08	7.6			7.7	432				3.0	3.0
Mon-09	7.6			7.5	427				3.6	3.6
Tue-10	7.6			7.5	424				3.0	3.0
Wed-11	7.6			7.6	452				3.0	3.0
Thu-12	7.6			7.5	472				4.6	4.6
Fri-13	7.6			7.4	397				3.4	3.4
Sat-14	7.6			7.5	480				4.0	4.0
Sun-15	7.5			7.6	420				2.7	2.7
Mon-16	7.6			7.5	412				3.0	3.0
Tue-17	7.6			7.6	400				2.1	2.1
Wed-18	7.6			7.5	420				1.8	1.8
Thu-19	7.5			7.5	363				3.4	3.4
Fri-20	7.5			7.6	324				2.4	2.4
Sat-21	7.4			7.7	332				2.2	2.2
Sun-22	7.5			7.5	328				2.4	2.4
Mon-23	7.5			7.5	332				2.8	2.8
Tue-24	7.4			7.7	356				2.4	2.4
Wed-25	7.5			7.5	328				2.2	2.2
Thu-26	7.3	7.3		7.5	408	168			2.8	2.8
Fri-27	7.5	7.7		7.4	304	106			2.1	2.1
Sat-28	7.6			7.5	328				2.5	2.5
Sun-29	7.5			7.8	364				2.1	2.1
Mon-30	7.5			7.5	373				3.0	3.0
Tue-31	7.7			7.6	420				2.3	2.3
Average	7.6	7.5	---	7.5	394	137	---	---	2.8	2.8
Minimum	7.3	7.3	---	7.4	304	106	---	---	1.8	1.8
Maximum	7.7	7.7	---	7.8	480	168	---	---	4.6	4.6
GeoMean	---	---	---	---	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---	---	---	---	---

DATE	BOD_5/$cBOD_5$ (mg/L) RAW BOD_5	OUTFALL 30 BOD_5	OUTFALL 20 BOD_5	EPEPS BOD_5	OUTFALL 10 FEC $cBOD_5$	OUTFALL 10 FE $cBOD_5$	TP (mg/L) RAW	TP OUTFALL 30	TP OUTFALL 20	TP EPEPS	TP OUTFALL 10 FEC	TP OUTFALL 10 FE
Sun-01	337				2	2	7.02				0.20	0.20
Mon-02	363				3	3	6.61				0.21	0.21
Tue-03	376				3	3	6.73				0.22	0.22
Wed-04	331				2	2	7.03				0.25	0.25
Thu-05	406				3	3	7.71				0.25	0.25
Fri-06	384				2	2	7.71				0.25	0.25
Sat-07	380				3	3	7.74				0.25	0.25
Sun-08	388				3	3	8.20				0.23	0.23
Mon-09	316				2	2	7.48				0.23	0.23
Tue-10	338				3	3	8.24				0.25	0.25
Wed-11	319				< 2	< 2	8.02				0.28	0.28
Thu-12	351				2	2	8.17				0.28	0.28
Fri-13	313				2	2	9.18				0.26	0.26
Sat-14	293				2	2	8.74				0.26	0.26
Sun-15	312				2	2	8.47				0.30	0.30
Mon-16	375				2	2	7.59				0.24	0.24
Tue-17	312				2	2	7.57				0.23	0.23
Wed-18	328				2	2	8.20				0.23	0.23
Thu-19	384				2	2	8.47				0.27	0.27
Fri-20	348				2	2	7.93				0.26	0.26
Sat-21	307				2	2	7.82				0.29	0.29
Sun-22	302				2	2	7.59				0.24	0.24
Mon-23	333				3	3	7.42				0.23	0.23
Tue-24	359				2	2	7.35				0.30	0.30
Wed-25	373				2	2	6.86				0.23	0.23
Thu-26	321	144			2	2	5.97	4.10			0.21	0.21
Fri-27	324	141			2	2	7.16	1.80			0.21	0.21
Sat-28	319				2	2	7.17				0.20	0.20
Sun-29	293				2	2	7.97				0.19	0.19
Mon-30	361				3	3	7.74				0.20	0.20
Tue-31	355				2	2	7.80				0.19	0.19
Average	342	143	---	---	2.3	2.3	7.67	2.95	---	---	0.24	0.24
Minimum	293	141	---	---	< 2	< 2	5.97	1.80	---	---	0.19	0.19
Maximum	406	144	---	---	3	3	9.18	4.10	---	---	0.30	0.30
GeoMean	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---	---	---	---	---	---	---

DATE	NH3-N (mg/L) RAW	NH3-N OUTFALL 30	NH3-N OUTFALL 20	NH3-N EPEPS	NH3-N OUTFALL 10 FEC	NH3-N OUTFALL 10 FE	un-ionized NH3-N (mg/L) OUT-FAL 30	un-ionized OUT-FAL 20	un-ionized OUT-FAL 10	TKN (mg/L) RAW	TKN OUTFALL 30	TKN OUTFALL 20	TKN OUTFALL 10 FEC
Sun-01	39.2				2.94	2.94				56.1			4.2
Mon-02	33.2				2.36	2.36				56.1			3.7
Tue-03	31.0				2.31	2.31				57.0			3.8
Wed-04	28.9				1.58	1.58				55.3			2.9
Thu-05	36.5				1.39	1.39				66.9			3.1
Fri-06	40.6				1.16	1.16				64.0			2.6
Sat-07	40.6				1.07	1.07				58.5			2.7
Sun-08	36.8				1.21	1.21				61.2			3.1
Mon-09	27.7				1.16	1.16				56.6			2.7
Tue-10	35.4				0.53	0.53				64.0			2.1
Wed-11	34.9				0.73	0.73				61.6			2.5
Thu-12	35.2				0.67	0.67				61.9			2.4
Fri-13	34.0				0.84	0.84				61.1			2.4
Sat-14	28.6				0.82	0.82				63.4			2.5
Sun-15	31.0				1.10	1.10				66.2			3.6
Mon-16	33.3				1.21	1.21				61.0			2.8
Tue-17	36.3				0.57	0.57				58.7			2.4
Wed-18	33.0				0.80	0.80				61.5			2.4
Thu-19	41.6				1.35	1.35				67.8			2.8
Fri-20	42.9				1.75	1.75				64.2			3.5
Sat-21	44.6				2.36	2.36				64.6			4.2
Sun-22	41.1				2.94	2.94				64.4			4.8
Mon-23	42.9				2.30	2.30				60.2			3.8
Tue-24	39.4				1.73	1.73				57.9			3.6
Wed-25	40.5				1.68	1.68				57.6			3.3
Thu-26	24.4	28.5			1.17	1.17				44.0	44.5		3.0
Fri-27	37.5	29.2			1.02	1.02				57.8	21.8		2.4
Sat-28	44.7				2.10	2.10				61.2			3.9
Sun-29	35.7				2.40	2.40				68.8			4.4
Mon-30	30.9				2.37	2.37				68.8			4.2
Tue-31	33.3				1.26	1.26				62.6			3.1
Average	36.0	28.9	---	---	1.51	1.51	---	---	---	61.0	33.2	---	3.2
Minimum	24.4	28.5	---	---	0.53	0.53	---	---	---	44.0	21.8	---	2.1
Maximum	44.7	29.2	---	---	2.94	2.94	---	---	---	68.8	44.5	---	4.8
GeoMean	---	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---	---	---	---	---	---	---	---

DATE	NO_2+NO_3 (mg/L) RAW	NO_2+NO_3 OUTFALL 30	NO_2+NO_3 OUTFALL 20	NO_2+NO_3 OUTFALL 10 FEC	Chloride (mg/L) RAW	Chloride OUTFALL 30	Chloride OUTFALL 20	Chloride OUTFALL 10 FEC	*E. coli* (Counts/100 mL) RAW X10^6	*E. coli* OUTFALL 30 X10^6	*E. coli* OUTFALL 20 X10^6	*E. coli* OUTFALL 10 FEC
Sun-01				9.21	99.2			131				2
Mon-02				10.5	104			115				5
Tue-03				9.45	114			116				6
Wed-04	< 0.01			8.99	111			122				3
Thu-05				8.76	105			123				2
Fri-06				10.9	109			116				2
Sat-07				10.9	111			128				1
Sun-08				11.0	105			116				2
Mon-09				10.5	120			108				1
Tue-10				10.9	122			126				3
Wed-11	< 0.01			9.86	119			126				1
Thu-12				9.69	122			130				2
Fri-13				10.6	107			124				3
Sat-14				10.4	102			119				3
Sun-15				9.54	101			107				7
Mon-16				7.89	111			103				6
Tue-17				8.71	122			119	1.6			8
Wed-18	< 0.01			9.77	110			123				3
Thu-19				9.12	103			117				6
Fri-20				8.70	110			116				3
Sat-21				8.48	143			127				2
Sun-22				7.87	142			173				8
Mon-23				7.84	105			153				4
Tue-24				7.53	156			133				5
Wed-25	0.01			8.53	121			156				3
Thu-26		0.31		7.03	409	561		223		1.1		4
Fri-27		0.11		6.48	193	376		347	2.4	0.7		6
Sat-28				7.30	105			193				2
Sun-29				8.90	84.4			125				4
Mon-30				7.85	97.1			102				5
Tue-31				8.85	118			115				2
Average	< 0.01	0.21	---	9.10	125	469	---	137			---	
Minimum	< 0.01	0.11	---	6.48	84.4	376	---	102	1.6	0.7	---	1
Maximum	0.01	0.31	---	11.0	409	561	---	347	2.4	1.1	---	8
GeoMean	---	---	---	---	---	---	---	---	2.0	0.8	---	3.1
TOTAL	---	---	---	---	---	---	---	---	---	---	---	---

* Contact Laboratory for information about the quality assurance associated with the results

Enhanced Primary Treatment (EPT) Usage

Total Bypass (hr)	EPT Usage (hr)	% Usage	Total Bypass YTD (hr)	EPT Usage YTD (hr)	% Usage YTD
12	12	100%	12	12	100%

Report Comments

AEP Ref #

RAW	Untreated Influent into the plant
INF	Untreated wastewater from collection system
INFs	Influent, screened at the Headworks Diversion Structure
PE	Primary Effluent from conventional primaries
PE 30	Primary Effluent from conventional primaries discharged via Outfall 30
EPT	Enhanced Primary Treatment
EPE	Enhanced Primary Effluent
EPEPS	Enhanced Primary Effluent Pump Station
FE	Final Effluent from secondary treatment process (with biological nutrient removal). Pre-Ultraviolet disinfection.
FEC	Combined post-UV disinfection (FE+EPEPS)
OUTFALL 10	UV-disinfected, discharged via OUTFALL 10
OUTFALL 20	Combined Bypass (RAW + PE + EPE)
OUTFALL 30	Combined Bypass (INF + INFS + PE30 + EPE)
MPW	Membrane Product Water (Effluent re-use water)
ML	Megalitre (1,000,000 Litre)
MPN	Most Probable Number
NR	No Result
NS	No Sample
INS	Insufficient Sample
AEP	Alberta Environment & Parks

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Appendix A - Monthly Plant Performance Reports

Gold Bar Wastewater Treatment Plant
Plant Performance Report
February 2023

Digested Sludge: Total Monthly Volume (ML)	63.2

Volume of Flow (ML); pH@25°C; TSS (mg/L)

DATE	Peak Flow (MLD)	Influent INFs	Influent RAW	Effluent Non UV Disinfected OUTFALL 30	Effluent Non UV Disinfected OUTFALL 20	Effluent Non UV Disinfected MPW	Effluent UV Disinfected EPEPS	Effluent UV Disinfected OUTFALL 10 FEC	Effluent UV Disinfected OUTFALL 10 FE	pH@25°C RAW	pH@25°C OUTFALL 30	pH@25°C OUTFALL 20	pH@25°C OUTFALL 10 FEC	TSS RAW	TSS OUTFALL 30	TSS OUTFALL 20	TSS EPEPS	TSS OUTFALL 10 FEC	TSS OUTFALL 10 FE
Wed-01	308.9	0.0	265.8	0.0	0.0	10.5	0.0	255.3	255.3	7.6			7.5	400				4.2	4.2
Thu-02	322.8	0.0	266.2	0.0	0.0	10.6	0.0	255.6	255.6	7.6			7.6	377				2.4	2.4
Fri-03	336.4	0.0	260.0	0.0	0.0	9.6	0.0	250.4	250.4	7.6			7.5	384				2.2	2.2
Sat-04	375.0	0.0	273.2	0.0	0.0	10.5	0.0	262.7	262.7	7.6			7.6	396				2.1	2.1
Sun-05	380.8	0.0	272.3	0.0	0.0	11.4	0.0	260.9	260.9	7.7			7.6	408				3.2	3.2
Mon-06	373.8	0.0	274.5	0.0	0.0	11.7	0.0	262.8	262.8	7.5			7.5	323				2.3	2.3
Tue-07	383.2	0.0	281.2	0.0	0.0	11.0	0.0	270.2	270.2	7.3			7.6	308				2.9	2.9
Wed-08	378.9	0.0	277.6	0.0	0.0	11.0	0.0	266.6	266.6	7.4			7.5	320				2.7	2.7
Thu-09	389.3	0.0	269.9	0.0	0.0	11.7	0.0	258.2	258.2	7.5			7.5	258				2.7	2.7
Fri-10	411.5	0.0	280.4	0.0	0.0	9.8	0.0	270.6	270.6	7.5			7.6	288				2.8	2.8
Sat-11	347.5	0.0	271.9	0.0	0.0	11.2	0.0	260.7	260.7	7.3			7.6	340				2.5	2.5
Sun-12	362.6	0.0	271.7	0.0	0.0	12.2	0.0	259.5	259.5	7.5			7.6	260				2.6	2.6
Mon-13	334.4	0.0	277.6	0.0	0.0	12.5	0.0	265.1	265.1	7.4			7.6	244				2.6	2.6
Tue-14	312.3	0.0	267.3	0.0	0.0	11.6	0.0	255.7	255.7	7.6			7.5	297				3.0	3.0
Wed-15	398.1	0.0	263.7	0.0	0.0	10.8	0.0	252.9	252.9	7.4			7.4	352				2.2	2.2
Thu-16	346.1	0.0	275.5	0.0	0.0	11.2	0.0	264.3	264.3	7.5			7.5	271				3.8	3.8
Fri-17	345.6	0.0	267.5	0.0	0.0	11.3	0.0	256.2	256.2	7.4			7.7	260				3.4	3.4
Sat-18	330.2	0.0	250.2	0.0	0.0	11.3	0.0	238.9	238.9	7.5			7.6	290				3.6	3.6
Sun-19	350.9	0.0	256.8	0.0	0.0	11.2	0.0	245.6	245.6	7.5			7.6	276				3.8	3.8
Mon-20	336.9	0.0	255.1	0.0	0.0	11.3	0.0	243.8	243.8	7.4			7.6	256				3.7	3.7
Tue-21	332.4	0.0	260.5	0.0	0.0	11.4	0.0	249.1	249.1	7.5			7.6	266				4.1	4.1
Wed-22	329.0	0.0	264.7	0.0	0.0	12.1	0.0	252.6	252.6	7.4			7.5	296				3.6	3.6
Thu-23	314.8	0.0	262.8	0.0	0.0	11.7	0.0	251.1	251.1	7.5			7.4	264				2.7	2.7
Fri-24	321.5	0.0	267.3	0.0	0.0	11.6	0.0	255.7	255.7	7.4			7.5	276				9.2	9.2
Sat-25	342.2	0.0	266.2	0.0	0.0	11.2	0.0	255.0	255.0	7.4			7.5	276				2.6	2.6
Sun-26	349.3	0.0	268.3	0.0	0.0	11.2	0.0	257.1	257.1	7.6			7.6	304				3.1	3.1
Mon-27	335.1	0.0	271.6	0.0	0.0	11.2	0.0	260.4	260.4	7.4			7.6	460				3.7	3.7
Tue-28	326.9	0.0	267.5	0.0	0.0	11.2	0.0	256.3	256.3	7.5			7.5	252				3.6	3.6
Average	349.2	0.0	268.1	0.0	0.0	11.2	0.0	256.9	256.9	7.5	---	---	7.6	311	---	---	---	3.3	3.3
Minimum	308.9	0.0	250.2	0.0	0.0	9.6	0.0	238.9	238.9	7.3	---	---	7.4	244	---	---	---	2.1	2.1
Maximum	411.5	0.0	281.2	0.0	0.0	12.5	0.0	270.6	270.6	7.7	---	---	7.7	460	---	---	---	9.2	9.2
GeoMean	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL	---	0	7,507	0	0	314	0	7,193	7,193	---	---	---	---	---	---	---	---	---	---

Liquid Stream Quality: BOD_5/$cBOD_5$ (mg/L); TP (mg/L); NH3-N (mg/L)

DATE	BOD_5 RAW	BOD_5 OUTFALL 30	BOD_5 OUTFALL 20	BOD_5 EPEPS	OUTFALL 10 FEC $cBOD_5$	OUTFALL 10 FE $cBOD_5$	TP RAW	TP OUTFALL 30	TP OUTFALL 20	TP EPEPS	TP OUTFALL 10 FEC	TP OUTFALL 10 FE	NH3-N RAW	NH3-N OUTFALL 30	NH3-N OUTFALL 20	NH3-N EPEPS	NH3-N OUTFALL 10 FEC	NH3-N OUTFALL 10 FE
Wed-01	381				2	2	7.46				0.20	0.20	35.7				0.88	0.88
Thu-02	318				2	2	7.30				0.20	0.20	35.9				0.99	0.99
Fri-03	345				3	3	7.95				0.20	0.20	28.1				1.36	1.36
Sat-04	296				2	2	7.50				0.20	0.20	28.4				1.80	1.80
Sun-05	377				3	3	7.62				0.21	0.21	34.2				2.86	2.86
Mon-06	214				< 2	< 2	7.35				0.19	0.19	39.5				2.98	2.98
Tue-07	296				2	2	7.34				0.23	0.23	39.2				3.28	3.28
Wed-08	281				3	3	7.06				0.20	0.20	38.1				2.63	2.63
Thu-09	283				< 2	< 2	6.88				0.25	0.25	40.6				1.35	1.35
Fri-10	267				< 2	< 2	7.22				0.23	0.23	37.2				1.02	1.02
Sat-11	304				< 2	< 2	7.18				0.19	0.19	37.9				1.74	1.74
Sun-12	295				2	2	7.44				0.19	0.19	18.4				1.69	1.69
Mon-13	240				2	2	7.01				0.22	0.22	37.4				1.98	1.98
Tue-14	305				2	2	6.92				0.22	0.22	38.4				1.74	1.74
Wed-15	364				2	2	7.25				0.23	0.23	42.4				1.43	1.43
Thu-16	277				2	2	6.86				0.25	0.25	38.5				2.07	2.07
Fri-17	303				2	2	7.06				0.25	0.25	38.8				3.07	3.07
Sat-18	284				2	2	6.87				0.29	0.29	40.4				3.06	3.06
Sun-19	329				3	3	6.74				0.26	0.26	39.9				2.93	2.93
Mon-20	291				2	2	6.78				0.22	0.22	42.3				2.89	2.89
Tue-21	309				3	3	6.38				0.24	0.24	40.1				2.01	2.01
Wed-22	320				2	2	7.11				0.21	0.21	27.6				2.24	2.24
Thu-23	323				3	3	6.82				0.25	0.25	41.0				2.98	2.98
Fri-24	296				3	3	6.62				0.25	0.25	40.1				3.43	3.43
Sat-25	307				3	3	7.04				0.24	0.24	41.5				3.28	3.28
Sun-26	347				3	3	6.23				0.21	0.21	37.8				2.98	2.98
Mon-27	326				2	2	6.41				0.22	0.22	36.4				2.76	2.76
Tue-28	305				3	3	6.33				0.22	0.22	33.6				2.63	2.63
Average	307	---	---	---	2.4	2.4	7.03	---	---	---	0.22	0.22	36.8	---	---	---	2.29	2.29
Minimum	214	---	---	---	< 2	< 2	6.23	---	---	---	0.19	0.19	18.4	---	---	---	0.88	0.88
Maximum	381	---	---	---	3	3	7.95	---	---	---	0.29	0.29	42.4	---	---	---	3.43	3.43
GeoMean	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Liquid Stream Quality: un-ionized NH3-N (mg/L); TKN (mg/L); NO_2+NO_3 (mg/L); Chloride (mg/L); *E. coli* (Counts/100 mL)

DATE	un-ionized NH3-N OUT-FAL 30	un-ionized NH3-N OUT-FAL 20	un-ionized NH3-N OUT-FAL 10	TKN RAW	TKN OUTFALL 30	TKN OUTFALL 20	TKN OUTFALL 10 FEC	NO_2+NO_3 RAW	NO_2+NO_3 OUTFALL 30	NO_2+NO_3 OUTFALL 20	NO_2+NO_3 OUTFALL 10 FEC	Chloride RAW	Chloride OUTFALL 30	Chloride OUTFALL 20	Chloride OUTFALL 10 FEC	*E. coli* RAW X10^6	*E. coli* OUTFALL 30 X10^6	*E. coli* OUTFALL 20 X10^6	*E. coli* OUTFALL 10 FEC
Wed-01				64.1			2.6	< 0.01			8.49	128			137				6
Thu-02				56.2			2.6				9.33	115			142				6
Fri-03				58.0			3.2				10.0	143			134				9
Sat-04				61.5			3.7				8.92	271			169				5
Sun-05				59.4			4.6				8.71	137			274				5
Mon-06				59.6			4.6				8.07	159			176				4
Tue-07				57.3			4.7				6.18	166			174				6
Wed-08				62.3			4.4	< 0.01			7.67	313			244	3.0			10
Thu-09				62.9			2.9				9.08	119			304				16
Fri-10				59.6			3.7				10.5	167			167				8
Sat-11				61.0			3.3				8.58	121			175				6
Sun-12				66.2			3.6				8.07	109			140				10
Mon-13				60.5			3.5				7.31	124			127				100
Tue-14				60.0			3.4				7.45	94.7			142				4
Wed-15				61.4			3.0	< 0.01			8.62	88.8			115				4
Thu-16				61.6			4.2				7.99	95.0			105	2.2			3
Fri-17				55.8			5.0				8.46	110			114				5
Sat-18				63.8			4.8				6.91	93.2			113				6
Sun-19				55.4			4.1				7.88	240			116				2
Mon-20				50.5			4.2				8.20	138			238				5
Tue-21				49.1			3.5				8.55	114			167				3
Wed-22				52.0			3.7	0.16			7.87	103			129				2
Thu-23				54.8			4.2				8.37	93.8			110				4
Fri-24				60.4			5.0				9.02	90.1			102				3
Sat-25				60.4			4.9				8.20	82.9			92.4				2
Sun-26				56.0			4.8				7.41	86.9			91.4				5
Mon-27				56.6			4.5				7.07	98.6			91.3	2.5			5
Tue-28				56.0			4.2				7.78	113.0			105				1
Average	---	---	---	58.7	---	---	4.0	0.05	---	---	8.24	133	---	---	150		---	---	
Minimum	---	---	---	49.1	---	---	2.6	< 0.01	---	---	6.18	82.9	---	---	91.3	2.2	---	---	1
Maximum	---	---	---	66.2	---	---	5.0	0.16	---	---	10.5	313	---	---	304	3.0	---	---	100
GeoMean	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2.5	---	---	5.1
TOTAL	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

* Contact Laboratory for information about the quality assurance associated with the results

Enhanced Primary Treatment (EPT) Usage					
Total Bypass (hr)	EPT Usage (hr)	% Usage	Total Bypass YTD (hr)	EPT Usage YTD (hr)	% Usage YTD
0	0	100%	12	12	100%

Report Comments

AEP Ref #

RAW	Untreated Influent into the plant
INF	Untreated wastewater from collection system
INFs	Influent, screened at the Headworks Diversion Structure
PE	Primary Effluent from conventional primaries
PE 30	Primary Effluent from conventional primaries discharged via Outfall 30
EPT	Enhanced Primary Treatment
EPE	Enhanced Primary Effluent
EPEPS	Enhanced Primary Effluent Pump Station
FE	Final Effluent from secondary treatment process (with biological nutrient removal). Pre-Ultraviolet disinfection.
FEC	Combined post-UV disinfection (FE+EPEPS)
OUTFALL 10	UV-disinfected, discharged via OUTFALL 10
OUTFALL 20	Combined Bypass (RAW + PE + EPE)
OUTFALL 30	Combined Bypass (INF + INFS + PE30 + EPE)
MPW	Membrane Product Water (Effluent re-use water)
ML	Megalitre (1,000,000 Litre)
MPN	Most Probable Number
NR	No Result
NS	No Sample
INS	Insufficient Sample
AEP	Alberta Environment & Parks

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PROVIDING MORE EPCOR

Gold Bar Wastewater Treatment Plant
Plant Performance Report
March 2023

Digested Sludge: Total Monthly Volume (ML)	67.1

Volume of Flow (ML)

DATE	Peak Flow (MLD)	Influent: INFs	Influent: RAW	Effluent: Non UV Disinfected: OUTFALL 30	Effluent: Non UV Disinfected: OUTFALL 20	Effluent: Non UV Disinfected: MPW	Effluent: UV Disinfected: EPEPS	Effluent: UV Disinfected: OUTFALL 10: FEC	Effluent: UV Disinfected: OUTFALL 10: FE
Wed-01	318,6	0,0	264,1	0,0	0,0	11,1	0,0	253,0	253,0
Thu-02	329,9	0,0	268,4	0,0	0,0	12,0	0,0	256,4	256,4
Fri-03	337,5	0,0	271,4	0,0	0,0	12,0	0,0	259,4	259,4
Sat-04	336,7	0,0	266,4	0,0	0,0	12,0	0,0	254,4	254,4
Sun-05	343,4	0,0	265,5	0,0	0,0	12,0	0,0	253,5	253,5
Mon-06	326,7	0,0	268,6	0,0	0,0	11,8	0,0	256,8	256,8
Tue-07	367,9	0,0	263,0	0,0	0,0	12,0	0,0	251,0	251,0
Wed-08	368,5	0,0	265,1	0,0	0,0	11,6	0,0	253,5	253,5
Thu-09	315,0	0,0	265,9	0,0	0,0	11,4	0,0	254,5	254,5
Fri-10	312,5	0,0	269,2	0,0	0,0	10,8	0,0	258,4	258,4
Sat-11	340,3	0,0	266,3	0,0	0,0	10,6	0,0	255,7	255,7
Sun-12	354,7	0,0	259,6	0,0	0,0	12,1	0,0	247,5	247,5
Mon-13	341,5	0,0	270,9	0,0	0,0	12,3	0,0	258,6	258,6
Tue-14	343,7	0,0	270,1	0,0	0,0	12,2	0,0	257,9	257,9
Wed-15	338,8	0,0	273,1	0,0	0,0	12,5	0,0	260,6	260,6
Thu-16	427,0	0,0	291,0	6,8	0,0	11,9	0,0	272,3	272,3
Fri-17	503,4	0,0	299,7	28,2	0,0	12,0	0,0	259,5	259,5
Sat-18	496,5	0,0	295,7	29,3	0,0	11,9	0,0	255,5	255,5
Sun-19	549,1	0,0	312,1	49,0	0,0	11,8	0,0	251,5	251,5
Mon-20	482,4	0,0	317,6	32,8	0,0	11,8	0,0	273,0	273,0
Tue-21	461,4	0,0	320,6	25,8	0,0	12,2	0,0	282,6	282,6
Wed-22	493,1	0,0	339,4	52,0	0,0	12,2	0,0	275,2	275,2
Thu-23	533,5	0,0	349,6	57,5	0,0	12,0	0,0	280,1	280,1
Fri-24	464,6	0,0	326,6	30,2	0,0	12,3	0,0	284,1	284,1
Sat-25	427,0	0,0	285,9	10,1	0,0	12,3	0,0	263,5	263,5
Sun-26	361,4	0,0	276,4	0,0	0,0	12,1	0,0	264,3	264,3
Mon-27	339,0	0,0	273,9	0,0	0,0	12,1	0,0	261,8	261,8
Tue-28	338,6	0,0	275,6	0,0	0,0	11,9	0,0	263,7	263,7
Wed-29	364,7	0,0	284,8	0,0	0,0	12,1	0,0	272,7	272,7
Thu-30	360,4	0,0	275,2	0,0	0,0	12,2	0,0	263,0	263,0
Fri-31	365,2	0,0	280,4	0,0	0,0	12,2	0,0	268,2	268,2
Average	368,5	0,0	284,3	10,4	0,0	11,9	0,0	262,0	262,0
Minimum	312,5	0,0	259,6	0,0	0,0	10,6	0,0	247,5	247,5
Maximum	549,1	0,0	349,6	57,5	0,0	12,5	0,0	284,1	284,1
GeoMean	--	--	--	--	--	--	--	--	--
TOTAL	--	0	8.813	322	0	369	0	8,122	8,122

Liquid Stream Quality

DATE	pH@25°C: RAW	pH@25°C: OUTFALL 30	pH@25°C: OUTFALL 20	pH@25°C: OUTFALL 10 FEC	TSS (mg/L): RAW	TSS (mg/L): OUTFALL 30	TSS (mg/L): OUTFALL 20	TSS (mg/L): EPEPS	TSS (mg/L): OUTFALL 10 FEC	TSS (mg/L): OUTFALL 10 FE
Wed-01	7,5			7,6	340				3,6	3,6
Thu-02	7,6			7,5	304				3,6	3,6
Fri-03	7,6			7,6	300				4,4	4,4
Sat-04	7,6			7,6	356				3,7	3,7
Sun-05	7,3			7,6	284				3,2	3,2
Mon-06	7,4			7,6	276				4,5	4,5
Tue-07	7,4			7,6	252				4,5	4,5
Wed-08	7,6			7,6	352				3,3	3,3
Thu-09	7,4			7,6	260				4,5	4,5
Fri-10	7,5			7,6	272				4,8	4,8
Sat-11	7,4			7,7	276				5,0	5,0
Sun-12	7,5			7,6	296				4,5	4,5
Mon-13	7,5			7,6	288				3,9	3,9
Tue-14	7,5			7,7	324				3,8	3,8
Wed-15	7,3			7,6	344				2,9	2,9
Thu-16	7,4	7,7		7,7	352	120			3,8	3,8
Fri-17	7,4	7,5		7,5	400	121			3,0	3,0
Sat-18	7,5	7,6		7,5	248	80			3,3	3,3
Sun-19	7,5	7,5		7,5	336	66			2,8	2,8
Mon-20	7,4	7,7		7,5	344	57			5,0	5,0
Tue-21	7,3	7,7		7,5	332	83			3,7	3,7
Wed-22	7,5	7,6		7,5	303	60			2,2	2,2
Thu-23	7,3	7,4		7,6	300	65			1,6	1,6
Fri-24	7,4	7,5		7,5	298	69			2,1	2,1
Sat-25	7,3	7,7		7,5	340	87			2,3	2,3
Sun-26	7,5			7,6	288				2,1	2,1
Mon-27	7,4			7,6	268				2,0	2,0
Tue-28	7,3			7,6	344				2,6	2,6
Wed-29	7,5			7,7	304				10,0	10,0
Thu-30	7,5			7,5	300				5,7	5,7
Fri-31	7,4			7,6	292				4,4	4,4
Average	7,4	7,6	--	7,6	309	81	--	--	3,8	3,8
Minimum	7,3	7,4	--	7,5	248	57	--	--	1,6	1,6
Maximum	7,6	7,7	--	7,7	400	121	--	--	10,0	10,0
GeoMean	--	--	--	--	--	--	--	--	--	--
TOTAL	--	--	--	--	--	--	--	--	--	--

DATE	BOD_5<BOD_5 (mg/L): RAW (BOD_5)	OUTFALL 30 (BOD_5)	OUTFALL 20 (BOD_5)	EPEPS (BOD_5)	OUTFALL 10: FEC (<BOD_5)	OUTFALL 10: FE (<BOD_5)
Wed-01	293				< 2	2
Thu-02	381				2	2
Fri-03	350				2	2
Sat-04	337				3	3
Sun-05	290				2	2
Mon-06	342				3	3
Tue-07	401				2	2
Wed-08	294				3	3
Thu-09	322				3	3
Fri-10	316				3	3
Sat-11	402				3	3
Sun-12	305				3	3
Mon-13	253				< 2	< 2
Tue-14	385				3	3
Wed-15	362				2	2
Thu-16	318	161			3	3
Fri-17	298	155			3	3
Sat-18	272	101			3	3
Sun-19	293	125			2	2
Mon-20	307	152			3	3
Tue-21	159	122			2	2
Wed-22	282	117			2	2
Thu-23	383	114			2	2
Fri-24	276	121			2	2
Sat-25	281	152			2	2
Sun-26					< 2	2
Mon-27					3	3
Tue-28					2	2
Wed-29					5	5
Thu-30					3	3
Fri-31					3	3
Average	314	132	--	--	2,6	2,6
Minimum	159	101	--	--	< 2	< 2
Maximum	402	161	--	--	5	5
GeoMean	--	--	--	--	--	--
TOTAL	--	--	--	--	--	--

DATE	TP (mg/L): RAW	OUTFALL 30	OUTFALL 20	EPEPS	OUTFALL 10: FEC	OUTFALL 10: FE
Wed-01	1,18				0,82	0,82
Thu-02	6,87				0,29	0,29
Fri-03	6,76				0,28	0,28
Sat-04	7,36				0,30	0,30
Sun-05	7,08				0,27	0,27
Mon-06	6,67				0,26	0,26
Tue-07	7,01				0,28	0,28
Wed-08	7,25				0,28	0,26
Thu-09	6,96				0,30	0,30
Fri-10	6,30				0,28	0,28
Sat-11	6,69				0,30	0,30
Sun-12	6,92				0,32	0,32
Mon-13	7,37				0,30	0,30
Tue-14	7,23				0,28	0,28
Wed-15	7,99				0,29	0,29
Thu-16	6,79	6,09			0,25	0,25
Fri-17	6,56	4,54			0,25	0,25
Sat-18	6,01	5,70			0,23	0,23
Sun-19	6,10	4,05			0,19	0,19
Mon-20	6,06	3,66			0,23	0,23
Tue-21	6,59	3,98			0,24	0,24
Wed-22	10,0	3,94			0,16	0,16
Thu-23	6,58	3,78			0,15	0,15
Fri-24	6,60	4,28			0,19	0,19
Sat-25	7,34	5,60			0,18	0,18
Sun-26	7,43				0,18	0,18
Mon-27	6,60				0,18	0,18
Tue-28	7,17				0,17	0,17
Wed-29	7,10				0,45	0,45
Thu-30	7,21				0,34	0,34
Fri-31	7,34				0,29	0,29
Average	6,81	4,56	--	--	0,27	0,27
Minimum	1,18	3,66	--	--	0,15	0,15
Maximum	10,0	6,09	--	--	0,82	0,82
GeoMean	--	--	--	--	--	--
TOTAL	--	--	--	--	--	--

DATE	NH_3-N (mg/L): RAW	OUTFALL 30	OUTFALL 20	EPEPS	OUTFALL 10: FEC	OUTFALL 10: FE
Wed-01	33,3				2,44	2,44
Thu-02	37,8				2,77	2,77
Fri-03	30,5				2,85	2,85
Sat-04	36,3				2,48	2,48
Sun-05	38,2				3,71	3,71
Mon-06	39,8				2,79	2,79
Tue-07	39,8				2,29	2,29
Wed-08	38,1				2,14	2,14
Thu-09	37,6				2,87	2,87
Fri-10	27,8				2,03	2,03
Sat-11	31,1				2,15	2,15
Sun-12	37,9				3,10	3,10
Mon-13	38,1				2,37	2,37
Tue-14	31,6				1,05	1,05
Wed-15	33,8				1,38	1,38
Thu-16	34,5	42,4			2,21	2,21
Fri-17	33,2	38,6			4,08	4,08
Sat-18	26,2	30,1			2,86	2,86
Sun-19	32,6	32,0			2,47	2,47
Mon-20	31,7	29,3			1,37	1,37
Tue-21	26,4	29,4			1,64	1,64
Wed-22	30,4	26,4			2,40	2,40
Thu-23	28,7	28,3			1,95	1,95
Fri-24	29,3	26,8			1,41	1,41
Sat-25	34,5	31,4			2,29	2,29
Sun-26	31,5				2,40	2,40
Mon-27	34,3				3,50	3,50
Tue-28	38,1				3,35	3,35
Wed-29	33,8				5,83	5,83
Thu-30	30,4				5,34	5,34
Fri-31	34,2				3,62	3,62
Average	33,5	31,5	--	--	2,68	2,68
Minimum	26,2	26,4	--	--	1,05	1,05
Maximum	39,8	42,4	--	--	5,83	5,83
GeoMean	--	--	--	--	--	--
TOTAL	--	--	--	--	--	--

DATE	un-ionized NH_3-N (mg/L): OUT-FAL 30	OUT-FAL 20	OUT-FAL 10
Wed-01			
Thu-02			
Fri-03			
Sat-04			
Sun-05			
Mon-06			
Tue-07			
Wed-08			
Thu-09			
Fri-10			
Sat-11			
Sun-12			
Mon-13			
Tue-14			
Wed-15			
Thu-16			
Fri-17			
Sat-18			
Sun-19			
Mon-20			
Tue-21			
Wed-22			
Thu-23			
Fri-24			
Sat-25			
Sun-26			
Mon-27			
Tue-28			
Wed-29			
Thu-30			
Fri-31			
Average	--	--	--
Minimum	--	--	--
Maximum	--	--	--
GeoMean	--	--	--
TOTAL	--	--	--

DATE	TKN (mg/L): RAW	OUTFALL 30	OUTFALL 20	OUTFALL 10 FEC
Wed-01	32,6			4,2
Thu-02	52,4			4,6
Fri-03	49,7			4,3
Sat-04	56,0			4,1
Sun-05	56,2			5,4
Mon-06	55,0			4,6
Tue-07	54,7			3,9
Wed-08	58,1			4,1
Thu-09	58,9			4,6
Fri-10	55,0			4,4
Sat-11	56,1			4,3
Sun-12	66,2			5,2
Mon-13	62,9			4,8
Tue-14	63,7			3,2
Wed-15	63,3			3,4
Thu-16	59,6	55,2		4,0
Fri-17	52,9	51,5		6,2
Sat-18	52,2	44,2		5,0
Sun-19	46,9	39,4		3,9
Mon-20	51,9	37,1		2,9
Tue-21	55,8	45,9		3,5
Wed-22	81,9	43,8		4,0
Thu-23	53,2	42,1		3,8
Fri-24	48,3	40,7		3,3
Sat-25	51,8	48,5		4,0
Sun-26	52,7			4,6
Mon-27	55,3			5,2
Tue-28	53,9			4,8
Wed-29	49,3			5,0
Thu-30	50,9			8,2
Fri-31	53,3			5,1
Average	55,2	44,8	--	4,6
Minimum	32,6	37,1	--	2,9
Maximum	81,9	55,2	--	8,2
GeoMean	--	--	--	--
TOTAL	--	--	--	--

DATE	NO_3+NO_2 (mg/L): RAW	OUTFALL 30	OUTFALL 20	OUTFALL 10 FEC
Wed-01	0,02			8,74
Thu-02				9,04
Fri-03				8,52
Sat-04				7,41
Sun-05				7,08
Mon-06				7,30
Tue-07				6,40
Wed-08	0,02			7,02
Thu-09				7,25
Fri-10				6,82
Sat-11				6,81
Sun-12				6,83
Mon-13				6,52
Tue-14				5,24
Wed-15	< 0,01			5,22
Thu-16		0,36		4,38
Fri-17		0,13		5,28
Sat-18		0,71		5,66
Sun-19		0,10		5,68
Mon-20		0,10		4,23
Tue-21		0,03		4,15
Wed-22	0,01	0,07		4,20
Thu-23		0,10		4,22
Fri-24		0,04		3,41
Sat-25		0,01		3,86
Sun-26				3,99
Mon-27				3,20
Tue-28				3,91
Wed-29	< 0,01			3,69
Thu-30				4,51
Fri-31				3,76
Average	0,01	0,17	--	5,61
Minimum	< 0,01	0,01	--	3,20
Maximum	0,02	0,71	--	9,04
GeoMean	--	--	--	--
TOTAL	--	--	--	--

DATE	Chloride (mg/L): RAW	OUTFALL 30	OUTFALL 20	OUTFALL 10 FEC
Wed-01	133			106
Thu-02	179			142
Fri-03	146			186
Sat-04	107			163
Sun-05	120			120
Mon-06	90,8			96,5
Tue-07	98,6			105
Wed-08	100			108
Thu-09	97,3			104
Fri-10	93,0			99,3
Sat-11	103			99,0
Sun-12	96,0			103
Mon-13	103			96,4
Tue-14	125			102
Wed-15	142			129
Thu-16	199	397		151
Fri-17	190	277		190
Sat-18	119	212		186
Sun-19	151	160		160
Mon-20	130	182		145
Tue-21	104	126		133
Wed-22	108	133		111
Thu-23	114	141		112
Fri-24	101	119		116
Sat-25	112	162		113
Sun-26	90,7			119
Mon-27	86,6			101
Tue-28	88,4			96,8
Wed-29	92,6			98,0
Thu-30	83,6			103
Fri-31	88,6			97,3
Average	115	191	--	122
Minimum	83,6	119	--	96,4
Maximum	199	397	--	190
GeoMean	--	--	--	--
TOTAL	--	--	--	--

DATE	*E. coli* (Counts/100 mL): RAW	OUTFALL 30	OUTFALL 20	OUTFALL 10 FEC
Wed-01				3
Thu-02				2
Fri-03				4
Sat-04				3
Sun-05				2
Mon-06				4
Tue-07				4
Wed-08				3
Thu-09				2
Fri-10				3
Sat-11				2
Sun-12				6
Mon-13				2
Tue-14				8
Wed-15				8
Thu-16		1,5		7
Fri-17		0,6		14
Sat-18		1,8		6
Sun-19		2,6		9
Mon-20		2,1		2
Tue-21		1,9		2
Wed-22		2,7		2
Thu-23		1,5		2
Fri-24		1,9		6
Sat-25		2,2		6
Sun-26				6
Mon-27				6
Tue-28				8
Wed-29				13
Thu-30				9
Fri-31				6
Average				
Minimum	1,5	0,6	--	2
Maximum	2,1	2,7	--	14
GeoMean	1,8	1,8	--	4,3
TOTAL	--	--	--	--

* Contact Laboratory for information about the quality assurance associated with the results

Enhanced Primary Treatment (EPT) Usage					
Total Bypass (hr)	EPT Usage (hr)	% Usage	Total Bypass YTD (hr)	EPT Usage YTD (hr)	% Usage YTD
83	83	100%	95	95	100%

Report Comments

AEP Ref #

RAW	Untreated Influent into the plant
INF	Untreated wastewater from collection system
INFs	Influent, screened at the Headworks Diversion Structure
PE	Primary Effluent from conventional primaries
PE 30	Primary Effluent from conventional primaries discharged via Outfall 30
EPT	Enhanced Primary Treatment
EPE	Enhanced Primary Effluent
EPEPS	Enhanced Primary Effluent Pump Station
FE	Final Effluent from secondary treatment process (with biological nutrient removal), Pre-Ultraviolet disinfection.
FEC	Combined post-UV disinfection (FE+EPEPS)
OUTFALL 10	UV-disinfected, discharged via OUTFALL 10
OUTFALL 20	Combined Bypass (RAW + PE + EPE)
OUTFALL 30	Combined Bypass (INF + INFS + PE30 + EPE)
MPW	Membrane Product Water (Effluent re-use water)
ML	Megalitre (1,000,000 Litre)
MPN	Most Probable Number
NR	No Result
NS	No Sample
INS	Insufficient Sample
AEP	Alberta Environment & Parks

Alfredo Suarez M.Sc., P.Eng.
Senior Manager, Operations

Jeff Charrois PhD
Senior Manager, Analytical Operations & Process Development Teams

Appendix A - Monthly Plant Performance Reports

Gold Bar Wastewater Treatment Plant
Plant Performance Report
April 2023

Digested Sludge: Total Monthly Volume (ML)	69.2

Volume of Flow (ML)

DATE	Peak Flow (MLD)	Influent INFs	Influent RAW	Effluent Non UV Disinfected OUTFALL 30	Effluent Non UV Disinfected OUTFALL 20	Effluent Non UV Disinfected MPW	Effluent UV Disinfected EPEPS	Effluent UV Disinfected OUTFALL 10 FEC	Effluent UV Disinfected OUTFALL 10 FE
Sat-01	397.3	0.0	280.1	0.0	0.0	11.6	0.0	268.5	268.5
Sun-02	482.4	0.0	277.9	0.0	0.0	11.3	0.0	266.6	266.6
Mon-03	474.3	0.0	279.1	0.0	0.0	11.1	0.0	268.0	268.0
Tue-04	364.0	0.0	277.3	0.0	0.0	11.3	0.0	266.0	266.0
Wed-05	373.8	0.0	275.8	0.0	0.0	11.2	0.0	264.6	264.6
Thu-06	346.3	0.0	275.3	0.0	0.0	12.1	0.0	263.2	263.2
Fri-07	352.8	0.0	273.1	0.0	0.0	11.8	0.0	261.3	261.3
Sat-08	357.6	0.0	275.2	0.0	0.0	11.8	0.0	263.4	263.4
Sun-09	346.1	0.0	269.1	0.0	0.0	11.6	0.0	257.5	257.5
Mon-10	379.1	0.0	278.7	0.0	0.0	11.2	0.0	267.5	267.5
Tue-11	665.3	0.0	390.2	112.5	0.0	10.6	0.0	267.1	267.1
Wed-12	451.3	0.0	305.1	10.9	0.0	11.2	0.0	283.0	283.0
Thu-13	345.3	0.0	274.5	0.0	0.0	11.6	0.0	262.9	262.9
Fri-14	331.9	0.0	271.5	0.0	0.0	9.7	0.0	261.8	261.8
Sat-15	344.2	0.0	265.3	0.0	0.0	9.1	0.0	256.2	256.2
Sun-16	355.3	0.0	272.0	0.0	0.0	9.0	0.0	263.0	263.0
Mon-17	662.1	0.0	303.8	33.4	0.0	9.1	0.0	261.3	261.3
Tue-18	372.7	0.0	272.2	2.3	0.0	9.5	0.0	260.4	260.4
Wed-19	342.6	0.0	264.9	0.0	0.0	10.1	0.0	254.8	254.8
Thu-20	312.9	0.0	264.7	0.0	0.0	10.1	0.0	254.6	254.6
Fri-21	307.2	0.0	266.3	0.0	0.0	10.1	0.0	256.2	256.2
Sat-22	325.8	0.0	258.6	0.0	0.0	10.1	0.0	248.5	248.5
Sun-23	337.2	0.0	261.7	0.0	0.0	10.8	0.0	250.9	250.9
Mon-24	316.6	0.0	262.5	0.0	0.0	10.7	0.0	251.8	251.8
Tue-25	320.8	0.0	265.2	0.0	0.0	10.3	0.0	254.9	254.9
Wed-26	449.7	0.0	272.0	9.8	0.0	9.9	0.0	252.3	252.3
Thu-27	369.2	0.0	265.3	0.1	0.0	10.2	0.0	255.0	255.0
Fri-28	303.1	0.0	259.6	0.0	0.0	9.6	0.0	250.0	250.0
Sat-29	323.0	0.0	252.7	0.0	0.0	9.3	0.0	243.4	243.4
Sun-30	330.2	0.0	258.4	0.0	0.0	9.2	0.0	249.2	249.2
Average	381.3	0.0	275.6	5.6	0.0	10.5	0.0	259.5	259.5
Minimum	303.1	0.0	252.7	0.0	0.0	9.0	0.0	243.4	243.4
Maximum	665.3	0.0	390.2	112.5	0.0	12.1	0.0	283.0	283.0
GeoMean	---	---	---	---	---	---	---	---	---
TOTAL	—	0	8,268	169	0	315	0	7,784	7,784

Liquid Stream Quality

DATE	pH@25°C RAW	pH OUTFALL 30	pH OUTFALL 20	pH OUTFALL 10 FEC	TSS (mg/L) RAW	TSS OUTFALL 30	TSS OUTFALL 20	TSS EPEPS	TSS OUTFALL 10 FEC	TSS OUTFALL 10 FE
Sat-01	7.3			7.6	304				3.5	3.5
Sun-02	7.5			7.5	296				5.7	5.7
Mon-03	7.4			7.5	346				6.4	6.4
Tue-04	7.4			7.5	292				7.4	7.4
Wed-05	7.5			7.5	313				7.8	7.8
Thu-06	7.5			7.5	316				6.3	6.3
Fri-07	7.4			7.5	320				29.6	29.6
Sat-08	7.4			7.4	268				20.0	20.0
Sun-09	7.5			7.4	308				15.2	15.2
Mon-10	7.3			7.4	296				32.4	32.4
Tue-11	7.3	7.3		7.4	493	316			65.0	65.0
Wed-12	7.3	7.5		7.5	308	120			5.5	5.5
Thu-13	7.4			7.5	300				4.2	4.2
Fri-14	7.4			7.5	280				4.5	4.5
Sat-15	7.5			7.6	292				4.1	4.1
Sun-16	7.4			7.7	284				5.1	5.1
Mon-17	7.3	7.4		7.6	448	164			7.7	7.7
Tue-18	7.3	7.8		7.5	352	136			6.7	6.7
Wed-19	7.4			7.6	268				4.3	4.3
Thu-20	7.4			7.5	288				3.6	3.6
Fri-21	7.3			7.5	280				3.6	3.6
Sat-22	7.3			7.5	208				3.3	3.3
Sun-23	7.5			7.5	284				3.1	3.1
Mon-24	7.6			7.2	340				4.1	4.1
Tue-25	7.5			7.5	288				3.8	3.8
Wed-26	7.4	7.7		7.4	332	141			3.4	3.4
Thu-27	7.6			7.5	292				3.6	3.6
Fri-28	7.4			7.5	290				3.6	3.6
Sat-29	7.4			7.5	284				3.4	3.4
Sun-30	7.5			7.7	312				4.1	4.1
Average	7.4	7.5	---	7.5	309	175	---	---	9.4	9.4
Minimum	7.3	7.3	---	7.2	208	120	---	---	3.1	3.1
Maximum	7.6	7.8	---	7.7	493	316	---	---	65.0	65.0
GeoMean	---	---	---	---	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---	---	---	---	---

DATE	BOD_5/$cBOD_5$ (mg/L) RAW BOD_5	OUTFALL 30 BOD_5	OUTFALL 20 BOD_5	EPEPS BOD_5	OUTFALL 10 FEC $cBOD_5$	OUTFALL 10 FE $cBOD_5$	TP (mg/L) RAW	TP OUTFALL 30	TP OUTFALL 20	TP EPEPS	TP OUTFALL 10 FEC	TP OUTFALL 10 FE
Sat-01	352				2	2	7.04				0.29	0.29
Sun-02	309				3	3	7.11				0.32	0.32
Mon-03	299				3	3	7.70				0.31	0.31
Tue-04	355				3	3	8.76				0.32	0.32
Wed-05	329				3	3	8.29				0.37	0.37
Thu-06	304				2	2	8.55				0.34	0.34
Fri-07	341				8	8	8.42				1.13	1.13
Sat-08	303				6	6	8.64				0.95	0.95
Sun-09	256				4	4	7.46				0.70	0.70
Mon-10	324				8	8	6.94				1.47	1.47
Tue-11	370	154			14	14	6.73	5.07			2.86	2.86
Wed-12	301	130			3	3	6.74	5.70			0.27	0.27
Thu-13	309				3	3	7.41				0.28	0.28
Fri-14	310				2	2	7.31				0.30	0.30
Sat-15	322				3	3	7.64				0.24	0.24
Sun-16	337				3	3	7.32				0.31	0.31
Mon-17	329	133			3	3	6.89	5.16			0.35	0.35
Tue-18	309	154			3	3	6.85				0.22	0.22
Wed-19	302				3	3	7.67				0.25	0.25
Thu-20	307				3	3	7.74				0.28	0.28
Fri-21	276				2	2	8.30				0.26	0.26
Sat-22	239				2	2	7.08				0.26	0.26
Sun-23	361				3	3	7.72				0.21	0.21
Mon-24	323				2	2	8.52				0.23	0.23
Tue-25	331				3	3	8.45				0.29	0.29
Wed-26	303	276			3	3	8.73	7.84			0.27	0.27
Thu-27	328				2	2	8.10				0.25	0.25
Fri-28	313				2	2	8.52				0.25	0.25
Sat-29	328				2	2	8.49				0.25	0.25
Sun-30	350				3	3	9.08				0.26	0.26
Average	317	169	---	---	3.5	3.5	7.81	5.94	---	---	0.47	0.47
Minimum	239	130	---	---	2	2	6.73	5.07	---	---	0.21	0.21
Maximum	370	276	---	---	14	14	9.08	7.84	---	---	2.86	2.86
GeoMean	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---	---	---	---	---	---	---

DATE	NH3-N (mg/L) RAW	NH3-N OUTFALL 30	NH3-N OUTFALL 20	NH3-N EPEPS	NH3-N OUTFALL 10 FEC	NH3-N OUTFALL 10 FE	un-ionized NH3-N (mg/L) OUT-FAL 30	un-ionized OUT-FAL 20	un-ionized OUT-FAL 10	TKN (mg/L) RAW	TKN OUTFALL 30	TKN OUTFALL 20	TKN OUTFALL 10 FEC
Sat-01	33.9				3.49	3.49				54.8			5.3
Sun-02	34.7				3.15	3.15				51.0			5.0
Mon-03	32.7				3.46	3.46				61.6			5.7
Tue-04	35.2				4.89	4.89				62.4			7.2
Wed-05	39.3				5.82	5.82				60.8			7.7
Thu-06	49.2				5.10	5.10				63.0			7.0
Fri-07	53.6				5.65	5.65				62.5			8.5
Sat-08	40.6				6.02	6.02				65.8			8.6
Sun-09	48.6				5.25	5.25				56.7			7.3
Mon-10	44.3				5.22	5.22				51.2			8.8
Tue-11	32.2	36.6			4.56	4.56				45.1	40.1		11.1
Wed-12	25.8	24.6			2.27	2.27				45.8	29.6		3.9
Thu-13	37.3				6.20	6.20				54.2			7.5
Fri-14	39.7				5.79	5.79				57.9			8.1
Sat-15	40.7				4.02	4.02				59.2			6.8
Sun-16	41.0				5.09	5.09				60.0			8.6
Mon-17	37.0	31.5			8.02	8.02				51.4	40.9		9.6
Tue-18	39.5	28.8			5.01	5.01				52.1			7.0
Wed-19	39.8				4.97	4.97				57.3			9.5
Thu-20	38.4				7.63	7.63				60.0			9.9
Fri-21	38.3				4.73	4.73				61.2			6.7
Sat-22	39.7				4.33	4.33				55.6			5.9
Sun-23	39.2				4.17	4.17				67.1			6.1
Mon-24	38.0				4.16	4.16				56.5			5.2
Tue-25	39.5				4.74	4.74				54.1			5.5
Wed-26	38.2	37.9			4.88	4.88				51.2	51.9		6.4
Thu-27	36.9				5.00	5.00				50.2			6.2
Fri-28	41.1				5.51	5.51				51.1			6.1
Sat-29	40.6				6.39	6.39				51.6			7.2
Sun-30	42.4				6.17	6.17				55.3			7.1
Average	39.2	31.9	---	---	5.06	5.06	---	---	---	56.2	40.6	---	7.2
Minimum	25.8	24.6	---	---	2.27	2.27	---	---	---	45.1	29.6	---	3.9
Maximum	53.6	37.9	---	---	8.02	8.02	---	---	---	67.1	51.9	---	11.1
GeoMean	---	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---	---	---	---	---	---	---	---

DATE	NO_2+NO_3 (mg/L) RAW	NO_2+NO_3 OUTFALL 30	NO_2+NO_3 OUTFALL 20	NO_2+NO_3 OUTFALL 10 FEC	Chloride (mg/L) RAW	Chloride OUTFALL 30	Chloride OUTFALL 20	Chloride OUTFALL 10 FEC	*E. coli* (Counts/100 mL) RAW X10^6	*E. coli* OUTFALL 30 X10^6	*E. coli* OUTFALL 20 X10^6	*E. coli* OUTFALL 10 FEC
Sat-01				3.47	90.4			97.6				5
Sun-02				4.13	87.3			95.9				7
Mon-03				4.17	92.6			99.7				14
Tue-04				5.27	90.8			107				7
Wed-05	< 0.01			5.87	90.5			103				17
Thu-06				5.91	96.8			105				7
Fri-07				6.63	80.5			104				19
Sat-08				6.38	83.0			95.3				9
Sun-09				6.52	77.2			94.4				12
Mon-10				7.58	85.8			93.5				19
Tue-11		0.21		6.45	144	164		107		1.1		16
Wed-12	0.01	0.04		5.78	89.7	115		123		0.9		21
Thu-13				6.97	78.0			106				7
Fri-14				7.66	82.2			97.8	1.8			9
Sat-15				6.40	94.4			105				15
Sun-16				4.82	73.8			89.0				15
Mon-17		0.16		4.55	90.2	119		79.2		1.1		18
Tue-18				5.85	79.1			87.7	1.8	1.5		8
Wed-19	< 0.01			7.13	71.4			89.7				12
Thu-20				8.99	114			93.6				12
Fri-21				9.24	81.4			92.7				8
Sat-22				9.78	110			89.8				4
Sun-23				9.20	77.6			81.9				7
Mon-24				9.02	88.2			79.9				4
Tue-25				9.30	90.0			91.9				4
Wed-26	< 0.01	0.05		9.99	93.9	130		94.9		0.4		8
Thu-27				9.73	78.3			93.1		2.3		6
Fri-28				10.4	81.9			91.7				5
Sat-29				10.3	76.3			88.7				5
Sun-30				10.7	82.3			82.7				3
Average	0.01	0.11	---	7.27	88.4	132	---	95.4				
Minimum	< 0.01	0.04	---	3.47	71.4	115	---	79.2	1.8	0.4	---	3
Maximum	0.01	0.21	---	10.7	144	164	---	123	1.8	2.3	---	21
GeoMean	---	---	---	---	---	---	---	---	1.8	1.1	---	8.8
TOTAL	---	---	---	---	---	---	---	---	---	---	---	---

* Contact Laboratory for information about the quality assurance associated with the results

Enhanced Primary Treatment (EPT) Usage					
Total Bypass (hr)	EPT Usage (hr)	% Usage	Total Bypass YTD (hr)	EPT Usage YTD (hr)	% Usage YTD
24	24	100%	119	119	100%

RAW	Untreated Influent into the plant
INF	Untreated wastewater from collection system
INFs	Influent, screened at the Headworks Diversion Structure
PE	Primary Effluent from conventional primaries
PE 30	Primary Effluent from conventional primaries discharged via Outfall 30
EPT	Enhanced Primary Treatment
EPE	Enhanced Primary Effluent
EPEPS	Enhanced Primary Effluent Pump Station
FE	Final Effluent from secondary treatment process (with biological nutrient removal). Pre-Ultraviolet disinfection.
FEC	Combined post-UV disinfection (FE+EPEPS)
OUTFALL 10	UV-disinfected, discharged via OUTFALL 10
OUTFALL 20	Combined Bypass (RAW + PE + EPE)
OUTFALL 30	Combined Bypass (INF + INFS + PE30 + EPE)
MPW	Membrane Product Water (Effluent re-use water)
ML	Megalitre (1,000,000 Litre)
MPN	Most Probable Number
NR	No Result
NS	No Sample
INS	Insufficient Sample
AEP	Alberta Environment & Parks

Report Comments

18-Apr-23	Outfall 30 composite sample collected on April 18 (< 2 hours) was tested for BOD, Ammonia-nitrogen, pH, TSS and grab samples
	was tested for E.coli.
27-Apr-23	Grab sample was tested for E. coli. only.

AEP Ref #

Alfredo Suarez M.Sc.; P.Eng.
Senior Manager, Operations

Jeff Charrois PhD
Senior Manager, Analytical Operations & Process Development Teams

Appendix A - Monthly Plant Performance Reports

PROVIDING MORE EPCOR

Gold Bar Wastewater Treatment Plant
Plant Performance Report
May 2023

Digested Sludge: Total Monthly Volume (ML)	76.5

Volume of Flow (ML)

DATE	Peak Flow (MLD)	Influent: INFs	Influent: RAW	Effluent, Non UV Disinfected: OUTFALL 30	Effluent, Non UV Disinfected: OUTFALL 20	Effluent, Non UV Disinfected: MPW	Effluent, UV Disinfected: EPEPS	UV Disinfected, OUTFALL 10: FEC	UV Disinfected, OUTFALL 10: FE
Mon-01	329.9	0.0	268.2	0.0	0.0	9.3	0.0	258.9	258.9
Tue-02	313.8	0.0	262.8	0.0	0.0	9.4	0.0	253.4	253.4
Wed-03	322.1	0.0	263.0	0.0	0.0	8.4	0.0	254.6	254.6
Thu-04	325.8	0.0	263.9	0.0	0.0	7.6	0.0	256.3	256.3
Fri-05	337.6	0.0	267.9	0.0	0.0	7.2	0.0	260.7	260.7
Sat-06	343.2	0.0	254.5	0.0	0.0	7.2	0.0	247.3	247.3
Sun-07	344.6	0.0	270.5	0.0	0.0	9.9	0.0	260.6	260.6
Mon-08	1,654.9	17.0	499.3	223.0	1.0	10.7	0.0	264.6	264.6
Tue-09	333.4	0.0	315.4	7.8	0.0	10.6	0.0	297.0	297.0
Wed-10	326.8	0.0	271.0	0.0	0.0	10.0	0.0	261.0	261.0
Thu-11	1,163.2	0.0	342.9	57.7	0.0	10.4	0.0	274.8	274.8
Fri-12	400.2	0.0	296.4	5.0	0.0	9.6	0.0	281.8	281.8
Sat-13	315.4	0.0	265.6	0.0	0.0	9.7	0.0	255.9	255.9
Sun-14	337.0	0.0	282.7	0.0	0.0	10.5	0.0	272.2	272.2
Mon-15	346.1	0.0	286.3	0.0	0.0	10.3	0.0	276.0	276.0
Tue-16	309.8	0.0	268.4	0.0	0.0	10.4	0.0	258.0	258.0
Wed-17	310.5	0.0	266.1	0.0	0.0	10.3	0.0	255.8	255.8
Thu-18	302.0	0.0	270.2	0.0	0.0	10.6	0.0	259.6	259.6
Fri-19	312.5	0.0	267.7	0.0	0.0	10.1	0.0	257.6	257.6
Sat-20	326.9	0.0	252.2	0.0	0.0	10.5	0.0	241.7	241.7
Sun-21	330.8	0.0	249.4	0.0	0.0	10.1	0.0	239.3	239.3
Mon-22	368.0	0.0	258.3	0.0	0.0	10.3	0.0	248.0	248.0
Tue-23	773.9	0.0	331.3	31.7	0.0	10.3	0.0	289.3	289.3
Wed-24	323.1	0.0	266.8	0.0	0.0	10.5	0.0	256.3	256.3
Thu-25	306.6	0.0	263.9	0.0	0.0	10.9	0.0	253.0	253.0
Fri-26	297.9	0.0	298.1	0.0	0.0	10.9	0.0	287.2	287.2
Sat-27	312.4	0.0	324.2	0.0	0.0	10.8	0.0	313.4	313.4
Sun-28	344.2	0.0	325.2	0.0	0.0	10.8	0.0	314.4	314.4
Mon-29	815.3	0.0	340.2	33.6	0.0	10.6	0.0	296.0	296.0
Tue-30	703.2	0.0	313.3	46.2	0.0	10.8	0.0	256.3	256.3
Wed-31	1,880.1	8.0	433.0	162.2	0.1	10.8	0.0	259.9	259.9
Average	490.7	0.8	294.8	18.3	0.0	10.0	0.0	266.5	266.5
Minimum	297.9	0.0	249.4	0.0	0.0	7.2	0.0	239.3	239.3
Maximum	1,880.1	17.0	499.3	223.0	1.0	10.9	0.0	314.4	314.4
GeoMean	—	—	—	—	—	—	—	—	—
TOTAL	—	25	9,139	567	1	310	0	8,261	8,261

Liquid Stream Quality

DATE	pH@25°C: RAW	pH: OUTFALL 30	pH: OUTFALL 20	pH: OUTFALL 10 FEC	TSS (mg/L): RAW	TSS: OUTFALL 30	TSS: OUTFALL 20	TSS: EPEPS	TSS: OUTFALL 10 FEC	TSS: OUTFALL 10 FE	$BOD_5/cBOD_5$ (mg/L): RAW BOD_5	OUTFALL 30 BOD_5	OUTFALL 20 BOD_5	EPEPS BOD_5	OUTFALL 10 FEC $cBOD_5$	OUTFALL 10 FE $cBOD_5$
Mon-01	7.5			7.6	388				5.2	5.2	341				3	3
Tue-02	7.5			7.6	304				10.2	10.2	310				3	3
Wed-03	7.4			7.6	396				20.0	20.0	329				5	5
Thu-04	7.5			7.6	332				13.7	13.7	340				4	4
Fri-05	7.5			7.7	316				7.4	7.4	335				3	3
Sat-06	7.5			7.7	312				7.2	7.2	349				3	3
Sun-07	7.5			7.6	372				8.0	8.0	327				3	3
Mon-08	7.3	7.3	7.2	7.5	1070	420	652		8.3	8.3	305	138	124		3	3
Tue-09	7.5	7.6		7.4	320	58			5.2	5.2	266	76			3	3
Wed-10	7.4			7.6	332				6.0	6.0	339				3	3
Thu-11	7.5	7.6		7.6	480	113			6.3	6.3	282	108			3	3
Fri-12	7.6	7.8		7.6	380	38			4.5	4.5	344	64			2	2
Sat-13	7.5			7.5	356				4.6	4.6	334				3	3
Sun-14	7.4			7.6	388				5.3	5.3	424				3	3
Mon-15	7.4			7.6	332				6.2	6.2	331				3	3
Tue-16	7.4			7.7	304				5.7	5.7	376				3	3
Wed-17	7.5			7.6	284				6.4	6.4	423				2	2
Thu-18	7.4			7.6	292				8.4	8.4	321				3	3
Fri-19	7.5			7.6	332				5.3	5.3	310				3	3
Sat-20	7.5			7.7	296				4.3	4.3	333				3	3
Sun-21	7.5			7.7	288				4.8	4.8	320				3	3
Mon-22	7.4			7.6	328				5.1	5.1	252				3	3
Tue-23	7.4	7.6		7.6	505	57			4.5	4.5	381	148			3	3
Wed-24	7.5			7.7	388				5.5	5.5	320				3	3
Thu-25	7.5			7.5	288				5.5	5.5	322				2	2
Fri-26	7.4			7.6	296				5.1	5.1	399				3	3
Sat-27	7.5			7.6	288				4.8	4.8	296				4	4
Sun-28	7.5			7.6	304				6.5	6.5	298				3	3
Mon-29	7.4	7.5		7.6	560	74			4.3	4.3	414	167			3	3
Tue-30	7.5	7.6		7.6	396	79			3.3	3.3	305	182			2	2
Wed-31	7.3	7.5	7.4	7.6	560	104	200		3.1	3.1	244	96	97		< 2	2
Average	7.4	7.6	7.3	7.6	380	118	426	—	6.5	6.5	331	122	111	—	3.0	3.0
Minimum	7.3	7.3	7.2	7.4	284	38	200	—	3.1	3.1	244	64	97	—	2	2
Maximum	7.6	7.8	7.4	7.7	1,070	420	652	—	20.0	20.0	424	182	124	—	5	5
GeoMean	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TOTAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

DATE	TP (mg/L): RAW	TP: OUTFALL 30	TP: OUTFALL 20	TP: EPEPS	TP: OUTFALL 10 FEC	TP: OUTFALL 10 FE	NH3-N (mg/L): RAW	NH3-N: OUTFALL 30	NH3-N: OUTFALL 20	NH3-N: EPEPS	NH3-N: OUTFALL 10 FEC	NH3-N: OUTFALL 10 FE	un-ionized NH3-N (mg/L): OUT-FAL 30	un-ionized: OUT-FAL 20	un-ionized: OUT-FAL 10
Mon-01	9.46				0.32	0.32	39.8				5.90	5.90			
Tue-02	8.72				0.50	0.50	42.1				4.54	4.54			
Wed-03	8.43				0.97	0.97	37.5				4.79	4.79			
Thu-04	8.62				0.69	0.69	40.0				3.74	3.74			
Fri-05	7.83				0.40	0.40	39.1				2.81	2.81			
Sat-06	8.14				0.42	0.42	40.0				2.89	2.89			
Sun-07	8.44				0.42	0.42	40.8				2.38	2.38			
Mon-08	7.45	4.21	4.94		0.44	0.44	20.7	20.8	13.3		1.68	1.68			
Tue-09	6.54	3.38			0.26	0.26	32.8	23.6			0.90	0.90			
Wed-10	7.59				0.32	0.32	37.7				2.41	2.41			
Thu-11	6.94	3.46			0.33	0.33	28.0	21.4			3.50	3.50			
Fri-12	7.47	3.08			0.30	0.30	34.0	24.8			2.82	2.82			
Sat-13	7.10				0.27	0.27	30.8				2.29	2.29			
Sun-14	7.47				0.31	0.31	33.4				2.91	2.91			
Mon-15	7.24				0.38	0.38	33.5				6.24	6.24			
Tue-16	7.45				0.37	0.37	35.1				4.37	4.37			
Wed-17	7.12				0.40	0.40	36.3				3.23	3.23			
Thu-18	7.85				0.49	0.49	36.4				2.74	2.74			
Fri-19	8.25				0.34	0.34	36.4				2.02	2.02			
Sat-20	7.85				0.35	0.35	34.9				1.50	1.50			
Sun-21	7.94				0.34	0.34	35.5				1.75	1.75			
Mon-22	8.49				0.30	0.30	36.6				1.89	1.89			
Tue-23	7.96	5.12			0.29	0.29	28.8	27.3			1.79	1.79			
Wed-24	8.20				0.33	0.33	29.6				1.97	1.97			
Thu-25	8.44				0.32	0.32	37.4				1.98	1.98			
Fri-26	8.19				0.32	0.32	35.3				1.35	1.35			
Sat-27	8.05				0.34	0.34	33.4				1.46	1.46			
Sun-28	7.94				0.34	0.34	37.4				1.76	1.76			
Mon-29	7.71	5.48			0.30	0.30	31.1	34.1			1.63	1.63			
Tue-30	6.68	5.40			0.23	0.23	31.0	32.2			0.86	0.86			
Wed-31	5.51	3.32	2.94		0.23	0.23	21.6	21.6	12.3		0.90	0.90			
Average	7.78	4.18	3.94	—	0.37	0.37	34.4	25.7	12.8	—	2.61	2.61	—	—	—
Minimum	5.51	3.08	2.94	—	0.23	0.23	20.7	20.8	12.3	—	0.86	0.86	—	—	—
Maximum	9.46	5.48	4.94	—	0.97	0.97	42.1	34.1	13.3	—	6.24	6.24	—	—	—
GeoMean	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TOTAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

DATE	TKN (mg/L): RAW	TKN: OUTFALL 30	TKN: OUTFALL 20	TKN: OUTFALL 10 FEC	NO_2+NO_3 (mg/L): RAW	NO_2+NO_3: OUTFALL 30	NO_2+NO_3: OUTFALL 20	NO_2+NO_3: OUTFALL 10 FEC	Chloride (mg/L): RAW	Chloride: OUTFALL 30	Chloride: OUTFALL 20	Chloride: OUTFALL 10 FEC	*E. coli* (Counts/100 mL): RAW X10^6	*E. coli*: OUTFALL 30 X10^6	*E. coli*: OUTFALL 20 X10^6	*E. coli*: OUTFALL 10 FEC
Mon-01	56.4			7.0				10.0	78.9			80.5				11
Tue-02	51.5			5.4				10.9	86.0			87.1				8
Wed-03	48.5			7.3	< 0.01			7.90	85.3			91.3				9
Thu-04	49.4			5.4				5.34	84.7			96.0				16
Fri-05	52.6			4.5				6.26	94.1			94.4				4
Sat-06	54.4			4.6				5.75	82.4			93.2				8
Sun-07	56.9			4.4				6.28	83.3			91.6				4
Mon-08	37.8	30.0	25.5	3.4		0.29	0.02	6.23	66.3	69.4	60.4	89.0		1.3	0.7	9
Tue-09	45.8	27.9		2.5		0.54		4.25	84.2	63.3		77.4		0.3		6
Wed-10	52.7			3.9	< 0.01			6.67	87.6			89.5	2.9			14
Thu-11	44.0	26.9		5.5		0.26		5.93	76.3	72.3		95.5		1.3		10
Fri-12	51.6	29.1		5.0		0.33		5.19	81.7	66.2		92.9		0.2		9
Sat-13	45.3			3.8				8.88	77.6			89.5				9
Sun-14	50.7			4.3				9.47	76.5			88.1				10
Mon-15	44.3			7.7				6.67	82.9			86.9				10
Tue-16	50.9			5.9				8.06	89.9			95.8	2.7			10
Wed-17	47.1			4.4	< 0.01			9.90	84.9			92.2				9
Thu-18	46.6			4.5				9.12	88.5			95.3				12
Fri-19	51.9			3.4				9.61	85.6			95.6				9
Sat-20	47.3			3.0				8.63	84.7			94.0				4
Sun-21	51.2			3.3				9.60	84.0			87.9				4
Mon-22	61.4			3.3				10.0	87.9			88.4				10
Tue-23	51.4	37.2		3.3		0.14		7.52	82.4	79.2		83.9		1.3		8
Wed-24	56.6			3.6	< 0.05			8.52	84.9			89.2				12
Thu-25	53.9			3.5				8.73	84.4			94.2				19
Fri-26	55.2			3.0				8.71	88.4			92.0				270
Sat-27	51.2			3.2				8.75	82.3			92.1				1
Sun-28	51.1			3.5				9.18	79.0			86.6				2
Mon-29	47.4	42.3		3.1		0.02		7.84	82.1	100		85.5		1.9		4
Tue-30	39.3	34.2		2.0		0.11		6.63	77.6	84.7		89.4		3.0		16
Wed-31	31.3	24.6	20.4	2.0	< 0.01	0.31	0.03	7.24	56.8	61.9	53.2	83.4		1.9	1.4	5
Average	49.5	31.5	23.0	4.2	< 0.02	0.25	0.03	7.86	82.3	74.6	56.8	89.9				
Minimum	31.3	24.6	20.4	2.0	< 0.01	0.02	0.02	4.25	56.8	61.9	53.2	77.4	2.7	0.2	0.7	1
Maximum	61.4	42.3	25.5	7.7	< 0.05	0.54	0.03	10.9	94.1	100	60.4	96.0	2.9	3.0	1.4	270
GeoMean	—	—	—	—	—	—	—	—	—	—	—	—	2.8	1.0	0.7	8.4
TOTAL	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

* Contact Laboratory for information about the quality assurance associated with the results

Enhanced Primary Treatment (EPT) Usage					
Total Bypass (hr)	EPT Usage (hr)	% Usage	Total Bypass YTD (hr)	EPT Usage YTD (hr)	% Usage YTD
36	36	100%	155	155	100%

Report Comments

Note 1:	On May 26, 2023, the *E.coli* result (270 CFU/100mL) was due to the sample being taken during the UV light warm up period, immediately after a flow meter failure which caused all the UV channels to go into service. After the issue was resolved, a second sample was tested and the *E. coli* result was 5 CFU/100mL.

AEP Ref #

RAW	Untreated Influent into the plant
INF	Untreated wastewater from collection system
INFs	Influent, screened at the Headworks Diversion Structure
PE	Primary Effluent from conventional primaries
PE 30	Primary Effluent from conventional primaries discharged via Outfall 30
EPT	Enhanced Primary Treatment
EPE	Enhanced Primary Effluent
EPEPS	Enhanced Primary Effluent Pump Station
FE	Final Effluent from secondary treatment process (with biological nutrient removal), Pre-Ultraviolet disinfection.
FEC	Combined post-UV disinfection (FE+EPEPS)
OUTFALL 10	UV-disinfected, discharged via OUTFALL 10
OUTFALL 20	Combined Bypass (RAW + PE + EPE)
OUTFALL 30	Combined Bypass (INF + INFS + PE30 + EPE)
MPW	Membrane Product Water (Effluent re-use water)
ML	Megalitre (1,000,000 Litre)
MPN	Most Probable Number
NR	No Result
NS	No Sample
INS	Insufficient Sample
AEP	Alberta Environment & Parks

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Senior Manager, Operations

Jeff Charrois PhD
Senior Manager, Analytical Operations & Process Development Teams

Appendix A - Monthly Plant Performance Reports

PROVIDING MORE EPCOR

Gold Bar Wastewater Treatment Plant
Plant Performance Report
June 2023

Digested Sludge: Total Monthly Volume (ML)	65,0

Volume of Flow (ML)

DATE	Peak Flow (ML/D)	Influent	Effluent						
			Non UV Disinfected			UV Disinfected			
		INFs	RAW	OUTFALL 30	OUTFALL 20	MPW	EPEPS	OUTFALL 10 FEC	OUTFALL 10 FE
Thu-01	640,9	0,0	327,6	19,0	0,0	10,6	0,0	298,0	298,0
Fri-02	324,4	0,0	277,8	0,0	0,0	10,3	0,0	267,5	267,5
Sat-03	336,2	0,0	271,9	0,0	0,0	10,2	0,0	261,7	261,7
Sun-04	344,5	0,0	273,1	0,0	0,0	9,9	0,0	263,2	263,2
Mon-05	334,7	0,0	275,7	0,0	0,0	9,8	0,0	265,9	265,9
Tue-06	302,9	0,0	269,8	0,0	0,0	9,8	0,0	260,0	260,0
Wed-07	317,4	0,0	273,4	0,0	0,0	9,8	0,0	263,6	263,6
Thu-08	316,3	0,0	275,5	0,0	0,0	10,5	0,0	265,0	265,0
Fri-09	312,1	0,0	277,2	0,0	0,0	11,6	0,0	265,6	265,6
Sat-10	326,5	0,0	268,1	0,0	0,0	10,2	0,0	257,9	257,9
Sun-11	356,5	0,0	271,4	0,0	0,0	10,2	0,0	261,2	261,2
Mon-12	331,2	0,0	277,4	0,0	0,0	9,9	0,0	267,5	267,5
Tue-13	1.507,1	1,0	421,0	198,7	0,0	10,0	0,0	382,3	382,3
Wed-14	1.559,5	14,0	514,1	211,4	0,0	10,2	0,0	292,5	292,5
Thu-15	1.825,4	75,0	1.122,5	769,0	0,4	11,7	0,0	321,4	321,4
Fri-16	540,7	0,0	344,3	31,6	0,0	11,0	0,0	341,7	341,7
Sat-17	937,1	0,0	397,4	97,2	0,0	11,2	0,0	299,0	299,0
Sun-18	1.463,2	94,0	932,2	699,8	0,2	11,5	0,0	311,7	311,7
Mon-19	1.769,9	49,0	1.021,8	692,1	0,0	11,2	0,0	316,5	316,5
Tue-20	1.636,2	8,0	789,5	470,5	0,0	11,6	0,0	307,4	307,4
Wed-21	655,6	0,0	482,2	171,0	0,0	11,9	0,0	299,3	299,3
Thu-22	466,7	0,0	369,9	14,5	0,0	12,2	0,0	343,2	343,2
Fri-23	462,2	0,0	364,5	6,8	0,0	12,2	0,0	345,5	345,5
Sat-24	431,2	0,0	344,1	0,0	0,0	11,1	0,0	333,0	333,0
Sun-25	405,1	0,0	335,9	0,0	0,0	10,8	0,0	325,1	325,1
Mon-26	407,6	0,0	332,5	0,0	0,0	11,1	0,0	321,4	321,4
Tue-27	399,3	0,0	324,7	0,0	0,0	12,1	0,0	312,6	312,6
Wed-28	753,6	0,0	340,8	22,2	0,0	13,0	0,0	305,6	305,6
Thu-29	373,2	0,0	312,6	0,0	0,0	12,6	0,0	300,0	300,0
Fri-30	367,9	0,0	304,6	0,0	0,2	12,8	0,0	291,8	291,8
Average	697,0	8,0	414,5	107,8	0,0	11,0	0,0	295,8	295,8
Minimum	302,9	0,0	269,1	0,0	0,0	9,8	0,0	257,9	257,9
Maximum	1.863,2	94,0	1.122,5	769,0	0,4	13,0	0,0	345,5	345,5
GeoMean	---	---	---	---	---	---	---	---	---
TOTAL	---	241	12.434	3.233	1	331	0	8.869	8.869

Liquid Stream Quality

DATE	pH@25°C				TSS (mg/L)					BOD$_5$/cBOD$_5$ (mg/L)						TP (mg/L)					NH3-N (mg/L)					un-ionized NH3-N (mg/L)			TKN (mg/L)				NO_2+NO_3 (mg/L)				Chloride (mg/L)				E. coli (Counts/100 mL)			
	RAW	OUTFALL 30	OUTFALL 20	OUTFALL 10 FEC	RAW	OUTFALL 30	OUTFALL 20	EPEPS	OUTFALL 10 FEC	OUTFALL 10 FE	RAW	OUTFALL 30	OUTFALL 20	EPEPS	OUTFALL 10 FEC	OUTFALL 10 FE	RAW	OUTFALL 30	OUTFALL 20	EPEPS	OUTFALL 10 FEC	OUTFALL 10 FE	RAW	OUTFALL 30	OUTFALL 20	EPEPS	OUTFALL 10 FEC	OUTFALL 10 FE	OUT-FAL 30	OUT-FAL 20	OUT-FAL 10	RAW	OUTFALL 30	OUTFALL 20	OUTFALL 10 FEC	RAW	OUTFALL 30	OUTFALL 20	OUTFALL 10 FEC	RAW	OUTFALL 30	OUTFALL 20	OUTFALL 10 FEC
											BOD$_5$	BOD$_5$	BOD$_5$	BOD$_5$	cBOD$_5$	cBOD$_5$																											X10^6	X10^6	X10^6	
Thu-01	7,4	7,5		7,5	416	42			2,9	2,9	317	51			< 2	< 2	7,51	2,60			0,22	0,22	30,9	16,6			1,16	1,16				51,2	24,0		2,6		0,34		6,42	75,7	55,9		73,2		0,6		6
Fri-02	7,4			7,5	308				3,5	3,5	292				< 2	< 2	8,43				0,22	0,22	36,7				2,35	2,35				59,0			4,5				10,1	87,0			86,4			12
Sat-03	7,4			7,6	270				3,3	3,3	301				< 2	< 2	9,09				0,25	0,25	35,3				1,71	1,71				60,6			4,0				11,2	77,2			89,0			9
Sun-04	7,5			7,6	266				3,2	3,2	309				2	2	8,50				0,24	0,24	36,8				2,61	2,61				57,1			4,1				11,4	79,6			81,8			13
Mon-05	7,5			7,5	320				4,1	4,1	313				2	2	9,41				0,28	0,28	35,8				1,70	1,70				64,4			3,1				11,0	81,6			80,4			6
Tue-06	7,4			7,6	292				3,7	3,7	341				2	2	9,44				0,29	0,29	33,7				1,35	1,35				62,6			3,0				10,9	87,9			89,9			8
Wed-07	7,5			7,6	360				3,8	3,8	379				2	2	8,67				0,32	0,32	36,4				2,61	2,61				46,5			3,9	< 0,01			9,10	91,3			92,8			12
Thu-08	7,5			7,6	346				3,0	3,0	343				2	2	8,62				0,28	0,28	37,0				3,45	3,45				49,2			4,5				9,9	82,0			91,9			6
Fri-09	7,6			7,7	312				3,5	3,5	268				2	2	7,92				0,28	0,28	38,2				1,34	1,34				49,5			2,5				10,9	81,7			86,9			7
Sat-10	7,5			7,6	306				3,5	3,5	304				2	2	8,16				0,27	0,27	37,7				0,88	0,88				48,9			2,1				11,2	76,4			86,1			5
Sun-11	7,5			7,6	344				4,1	4,1	326				2	2	8,11				0,29	0,29	35,7				1,27	1,27				50,5			2,3				11,1	72,5			81,1			3
Mon-12	7,6			7,5	332				4,2	4,2	296				< 2	< 2	8,19				0,29	0,29	35,0				0,79	0,79				47,4			2,1				11,7	80,2			78,7			2
Tue-13	7,3	7,1		7,7	448	93			5,3	5,3	240	100			2	2	5,98	2,66			0,37	0,37	22,9	13,2			0,09	0,09				35,1	16,7		1,4		0,29		6,27	60,5	52,4		79,0		1,7		4
Wed-14	7,3	7,5		7,4	352	121			5,3	5,3	144	69			3	3	4,21	4,58			0,33	0,33	14,3	10,2			0,41	0,41				23,4	26,7		2,0	< 0,01	0,22		7,95	42,3	55,6		73,9		2,0		8
Thu-15	7,2	7,5	7,4	7,3	186	78	61		5,0	5,0	88	41	42		< 2	< 2	1,99	2,26	2,16		0,28	0,28	7,9	14,6	8,8		0,11	0,11				12,9	16,3	11,0	1,3		2,30	0,52	3,01	31,2	44,3	20,6	47,6		0,9	1	2
Fri-16	7,4	7,6		7,4	236	60			3,3	3,3	202	70			< 2	< 2	4,91	4,08			0,20	0,20	25,1	29,0			2,23	2,23				35,0	30,7		3,2		0,84		8,67	61,2	64,7		71,7		1,1		4
Sat-17	7,4	7,6		7,4	260	51			3,7	3,7	259	73			3	3	5,08	4,44			0,22	0,22	23,5	29,5			2,13	2,13				30,2	30,1		3,2		0,03		10,2	66,6	72,2		90,9		1,7		16
Sun-18	7,5	7,5	7,5	7,4	292	113	53		2,7	2,7	93	52	24		< 2	< 2	3,20	2,61	1,26		0,16	0,16	10,2	11,7	5,6		0,37	0,37				19,6	14,8	6,7	1,6		1,23	2,16	7,56	37,1	44,5	22,9	67,8		1,5	0,4	6
Mon-19	7,7	7,8		7,4	176	55			3,2	3,2	110	27			< 2	< 2	2,92	1,65			0,20	0,20	13,1	8,8			0,07	0,07				19,9	13,5		1,0		7,61		3,47	70,2	57,0		46,7		0,6		12
Tue-20	7,3	7,6		7,5	190	53			4,4	4,4	96	42			2	2	2,79	2,02			0,23	0,23	10,5	19,5			0,06	0,06				17,3	22,3		1,2		2,49		7,57	57,6	73,3		75,0		0,5		6
Wed-21	7,4	7,8		7,4	236	34			4,6	4,6	164	34			< 2	< 2	4,24	2,48			0,28	0,28	18,0	28,2			0,11	0,11				27,5	26,5		1,2	< 0,01	2,44		6,66	64,7	92,1		71,2		0,5		8
Thu-22	7,6	7,7		7,5	249	75			4,9	4,9	195	81			2	2	5,17	3,84			0,34	0,34	25,7	30,6			1,69	1,69				34,9	34,8		3,3		0,16		9,93	93,4	102		95,6	2,1	1,5		19
Fri-23	7,6	8,0		7,4	488	55			4,6	4,6	202	62			3	3	5,76	3,42			0,44	0,44	26,3	30,2			3,35	3,35				39,9	34,2		4,4		0,01		10,3	101	107		103		1,1		6
Sat-24	7,4			7,4	252				6,4	6,4	201				3	3	6,33				0,47	0,47	27,4				3,04	3,04				41,2			4,7				10,5	87,1			104			13
Sun-25	7,8			7,5	258				7,3	7,3	250				3	3	5,96				0,38	0,38	27,9				1,96	1,96				39,1			3,4				10,9	88,9			99,7			6
Mon-26	7,8			7,5	264				6,8	6,8	277				3	3	6,43				0,40	0,40	25,2				1,71	1,71				40,1			3,2				10,3	94,6			98,1			27
Tue-27	7,5			7,6	303				6,5	6,5	253				3	3	7,29				0,42	0,42	29,2				1,34	1,34				41,4			2,8				9,68	103			110	1,5			12
Wed-28	7,5	7,7		7,5	360	111			7,1	7,1	267	315			3	3	7,70	7,29			0,42	0,42	26,3	38,7			0,65	0,65				43,6	49,3		2,3	< 0,01	0,04		10,7	85,8	86,6		104		1,1		10
Thu-29	7,6			7,6	420				5,8	5,8	260				4	4	7,63				0,36	0,36	29,3				0,58	0,58				46,1			2,2				10,4	97,7			99,5			10
Fri-30	7,6			7,6	336				5,6	5,6	286				3	3	7,16				0,38	0,38	27,7				0,63	0,63				39,9			2,3				11,1	92,4			108			12
Average	7,5	7,6	7,4	7,5	307	72	57	---	4,5	4,5	246	80	33	---	2,4	2,4	6,56	3,39	1,71	---	0,31	0,31	27,3	21,3	7,1	---	1,41	1,41	---	---	---	41,2	26,1	8,9	2,8	< 0,01	1,38	1,35	9,36	77,9	71,5	21,8	86,0				
Minimum	7,2	7,1	7,4	7,3	176	34	53	---	2,7	2,7	88	27	24	---	< 2	< 2	1,99	1,65	1,26	---	0,16	0,16	7,9	8,9	5,6	---	0,06	0,06	---	---	---	12,9	13,5	6,7	1,0	< 0,01	0,01	0,52	3,01	31,2	44,3	20,6	46,7	1,5	0,5	0,4	2
Maximum	7,7	8,0	7,5	7,7	488	121	61	---	7,3	7,3	378	315	42	---	4	4	9,44	7,29	2,16	---	0,47	0,47	36,2	38,7	8,8	---	3,45	3,45	---	---	---	64,4	49,3	11,0	4,8	< 0,01	7,61	2,16	11,7	103	107	22,9	110	2,1	2,0	0,7	27
GeoMean	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

* Contact Laboratory for information about the quality assurance associated with the results

Enhanced Primary Treatment (EPT) Usage					
Total Bypass (hr)	EPT Usage (hr)	% Usage	Total Bypass YTD (hr)	EPT Usage YTD (hr)	% Usage YTD
157	157	100%	312	312	100%

Report Comments

Note 1:	On July 18, 2023, due to heavy rain, the auto-sampler for RAW Influent overflowed the sample container. The test results shown
	are from the overflow composite sample. Grab samples for RAW were collected following the overflow at 17:30,
	19:30 and 23:30 manually which were combined into a composite and tested. Those results were: pH-7,3. TSS-172 mg/L
	BOD-47 mg/L, TP-1,60 mg/L. NH3-N-4,79 mg/L. TKN-8,3 mg/L N. chloride - 36,1 mg/L.
	Composite sample requirements for RAW Influent on July 18th were met.

AEP Ref #

RAW Untreated Influent into the plant
INF Untreated wastewater from collection system
INFs Influent, screened at the Headworks Diversion Structure
PE Primary Effluent from conventional primaries
PE 30 Primary Effluent from conventional primaries discharged via Outfall 30
EPT Enhanced Primary Treatment
EPE Enhanced Primary Effluent
EPEPS Enhanced Primary Effluent Pump Station
FE Final Effluent from secondary treatment process (with biological nutrient removal). Pre-/Ultraviolet disinfection.

FEC Combined post-UV disinfection (FE+EPEPS)
OUTFALL 10 UV-disinfected, discharged via OUTFALL 10
OUTFALL 20 Combined Bypass (RAW + PE + EPE)
OUTFALL 30 Combined Bypass (INF - INFS + PE30 + EPE)
MPW Membrane Product Water (Effluent re-use water)
ML Megalitre (1,000,000 Litre)
MPN Most Probable Number
NR No Result
NS No Sample
INS Insufficient Sample
AEP Alberta Environment & Parks

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Appendix A - Monthly Plant Performance Reports

PROVIDING MORE EPCOR

Gold Bar Wastewater Treatment Plant
Plant Performance Report
July 2023

Digested Sludge: Total Monthly Volume (ML)	67.7

Volume of Flow (ML)

DATE	Peak Flow (MLD)	Influent: INFs	Influent: RAW	Effluent: Non UV Disinfected: OUTFALL 30	Effluent: Non UV Disinfected: OUTFALL 20	Effluent: Non UV Disinfected: MPW	Effluent: UV Disinfected: EPE/PS	Effluent: UV Disinfected: OUTFALL 10: FEC	Effluent: UV Disinfected: OUTFALL 10: FE
Sat-01	802.2	0.0	357.7	72.4	0.0	11.9	0.0	273.4	273.4
Sun-02	370.1	0.0	290.4	0.0	0.0	12.3	0.0	278.1	278.1
Mon-03	440.2	0.0	297.6	10.9	0.0	12.1	0.0	274.6	274.6
Tue-04	360.3	0.0	293.2	0.0	0.0	12.1	0.0	281.1	281.1
Wed-05	349.4	0.0	295.1	0.0	0.0	11.8	0.0	283.3	283.3
Thu-06	344.3	0.0	293.0	0.0	0.0	11.5	0.0	281.5	281.5
Fri-07	347.5	0.0	294.3	0.0	0.0	11.9	0.0	282.4	282.4
Sat-08	345.1	0.0	282.1	0.0	0.0	11.8	0.0	270.3	270.3
Sun-09	358.0	0.0	283.4	0.0	0.0	12.1	0.0	271.3	271.3
Mon-10	443.8	0.0	305.9	3.7	0.0	12.2	0.0	290.0	290.0
Tue-11	341.3	0.0	288.6	0.0	0.0	12.0	0.0	276.6	276.6
Wed-12	460.7	0.0	293.2	0.0	0.0	12.0	0.0	281.2	281.2
Thu-13	433.3	0.0	299.2	0.0	0.0	12.1	0.0	287.1	287.1
Fri-14	336.0	0.0	279.7	0.0	0.0	11.9	0.0	267.8	267.8
Sat-15	322.5	0.0	265.5	0.0	0.0	11.9	0.0	253.6	253.6
Sun-16	1,867.8	9.0	471.0	144.7	0.0	12.0	0.0	314.3	314.3
Mon-17	1,224.1	0.0	325.5	26.0	0.0	11.9	0.0	287.6	287.6
Tue-18	1,732.5	46.0	906.1	564.6	0.0	12.2	0.0	329.3	329.3
Wed-19	412.6	0.0	352.0	5.8	0.0	12.1	0.0	334.1	334.1
Thu-20	391.6	0.0	324.3	0.0	0.0	11.6	0.0	312.7	312.7
Fri-21	400.4	0.0	319.7	0.0	0.0	11.9	0.0	307.8	307.8
Sat-22	376.7	0.0	301.9	0.0	0.0	11.7	0.0	290.2	290.2
Sun-23	371.8	0.0	311.5	0.0	0.0	11.4	0.0	300.1	300.1
Mon-24	1,789.0	18.0	653.7	301.4	0.0	11.7	0.0	340.6	340.6
Tue-25	403.3	0.0	354.7	3.6	0.0	12.2	0.0	338.9	338.9
Wed-26	1,401.1	0.0	498.1	167.2	0.0	11.9	0.0	319.0	319.0
Thu-27	570.8	0.0	371.9	23.2	0.0	12.6	0.0	336.1	336.1
Fri-28	657.2	0.0	359.6	24.1	0.0	12.0	0.0	323.5	323.5
Sat-29	375.2	0.0	318.3	0.0	0.0	10.6	0.0	307.7	307.7
Sun-30	1,245.8	0.0	336.8	30.9	0.0	10.2	0.0	295.7	295.7
Mon-31	1,098.6	0.0	409.9	48.8	0.0	9.9	0.0	351.2	351.2
Average	657.2	2.4	355.9	46.0	0.0	11.8	0.0	298.1	298.1
Minimum	322.5	0.0	265.5	0.0	0.0	9.9	0.0	253.6	253.6
Maximum	1,867.8	46.0	906.1	564.6	0.0	12.6	0.0	351.2	351.2
GeoMean	---	---	---	---	---	---	---	---	---
TOTAL	---	73	11,034	1,427	0	366	0	9,241	9,241

Liquid Stream Quality

DATE	pH@25°C: RAW	pH@25°C: OUTFALL 30	pH@25°C: OUTFALL 20	pH@25°C: OUTFALL 10: FEC
Sat-01	7.4	7.6		7.5
Sun-02	7.8			7.5
Mon-03	7.5	7.7		7.5
Tue-04	7.5			7.5
Wed-05	7.5			7.5
Thu-06	7.6			7.6
Fri-07	7.5			7.6
Sat-08	7.6			7.6
Sun-09	7.5			7.6
Mon-10	7.6	7.9		7.6
Tue-11	7.5			7.6
Wed-12	7.4			7.6
Thu-13	7.6			7.6
Fri-14	7.5			7.6
Sat-15	7.5			7.6
Sun-16	7.4	7.3		7.6
Mon-17	7.5	7.7		7.7
Tue-18	7.3	7.4		7.4
Wed-19	7.5	8.0		7.5
Thu-20	7.6			7.5
Fri-21	7.6			7.6
Sat-22	7.6			7.7
Sun-23	7.6			7.5
Mon-24	7.4	7.7		7.6
Tue-25	7.6	7.9		7.5
Wed-26	7.5	7.6		7.5
Thu-27	7.6	7.8		7.4
Fri-28	7.6	7.8		7.5
Sat-29	7.6			7.6
Sun-30	7.6	7.8		7.6
Mon-31	7.5	7.6		7.6
Average	7.5	7.7	---	7.5
Minimum	7.3	7.3	---	7.4
Maximum	7.8	8.0	---	7.7
GeoMean	---	---	---	---
TOTAL	---	---	---	---

DATE	TSS (mg/L): RAW	TSS (mg/L): OUTFALL 30	TSS (mg/L): OUTFALL 20	TSS (mg/L): EPE/PS	TSS (mg/L): OUTFALL 10: FEC	TSS (mg/L): OUTFALL 10: FE
Sat-01	252	70			5.7	5.7
Sun-02	512				6.1	6.1
Mon-03	316	85			6.6	6.6
Tue-04	251				4.2	4.2
Wed-05	252				3.9	3.9
Thu-06	276				2.8	2.8
Fri-07	274				3.8	3.8
Sat-08	240				3.4	3.4
Sun-09	357				3.5	3.5
Mon-10	329	135			3.8	3.8
Tue-11	292				3.5	3.5
Wed-12	388				3.8	3.8
Thu-13	276				3.5	3.5
Fri-14	320				3.0	3.0
Sat-15	340				3.2	3.2
Sun-16	460	202			3.3	3.3
Mon-17	309	112			4.2	4.2
Tue-18	210	58			2.5	2.5
Wed-19	232	34			2.8	2.8
Thu-20	235				2.6	2.6
Fri-21	223				2.0	2.0
Sat-22	235				2.4	2.4
Sun-23	228				2.6	2.6
Mon-24	384	51			2.5	2.5
Tue-25	336	37			2.2	2.2
Wed-26	268	45			2.4	2.4
Thu-27	232	40			2.7	2.7
Fri-28	228	48			3.2	3.2
Sat-29	184				2.3	2.3
Sun-30	296	117			2.8	2.8
Mon-31	428	41			3.0	3.0
Average	296	77	---	---	3.4	3.4
Minimum	184	34	---	---	2.0	2.0
Maximum	512	202	---	---	6.6	6.6
GeoMean	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---

DATE	BOD_5/$cBOD_5$ (mg/L): RAW	BOD_5/$cBOD_5$ (mg/L): OUTFALL 30	BOD_5/$cBOD_5$ (mg/L): OUTFALL 20	BOD_5/$cBOD_5$ (mg/L): EPE/PS	BOD_5/$cBOD_5$ (mg/L): OUTFALL 10: FEC	BOD_5/$cBOD_5$ (mg/L): OUTFALL 10: FE
Sat-01	158	115			4	4
Sun-02	375				4	4
Mon-03	278	178			4	4
Tue-04	302				2	2
Wed-05	279				< 2	< 2
Thu-06	340				2	2
Fri-07	291				2	2
Sat-08	314				2	2
Sun-09	296				2	2
Mon-10	281	366			2	2
Tue-11	365				2	2
Wed-12	304				2	2
Thu-13	265				3	3
Fri-14	275				2	2
Sat-15	303				3	3
Sun-16	316	58			2	2
Mon-17	247	214			2	2
Tue-18	101	49			< 2	< 2
Wed-19	184	40			< 2	< 2
Thu-20	225				< 2	< 2
Fri-21	233				< 2	< 2
Sat-22	221				< 2	< 2
Sun-23	242				2	2
Mon-24	119	49			< 2	< 2
Tue-25	248	48			< 2	< 2
Wed-26	135	38			< 2	< 2
Thu-27	191	42			< 2	< 2
Fri-28	185	81			< 2	< 2
Sat-29	212				< 2	< 2
Sun-30	213	213			< 2	< 2
Mon-31	190	34			< 2	< 2
Average	248	109	---	---	2.3	2.3
Minimum	101	34	---	---	< 2	2
Maximum	375	366	---	---	4	4
GeoMean	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---

DATE	TP (mg/L): RAW	TP (mg/L): OUTFALL 30	TP (mg/L): OUTFALL 20	TP (mg/L): EPE/PS	TP (mg/L): OUTFALL 10: FEC	TP (mg/L): OUTFALL 10: FE
Sat-01	5.12	4.01			0.32	0.32
Sun-02	8.76				0.35	0.35
Mon-03	7.58	7.27			0.41	0.41
Tue-04	7.00				0.29	0.29
Wed-05	7.46				0.27	0.27
Thu-06	7.50				0.25	0.25
Fri-07	7.82				0.26	0.26
Sat-08	7.98				0.24	0.24
Sun-09	7.97				0.23	0.23
Mon-10	8.16	10.2			0.24	0.24
Tue-11	8.73				0.24	0.24
Wed-12	8.70				0.26	0.26
Thu-13	7.43				0.27	0.27
Fri-14	8.25				0.26	0.26
Sat-15	8.06				0.25	0.25
Sun-16	5.66	2.98			0.59	0.59
Mon-17	6.21				0.25	0.25
Tue-18	2.53	2.03			0.21	0.21
Wed-19	6.00	3.48			0.20	0.20
Thu-20	6.79				0.25	0.25
Fri-21	7.02				0.24	0.24
Sat-22	7.25				0.23	0.23
Sun-23	7.56				0.21	0.21
Mon-24	2.86	1.46			0.14	0.14
Tue-25	6.40	2.14			0.09	0.09
Wed-26	4.39	2.62			0.21	0.21
Thu-27	5.34	2.92			0.20	0.20
Fri-28	5.79	4.61			0.22	0.22
Sat-29	6.12				0.20	0.20
Sun-30	6.29	6.38			0.20	0.20
Mon-31	4.99	1.74			0.19	0.19
Average	6.69	4.15	---	---	0.25	0.25
Minimum	2.53	1.46	---	---	0.09	0.09
Maximum	8.76	10.2	---	---	0.59	0.59
GeoMean	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---

DATE	NH_3-N (mg/L): RAW	NH_3-N (mg/L): OUTFALL 30	NH_3-N (mg/L): OUTFALL 20	NH_3-N (mg/L): EPE/PS	NH_3-N (mg/L): OUTFALL 10: FEC	NH_3-N (mg/L): OUTFALL 10: FE
Sat-01	23.4	34.9			0.38	0.38
Sun-02	26.1				0.67	0.67
Mon-03	35.0	42.2			1.45	1.45
Tue-04	33.6				1.09	1.09
Wed-05	32.8				1.37	1.37
Thu-06	33.9				1.13	1.13
Fri-07	32.3				0.82	0.82
Sat-08	32.4				0.67	0.67
Sun-09	31.5				0.85	0.85
Mon-10	32.8	43.9			0.78	0.78
Tue-11	32.1				0.84	0.84
Wed-12	33.7				1.04	1.04
Thu-13	31.5				2.20	2.20
Fri-14	34.3				2.89	2.89
Sat-15	33.9				3.01	3.01
Sun-16	17.2	12.9			1.54	1.54
Mon-17	28.1	31.4			1.76	1.76
Tue-18	9.5	16.5			0.54	0.54
Wed-19	25.6	30.9			1.11	1.11
Thu-20	28.1				1.61	1.61
Fri-21	27.9				0.98	0.98
Sat-22	28.2				0.78	0.78
Sun-23	27.6				0.51	0.51
Mon-24	10.0	19.4			0.31	0.31
Tue-25	24.6	24.5			0.21	0.21
Wed-26	14.5	21.5			0.18	0.18
Thu-27	20.8	25.0			0.11	0.11
Fri-28	23.8	31.6			0.37	0.37
Sat-29	26.7				0.24	0.24
Sun-30	22.1	29.2			0.58	0.58
Mon-31	14.3	13.8			0.38	0.38
Average	26.7	27.0	---	---	0.98	0.98
Minimum	9.5	12.9	---	---	0.11	0.11
Maximum	35.0	43.9	---	---	3.01	3.01
GeoMean	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---

DATE	un-ionized NH_3-N (mg/L): OUT FAL 30	un-ionized NH_3-N (mg/L): OUT FAL 20	un-ionized NH_3-N (mg/L): OUT FAL 10
Sat-01			
Sun-02			
Mon-03			
Tue-04			
Wed-05			
Thu-06			
Fri-07			
Sat-08			
Sun-09			
Mon-10			
Tue-11			
Wed-12			
Thu-13			
Fri-14			
Sat-15			
Sun-16			
Mon-17			
Tue-18			
Wed-19			
Thu-20			
Fri-21			
Sat-22			
Sun-23			
Mon-24			
Tue-25			
Wed-26			
Thu-27			
Fri-28			
Sat-29			
Sun-30			
Mon-31			
Average	---	---	---
Minimum	---	---	---
Maximum	---	---	---
GeoMean	---	---	---
TOTAL	---	---	---

DATE	TKN (mg/L): RAW	TKN (mg/L): OUTFALL 30	TKN (mg/L): OUTFALL 20	TKN (mg/L): OUTFALL 10: FEC
Sat-01	30.2	32.3		1.7
Sun-02	47.1			2.0
Mon-03	46.4	45.2		2.7
Tue-04	44.1			2.4
Wed-05	43.4			2.5
Thu-06	43.1			2.2
Fri-07	46.4			2.0
Sat-08	48.4			2.0
Sun-09	49.3			2.2
Mon-10	51.5	57.1		2.1
Tue-11	51.0			2.1
Wed-12	50.9			2.3
Thu-13	44.6			3.3
Fri-14	48.9			4.3
Sat-15	46.0			3.8
Sun-16	33.4	16.3		2.6
Mon-17	32.1	37.6		2.9
Tue-18	11.8	18.6		1.3
Wed-19	36.2	30.8		2.0
Thu-20	40.3			2.9
Fri-21	40.7			2.3
Sat-22	40.1			1.9
Sun-23	43.6			1.8
Mon-24	18.2	21.0		1.4
Tue-25	39.0	29.5		1.4
Wed-26	24.9	27.2		1.6
Thu-27	31.0	29.3		1.2
Fri-28	34.2	37.6		1.7
Sat-29	38.3			1.4
Sun-30	32.8	39.6		1.7
Mon-31	28.4	15.7		1.4
Average	39.2	31.3	---	2.2
Minimum	11.8	15.7	---	1.2
Maximum	51.5	57.1	---	4.3
GeoMean	---	---	---	---
TOTAL	---	---	---	---

DATE	NO_2+NO_3 (mg/L): RAW	NO_2+NO_3 (mg/L): OUTFALL 30	NO_2+NO_3 (mg/L): OUTFALL 20	NO_2+NO_3 (mg/L): OUTFALL 10: FEC
Sat-01		0.56		11.2
Sun-02				9.66
Mon-03		0.02		12.9
Tue-04				11.7
Wed-05	< 0.01			12.5
Thu-06				10.8
Fri-07				11.6
Sat-08				10.3
Sun-09				11.0
Mon-10		0.10		10.4
Tue-11				10.8
Wed-12	< 0.01			10.9
Thu-13				8.89
Fri-14				9.02
Sat-15				9.40
Sun-16		0.29		7.39
Mon-17		0.30		9.89
Tue-18		0.95		5.01
Wed-19	< 0.01	0.11		9.90
Thu-20				10.5
Fri-21				10.3
Sat-22				10.4
Sun-23				9.92
Mon-24		0.79		7.11
Tue-25		0.05		9.58
Wed-26	0.38	0.11		9.18
Thu-27		0.07		7.72
Fri-28		0.03		9.95
Sat-29				10.1
Sun-30		0.07		11.2
Mon-31		0.20		8.09
Average	0.10	0.24	---	9.94
Minimum	< 0.01	0.02	---	5.01
Maximum	0.38	0.95	---	12.9
GeoMean	---	---	---	---
TOTAL	---	---	---	---

DATE	Chloride (mg/L): RAW	Chloride (mg/L): OUTFALL 30	Chloride (mg/L): OUTFALL 20	Chloride (mg/L): OUTFALL 10: FEC
Sat-01	79.2	84.3		98.1
Sun-02	81.2			86.7
Mon-03	87.7	93.3		91.2
Tue-04	88.3			94.7
Wed-05	85.0			99.1
Thu-06	84.8			99.5
Fri-07	87.8			97.7
Sat-08	82.7			97.1
Sun-09	79.5			91.2
Mon-10	88.5	94.3		87.8
Tue-11	85.3			93.1
Wed-12	98.2			94.2
Thu-13	87.0			95.1
Fri-14	87.6			95.3
Sat-15	80.0			96.2
Sun-16	55.5	38.4		77.1
Mon-17	81.3	87.4		79.6
Tue-18	36.1	49.6		65.0
Wed-19	79.4	89.2		72.8
Thu-20	88.1			91.4
Fri-21	83.1			97.8
Sat-22	80.9			92.1
Sun-23	78.6			88.5
Mon-24	42.2	57.0		67.4
Tue-25	82.9	85.9		75.6
Wed-26	59.5	66.5		86.1
Thu-27	72.2	73.2		69.0
Fri-28	82.0	87.2		89.9
Sat-29	74.5	81.5		90.1
Sun-30	78.2	74.4	---	87.9
Mon-31	36.1	38.4	---	65.0
Average	78.2	74.4	---	87.9
Minimum	36.1	38.4	---	65.0
Maximum	98.2	94.3	---	100
GeoMean	---	---	---	---
TOTAL	---	---	---	---

DATE	*E. coli* (Counts/100 mL): RWI	*E. coli* (Counts/100 mL): OUTFALL 30	*E. coli* (Counts/100 mL): OUTFALL 20	*E. coli* (Counts/100 mL): OUTFALL 10
Sat-01		1.1		4
Sun-02				6
Mon-03		3.7		6
Tue-04				8
Wed-05				10
Thu-06				4
Fri-07				10
Sat-08				9
Sun-09				5
Mon-10	1.6	0.6		4
Tue-11				8
Wed-12				6
Thu-13				9
Fri-14				4
Sat-15				6
Sun-16		0.2		12
Mon-17		7.5		11
Tue-18		5.6		8
Wed-19		0.4		14
Thu-20				13
Fri-21	2.8			13
Sat-22				10
Sun-23				2
Mon-24		1.2		11
Tue-25		1.3		8
Wed-26		1.3		22
Thu-27		1.0		2
Fri-28		1.5		7
Sat-29				7
Sun-30		2.8		9
Mon-31		0.8		5
Average	---	---	---	---
Minimum	---	---	---	---
Maximum	---	---	---	---
GeoMean	2.1	1.3	---	7.2
TOTAL	---	---	---	---

* Contact Laboratory for information about the quality assurance associated with the results

Enhanced Primary Treatment (EPT) Usage

Total Bypass (hr)	EPT Usage (hr)	% Usage	Total Bypass YTD (hr)	EPT Usage YTD (hr)	% Usage YTD
105	105	100%	417	417	100%

Report Comments

AEP Ref #

RAW	Untreated Influent into the plant
INF	Untreated wastewater from collection system
INFs	Influent, screened at the Headworks Diversion Structure
PE	Primary Effluent from conventional primaries
PE 30	Primary Effluent from conventional primaries discharged via Outfall 30
EPT	Enhanced Primary Treatment
EPE	Enhanced Primary Effluent
EPEPS	Enhanced Primary Effluent Pump Station
FE	Final Effluent from secondary treatment process (with biological nutrient removal). Pre-Ultraviolet disinfection.

FEC	Combined post-UV disinfection (FE+EPEPS)
OUTFALL 10	UV-disinfected, discharged via OUTFALL 10
OUTFALL 20	Combined Bypass (RAW + PE + EPE)
OUTFALL 30	Combined Bypass (INF + INFS + PE30 + EPE)
MPW	Membrane Product Water (Effluent re-use water)
ML	Megalitre (1,000,000 Litre)
MPN	Most Probable Number
NR	No Result
NS	No Sample
INS	Insufficient Sample
AEP	Alberta Environment & Parks

Trina Manning M.Sc.; P.Eng.
Senior Manager, WWTP Operations

Jeff Charrois PhD
Senior Manager, Analytical Operations

Appendix A - Monthly Plant Performance Reports

PROVIDING MORE EPCOR

Gold Bar Wastewater Treatment Plant
Plant Performance Report
August 2023

Digested Sludge: Total Monthly Volume (ML)	64.4

Volume of Flow (ML) and **pH@25°C**

DATE	Peak Flow (MLD)	Influent: INFs	Influent: RAW	Effluent, Non UV Disinfected: OUTFALL 30	Effluent, Non UV Disinfected: OUTFALL 20	Effluent, Non UV Disinfected: MPW	Effluent, UV Disinfected: EPEPS	UV Disinfected OUTFALL 10: FEC	UV Disinfected OUTFALL 10: FE	pH: RAW	pH: OUTFALL 30	pH: OUTFALL 20	pH: OUTFALL 10 FEC
Tue-01	387.3	0.0	330.2	0.0	0.0	10.5	0.0	319.7	319.7	7.7			7.6
Wed-02	370.3	0.0	313.7	0.0	0.0	10.5	0.0	303.2	303.2	7.6			7.7
Thu-03	361.1	0.0	300.2	0.0	0.0	10.7	0.0	289.5	289.5	7.5			7.7
Fri-04	375.7	0.0	292.2	0.0	0.0	11.0	0.0	281.2	281.2	7.6			7.6
Sat-05	359.7	0.0	276.1	0.0	0.0	11.0	0.0	265.1	265.1	7.7			7.6
Sun-06	325.2	0.0	272.8	0.0	0.0	10.9	0.0	261.9	261.9	7.6			7.6
Mon-07	357.6	0.0	279.6	0.0	0.0	11.0	0.0	268.6	268.6	7.7			7.6
Tue-08	1,643.9	3.0	527.7	194.1	0.0	10.8	0.0	322.8	322.8	7.4	7.5		7.5
Wed-09	1,933.4	20.0	562.1	204.7	0.0	10.9	0.0	346.5	346.5	7.4	7.5		7.5
Thu-10	841.4	0.0	413.3	31.1	0.0	11.0	0.0	371.2	371.2	7.6	7.9		7.5
Fri-11	387.1	0.0	332.6	0.0	0.0	10.9	0.0	321.7	321.7	7.8			7.6
Sat-12	369.3	0.0	302.8	0.0	0.0	10.9	0.0	291.9	291.9	7.7			7.6
Sun-13	378.3	0.0	300.8	0.0	0.0	12.2	0.0	288.6	288.6	7.6			7.6
Mon-14	373.7	0.0	308.8	0.0	0.0	11.3	0.0	297.5	297.5	7.5			7.6
Tue-15	377.5	0.0	300.5	0.0	0.0	11.7	0.0	288.8	288.8	7.6			7.8
Wed-16	358.0	0.0	294.7	0.0	0.0	11.5	0.0	283.2	283.2	7.6			7.7
Thu-17	1,237.1	0.0	347.5	47.9	0.0	11.3	0.0	288.3	288.3	7.5	7.6		7.6
Fri-18	1,532.4	2.0	874.5	528.8	0.0	10.6	0.0	335.1	335.1	7.4	7.5		7.5
Sat-19	683.6	0.0	412.0	28.6	0.0	10.5	0.0	372.9	372.9	7.6	7.9		7.4
Sun-20	414.1	0.0	339.5	0.0	0.0	11.1	0.0	328.4	328.4	7.6			7.6
Mon-21	401.7	0.0	334.6	0.0	0.0	10.5	0.0	324.1	324.1	7.6			7.7
Tue-22	386.3	0.0	321.2	0.0	0.0	2.6	0.0	318.6	318.6	7.5			7.7
Wed-23	1,129.9	0.0	429.3	121.0	0.0	2.6	0.0	305.7	305.7	7.5	7.6		7.5
Thu-24	537.4	0.0	364.1	5.7	0.0	12.2	0.0	346.2	346.2	7.6	8.0		7.5
Fri-25	405.3	0.0	315.5	0.0	0.0	11.5	0.0	304.0	304.0	7.6			7.6
Sat-26	386.9	0.0	311.1	0.0	0.0	10.9	0.0	300.2	300.2	7.6			7.6
Sun-27	405.7	0.0	303.6	0.0	0.0	11.0	0.0	292.6	292.6	7.5			7.7
Mon-28	471.1	0.0	319.9	0.0	0.0	11.3	0.0	308.6	308.6	7.6			7.6
Tue-29	378.9	0.0	317.6	0.0	0.0	12.2	0.0	305.4	305.4	7.5			7.7
Wed-30	443.2	0.0	310.1	0.0	0.0	12.7	0.0	297.4	297.4	7.5			7.7
Thu-31	408.4	0.0	312.6	0.0	0.0	12.7	0.0	299.9	299.9	7.6			7.7
Average	594.2	0.8	355.5	37.5	0.0	10.7	0.0	307.4	307.4	7.6	7.7	---	7.6
Minimum	325.2	0.0	272.8	0.0	0.0	2.6	0.0	261.9	261.9	7.4	7.5	---	7.4
Maximum	1,933.4	20.0	874.5	528.8	0.0	12.7	0.0	372.9	372.9	7.8	8.0	---	7.8
GeoMean	---	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL	---	25	11,021	1,162	0	331	0	9,529	9,529	---	---	---	---

Liquid Stream Quality: TSS (mg/L), $BOD_5/cBOD_5$ (mg/L), TP (mg/L)

DATE	TSS: RAW	TSS: OUTFALL 30	TSS: OUTFALL 20	TSS: EPEPS	TSS OUTFALL 10: FEC	TSS OUTFALL 10: FE	BOD: RAW BOD_5	BOD: OUTFALL 30 BOD_5	BOD: OUTFALL 20 BOD_5	BOD: EPEPS BOD_5	BOD OUTFALL 10: FEC $cBOD_5$	BOD OUTFALL 10: FE $cBOD_5$	TP: RAW	TP: OUTFALL 30	TP: OUTFALL 20	TP: EPEPS	TP OUTFALL 10: FEC	TP OUTFALL 10: FE
Tue-01	238				4.5	4.5	280				< 2	< 2	6.67				0.23	0.23
Wed-02	224				3.7	3.7	223				2	2	6.24				0.22	0.22
Thu-03	236				3.0	3.0	267				2	2	6.73				0.24	0.24
Fri-04	280				3.1	3.1	226				< 2	< 2	7.32				0.23	0.23
Sat-05	220				3.7	3.7	172				2	2	5.84				0.24	0.24
Sun-06	292				3.5	3.5	249				2	2	7.29				0.73	0.73
Mon-07	263				3.9	3.9	226				< 2	< 2	7.28				0.33	0.33
Tue-08	120	98.0			3.3	3.3	207	91			< 2	< 2	3.25	3.34			0.26	0.26
Wed-09	308	101			3.5	3.5	131	50			< 2	< 2	3.79	2.76			0.24	0.24
Thu-10	268	41.1			3.7	3.7	199	36			< 2	< 2	5.37	2.04			0.25	0.25
Fri-11	304				3.6	3.6	368				< 2	< 2	7.35				0.25	0.25
Sat-12	316				3.1	3.1	243				2	2	6.63				0.27	0.27
Sun-13	229				3.5	3.5	318				< 2	< 2	7.01				0.26	0.26
Mon-14	223				3.7	3.7	226				2	2	6.52				0.26	0.26
Tue-15	268				4.3	4.3	181				3	3	6.65				0.25	0.25
Wed-16	296				2.7	2.7	277				< 2	< 2	7.08				0.22	0.22
Thu-17	332	156			2.5	2.5	247	249			< 2	< 2	6.26	5.96			0.19	0.19
Fri-18	242	64.0			2.7	2.7	116	41			< 2	< 2	2.92	2.10			0.24	0.24
Sat-19	217	28.0			3.0	3.0	123	24			< 2	< 2	4.49	2.24			0.23	0.23
Sun-20	242				2.8	2.8	177				< 2	< 2	5.83				0.22	0.22
Mon-21	284				6.6	6.6	261				2	2	7.09				0.26	0.26
Tue-22	288				3.5	3.5	301				< 2	< 2	7.23				0.21	0.21
Wed-23	420	64.0			2.2	2.2	204	78			< 2	< 2	6.43	3.38			0.20	0.20
Thu-24	244	45.8			2.9	2.9	236	48			< 2	< 2	7.07	3.18			0.18	0.18
Fri-25	260				3.4	3.4	272				< 2	< 2	6.45				0.22	0.22
Sat-26	258				1.9	1.9	233				< 2	< 2	6.85				0.35	0.35
Sun-27	252				2.4	2.4	275				< 2	< 2	7.06				0.34	0.34
Mon-28	289				2.6	2.6	235				< 2	< 2	7.21				0.24	0.24
Tue-29	324				3.2	3.2	262				< 2	< 2	7.61				0.34	0.34
Wed-30	260				3.0	3.0	244				< 2	< 2	8.50				0.26	0.26
Thu-31	296				3.8	3.8	305				2	2	7.56				0.23	0.23
Average	268	74.7	---	---	3.3	3.3	235	77	---	---	2.0	2.0	6.44	3.13	---	---	0.26	0.26
Minimum	120	28.0	---	---	1.9	1.9	116	24	---	---	< 2	< 2	2.92	2.04	---	---	0.18	0.18
Maximum	420	156	---	---	6.6	6.6	368	249	---	---	3	3	8.50	5.96	---	---	0.73	0.73
GeoMean	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Liquid Stream Quality: NH3-N (mg/L), un-ionized NH3-N (mg/L), TKN (mg/L)

DATE	NH3-N: RAW	NH3-N: OUTFALL 30	NH3-N: OUTFALL 20	NH3-N: EPEPS	NH3-N OUTFALL 10: FEC	NH3-N OUTFALL 10: FE	un-ionized: OUT-FAL 30	un-ionized: OUT-FAL 20	un-ionized: OUT-FAL 10	TKN: RAW	TKN: OUTFALL 30	TKN: OUTFALL 20	TKN: OUTFALL 10 FEC
Tue-01	26.4				0.46	0.46				39.6			1.7
Wed-02	27.4				0.31	0.31				39.4			1.6
Thu-03	27.9				0.38	0.38				40.6			2.0
Fri-04	28.9				1.06	1.06				41.9			2.3
Sat-05	28.0				1.16	1.16				36.2			2.4
Sun-06	28.0				0.59	0.59				40.3			1.7
Mon-07	28.6				0.63	0.63				41.2			1.9
Tue-08	9.44	16.9			0.54	0.54				17.6	23.1		1.9
Wed-09	11.4	12.9			0.33	0.33				22.3	17.2		1.4
Thu-10	16.9	14.3			0.26	0.26				30.3	17.0		1.5
Fri-11	23.3				0.36	0.36				39.6			1.8
Sat-12	24.3				0.47	0.47				36.3			1.8
Sun-13	29.2				0.92	0.92				41.8			2.1
Mon-14	28.0				0.99	0.99				38.1			2.1
Tue-15	28.8				0.36	0.36				37.7			1.7
Wed-16	28.7				0.24	0.24				38.1			1.4
Thu-17	22.1	22.9			0.41	0.41				31.8	35.9		1.5
Fri-18	8.64	11.8			0.18	0.18				14.7	12.8		1.1
Sat-19	18.3	16.2			0.44	0.44				23.6	16.2		1.3
Sun-20	23.2				0.96	0.96				33.8			2.0
Mon-21	26.9				1.01	1.01				39.6			2.3
Tue-22	27.8				0.55	0.55				42.1			1.8
Wed-23	21.8	21.2			0.37	0.37				36.6	24.8		1.6
Thu-24	32.4	22.4			0.31	0.31				45.6	26.2		1.3
Fri-25	32.2				0.74	0.74				41.5			1.8
Sat-26	33.0				0.59	0.59				46.9			2.0
Sun-27	28.2				0.40	0.40				48.5			1.6
Mon-28	31.3				1.48	1.48				46.3			2.5
Tue-29	31.3				1.58	1.58				43.3			2.8
Wed-30	32.0				0.81	0.81				47.9			2.1
Thu-31	30.8				0.36	0.36				41.0			1.5
Average	25.7	17.3	---	---	0.62	0.62	---	---	---	37.6	21.7	---	1.8
Minimum	8.6	11.8	---	---	0.18	0.18	---	---	---	14.7	12.8	---	1.1
Maximum	33.0	22.9	---	---	1.58	1.58	---	---	---	48.5	35.9	---	2.8
GeoMean	---	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---	---	---	---	---	---	---	---

Liquid Stream Quality: NO_2+NO_3 (mg/L), Chloride (mg/L), *E. coli* (Counts/100 mL)

DATE	NO_2+NO_3: RAW	NO_2+NO_3: OUTFALL 30	NO_2+NO_3: OUTFALL 20	NO_2+NO_3: OUTFALL 10 FEC	Chloride: RAW	Chloride: OUTFALL 30	Chloride: OUTFALL 20	Chloride: OUTFALL 10 FEC	*E. coli*: RAW X10^6	*E. coli*: OUTFALL 30 X10^6	*E. coli*: OUTFALL 20 X10^6	*E. coli*: OUTFALL 10 FEC
Tue-01				10.5	82.0			86.3				22
Wed-02	< 0.01			10.7	83.5			89.4				10
Thu-03				11.8	86.6			94.8				18
Fri-04				11.0	92.7			98.1				6
Sat-05				11.6	84.3			98.9				6
Sun-06				11.8	82.3			91.4				4
Mon-07				12.9	82.8			91.2				7
Tue-08		0.16		10.8	45.0	53.6		83.3		1.6		2
Wed-09	< 0.01	0.19		7.68	45.3	42.2		67.3		0.7	1	5
Thu-10		0.44		7.51	67.3	48.9		63.7		0.7		5
Fri-11				10.3	87.7			85.4				8
Sat-12				10.8	103			94.9				4
Sun-13				11.4	83.6			90.9				15
Mon-14				10.4	85.6			90.1				11
Tue-15				9.58	88.5			96.7				9
Wed-16				10.5	88.4			102				10
Thu-17		0.05		9.66	76.7	95.5		96.0	5.1	5.1		4
Fri-18		0.36		4.58	39.0	44.5		68.9		1.0		6
Sat-19		0.59		6.40	73.7	53.7		56.8		0.7		5
Sun-20				9.58	100			88.8				5
Mon-21				9.77	93.2			94.9				8
Tue-22				8.57	94.9			98.1	4.2			16
Wed-23	< 0.01	0.13		8.89	70.2	67.8		98.3		2.0		10
Thu-24		0.07		7.71	88.7	67.3		78.4		1.0		5
Fri-25				10.7	88.7			89.3				5
Sat-26				10.4	85.5			96.3				7
Sun-27				11.3	83.5			92.2				7
Mon-28				9.13	91.1			91.4				3
Tue-29				8.81	89.4			96.9				16
Wed-30	< 0.01			9.28	95.8			96.2				11
Thu-31				10.0	92.9			104				5
Average	< 0.01	0.25	---	9.81	82.3	59.2	---	89.4				
Minimum	< 0.01	0.05	---	4.58	39.0	42.2	---	56.8	4.2	0.7	1.0	2
Maximum	< 0.01	0.59	---	12.9	103	95.5	---	104	5.1	5.1	1.0	22
GeoMean	---	---	---	---	---	---	---	---	4.6	1.2	1	7.1
TOTAL	---	---	---	---	---	---	---	---	---	---	---	---

* Contact Laboratory for information about the quality assurance associated with the results

Enhanced Primary Treatment (EPT) Usage					
Total Bypass (hr)	EPT Usage (hr)	% Usage	Total Bypass YTD (hr)	EPT Usage YTD (hr)	% Usage YTD
60	60	100%	477	477	100%

Report Comments

AEP Ref #

RAW	Untreated Influent into the plant
INF	Untreated wastewater from collection system
INFs	Influent, screened at the Headworks Diversion Structure
PE	Primary Effluent from conventional primaries
PE 30	Primary Effluent from conventional primaries discharged via Outfall 30
EPT	Enhanced Primary Treatment
EPE	Enhanced Primary Effluent
EPEPS	Enhanced Primary Effluent Pump Station
FE	Final Effluent from secondary treatment process (with biological nutrient removal). Pre-Ultraviolet disinfection.
FEC	Combined post-UV disinfection (FE+EPEPS)
OUTFALL 10	UV-disinfected, discharged via OUTFALL 10
OUTFALL 20	Combined Bypass (RAW + PE + EPE)
OUTFALL 30	Combined Bypass (INF + INFS + PE30 + EPE)
MPW	Membrane Product Water (Effluent re-use water)
ML	Megalitre (1,000,000 Litre)
MPN	Most Probable Number
NR	No Result
NS	No Sample
INS	Insufficient Sample
AEP	Alberta Environment & Parks

Trina Manning M.Sc., P.Eng.
Senior Manager, WWTP Operations

Jeff Charrois PhD
Senior Manager, Analytical Operations

Appendix A - Monthly Plant Performance Reports

PROVIDING MORE EPCOR

Gold Bar Wastewater Treatment Plant
Plant Performance Report
September 2023

Digested Sludge: Total Monthly Volume (ML)	73.8

Volume of Flow (ML)

DATE	Peak Flow (MLD)	Influent	Effluent					
			Non UV Disinfected			UV Disinfected		
		INFs	OUTFALL 30	OUTFALL 20	MPW	EPEPS	OUTFALL 10 FEC	OUTFALL 10 FE
Fri-01	363.3	0.0	0.0	0.0	12.2	0.0	296.3	296.3
Sat-02	357.4	0.0	0.0	0.0	11.7	0.0	277.5	277.5
Sun-03	355.8	0.0	0.0	0.0	12.0	0.0	270.1	270.1
Mon-04	482.3	0.0	0.0	0.0	11.8	0.0	272.3	272.3
Tue-05	977.8	0.0	0.0	55.2	10.9	0.0	290.2	290.2
Wed-06	468.8	0.0	0.0	5.6	10.9	0.0	309.4	309.4
Thu-07	364.7	0.0	0.0	0.0	11.2	0.0	299.0	299.0
Fri-08	378.9	0.0	0.0	0.0	11.1	0.0	280.3	280.3
Sat-09	362.7	0.0	0.0	0.0	10.9	0.0	273.5	273.5
Sun-10	370.8	0.0	0.0	0.0	10.7	0.0	273.0	273.0
Mon-11	366.8	0.0	0.0	0.0	10.9	0.0	281.7	281.7
Tue-12	359.5	0.0	0.0	0.0	10.8	0.0	279.9	279.9
Wed-13	425.8	0.0	0.0	0.0	11.1	0.0	302.6	302.6
Thu-14	355.4	0.0	0.0	0.0	11.1	0.0	276.3	276.3
Fri-15	339.9	0.0	0.0	0.0	11.9	0.0	272.4	272.4
Sat-16	363.7	0.0	0.0	0.0	11.8	0.0	265.3	265.3
Sun-17	373.0	0.0	0.0	0.0	11.5	0.0	265.4	265.4
Mon-18	380.9	0.0	0.0	0.0	12.0	0.0	275.2	275.2
Tue-19	358.9	0.0	0.0	0.0	11.6	0.0	267.4	267.4
Wed-20	350.4	0.0	0.0	0.0	11.1	0.0	267.8	267.8
Thu-21	355.2	0.0	0.0	0.0	11.2	0.0	269.8	269.8
Fri-22	348.7	0.0	0.0	0.0	11.4	0.0	272.4	272.4
Sat-23	362.3	0.0	0.0	0.0	10.8	0.0	264.9	264.9
Sun-24	361.7	0.0	0.0	0.0	10.7	0.0	264.2	264.2
Mon-25	367.8	0.0	0.0	0.0	11.0	0.0	272.2	272.2
Tue-26	349.8	0.0	0.0	0.0	10.9	0.0	267.0	267.0
Wed-27	349.3	0.0	0.0	0.0	11.5	0.0	269.6	269.6
Thu-28	457.9	0.0	0.0	0.0	11.3	0.0	272.8	272.8
Fri-29	490.7	0.0	0.0	11.4	11.2	0.0	291.5	291.5
Sat-30	353.9	0.0	0.0	0.0	11.3	0.0	265.1	265.1
Average	398.5	0.0	0.0	2.3	11.3	0.0	276.8	276.8
Minimum	339.9	0.0	0.0	0.0	10.7	0.0	264.2	264.2
Maximum	977.8	0.0	0.0	55.2	12.2	0.0	309.4	309.4
GeoMean	--	--	--	--	--	--	--	--
TOTAL	--	0	0.0	74	0	339	0	8,305	8,305

Liquid Stream Quality

DATE	pH@25°C RAW	pH@25°C OUTFALL 30	pH@25°C OUTFALL 20	pH@25°C OUTFALL 10 FEC	TSS (mg/L) RAW	TSS OUTFALL 30	TSS OUTFALL 20	TSS EPEPS	TSS OUTFALL 10 FEC	TSS OUTFALL 10 FE
Fri-01	7.4			7.6	244				2.9	2.9
Sat-02	7.5			7.6	283				3.2	3.2
Sun-03	7.6			7.7	288				3.1	3.1
Mon-04	7.6			7.6	277				3.2	3.2
Tue-05	7.4	7.6		7.6	440	45			3.8	3.8
Wed-06	7.5	7.5		7.7	271	49			3.6	3.6
Thu-07	7.5			7.6	294				3.2	3.2
Fri-08	7.6			7.6	308				2.8	2.8
Sat-09	7.4			7.5	284				2.6	2.6
Sun-10	7.4			7.7	286				2.9	2.9
Mon-11	7.5			7.7	300				4.5	4.5
Tue-12	7.4			7.7	284				4.3	4.3
Wed-13	7.5			7.6	280				3.6	3.6
Thu-14	7.5			7.7	272				4.1	4.1
Fri-15	7.4			7.7	251				4.4	4.4
Sat-16	7.5			7.6	276				4.4	4.4
Sun-17	7.4			7.6	247				4.9	4.9
Mon-18	7.5			7.5	236				6.8	6.8
Tue-19	7.5			7.6	263				3.2	3.2
Wed-20	7.5			7.6	272				3.0	3.0
Thu-21	7.5			7.6	280				3.3	3.3
Fri-22	7.4			7.7	292				3.5	3.5
Sat-23	7.5			7.7	268				3.7	3.7
Sun-24	7.5			7.6	260				3.5	3.5
Mon-25	7.6			7.7	269				4.0	4.0
Tue-26	7.5			7.6	326				3.2	3.2
Wed-27	7.5			7.6	376				2.9	2.9
Thu-28	7.5	6.7		7.6	360	81			3.7	3.7
Fri-29	7.5	7.8		7.8	268	126			3.2	3.2
Sat-30	7.5			7.5	268				3.6	3.6
Average	7.5	7.4	--	7.6	289	75	--	--	3.7	3.7
Minimum	7.4	6.7	--	7.5	236	45	--	--	2.6	2.6
Maximum	7.6	7.8	--	7.7	440	126	--	--	6.8	6.8
GeoMean	--	--	--	--	--	--	--	--	--	--
TOTAL	--	--	--	--	--	--	--	--	--	--

DATE	BOD_5/$cBOD_5$ (mg/L) RAW	BOD_5 OUTFALL 30	BOD_5 OUTFALL 20	BOD_5 EPEPS	$cBOD_5$ OUTFALL 10 FEC	$cBOD_5$ OUTFALL 10 FE
Fri-01	329				2	2
Sat-02	186				< 2	< 2
Sun-03	265				< 2	< 2
Mon-04	296				< 2	< 2
Tue-05	327	196			2	2
Wed-06	253	75			2	2
Thu-07	368				3	3
Fri-08	268				< 2	< 2
Sat-09	229				2	2
Sun-10	276				2	2
Mon-11	344				2	2
Tue-12	284				2	2
Wed-13	270				< 2	< 2
Thu-14	262				2	2
Fri-15	355				3	3
Sat-16	293				3	3
Sun-17	256				3	3
Mon-18	246				3	3
Tue-19	269				2	2
Wed-20	256				2	2
Thu-21	311				3	3
Fri-22	290				3	3
Sat-23	292				3	3
Sun-24	260				3	3
Mon-25	321				2	2
Tue-26	307				2	2
Wed-27	259				2	2
Thu-28	299	173			2	2
Fri-29	335	172			2	2
Sat-30	272				2	2
Average	286	154	--	--	2.3	2.3
Minimum	186	75	--	--	< 2	< 2
Maximum	368	196	--	--	3	3
GeoMean	--	--	--	--	--	--
TOTAL	--	--	--	--	--	--

DATE	TP (mg/L) RAW	TP OUTFALL 30	TP OUTFALL 20	TP EPEPS	TP OUTFALL 10 FEC	TP OUTFALL 10 FE
Fri-01	6.94				0.24	0.24
Sat-02	7.12				0.24	0.24
Sun-03	7.05				0.22	0.22
Mon-04	6.62				0.23	0.23
Tue-05	6.30	6.05			0.24	0.24
Wed-06	7.33	3.62			0.23	0.23
Thu-07	7.32				0.24	0.24
Fri-08	6.80				0.24	0.24
Sat-09	6.66				0.22	0.22
Sun-10	7.61				0.22	0.22
Mon-11	8.32				0.27	0.27
Tue-12	8.19				0.31	0.31
Wed-13	6.69				0.26	0.26
Thu-14	7.26				0.32	0.32
Fri-15	7.41				0.29	0.29
Sat-16	7.41				0.29	0.29
Sun-17	8.19				0.32	0.32
Mon-18	8.39				0.32	0.32
Tue-19	8.39				0.30	0.30
Wed-20	7.71				0.32	0.32
Thu-21	8.45				0.45	0.45
Fri-22	7.47				0.26	0.26
Sat-23	7.66				0.27	0.27
Sun-24	7.73				0.23	0.23
Mon-25	7.64				0.23	0.23
Tue-26	7.94				0.23	0.23
Wed-27	7.57				0.25	0.25
Thu-28	9.00	9.19			0.24	0.24
Fri-29	6.96	9.06			0.28	0.28
Sat-30	8.14				0.29	0.29
Average	7.56	7.03	--	--	0.27	0.27
Minimum	6.30	3.62	--	--	0.22	0.22
Maximum	9.80	9.19	--	--	0.45	0.45
GeoMean	--	--	--	--	--	--
TOTAL	--	--	--	--	--	--

DATE	NH_3-N (mg/L) RAW	NH_3-N OUTFALL 30	NH_3-N OUTFALL 20	NH_3-N EPEPS	NH_3-N OUTFALL 10 FEC	NH_3-N OUTFALL 10 FE
Fri-01	32.9				0.89	0.89
Sat-02	32.3				0.62	0.62
Sun-03	33.0				0.55	0.55
Mon-04	28.7				1.05	1.05
Tue-05	29.1	30.0			0.64	0.64
Wed-06	30.7	19.2			0.59	0.59
Thu-07	32.6				1.07	1.07
Fri-08	30.8				0.67	0.67
Sat-09	34.4				0.94	0.94
Sun-10	35.5				0.97	0.97
Mon-11	31.9				0.68	0.68
Tue-12	36.0				0.64	0.64
Wed-13	33.5				1.01	1.01
Thu-14	36.1				1.13	1.13
Fri-15	36.5				0.88	0.88
Sat-16	36.5				0.64	0.64
Sun-17	40.5				0.76	0.76
Mon-18	39.4				1.21	1.21
Tue-19	39.5				1.52	1.52
Wed-20	31.9				0.63	0.63
Thu-21	37.6				0.59	0.59
Fri-22	38.1				1.75	1.75
Sat-23	37.8				1.76	1.76
Sun-24	39.5				1.59	1.59
Mon-25	37.6				1.46	1.46
Tue-26	37.8				1.71	1.71
Wed-27	36.7				1.66	1.66
Thu-28	36.7	32.0			1.90	1.90
Fri-29	34.8	39.5			2.40	2.40
Sat-30	39.6				3.00	3.00
Average	35.3	29.9	--	--	1.19	1.19
Minimum	28.7	19.2	--	--	0.55	0.55
Maximum	40.5	39.5	--	--	3.00	3.00
GeoMean	--	--	--	--	--	--
TOTAL	--	--	--	--	--	--

DATE	un-ionized NH_3-N (mg/L) OUTFAL 30	un-ionized NH_3-N OUT-FAL 20	un-ionized NH_3-N OUT-FAL 10
Fri-01			
Sat-02			
Sun-03			
Mon-04			
Tue-05			
Wed-06			
Thu-07			
Fri-08			
Sat-09			
Sun-10			
Mon-11			
Tue-12			
Wed-13			
Thu-14			
Fri-15			
Sat-16			
Sun-17			
Mon-18			
Tue-19			
Wed-20			
Thu-21			
Fri-22			
Sat-23			
Sun-24			
Mon-25			
Tue-26			
Wed-27			
Thu-28			
Fri-29			
Sat-30			
Average	---	---	---
Minimum	---	---	---
Maximum	---	---	---
GeoMean	--	--	--
TOTAL	--	--	--

DATE	TKN (mg/L) RAW	TKN OUTFALL 30	TKN OUTFALL 20	TKN OUTFALL 10 FEC
Fri-01	44.4			2.0
Sat-02	41.9			1.9
Sun-03	43.7			1.7
Mon-04	39.2			1.9
Tue-05	40.5	34.7		1.8
Wed-06	45.4	25.5		1.7
Thu-07	44.3			2.2
Fri-08	54.4			2.0
Sat-09	45.2			2.0
Sun-10	48.3			2.1
Mon-11	53.1			1.9
Tue-12	51.0			2.1
Wed-13	42.8			2.1
Thu-14	46.9			2.4
Fri-15	46.5			1.9
Sat-16	47.0			2.3
Sun-17	49.3			2.0
Mon-18	51.9			2.5
Tue-19	51.4			2.5
Wed-20	47.0			1.9
Thu-21	45.8			2.7
Fri-22	49.4			2.7
Sat-23	45.8			2.7
Sun-24	47.5			2.6
Mon-25	47.1			2.6
Tue-26	50.5			2.5
Wed-27	47.1			2.0
Thu-28	46.7	45.8		2.8
Fri-29	43.8	44.5		3.1
Sat-30	50.1			4.3
Average	47.0	37.6	--	2.3
Minimum	39.2	25.5	--	1.7
Maximum	54.4	45.8	--	4.3
GeoMean	--	--	--	--
TOTAL	--	--	--	--

DATE	NO_3+NO_2 (mg/L) RAW	NO_3+NO_2 OUTFALL 30	NO_3+NO_2 OUTFALL 20	NO_3+NO_2 OUTFALL 10 FEC
Fri-01				11.0
Sat-02				10.4
Sun-03				11.3
Mon-04				12.3
Tue-05		0.14		12.5
Wed-06	< 0.01	0.16		9.98
Thu-07				11.5
Fri-08				11.6
Sat-09				11.3
Sun-10				11.9
Mon-11				10.8
Tue-12				10.4
Wed-13	< 0.01			10.9
Thu-14				10.8
Fri-15				10.8
Sat-16				10.3
Sun-17				11.2
Mon-18				10.2
Tue-19				11.4
Wed-20	0.25			12.4
Thu-21				10.8
Fri-22				8.67
Sat-23				9.78
Sun-24				11.0
Mon-25				11.3
Tue-26				11.9
Wed-27	< 0.01			12.5
Thu-28		0.02		12.6
Fri-29		0.03		11.6
Sat-30				12.1
Average	0.07	0.09	--	11.14
Minimum	< 0.01	0.02	--	8.67
Maximum	0.25	0.16	--	12.6
GeoMean	--	--	--	--
TOTAL	--	--	--	--

DATE	Chloride (mg/L) RAW	Chloride OUTFALL 10	Chloride OUTFALL 20	Chloride OUTFALL 10 FEC
Fri-01	86.1			96.4
Sat-02	87.4			96.1
Sun-03	87.1			96.4
Mon-04	83.8			97.2
Tue-05	84.3	81.0		97.6
Wed-06	87.0	60.0		89.8
Thu-07	84.0			91.5
Fri-08	87.7			95.2
Sat-09	86.7			97.1
Sun-10	87.0			93.7
Mon-11	92.2			90.0
Tue-12	89.1			99.5
Wed-13	83.2			106
Thu-14	89.3			98.5
Fri-15	83.5			92.6
Sat-16	79.3			96.4
Sun-17	81.6			86.7
Mon-18	87.6			90.1
Tue-19	84.5			91.1
Wed-20	89.5			89.5
Thu-21	83.9			94.7
Fri-22	86.1			90.1
Sat-23	77.9			93.2
Sun-24	81.1			86.9
Mon-25	84.3			87.4
Tue-26	79.8			94.1
Wed-27	82.1			92.3
Thu-28	79.7	86.9		89.2
Fri-29	77.3	82.4		93.9
Sat-30	80.0			91.3
Average	84.2	77.7	---	93.0
Minimum	77.3	60.0	---	81.3
Maximum	92.2	86.9	---	106
GeoMean	--	--	--	--
TOTAL	--	--	--	--

DATE	*E. coli* (Counts/100 mL) RAW	*E. coli* OUTFALL 30	*E. coli* OUTFALL 20	*E. coli* OUTFALL 10 FEC
Fri-01				9
Sat-02				4
Sun-03				6
Mon-04				4
Tue-05		1.9		7
Wed-06		1.7		2
Thu-07				9
Fri-08				9
Sat-09				4
Sun-10				5
Mon-11				8
Tue-12				7
Wed-13				2
Thu-14	6.0			5
Fri-15				9
Sat-16				8
Sun-17				8
Mon-18				6
Tue-19				5
Wed-20				6
Thu-21				4
Fri-22				7
Sat-23				5
Sun-24				3
Mon-25				2
Tue-26				5
Wed-27	3.1			6
Thu-28		6.0		4
Fri-29		2.5		9
Sat-30				6
Average				
Minimum	4.3	2.5	--	5.4
Maximum	--	--	--	--
GeoMean	--	--	--	--
TOTAL	--	--	--	--

* Contact Laboratory for information about the quality assurance associated with the results

Enhanced Primary Treatment (EPT) Usage

Total Bypass (hr)	EPT Usage (hr)	% Usage	Total Bypass YTD (hr)	EPT Usage YTD (hr)	% Usage YTD
9	9	100%	486	486	100%

Report Comments

AEP Ref #

RAW Untreated Influent into the plant
INF Untreated wastewater from collection system
INFs Influent, screened at the Headworks Diversion Structure
PE Primary Effluent from conventional primaries
PE 30 Primary Effluent from conventional primaries discharged via Outfall 30
EPT Enhanced Primary Treatment
EPE Enhanced Primary Effluent
EPEPS Enhanced Primary Effluent Pump Station
FE Final Effluent from secondary treatment process (with biological nutrient removal), Pre-Ultraviolet disinfection.

FEC Combined post-UV disinfection (FE+EPEPS)
OUTFALL 10 UV-disinfected, discharged via OUTFALL 10
OUTFALL 20 Combined Bypass (RAW + PE + EPE)
OUTFALL 30 Combined Bypass (INF + INFS + PE30 + EPE)
MPW Membrane Product Water (Effluent re-use water)
ML Megalitre (1,000,000 Litre)
MPN Most Probable Number
NR No Result
NS No Sample
INS Insufficient Sample
AEP Alberta Environment & Parks

Trina Manning M.Sc., P.Eng.
Senior Manager, WWTP Operations

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Senior Manager, Analytical Operations

Appendix A - Monthly Plant Performance Reports

PROVIDING MORE EPCOR

Gold Bar Wastewater Treatment Plant
Plant Performance Report
October 2023

Digested Sludge: Total Monthly Volume (ML)	72.9

Volume of Flow (ML)

DATE	Peak Flow (MLD)	Influent: INFs	Influent: RAW	Effluent: Non UV Disinfected: OUTFALL 10	Effluent: Non UV Disinfected: OUTFALL 20	Effluent: Non UV Disinfected: MPW	Effluent: UV Disinfected: EPEPS	Effluent: UV Disinfected: OUTFALL 10: FEC	Effluent: UV Disinfected: OUTFALL 10: FE
Sun-01	368.9	0.0	278.2	0.0	0.0	11.3	0.0	266.9	266.9
Mon-02	360.1	0.0	283.6	0.0	0.0	11.8	0.0	271.8	271.8
Tue-03	353.8	0.0	278.0	0.0	0.0	11.7	0.0	266.3	266.3
Wed-04	381.1	0.0	291.4	0.0	0.0	10.8	0.0	280.6	280.6
Thu-05	417.2	0.0	274.2	0.0	0.0	11.3	0.0	262.9	262.9
Fri-06	407.4	0.0	274.9	0.0	0.0	11.0	0.0	263.9	263.9
Sat-07	351.8	0.0	261.4	0.0	0.0	11.1	0.0	250.3	250.3
Sun-08	347.1	0.0	261.5	0.0	0.0	11.3	0.0	250.2	250.2
Mon-09	361.1	0.0	273.1	0.0	0.0	11.7	0.0	261.4	261.4
Tue-10	353.0	0.0	277.0	0.0	0.0	12.0	0.0	265.0	265.0
Wed-11	337.3	0.0	268.3	0.0	0.0	12.1	0.0	256.2	256.2
Thu-12	334.8	0.0	268.1	0.0	0.0	12.0	0.0	256.1	256.1
Fri-13	332.1	0.0	267.3	0.0	0.0	12.0	0.0	255.3	255.3
Sat-14	349.3	0.0	261.2	0.0	0.0	11.6	0.0	249.6	249.6
Sun-15	433.0	0.0	272.0	0.0	0.0	11.7	0.0	260.3	260.3
Mon-16	446.4	0.0	275.1	0.0	0.0	11.8	0.0	263.3	263.3
Tue-17	341.8	0.0	270.9	0.0	0.0	11.9	0.0	259.0	259.0
Wed-18	329.9	0.0	270.6	0.0	0.0	12.4	0.0	258.2	258.2
Thu-19	326.3	0.0	268.7	0.0	0.0	12.3	0.0	256.4	256.4
Fri-20	327.8	0.0	269.9	0.0	0.0	12.8	0.0	257.1	257.1
Sat-21	376.1	0.0	259.7	0.0	0.0	11.4	0.0	248.3	248.3
Sun-22	367.0	0.0	262.2	0.0	0.0	13.0	0.0	249.2	249.2
Mon-23	338.3	0.0	272.4	0.0	0.0	12.8	0.0	259.6	259.6
Tue-24	342.2	0.0	270.6	0.0	0.0	11.5	0.0	259.1	259.1
Wed-25	350.3	0.0	271.3	0.0	0.0	11.5	0.0	259.8	259.8
Thu-26	343.5	0.0	271.9	0.0	0.0	11.1	0.0	260.8	260.8
Fri-27	333.8	0.0	275.4	0.0	0.0	10.8	0.0	264.6	264.6
Sat-28	362.9	0.0	273.4	0.0	0.0	11.1	0.0	262.3	262.3
Sun-29	379.4	0.0	277.8	0.0	0.0	11.7	0.0	266.1	266.1
Mon-30	356.6	0.0	283.3	0.0	0.0	11.6	0.0	271.7	271.7
Tue-31	338.4	0.0	273.6	0.0	0.0	11.4	0.0	262.2	262.2
Average	359.6	0.0	272.2	0.0	0.0	11.7	0.0	260.5	260.5
Minimum	326.3	0.0	259.7	0.0	0.0	10.8	0.0	248.3	248.3
Maximum	446.4	0.0	291.4	0.0	0.0	13.0	0.0	280.6	280.6
GeoMean	---	---	---	---	---	---	---	---	---
TOTAL	---	0	8,437	0	0	363	0	8,075	8,075

Liquid Stream Quality

DATE	pH@25°C: RAW	pH@25°C: OUTFALL 10: FEC	TSS (mg/L): RAW	TSS (mg/L): OUTFALL 10: FEC	TSS (mg/L): OUTFALL 10: FE	BOD_5/$cBOD_5$ (mg/L): RAW BOD_5	BOD_5/$cBOD_5$ (mg/L): OUTFALL 10: FEC $cBOD_5$	BOD_5/$cBOD_5$ (mg/L): OUTFALL 10: FE $cBOD_5$	TP (mg/L): RAW	TP (mg/L): OUTFALL 10: FEC	TP (mg/L): OUTFALL 10: FE	NH3-N (mg/L): RAW	NH3-N (mg/L): OUTFALL 10: FEC	NH3-N (mg/L): OUTFALL 10: FE	un-ionized NH3-N (mg/L): OUTFALL 30	un-ionized NH3-N (mg/L): OUTFALL 20	un-ionized NH3-N (mg/L): OUTFALL 10	TKN (mg/L): RAW	TKN (mg/L): OUTFALL 10: FEC	NO_3+NO_2 (mg/L): RAW	NO_3+NO_2 (mg/L): OUTFALL 10: FEC	Chloride (mg/L): RAW	Chloride (mg/L): OUTFALL 10: FEC	*E. coli* (Counts/100 mL): RAW	*E. coli* (Counts/100 mL): OUTFALL 10: FEC
Sun-01	7.4	7.6	308	4.1	4.1	321	2	2	7.94	0.27	0.27	40.5	2.86	2.86				53.0	4.0			78.0	80.7		4
Mon-02	7.5	7.6	312	2.8	2.8	260	3	3	8.31	0.25	0.25	38.1	2.62	2.62				53.3	3.7			85.2	75.9		8
Tue-03	7.5	7.6	336	3.3	3.3	265	< 2	2	8.87	0.26	0.26	41.7	2.08	2.08				57.4	3.0			85.2	85.2		4
Wed-04	7.4	7.5	306	3.3	3.3	360	2	2	7.59	0.25	0.25	35.3	0.90	0.90				45.3	2.0	< 0.01		83.2	89.8		8
Thu-05	7.6	7.6	316	3.5	3.5	296	3	3	7.78	0.26	0.26	38.4	0.62	0.62				49.1	1.8			81.9	88.1		10
Fri-06	7.4	7.6	284	3.0	3.0	315	3	3	8.07	0.28	0.28	38.3	0.56	0.56				49.0	1.7			83.9	89.5		5
Sat-07	7.4	7.5	296	3.1	3.1	313	2	2	8.19	0.27	0.27	37.4	0.65	0.65				49.8	1.7			76.8	88.2		4
Sun-08	7.5	7.5	296	3.6	3.6	296	2	2	7.39	0.24	0.24	38.3	0.68	0.68				46.7	1.7			82.3	80.8		5
Mon-09	7.6	7.7	310	4.0	4.0	310	3	3	7.57	0.26	0.26	39.1	1.60	1.60				49.7	2.5			79.2	86.7		2
Tue-10	7.5	7.7	317	4.6	4.6	305	3	3	8.01	0.32	0.32	37.8	1.86	1.86				48.5	2.8			83.7	88.8		8
Wed-11	7.5	7.6	348	3.2	3.2	323	3	3	8.03	0.29	0.29	37.6	1.12	1.12				50.5	2.0	< 0.01		84.5	91.2		4
Thu-12	7.5	7.6	356	3.2	3.2	337	2	2	8.79	0.28	0.28	38.3	1.50	1.50				50.1	2.6			86.4	87.5		4
Fri-13	7.5	7.7	320	3.5	3.5	306	3	3	7.94	0.31	0.31	38.0	1.68	1.68				46.4	2.5			83.2	89.4		3
Sat-14	7.4	7.5	328	3.2	3.2	361	2	2	8.97	0.40	0.40	36.9	1.83	1.83				54.2	2.9			80.5	87.7		3
Sun-15	7.6	7.6	309	4.3	4.3	336	3	3	9.26	0.48	0.48	34.8	1.70	1.70				56.7	2.8			80.2	82.6		3
Mon-16	7.4	7.7	340	4.2	4.2	303	3	3	7.40	0.27	0.27	36.9	1.30	1.30				46.0	2.2			79.5	82.3		5
Tue-17	7.5	7.7	317	5.0	5.0	290	2	2	7.68	0.31	0.31	37.8	0.77	0.77				48.7	2.0			83.5	88.4		2
Wed-18	7.5	7.6	276	4.7	4.7	293	2	2	7.61	0.30	0.30	37.9	0.71	0.71				48.4	1.9	< 0.01		80.0	85.4		5
Thu-19	7.4	7.6	320	3.4	3.4	283	2	2	8.08	0.29	0.29	37.4	0.96	0.96				52.4	2.0			81.0	85.5		13
Fri-20	7.4	7.5	287	3.6	3.6	313	3	3	8.03	0.30	0.30	37.6	0.78	0.78				49.5	2.2			81.5	82.2		8
Sat-21	7.5	7.5	292	3.6	3.6	319	3	3	7.98	0.28	0.28	39.1	0.82	0.82				50.4	1.9			76.4	89.9		3
Sun-22	7.5	7.6	268	3.9	3.9	312	3	3	8.25	0.28	0.28	39.4	1.38	1.38				50.4	2.6			75.7	81.6		4
Mon-23	7.5	7.6	280	3.7	3.7	325	3	3	8.11	0.30	0.30	37.2	1.15	1.15				50.7	2.4			92.1	79.8	2.6	5
Tue-24	7.5	7.6	306	3.8	3.8	312	3	3	8.22	0.28	0.28	37.0	0.70	0.70				50.2	1.9			83.6	96.0		9
Wed-25	7.4	7.5	328	3.2	3.2	303	2	2	8.27	0.27	0.27	37.8	1.38	1.38				49.8	2.7	< 0.01		85.4	89.6	3.4	9
Thu-26	7.3	7.4	344	3.2	3.2	275	3	3	8.30	0.30	0.30	38.7	3.41	3.41				52.8	4.4			85.1	87.5		6
Fri-27	7.4	7.3	320	3.7	3.7	317	3	3	8.54	0.32	0.32	39.0	3.42	3.42				51.3	4.5			86.0	88.3		7
Sat-28	7.5	7.5	328	4.7	4.7	332	3	3	8.78	0.32	0.32	39.3	3.39	3.39				51.4	4.6			84.3	91.1		5
Sun-29	7.4	7.3	313	3.8	3.8	309	3	3	8.37	0.33	0.33	39.0	3.40	3.40				50.9	4.4			79.3	85.7		5
Mon-30	7.4	7.6	304	4.5	4.5	339	3	3	8.28	0.30	0.30	36.4	2.42	2.42				51.0	3.4			84.3	81.9		8
Tue-31	7.5	7.5	312	3.9	3.9	307	3	3	8.89	0.30	0.30	36.6	1.31	1.31				51.3	2.6			91.8	86.8		4
Average	7.5	7.6	312	3.7	3.7	311	2.6	2.6	8.18	0.30	0.30	38.0	1.60	1.60				50.5	2.7	< 0.01		82.7	86.3		
Minimum	7.3	7.3	268	2.8	2.8	260	< 2	2	7.39	0.24	0.24	34.8	0.56	0.56				45.3	1.7	< 0.01		75.7	75.9	2.6	2
Maximum	7.6	7.8	356	5.0	5.0	361	3	3	9.26	0.48	0.48	41.7	3.42	3.42				57.4	4.6	< 0.01		92.1	96.0	3.4	13
GeoMean	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

* Contact Laboratory for information about the quality assurance associated with the results

Enhanced Primary Treatment (EPT) Usage

Total Bypass (hr)	EPT Usage (hr)	% Usage	Total Bypass YTD (hr)	EPT Usage YTD (hr)	% Usage YTD
0	0	100%	486	486	100%

Report Comments

AEP Ref #

RAW	Untreated Influent into the plant
INF	Untreated wastewater from collection system
INFs	Influent, screened at the Headworks Diversion Structure
PE	Primary Effluent from conventional primaries
PE 30	Primary Effluent from conventional primaries discharged via Outfall 30
EPT	Enhanced Primary Treatment
EPE	Enhanced Primary Effluent
EPEPS	Enhanced Primary Effluent Pump Station
FE	Final Effluent from secondary treatment process (with biological nutrient removal). Pre-Ultraviolet disinfection.

FEC	Combined post-UV disinfection (FE+EPEPS)
OUTFALL 10	UV-disinfected, discharged via OUTFALL 10
OUTFALL 20	Combined Bypass (RAW + PE + EPE)
OUTFALL 30	Combined Bypass (INF + INFS + PE30 + EPE)
MPW	Membrane Product Water (Effluent re-use water)
ML	Megalitre (1,000,000 Litre)
MPN	Most Probable Number
NR	No Result
NS	No Sample
INS	Insufficient Sample
AEP	Alberta Environment & Parks

Trina Manning M.Sc., P.Eng
Senior Manager, WWTP Operations

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Senior Manager, Analytical Operations

Appendix A - Monthly Plant Performance Reports

PROVIDING MORE EPCOR

Gold Bar Wastewater Treatment Plant
Plant Performance Report
November 2023

Digested Sludge: Total Monthly Volume (ML)	70.3

Volume of Flow (ML)

DATE	Peak Flow (MLD)	INFs	Influent RAW	Effluent Non UV Disinfected OUTFALL 30	Non UV Disinfected OUTFALL 20	Non UV Disinfected MPW	UV Disinfected EPEPS	UV Disinfected OUTFALL 10 FEC	UV Disinfected OUTFALL 10 FE
Wed-01	372.0	0.0	267.5	0.0	0.0	11.5	0.0	256.0	256.0
Thu-02	333.5	0.0	274.5	0.0	0.0	12.2	0.0	262.3	262.3
Fri-03	320.5	0.0	272.7	0.0	0.0	11.6	0.0	261.1	261.1
Sat-04	369.9	0.0	268.3	0.0	0.0	11.1	0.0	257.2	257.2
Sun-05	417.4	0.0	282.5	0.0	0.0	11.6	0.0	270.9	270.9
Mon-06	336.9	0.0	276.4	0.0	0.0	11.6	0.0	264.8	264.8
Tue-07	321.8	0.0	267.3	0.0	0.0	10.0	0.0	257.3	257.3
Wed-08	320.9	0.0	267.8	0.0	0.0	10.9	0.0	256.9	256.9
Thu-09	344.6	0.0	268.3	0.0	0.0	10.9	0.0	257.4	257.4
Fri-10	336.9	0.0	270.6	0.0	0.0	11.1	0.0	259.5	259.5
Sat-11	342.1	0.0	264.3	0.0	0.0	11.2	0.0	253.1	253.1
Sun-12	342.2	0.0	262.0	0.0	0.0	11.0	0.0	251.0	251.0
Mon-13	342.4	0.0	266.5	0.0	0.0	11.6	0.0	254.9	254.9
Tue-14	354.1	0.0	270.0	0.0	0.0	10.7	0.0	259.3	259.3
Wed-15	400.3	0.0	269.4	0.0	0.0	11.0	0.0	258.4	258.4
Thu-16	405.5	0.0	266.8	0.0	0.0	11.0	0.0	255.8	255.8
Fri-17	396.9	0.0	268.0	0.0	0.0	10.9	0.0	257.1	257.1
Sat-18	333.6	0.0	265.6	0.0	0.0	10.7	0.0	254.9	254.9
Sun-19	356.4	0.0	268.6	0.0	0.0	10.9	0.0	257.7	257.7
Mon-20	340.0	0.0	271.0	0.0	0.0	10.9	0.0	260.1	260.1
Tue-21	331.7	0.0	264.3	0.0	0.0	11.2	0.0	253.1	253.1
Wed-22	336.8	0.0	263.9	0.0	0.0	11.1	0.0	252.8	252.8
Thu-23	393.2	0.0	264.5	0.0	0.0	11.5	0.0	253.0	253.0
Fri-24	340.2	0.0	268.4	0.0	0.0	10.9	0.0	257.5	257.5
Sat-25	341.8	0.0	264.0	0.0	0.0	11.0	0.0	253.0	253.0
Sun-26	355.7	0.0	265.9	0.0	0.0	11.3	0.0	254.6	254.6
Mon-27	331.9	0.0	271.1	0.0	0.0	11.0	0.0	260.1	260.1
Tue-28	325.0	0.0	265.0	0.0	0.0	10.9	0.0	254.1	254.1
Wed-29	346.5	0.0	266.5	0.0	0.0	10.8	0.0	255.7	255.7
Thu-30	342.5	0.0	267.6	0.0	0.0	10.7	0.0	256.9	256.9
Average	351.1	0.0	268.3	0.0	0.0	11.1	0.0	257.2	257.2
Minimum	320.5	0.0	262.0	0.0	0.0	10.0	0.0	251.0	251.0
Maximum	417.4	0.0	282.5	0.0	0.0	12.2	0.0	270.9	270.9
GeoMean	---	---	---	---	---	---	---	---	---
TOTAL	---	0	8,049	0	0	333	0	7,717	7,717

Liquid Stream Quality

DATE	pH@25°C RAW	pH@25°C OUTFALL 30	pH@25°C OUTFALL 20	pH@25°C OUTFALL 10 FEC
Wed-01	7.5			7.5
Thu-02	7.5			7.5
Fri-03	7.5			7.5
Sat-04	7.5			7.5
Sun-05	7.5			7.5
Mon-06	7.3			7.4
Tue-07	7.4			7.4
Wed-08	7.3			7.2
Thu-09	7.5			7.4
Fri-10	7.5			7.4
Sat-11	7.5			7.4
Sun-12	7.3			7.3
Mon-13	7.3			7.3
Tue-14	7.4			7.3
Wed-15	7.3			7.3
Thu-16	7.3			7.3
Fri-17	7.4			7.4
Sat-18	7.5			7.5
Sun-19	7.6			7.5
Mon-20	7.5			7.5
Tue-21	7.5			7.5
Wed-22	7.6			7.6
Thu-23	7.4			7.6
Fri-24	7.6			7.6
Sat-25	7.6			7.5
Sun-26	7.6			7.6
Mon-27	7.5			7.6
Tue-28	7.5			7.6
Wed-29	7.4			7.6
Thu-30	7.6			7.7
Average	7.5	---	---	7.4
Minimum	7.3	---	---	7.2
Maximum	7.6	---	---	7.7
GeoMean	---	---	---	---
TOTAL	---	---	---	---

DATE	TSS (mg/L) RAW	TSS (mg/L) OUTFALL 30	TSS (mg/L) OUTFALL 20	TSS (mg/L) EPEPS	TSS (mg/L) OUTFALL 10 FEC	TSS (mg/L) OUTFALL 10 FE
Wed-01	352				3.1	3.1
Thu-02	288				3.7	3.7
Fri-03	320				3.9	3.9
Sat-04	297				3.8	3.8
Sun-05	316				3.6	3.6
Mon-06	313				3.2	3.2
Tue-07	368				4.7	4.7
Wed-08	303				3.7	3.7
Thu-09	300				3.3	3.3
Fri-10	307				3.8	3.8
Sat-11	308				2.5	2.5
Sun-12	307				2.6	2.6
Mon-13	312				3.6	3.6
Tue-14	324				3.6	3.6
Wed-15	323				4.9	4.9
Thu-16	304				3.4	3.4
Fri-17	304				3.4	3.4
Sat-18	296				3.6	3.6
Sun-19	310				3.3	3.3
Mon-20	284				3.9	3.9
Tue-21	604				3.2	3.2
Wed-22	308				2.7	2.7
Thu-23	308				3.4	3.4
Fri-24	312				3.0	3.0
Sat-25	284				3.1	3.1
Sun-26	277				3.2	3.2
Mon-27	309				3.1	3.1
Tue-28	360				3.5	3.5
Wed-29	356				4.5	4.5
Thu-30	332				3.2	3.2
Average	322	---	---	---	3.5	3.5
Minimum	277	---	---	---	2.5	2.5
Maximum	604	---	---	---	4.9	4.9
GeoMean	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---

DATE	BOD_5/$cBOD_5$ (mg/L) RAW	BOD_5/$cBOD_5$ (mg/L) OUTFALL 30	BOD_5/$cBOD_5$ (mg/L) OUTFALL 20	BOD_5/$cBOD_5$ (mg/L) EPEPS	BOD_5/$cBOD_5$ (mg/L) OUTFALL 10 FEC	BOD_5/$cBOD_5$ (mg/L) OUTFALL 10 FE
Wed-01	313				2	2
Thu-02	307				2	2
Fri-03	318				3	3
Sat-04	285				2	2
Sun-05	324				2	2
Mon-06	300				3	3
Tue-07	290				3	3
Wed-08	301				3	3
Thu-09	245				2	2
Fri-10	268				2	2
Sat-11	288				2	2
Sun-12	260				2	2
Mon-13	312				3	3
Tue-14	300				2	2
Wed-15	290				2	2
Thu-16	286				3	3
Fri-17	297				2	2
Sat-18	316				3	3
Sun-19	280				2	2
Mon-20	293				2	2
Tue-21	191				2	2
Wed-22	324				2	2
Thu-23	324				2	2
Fri-24	357				2	2
Sat-25	232				< 2	2
Sun-26	331				2	2
Mon-27	295				3	3
Tue-28	311				3	3
Wed-29	303				3	3
Thu-30	320				2	2
Average	296	---	---	---	2.3	2.3
Minimum	191	---	---	---	< 2	2
Maximum	357	---	---	---	3	3
GeoMean	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---

DATE	TP (mg/L) RAW	TP (mg/L) OUTFALL 30	TP (mg/L) OUTFALL 20	TP (mg/L) EPEPS	TP (mg/L) OUTFALL 10 FEC	TP (mg/L) OUTFALL 10 FE
Wed-01	8.56				0.31	0.31
Thu-02	8.39				0.29	0.29
Fri-03	7.52				0.31	0.31
Sat-04	7.77				0.31	0.31
Sun-05	8.10				0.29	0.29
Mon-06	8.02				0.26	0.26
Tue-07	7.54				0.28	0.28
Wed-08	8.72				0.30	0.30
Thu-09	8.77				0.30	0.30
Fri-10	8.96				0.29	0.29
Sat-11	9.65				0.29	0.29
Sun-12	8.66				0.26	0.26
Mon-13	9.11				0.25	0.25
Tue-14	8.62				0.28	0.28
Wed-15	8.93				0.28	0.28
Thu-16	8.30				0.28	0.28
Fri-17	8.92				0.26	0.26
Sat-18	9.07				0.26	0.26
Sun-19	8.40				0.29	0.29
Mon-20	8.16				0.26	0.26
Tue-21	9.68				0.25	0.25
Wed-22	8.29				0.28	0.28
Thu-23	8.39				0.24	0.24
Fri-24	8.21				0.23	0.23
Sat-25	8.42				0.23	0.23
Sun-26	8.94				0.19	0.19
Mon-27	8.66				0.24	0.24
Tue-28	8.90				0.24	0.24
Wed-29	8.53				0.28	0.28
Thu-30	8.86				0.26	0.26
Average	8.37	---	---	---	0.27	0.27
Minimum	3.65	---	---	---	0.19	0.19
Maximum	9.68	---	---	---	0.31	0.31
GeoMean	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---

DATE	NH_3-N (mg/L) RAW	NH_3-N (mg/L) OUTFALL 30	NH_3-N (mg/L) OUTFALL 20	NH_3-N (mg/L) EPEPS	NH_3-N (mg/L) OUTFALL 10 FEC	NH_3-N (mg/L) OUTFALL 10 FE
Wed-01	37.2				0.62	0.62
Thu-02	37.0				0.78	0.78
Fri-03	30.3				0.56	0.56
Sat-04	37.5				0.68	0.68
Sun-05	35.1				1.20	1.20
Mon-06	34.2				1.11	1.11
Tue-07	33.9				1.05	1.05
Wed-08	35.7				1.97	1.97
Thu-09	36.2				2.57	2.57
Fri-10	37.2				1.95	1.95
Sat-11	36.1				1.63	1.63
Sun-12	36.7				1.89	1.89
Mon-13	37.9				1.85	1.85
Tue-14	31.5				1.92	1.92
Wed-15	32.3				0.96	0.96
Thu-16	35.7				1.73	1.73
Fri-17	36.1				1.09	1.09
Sat-18	36.9				1.12	1.12
Sun-19	37.4				2.01	2.01
Mon-20	35.5				2.14	2.14
Tue-21	36.6				1.76	1.76
Wed-22	35.0				1.23	1.23
Thu-23	35.5				1.09	1.09
Fri-24	33.8				1.36	1.36
Sat-25	35.2				1.43	1.43
Sun-26	35.8				2.01	2.01
Mon-27	31.0				1.94	1.94
Tue-28	34.2				0.58	0.58
Wed-29	31.9				1.45	1.45
Thu-30	33.1				1.71	1.71
Average	35.1	---	---	---	1.45	1.45
Minimum	30.3	---	---	---	0.56	0.56
Maximum	37.9	---	---	---	2.57	2.57
GeoMean	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---

DATE	un-ionized NH_3-N (mg/L) OUTFALL 30	un-ionized NH_3-N (mg/L) OUTFALL 20	un-ionized NH_3-N (mg/L) OUTFALL 10
Wed-01			
Thu-02			
Fri-03			
Sat-04			
Sun-05			
Mon-06			
Tue-07			
Wed-08			
Thu-09			
Fri-10			
Sat-11			
Sun-12			
Mon-13			
Tue-14			
Wed-15			
Thu-16			
Fri-17			
Sat-18			
Sun-19			
Mon-20			
Tue-21			
Wed-22			
Thu-23			
Fri-24			
Sat-25			
Sun-26			
Mon-27			
Tue-28			
Wed-29			
Thu-30			
Average	---	---	---
Minimum	---	---	---
Maximum	---	---	---
GeoMean	---	---	---
TOTAL	---	---	---

DATE	TKN (mg/L) RAW	TKN (mg/L) OUTFALL 30	TKN (mg/L) OUTFALL 20	TKN (mg/L) OUTFALL 10 FEC
Wed-01	50.0			1.9
Thu-02	50.2			2.1
Fri-03	43.0			1.7
Sat-04	44.2			1.8
Sun-05	46.3			2.3
Mon-06	45.2			2.2
Tue-07	45.4			2.2
Wed-08	52.8			3.3
Thu-09	52.0			3.8
Fri-10	54.3			3.3
Sat-11	38.3			3.2
Sun-12	50.8			3.1
Mon-13	52.9			3.5
Tue-14	57.3			3.4
Wed-15	51.2			2.4
Thu-16	48.9			2.7
Fri-17	48.4			2.3
Sat-18	51.6			2.4
Sun-19	49.2			2.9
Mon-20	49.3			3.5
Tue-21	60.1			2.8
Wed-22	47.1			2.3
Thu-23	47.6			2.3
Fri-24	55.8			3.1
Sat-25	56.6			2.9
Sun-26	61.1			3.4
Mon-27	56.7			3.4
Tue-28	55.7			2.0
Wed-29	53.0			2.9
Thu-30	54.9			3.1
Average	51.0	---	---	2.7
Minimum	38.3	---	---	1.7
Maximum	61.1	---	---	3.8
GeoMean	---	---	---	---
TOTAL	---	---	---	---

DATE	NO_3+NO_2 (mg/L) RAW	NO_3+NO_2 (mg/L) OUTFALL 30	NO_3+NO_2 (mg/L) OUTFALL 20	NO_3+NO_2 (mg/L) OUTFALL 10 FEC
Wed-01	< 0.01			11.3
Thu-02				11.4
Fri-03				12.6
Sat-04				9.75
Sun-05				9.95
Mon-06				9.92
Tue-07				9.89
Wed-08	< 0.01			10.4
Thu-09				10.1
Fri-10				11.4
Sat-11				11.4
Sun-12				11.4
Mon-13				11.4
Tue-14				10.6
Wed-15	< 0.01			9.22
Thu-16				8.62
Fri-17				9.20
Sat-18				9.16
Sun-19				10.3
Mon-20				9.19
Tue-21				7.43
Wed-22	< 0.01			7.98
Thu-23				8.04
Fri-24				8.51
Sat-25				8.55
Sun-26				8.50
Mon-27				7.52
Tue-28				7.30
Wed-29	< 0.01			6.38
Thu-30				7.23
Average	0.01	---	---	9.49
Minimum	< 0.01	---	---	6.38
Maximum	0.01	---	---	12.6
GeoMean	---	---	---	---
TOTAL	---	---	---	---

DATE	Chloride (mg/L) RAW	Chloride (mg/L) OUTFALL 30	Chloride (mg/L) OUTFALL 20	Chloride (mg/L) OUTFALL 10 FEC
Wed-01	87.9			95.8
Thu-02	82.1			93.3
Fri-03	79.3			90.7
Sat-04	83.4			89.0
Sun-05	81.3			82.6
Mon-06	86.0			78.8
Tue-07	85.8			88.9
Wed-08	86.1			88.1
Thu-09	85.8			91.2
Fri-10	80.4			88.2
Sat-11	80.2			89.8
Sun-12	73.9			82.5
Mon-13	82.5			80.5
Tue-14	88.1			85.1
Wed-15	84.2			88.3
Thu-16	90.1			87.7
Fri-17	83.5			89.5
Sat-18	79.9			87.6
Sun-19	78.4			83.0
Mon-20	87.1			84.8
Tue-21	87.4			91.3
Wed-22	84.1			90.0
Thu-23	83.9			89.0
Fri-24	87.0			87.6
Sat-25	76.4			89.5
Sun-26	73.3			87.3
Mon-27	87.5			79.7
Tue-28	81.7			90.5
Wed-29	91.8			91.7
Thu-30	85.4			91.1
Average	83.4	---	---	87.8
Minimum	73.3	---	---	78.8
Maximum	91.8	---	---	95.8
GeoMean	---	---	---	---
TOTAL	---	---	---	---

DATE	*E. coli* (Counts/100 mL) RAW	*E. coli* (Counts/100 mL) OUTFALL 30	*E. coli* (Counts/100 mL) OUTFALL 20	*E. coli* (Counts/100 mL) OUTFALL 10 FEC
	X10^6	X10^6	X10^6	
Wed-01				10
Thu-02				7
Fri-03				4
Sat-04				6
Sun-05				13
Mon-06				4
Tue-07				5
Wed-08	2.8			6
Thu-09				8
Fri-10				4
Sat-11				4
Sun-12				2
Mon-13				4
Tue-14				5
Wed-15				5
Thu-16				1
Fri-17				4
Sat-18				5
Sun-19				4
Mon-20				3
Tue-21	6.6			13
Wed-22				5
Thu-23				5
Fri-24				4
Sat-25				5
Sun-26				10
Mon-27				10
Tue-28				4
Wed-29				10
Thu-30				5
Average		---	---	---
Minimum		---	---	1
Maximum		---	---	13
GeoMean		---	---	5.1
TOTAL		---	---	---

* Contact Laboratory for information about the quality assurance associated with the results

Enhanced Primary Treatment (EPT) Usage					
Total Bypass (hr)	EPT Usage (hr)	% Usage	Total Bypass YTD (hr)	EPT Usage YTD (hr)	% Usage YTD
0	0	100%	486	486	100%

Report Comments

AEP Ref #

RAW	Untreated Influent into the plant
INF	Untreated wastewater from collection system
INFs	Influent, screened at the Headworks Diversion Structure
PE	Primary Effluent from conventional primaries
PE 30	Primary Effluent from conventional primaries discharged via Outfall 30
EPT	Enhanced Primary Treatment
EPE	Enhanced Primary Effluent
EPEPS	Enhanced Primary Effluent Pump Station
FE	Final Effluent from secondary treatment process (with biological nutrient removal). Pre-Ultraviolet disinfection.
FEC	Combined post-UV disinfection (FE+EPEPS)
OUTFALL 10	UV-disinfected, discharged via OUTFALL 10
OUTFALL 20	Combined Bypass (RAW + PE + EPE)
OUTFALL 30	Combined Bypass (INF + INFS + PE30 + EPE)
MPW	Membrane Product Water (Effluent re-use water)
ML	Megalitre (1,000,000 Litre)
MPN	Most Probable Number
NR	No Result
NS	No Sample
INS	Insufficient Sample
AEP	Alberta Environment & Parks

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Senior Manager, WWTP Operations

Jeff Charrois PhD
Senior Manager, Analytical Operations

Appendix A - Monthly Plant Performance Reports

PROVIDING MORE EPCOR

Gold Bar Wastewater Treatment Plant
Plant Performance Report
December 2023

Digested Sludge: Total Monthly Volume (ML)	72.7

Volume of Flow (ML) / Liquid Stream Quality

DATE	Peak Flow (MLD)	Influent INFs	Influent RAW	Effluent Non UV Disinfected OUTFALL 30	Effluent Non UV Disinfected OUTFALL 20	Effluent Non UV Disinfected MPW	Effluent UV Disinfected EPEPS	Effluent UV Disinfected OUTFALL 10 FEC	Effluent UV Disinfected OUTFALL 10 FE	pH@25°C RAW	pH@25°C OUTFALL 30	pH@25°C OUTFALL 20	pH@25°C OUTFALL 10 FEC	TSS (mg/L) RAW	TSS (mg/L) OUTFALL 30	TSS (mg/L) OUTFALL 20	TSS (mg/L) EPEPS	TSS (mg/L) OUTFALL 10 FEC	TSS (mg/L) OUTFALL 10 FE
Fri-01	348.8	0.0	269.8	0.0	0.0	10.9	0.0	258.9	258.9	7.5			7.6	328				3.5	3.5
Sat-02	348.7	0.0	267.6	0.0	0.0	10.9	0.0	256.7	256.7	7.5			7.6	324				3.7	3.7
Sun-03	355.6	0.0	269.9	0.0	0.0	10.9	0.0	259.0	259.0	7.5			7.6	360				4.0	4.0
Mon-04	342.0	0.0	267.6	0.0	0.0	10.8	0.0	256.8	256.8	7.4			7.5	340				4.2	4.2
Tue-05	380.1	0.0	264.4	0.0	0.0	10.7	0.0	253.7	253.7	7.5			7.5	360				5.9	5.9
Wed-06	359.6	0.0	264.7	0.0	0.0	11.0	0.0	253.7	253.7	7.4			7.5	348				4.1	4.1
Thu-07	373.2	0.0	277.1	0.0	0.0	10.8	0.0	266.3	266.3	7.5			7.5	292				6.4	6.4
Fri-08	343.7	0.0	270.7	0.0	0.0	11.0	0.0	259.7	259.7	7.6			7.6	264				7.5	7.5
Sat-09	351.2	0.0	268.0	0.0	0.0	10.9	0.0	257.1	257.1	7.5			7.6	297				5.4	5.4
Sun-10	403.6	0.0	268.6	0.0	0.0	10.9	0.0	257.7	257.7	7.5			7.7	352				6.8	6.8
Mon-11	412.6	0.0	270.3	0.0	0.0	10.9	0.0	259.4	259.4	7.5			7.6	296				5.8	5.8
Tue-12	369.0	0.0	270.4	0.0	0.0	10.9	0.0	259.5	259.5	7.5			7.5	231				3.9	3.9
Wed-13	363.7	0.0	274.7	0.0	0.0	10.9	0.0	263.8	263.8	7.5			7.6	304				5.6	5.6
Thu-14	362.1	0.0	266.3	0.0	0.0	10.8	0.0	255.5	255.5	7.5			7.6	304				5.1	5.1
Fri-15	368.2	0.0	268.9	0.0	0.0	10.9	0.0	258.0	258.0	7.6			7.5	272				4.9	4.9
Sat-16	365.6	0.0	265.4	0.0	0.0	11.0	0.0	254.4	254.4	7.5			7.6	284				4.6	4.6
Sun-17	358.1	0.0	267.5	0.0	0.0	10.7	0.0	256.8	256.8	7.5			7.5	297				4.3	4.3
Mon-18	345.3	0.0	269.4	0.0	0.0	10.9	0.0	258.5	258.5	7.4			7.6	320				5.2	5.2
Tue-19	348.2	0.0	264.9	0.0	0.0	10.7	0.0	254.2	254.2	7.4			7.6	328				4.4	4.4
Wed-20	312.8	0.0	269.0	0.0	0.0	10.9	0.0	258.1	258.1	7.5			7.5	286				3.5	3.5
Thu-21	316.7	0.0	269.2	0.0	0.0	10.9	0.0	258.3	258.3	7.5			7.5	320				3.4	3.4
Fri-22	328.9	0.0	272.4	0.0	0.0	10.9	0.0	261.5	261.5	7.4			7.5	276				4.0	4.0
Sat-23	359.4	0.0	267.1	0.0	0.0	10.8	0.0	256.3	256.3	7.4			7.5	304				3.5	3.5
Sun-24	362.5	0.0	266.7	0.0	0.0	10.8	0.0	255.9	255.9	7.5			7.5	264				3.9	3.9
Mon-25	311.5	0.0	245.7	0.0	0.0	10.9	0.0	234.8	234.8	7.4			7.6	332				3.8	3.8
Tue-26	325.5	0.0	247.3	0.0	0.0	10.9	0.0	236.4	236.4	7.5			7.5	372				4.7	4.7
Wed-27	352.1	0.0	262.8	0.0	0.0	10.6	0.0	252.2	252.2	7.5			7.5	352				5.1	5.1
Thu-28	316.5	0.0	264.3	0.0	0.0	10.9	0.0	253.4	253.4	7.6			7.5	324				4.7	4.7
Fri-29	327.2	0.0	264.9	0.0	0.0	11.6	0.0	253.3	253.3	7.5			7.5	288				3.8	3.8
Sat-30	360.1	0.0	259.8	0.0	0.0	10.9	0.0	248.9	248.9	7.4			7.5	297				3.8	3.8
Sun-31	440.6	0.0	262.1	0.0	0.0	11.0	0.0	251.1	251.1	7.5			7.5	314				4.3	4.3
Average	355.3	0.0	266.4	0.0	0.0	10.9	0.0	255.5	255.5	7.5	---	---	7.5	311	---	---	---	4.6	4.6
Minimum	311.5	0.0	245.7	0.0	0.0	10.6	0.0	234.8	234.8	7.4	---	---	7.5	231	---	---	---	3.4	3.4
Maximum	440.6	0.0	277.1	0.0	0.0	11.6	0.0	266.3	266.3	7.6	---	---	7.7	372	---	---	---	7.5	7.5
GeoMean	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL	---	0	8,258	0	0	338	0	7,920	7,920	---	---	---	---	---	---	---	---	---	---

DATE	BOD_5/$cBOD_5$ (mg/L) RAW BOD_5	OUTFALL 30 BOD_5	OUTFALL 20 BOD_5	EPEPS BOD_5	OUTFALL 10 FEC $cBOD_5$	OUTFALL 10 FE $cBOD_5$	TP (mg/L) RAW	TP OUTFALL 30	TP OUTFALL 20	TP EPEPS	TP OUTFALL 10 FEC	TP OUTFALL 10 FE	NH3-N (mg/L) RAW	NH3-N OUTFALL 30	NH3-N OUTFALL 20	NH3-N EPEPS	NH3-N OUTFALL 10 FEC	NH3-N OUTFALL 10 FE
Fri-01	354				3	3	8.70				0.30	0.30	33.5				1.36	1.36
Sat-02	306				3	3	7.94				0.25	0.25	34.3				1.86	1.86
Sun-03	355				3	3	7.38				0.26	0.26	32.7				1.83	1.83
Mon-04	249				3	3	7.22				0.29	0.29	37.7				1.48	1.48
Tue-05	314				3	3	7.82				0.37	0.37	38.3				0.96	0.96
Wed-06	316				3	3	7.57				0.34	0.34	40.3				1.66	1.66
Thu-07	321				3	3	7.14				0.36	0.36	39.5				1.64	1.64
Fri-08	350				4	4	7.37				0.40	0.40	41.0				1.64	1.64
Sat-09	324				3	3	7.84				0.38	0.38	40.3				2.13	2.13
Sun-10	327				3	3	7.92				0.36	0.36	41.4				2.55	2.55
Mon-11	324				4	4	7.83				0.32	0.32	34.6				1.90	1.90
Tue-12	251				4	4	7.04				0.41	0.41	40.5				1.63	1.63
Wed-13	268				3	3	7.29				0.36	0.36	39.6				1.76	1.76
Thu-14	348				3	3	7.97				0.24	0.24	38.4				1.73	1.73
Fri-15	322				3	3	8.19				0.30	0.30	40.3				2.12	2.12
Sat-16	350				3	3	7.94				0.33	0.33	38.1				2.07	2.07
Sun-17	312				3	3	8.17				0.32	0.32	40.0				1.68	1.68
Mon-18	321				3	3	8.60				0.26	0.26	38.1				2.08	2.08
Tue-19	358				3	3	8.50				0.28	0.28	38.2				1.94	1.94
Wed-20	321				3	3	8.82				0.31	0.31	38.4				3.85	3.85
Thu-21	339				3	3	8.82				0.29	0.29	37.6				3.93	3.93
Fri-22	320				2	2	9.00				0.30	0.30	39.6				4.65	4.65
Sat-23	324				3	3	8.71				0.32	0.32	39.9				4.92	4.92
Sun-24	339				3	3	8.25				0.26	0.26	39.9				5.36	5.36
Mon-25	357				3	3	8.27				0.26	0.26	43.9				5.02	5.02
Tue-26	358				3	3	9.02				0.27	0.27	45.5				5.73	5.73
Wed-27	324				3	3	9.02				0.30	0.30	42.4				5.88	5.88
Thu-28	272				3	3	8.30				0.29	0.29	31.7				4.23	4.23
Fri-29	337				3	3	8.41				0.34	0.34	32.1				3.76	3.76
Sat-30	330				3	3	8.69				0.32	0.32	32.7				3.72	3.72
Sun-31	342				3	3	8.30				0.31	0.31	41.5				4.44	4.44
Average	324	---	---	---	3.1	3.1	8.13	---	---	---	0.31	0.31	38.5	---	---	---	2.89	2.89
Minimum	249	---	---	---	2	2	7.04	---	---	---	0.24	0.24	31.7	---	---	---	0.96	0.96
Maximum	358	---	---	---	4	4	9.02	---	---	---	0.41	0.41	45.5	---	---	---	5.88	5.88
GeoMean	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

DATE	un-ionized NH3-N (mg/L) OUT-FAL 30	un-ionized OUT-FAL 20	un-ionized OUT-FAL 10	TKN (mg/L) RAW	TKN OUTFALL 30	TKN OUTFALL 20	TKN OUTFALL 10 FEC	NO_2+NO_3 (mg/L) RAW	NO_2+NO_3 OUTFALL 30	NO_2+NO_3 OUTFALL 20	NO_2+NO_3 OUTFALL 10 FEC	Chloride (mg/L) RAW	Chloride OUTFALL 30	Chloride OUTFALL 20	Chloride OUTFALL 10 FEC	*E. coli* (Counts/100 mL) RAW X10^6	*E. coli* OUTFALL 30 X10^6	*E. coli* OUTFALL 20 X10^6	*E. coli* OUTFALL 10 FEC
Fri-01				55.2			2.90				7.4	79.9			89.5				5
Sat-02				46.2			3.00				7.2	81.9			95.2				8
Sun-03				44.7			2.80				7.6	79.3			85.9				8
Mon-04				42.5			2.50				6.7	92.2			82.4				7
Tue-05				45.3			2.10				6.6	92.0			105				9
Wed-06				48.5			2.90	< 0.01			6.6	88.0			110				17
Thu-07				53.4			3.00				7.3	213			156				9
Fri-08				49.1			3.30				6.4	95.0			190				12
Sat-09				46.5			3.20				6.9	89.2			116				12
Sun-10				54.3			3.40				7.6	89.0			96.4				8
Mon-11				53.3			3.50				7.2	94.4			93.0				5
Tue-12				48.9			2.90				7.6	90.9			103				9
Wed-13				44.7			2.80	< 0.01			7.6	92.6			103				7
Thu-14				55.8			2.90				6.6	97.9			105	2.0			8
Fri-15				54.2			3.40				7.0	92.5			104				13
Sat-16				53.1			3.30				7.9	103			98.9				9
Sun-17				55.3			3.20				7.5	94.7			120				12
Mon-18				53.3			3.50				7.3	95.5			103				8
Tue-19				56.9			3.50				7.4	97.6			101	2.8			8
Wed-20				54.4			5.10	0.01			9.4	92.3			101				12
Thu-21				56.0			5.60				10.2	101			105				13
Fri-22				53.2			5.60				10.8	94.0			104				12
Sat-23				54.8			5.70				10.2	89.5			102				15
Sun-24				51.9			6.10				10.3	85.1			92.1				9
Mon-25				53.4			5.60				11.3	75.3			87.2				10
Tue-26				59.9			6.50				12.5	83.5			82.2				13
Wed-27				52.2			6.40	< 0.01			12.1	81.9			81.0				14
Thu-28				54.0			5.80				11.2	83.3			87.0				28
Fri-29				53.0			5.10				11.4	84.0			88.3				12
Sat-30				51.0			5.00				10.2	76.8			89.6				12
Sun-31				53.0			4.90				10.7	73.0			81.6				15
Average	---	---	---	51.9	---	---	4.0	0.01	---	---	8.60	92.8	---	---	102		---	---	
Minimum	---	---	---	42.5	---	---	2.10	< 0.01	---	---	6.38	73.0	---	---	81.0	2.0	---	---	5
Maximum	---	---	---	59.9	---	---	6.50	0.01	---	---	12.5	213	---	---	190	2.8	---	---	28
GeoMean	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2.4	---	---	10.3
TOTAL	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

* Contact Laboratory for information about the quality assurance associated with the results

Enhanced Primary Treatment (EPT) Usage					
Total Bypass (hr)	EPT Usage (hr)	% Usage	Total Bypass YTD (hr)	EPT Usage YTD (hr)	% Usage YTD
0	0	100%	486	486	100%

Report Comments

AEP Ref #

RAW	Untreated Influent into the plant	FEC	Combined post-UV disinfection (FE+EPEPS)
INF	Untreated wastewater from collection system	OUTFALL 10	UV-disinfected, discharged via OUTFALL 10
INFs	Influent, screened at the Headworks Diversion Structure	OUTFALL 20	Combined Bypass (RAW + PE + EPE)
PE	Primary Effluent from conventional primaries	OUTFALL 30	Combined Bypass (INF + INFS + PE30 + EPE)
PE 30	Primary Effluent from conventional primaries discharged via Outfall 30	MPW	Membrane Product Water (Effluent re-use water)
EPT	Enhanced Primary Treatment	ML	Megalitre (1,000,000 Litre)
EPE	Enhanced Primary Effluent	MPN	Most Probable Number
EPEPS	Enhanced Primary Effluent Pump Station	NR	No Result
FE	Final Effluent from secondary treatment process (with biological nutrient removal). Pre-Ultraviolet disinfection.	NS	No Sample
		INS	Insufficient Sample
		AEP	Alberta Environment & Parks

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Senior Manager, Analytical Operations

Appendix B – WWTP Chemicals

2023 Secondary Alum Usage (kg)

	January	February	March	April	May	June	July	August	September	October	November	December
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	129	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	2	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	672	0	0	0	0	0	0	0	0
11	0	0	0	3905	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	117	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0
29	0		0	0	0	0	0	0	0	0	0	0
30	0		0	0	0	0	0	0	0	0	0	0
31	0		0		0		0	0		0		0
Total (kg)	**0**	**0**	**0**	**4,709**	**0**	**0**	**0**	**0**	**117**	**0**	**0**	**0**

2023 EPT Alum Usage (kg)

	January	February	March	April	May	June	July	August	September	October	November	December
1	0	0	0	0	0	1764	6824	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	2368	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	2682	0	0	0
6	0	0	0	0	0	0	0	0	1124	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	16725	0	0	7331	0	0	0	0
9	0	0	0	0	963	0	0	5435	0	0	0	0
10	0	0	0	0	0	0	1128	1885	0	0	0	0
11	0	0	0	13520	4834	0	0	0	0	0	0	0
12	0	0	0	1706	1018	0	0	0	0	0	0	0
13	0	0	0	0	0	6799	0	0	0	0	0	0
14	0	0	0	0	0	6506	0	0	0	0	0	0
15	0	0	200	0	0	13032	0	0	0	0	0	0
16	0	0	2655	0	0	3413	7254	0	0	0	0	0
17	0	0	6086	5248	0	4665	789	1866	0	0	0	0
18	0	0	4149	773	0	8005	12362	12872	0	0	0	0
19	0	0	5749	0	0	11998	871	2097	0	0	0	0
20	0	0	6030	0	0	12951	0	0	0	0	0	0
21	0	0	5167	0	0	11785	0	0	0	0	0	0
22	0	0	7408	0	0	4510	0	0	0	0	0	0
23	0	0	7411	0	948	1330	0	4739	0	0	0	0
24	0	0	5297	0	0	0	14549	817	0	0	0	0
25	0	0	2385	0	0	0	869	0	0	0	0	0
26	10278	0	0	1766	0	0	7416	0	0	0	0	0
27	875	0	0	4	0	0	3178	0	0	0	0	0
28	0	0	0	0	0	2920	2038	0	96	0	0	0
29	0		0	0	967	0	0	0	1147	0	0	0
30	0		0	0	901	0	1277	0	0	0	0	0
31	0		0		1999		2797	0		0		0
Total (kg)	**11,153**	**0**	**52,536**	**23,017**	**28,356**	**89,678**	**63,720**	**37,042**	**5,050**	**0**	**0**	**0**

2023 EPT Polymer Usage (kg)

	January	February	March	April	May	June	July	August	September	October	November	December
1	0	0	0	0	0	5	18	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	7	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	9	0	0	0
6	0	0	0	0	0	0	0	0	3	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	24	0	0	27	0	0	0	0
9	0	0	0	0	3	0	0	24	0	0	0	0
10	0	0	0	0	0	0	3	7	0	0	0	0
11	0	0	0	22	12	0	0	0	0	0	0	0
12	0	0	0	4	6	0	0	0	0	0	0	0
13	0	0	0	0	0	16	0	0	0	0	0	0
14	0	0	0	0	0	26	0	0	0	0	0	0
15	0	0	0	0	0	80	0	0	0	0	0	0
16	0	0	5	0	0	11	19	0	0	0	0	0
17	0	0	13	9	0	17	4	6	0	0	0	0
18	0	0	11	2	0	55	67	72	0	0	0	0
19	0	0	16	0	0	76	2	7	0	0	0	0
20	0	0	15	0	0	63	0	0	0	0	0	0
21	0	0	15	0	0	41	0	0	0	0	0	0
22	0	0	19	0	0	14	0	0	0	0	0	0
23	0	0	20	0	6	4	0	20	0	0	0	0
24	0	0	14	0	0	0	50	2	0	0	0	0
25	0	0	7	0	0	0	2	0	0	0	0	0
26	19	0	0	4	0	0	30	0	0	0	0	0
27	2	0	0	0	0	0	10	0	0	0	0	0
28	0	0	0	0	0	6	7	0	0	0	0	0
29	0		0	0	7	0	0	0	4	0	0	0
30	0		0	0	9	0	4	0	0	0	0	0
31	0		0		20		9	0		0		0
Total (kg)	**21**	**0**	**134**	**42**	**87**	**414**	**232**	**166**	**16**	**0**	**0**	**0**

2023 DAF Polymer Usage (kg)

	January	February	March	April	May	June	July	August	September	October	November	December
1	31	35	30	29	28	35	46	30	34	26	35	36
2	31	34	28	29	31	38	47	34	31	26	34	35
3	31	34	30	29	35	41	46	34	31	26	36	33
4	32	34	31	27	53	37	47	31	33	25	38	34
5	32	37	33	30	57	36	47	31	32	25	40	35
6	31	37	30	29	84	32	46	31	33	28	38	35
7	32	36	29	27	43	31	45	34	32	29	37	36
8	31	36	28	27	42	33	43	31	31	27	33	35
9	31	33	30	27	39	38	43	27	30	25	27	31
10	32	33	30	36	42	39	40	26	31	28	29	35
11	31	34	32	46	42	40	41	30	35	27	31	36
12	31	32	35	49	48	39	38	29	41	28	36	32
13	30	33	36	43	49	35	42	36	47	26	37	31
14	31	35	38	41	39	36	37	26	32	23	38	30
15	31	27	37	45	38	32	38	26	33	31	36	30
16	32	35	41	44	37	35	33	24	37	32	38	30
17	31	30	43	42	33	37	33	27	36	35	38	31
18	34	29	39	42	31	36	27	27	37	35	39	29
19	35	37	36	41	33	31	31	26	35	37	38	29
20	34	36	33	37	39	25	32	28	35	36	38	30
21	32	34	31	47	39	23	34	29	34	37	38	31
22	34	35	35	42	33	25	36	31	36	36	39	33
23	33	35	31	43	31	26	37	30	35	37	37	37
24	32	32	31	41	35	27	34	29	35	37	37	37
25	33	31	36	34	34	28	33	31	34	35	37	37
26	29	32	46	34	35	28	32	28	32	38	37	37
27	25	31	37	34	35	36	29	25	31	36	37	39
28	28	30	26	33	36	40	26	27	31	33	36	40
29	31		27	33	38	44	28	34	31	36	36	39
30	36		32	34	36	46	29	37	31	36	36	40
31	37		30		36		29	35		34		44
Total (kg)	**985**	**937**	**1,030**	**1,095**	**1,231**	**1,029**	**1,149**	**924**	**1,016**	**970**	**1,086**	**1,067**

2023 Membrane Bleach Usage (L as delivered 16% sodium hypochlorite solution)

	January	February	March	April	May	June	July	August	September	October	November	December
1	212	352	387	344	361	524	586	563	742	528	581	529
2	290	317	319	370	314	620	599	523	645	410	729	531
3	274	232	355	440	355	582	580	589	612	447	580	409
4	351	436	382	379	296	606	598	657	553	262	622	472
5	498	327	288	552	372	670	645	609	622	465	566	527
6	764	217	333	399	413	520	540	576	558	675	584	462
7	492	340	411	282	420	514	633	595	577	700	528	435
8	578	345	286	354	492	570	660	544	555	746	483	542
9	547	293	315	427	570	605	604	488	562	714	396	496
10	530	435	375	292	456	569	644	493	512	424	521	466
11	627	410	293	325	440	556	696	489	572	678	622	483
12	708	311	396	466	325	471	618	567	554	658	530	538
13	488	439	434	232	346	527	585	666	620	672	634	548
14	591	437	368	285	738	574	572	564	610	529	590	481
15	539	317	392	363	412	421	588	630	714	651	633	514
16	724	363	495	277	502	434	503	644	702	630	422	582
17	673	409	346	300	742	571	479	540	597	685	537	485
18	691	255	349	419	836	601	558	471	642	671	546	511
19	560	391	445	249	713	383	609	434	552	601	503	455
20	483	442	395	400	778	506	690	469	644	595	661	330
21	526	430	375	490	702	426	710	523	609	574	771	236
22	396	407	379	317	578	511	615	126	627	582	817	317
23	334	506	303	333	592	650	685	125	627	570	573	314
24	416	418	381	484	700	576	474	564	608	577	374	304
25	304	395	430	375	476	596	532	625	645	522	431	307
26	425	477	378	380	404	703	603	558	697	422	478	341
27	412	323	386	278	525	621	540	564	703	413	281	294
28	268	383	430	258	504	674	539	664	649	389	407	348
29	307		285	219	560	654	548	686	591	380	416	304
30	403		359	295	607	581	506	710	667	480	460	296
31	251		467		542		464	777		528		325
Total (L)	**14,659**	**10,407**	**11,539**	**10,586**	**16,073**	**16,817**	**18,201**	**17,031**	**18,567**	**17,181**	**16,275**	**13,181**

2023 Ostara Magnesium Chloride Usage (L as delivered 30% magnesium chloride solution)

	January	February	March	April	May	June	July	August	September	October	November	December
1	0	0	0	0	2191	6897	6203	5785	6743	0	0	0
2	0	0	0	0	4138	3689	5969	5221	6558	0	0	0
3	0	0	0	0	4386	0	5574	6485	6444	0	0	0
4	0	0	0	0	4236	116	5012	6417	6608	0	0	0
5	0	0	0	0	3636	3289	2464	6396	6238	0	0	0
6	0	0	0	0	4160	3746	4210	6394	6273	0	0	0
7	0	0	0	0	3925	429	4788	6222	8188	0	0	0
8	0	0	0	0	4593	0	5392	5897	5227	0	0	0
9	0	0	0	0	4605	0	5815	6353	6329	0	0	0
10	0	0	0	0	4574	0	5143	6406	6552	0	0	0
11	0	0	0	0	4125	0	6635	6344	6687	0	0	0
12	0	0	0	0	5345	93	5888	6274	5873	0	0	0
13	0	0	0	0	5145	1205	4969	6327	6351	0	0	0
14	0	0	0	0	5101	3937	7424	6295	6177	0	0	0
15	0	0	0	0	5166	4955	6639	6030	6455	0	0	0
16	0	0	0	0	5269	5565	6806	6274	6131	0	0	0
17	0	0	0	0	4618	5855	6657	6429	6061	0	0	0
18	0	0	0	0	5974	5880	6063	5989	2392	0	0	0
19	0	0	0	0	5671	5923	5648	6440	3520	0	0	0
20	0	0	0	0	5188	6268	6483	6340	1721	0	0	0
21	0	0	0	0	5366	4861	6351	6292	-3886	0	0	0
22	0	0	0	0	2796	6376	6272	6202	-3886	0	0	0
23	0	0	0	0	3058	6695	6253	6113	-3125	0	0	0
24	0	0	0	0	5191	6328	6274	6062	5932	0	0	0
25	0	0	0	0	6200	6137	6101	5771	6499	0	0	0
26	0	0	0	0	6234	6368	4780	5457	6185	0	0	0
27	0	0	0	0	5478	6409	4851	4744	2681	0	0	0
28	0	0	0	0	5483	6563	6260	6227	0	0	0	0
29	0		0	0	5148	6068	6019	6126	0	0	0	0
30	0		0	0	6321	6400	5973	5791	0	0	0	0
31	0		0		6444		6201	6386		0		0
Total (L)	**0**	**0**	**0**	**0**	**149,765**	**120,054**	**179,117**	**189,489**	**126,928**	**0**	**0**	**0**

2023 Ostara Caustic Usage (kg)

	January	February	March	April	May	June	July	August	September	October	November	December
1	0	0	0	0	887	872	528	568	839	0	0	0
2	0	0	0	0	1686	301	644	820	835	0	0	0
3	0	0	0	0	1955	0	570	927	744	0	0	0
4	0	0	0	0	1774	58	426	979	794	0	0	0
5	0	0	0	0	1515	403	142	902	676	0	0	0
6	0	0	0	0	1265	527	275	996	868	0	0	0
7	0	0	0	0	1071	43	181	780	827	0	0	0
8	0	0	0	0	1024	0	523	802	794	0	0	0
9	0	0	0	0	1080	0	498	948	844	0	0	0
10	0	0	0	0	880	0	569	858	837	0	0	0
11	0	0	0	0	869	0	740	835	854	0	0	0
12	0	0	0	0	1207	65	898	866	646	0	0	0
13	0	0	0	0	1224	59	891	933	864	0	0	0
14	0	0	0	0	1201	241	849	740	672	0	0	0
15	0	0	0	0	1247	329	802	662	717	0	0	0
16	0	0	0	0	1208	522	786	879	748	0	0	0
17	0	0	0	0	1385	624	729	906	706	0	0	0
18	0	0	0	0	1216	567	724	788	402	0	0	0
19	0	0	0	0	946	518	673	844	153	0	0	0
20	0	0	0	0	872	634	719	798	568	0	0	0
21	0	0	0	0	922	410	688	725	781	0	0	0
22	0	0	0	0	450	555	770	784	781	0	0	0
23	0	0	0	0	529	441	632	838	762	0	0	0
24	0	0	0	0	976	441	762	787	852	0	0	0
25	0	0	0	0	1093	278	607	668	968	0	0	0
26	0	0	0	0	956	561	632	755	987	0	0	0
27	0	0	0	0	799	616	681	648	452	0	0	0
28	0	0	0	0	760	617	515	742	0	0	0	0
29	0		0	0	729	740	637	789	0	0	0	0
30	0		0	0	938	680	688	729	0	0	0	0
31	0		0		928		702	720		0		0
Total (kg)	**0**	**0**	**0**	**0**	**33,590**	**11,100**	**19,479**	**25,015**	**19,971**	**0**	**0**	**0**

2023 Ostara Magnesium Chloride Usage (L as delivered 30% magnesium chloride solution)

	January	February	March	April	May	June	July	August	September	October	November	December
1	0	0	0	0	2191	6897	6203	5785	6743	0	0	0
2	0	0	0	0	4138	3689	5969	5221	6558	0	0	0
3	0	0	0	0	4386	0	5574	6485	6444	0	0	0
4	0	0	0	0	4236	116	5012	6417	6608	0	0	0
5	0	0	0	0	3636	3289	2464	6396	6238	0	0	0
6	0	0	0	0	4160	3746	4210	6394	6273	0	0	0
7	0	0	0	0	3925	429	4788	6222	8188	0	0	0
8	0	0	0	0	4593	0	5392	5897	5227	0	0	0
9	0	0	0	0	4605	0	5815	6353	6329	0	0	0
10	0	0	0	0	4574	0	5143	6406	6552	0	0	0
11	0	0	0	0	4125	0	6635	6344	6687	0	0	0
12	0	0	0	0	5345	93	5888	6274	5873	0	0	0
13	0	0	0	0	5145	1205	4969	6327	6351	0	0	0
14	0	0	0	0	5101	3937	7424	6295	6177	0	0	0
15	0	0	0	0	5166	4955	6639	6030	6455	0	0	0
16	0	0	0	0	5269	5565	6806	6274	6131	0	0	0
17	0	0	0	0	4618	5855	6657	6429	6061	0	0	0
18	0	0	0	0	5974	5880	6063	5989	2392	0	0	0
19	0	0	0	0	5671	5923	5648	6440	3520	0	0	0
20	0	0	0	0	5188	6268	6483	6340	1721	0	0	0
21	0	0	0	0	5366	4861	6351	6292	-3886	0	0	0
22	0	0	0	0	2796	6376	6272	6202	-3886	0	0	0
23	0	0	0	0	3058	6695	6253	6113	-3125	0	0	0
24	0	0	0	0	5191	6328	6274	6062	5932	0	0	0
25	0	0	0	0	6200	6137	6101	5771	6499	0	0	0
26	0	0	0	0	6234	6368	4780	5457	6185	0	0	0
27	0	0	0	0	5478	6409	4851	4744	2681	0	0	0
28	0	0	0	0	5483	6563	6260	6227	0	0	0	0
29	0		0	0	5148	6068	6019	6126	0	0	0	0
30	0		0	0	6321	6400	5973	5791	0	0	0	0
31	0		0		6444		6201	6386		0		0
Total (L)	**0**	**0**	**0**	**0**	**149,765**	**120,054**	**179,117**	**189,489**	**126,928**	**0**	**0**	**0**

2023 Ostara Caustic Usage (kg)

	January	February	March	April	May	June	July	August	September	October	November	December
1	0	0	0	0	887	872	528	568	839	0	0	0
2	0	0	0	0	1686	301	644	820	835	0	0	0
3	0	0	0	0	1955	0	570	927	744	0	0	0
4	0	0	0	0	1774	58	426	979	794	0	0	0
5	0	0	0	0	1515	403	142	902	676	0	0	0
6	0	0	0	0	1265	527	275	996	868	0	0	0
7	0	0	0	0	1071	43	181	780	827	0	0	0
8	0	0	0	0	1024	0	523	802	794	0	0	0
9	0	0	0	0	1080	0	498	948	844	0	0	0
10	0	0	0	0	880	0	569	858	837	0	0	0
11	0	0	0	0	869	0	740	835	854	0	0	0
12	0	0	0	0	1207	65	898	866	646	0	0	0
13	0	0	0	0	1224	59	891	933	864	0	0	0
14	0	0	0	0	1201	241	849	740	672	0	0	0
15	0	0	0	0	1247	329	802	662	717	0	0	0
16	0	0	0	0	1208	522	786	879	748	0	0	0
17	0	0	0	0	1385	624	729	906	706	0	0	0
18	0	0	0	0	1216	567	724	788	402	0	0	0
19	0	0	0	0	946	518	673	844	153	0	0	0
20	0	0	0	0	872	634	719	798	568	0	0	0
21	0	0	0	0	922	410	688	725	781	0	0	0
22	0	0	0	0	450	555	770	784	781	0	0	0
23	0	0	0	0	529	441	632	838	762	0	0	0
24	0	0	0	0	976	441	762	787	852	0	0	0
25	0	0	0	0	1093	278	607	668	968	0	0	0
26	0	0	0	0	956	561	632	755	987	0	0	0
27	0	0	0	0	799	616	681	648	452	0	0	0
28	0	0	0	0	760	617	515	742	0	0	0	0
29	0		0	0	729	740	637	789	0	0	0	0
30	0		0	0	938	680	688	729	0	0	0	0
31	0		0		928		702	720		0		0
Total (kg)	**0**	**0**	**0**	**0**	**33,590**	**11,100**	**19,479**	**25,015**	**19,971**	**0**	**0**	**0**

Appendix C – Operations Monthly Reports

Gold Bar Wastewater Treatment Plant
10977 50 Street
Edmonton AB T6A 2E9
Canada
epcor.com

Approval 639-03-07
Gold Bar Waste Water Treatment Plant Operations Monthly Summary

2023

SENIOR MANAGER, OPERATIONS MANAGER, OPERATIONS	• TRINA MANNING • KEN GROSSELL (LEVEL IV)
LEVEL IV OPERATORS	• TOM KWAN • DIEGO ESPINOSA • JANAKA LEKAMWASAM • MIKE NUNES • JODY PENNER • COLE BAKER • ANDREW NIEUWENHUIS • ISMAIL SANDOUGA • ARMEN OMERAGIC • ADAM KELLY

January

- 1 secondary bypass event – Jan 26-27
- 15 dead ducks found in secondaries/UV for Jan
- Bio 5, Cell 8 mixer tripped – Jan 3
- Grit 5 bypass gate – issues opening – Jan 3
- Fermenter Scrubber P-trap/overflow line cleaned – Jan 10
- EPT 9/10 cleaning – Jan 4 – completed Jan 16
- Vac truck to clean Primary 7/8 scum tanks – Jan 5
- Broken shear pin Sec 8, Cell 3 – Jan 5
- Membrane Train 3 cyclic air valve issues – Jan 8 – repaired Jan 17
- Prim 4 Cell 2 flights misaligned – shut off – Jan 9 – returned Jan 12
- EPT Scrubber shutdown for project tie in and maintenance – Jan 9-10
- Prim 4 dewatered to work on flights – Jan 9 – returned Jan 17
- Ferm 4 back in service – Jan 10
- K101 and Boiler 9 shutdown – returned to service – Jan 11
- Bio 8, Cell 3 mixer tripped – Jan 11
- Bio 3 influent pump guide rail off – flow through influent gate – Jan 12
- Grit 7 returned to service – Jan 12

- Membrane Train 3 off – Jan 13
- Prim 11 shear pin break – Jan 14
- Raw sampler fail – back up working – Jan 15
- Ferm Scrubber recirc pump phase loss – returned to service – Jan 15
- Ferm Scrubber off for maintenance – returned to service – Jan 16
- UV Channel 2 OOS for mud valve rotork replacement – Jan 16 – returned Jan 26
- Bio 3 influent pump repaired – Jan 17
- UV back up sampler fault – repaired Jan 17
- PE sampler fail – take grab samples – repaired – Jan 18
- Prim 5/6 influent gate repaired – Jan 19
- Bio/Sec 2 dewatered for inDENSE project – Jan 20 – filled Jan 26
- Sec 2 WAS pump fail – Jan 21
- West Scrubber shutdown for tie in and maintenance – Jan 23-24
- DAF 1 returned to service – Jan 23
- DAF 3 OOS for recycle pump repairs – Jan 23 – available Jan 24
- Grit 4/5 pre-screens OOS to repair scrapers – Jan 23 – returned Jan 25/26
- Bypass gate 2735/36 card failure – local operation only – Jan 24
- Product water pump motor replacement – Jan 24 – returned Jan 25
- K-102 OOS for temperature sensor tightening – repaired – Jan 25
- Blend tank mixers repaired and back in service – Jan 25
- South Flare flow meter reading 0, WR in – Jan 25
- EPT 12 west flights broken shear pin – Jan 28
- Prim 7 scum pump failure – Jan 29
- UV Channel 3 OOS for drain valve replacement – Jan 30
- Supernatant distribution valve relay replaced – Jan 30
- Aerzen Blower 4 OOS for bearing replacement – Jan 30
- Ferm 1 TPS pump OOS – Jan 31

February

- 0 secondary bypass events
- 20 dead ducks found in Secondaries/UV for Feb, one on path by Outfall 10
- 1 Voltus call – Feb 4 (<10 minutes)
- Filling EPT 9/10 – Feb 2 – full service Feb 4
- Dig 3 discharge line plugged – temporarily rerouted – Feb 5
- Transfer switch alarm for Penthouse 6 – generator started, no equipment lost – Feb 5
- Cell 5 centre line thawed with steamer truck – Feb 6
- Lost control wiring while installing actuators on mud valves in UV due to wiring caught in housing – four UV channels engaged causing power spike – no contravention – Feb 6
- Dewater EPT 11/12 – Feb 6
- Dig 3 disabled – no flow – rerouted and back in service – Feb 6
- Grit 7 incline auger repaired by E/I – Feb 7
- Screen 4 OOS for inspection – Feb 8-9
- Channel 2 UV bulb replacement – Feb 13
- Dewatering Primary 4 Feb 13 – filling Feb 17
- EPT 10 cross collector broken shear pin – repaired – Feb 13
- No reading on South Flare flow meter since Jan 25 – transmitter failed

- Bio 9, Cell 6 DO probe fail – Feb 13
- Primary 4, 2 flights delaminated – draining – Feb 13
- Secondary 5 flight inspection – Feb 13
- Labatts released 58 m3 of liquid with pH of 5.7 around 05:00 – no impact observed at plant – Feb 13
- Flushed supernatant pumps – Feb 13
- Sludge outage – repair leaks on Loop 1 and 2 in primaries and remove plug in Dig Sq 1 – Feb 15
- Screen 5 OOS – Feb 15 – returned to service Feb 16
- Grit 7 broken shear pin on bottom auger – repaired – Feb 15
- Sec 11, Cell 7 sprocket fell off of shaft – started draining Feb 16 – repaired and started filling Feb 17
- Sec 7, Cell 7 broken shear pin – Feb 17
- Supernatant shutdown to clean pumps of struvite buildup (8 hours) – supernatant pump tripping – cleaned/repaired Feb 21
- Membrane hypo cleans – week of Feb 21 – moved up from March due to decreased permeability
- Ice build-up on EPT Scrubber booster fan caused fan to go out of balance and come off of base – suction and discharged tarped to keep warm and prevent fugitive emissions – no impact to scrubber operation – Feb 22
- PCA investigating issue with UV drain valve control – does not impact UV operation – Feb 23
- RAS 1 pinhole leak – Feb 23
- Failed breaker for UV Channel 2 during re-lamping – Feb 23
- Prim 8, Cell 3/4 drive chain and idle sprocket replaced – Feb 23
- Low flow in EPT Scrubber recirculation line – replace nozzles and inspect recirculation pump – recirculation pump seized when shut down – replaced pump – Feb 27
- Scum 5-8 flow issues – Feb 27 – sprayer bars cleaned Feb 28
- Flights wrapped around drive on EPT 12 – will be replaced – extended EPT 11/12 outage additional 1 week from end of Feb – Feb 27
- RAS 2 dime-sized hole in volute – leak temporarily stopped – Feb 28 – Repaired Mar 1
- RAS 4 VFD faulted – temp VFD installed – Feb 28

March

- 10 secondary bypass events – Mar 16, 17, 18-19, 19-20, 20-21, 21-22, 22-23, 23-24, 24, & 25
- Membrane Train 6 aeration valve failed and repaired – Mar 1
- Bio 8 MLSS meter failed – Mar 1
- EPT 10 mixer repaired – Mar 1
- Prim 4 dewatering Mar 1 to tighten chain – filling Mar 2
- UV Channel 2 re-lamping complete – Mar 2
- EPT Scrubber pH probe fail – repaired – Mar 3
- Pinhole leak on Square 1 transfer pump – isolated – Mar 5
- EPT Scrubber bleach pump allowing water to backflow through it – WR to inspect check valves Mar 5 – replaced pump Mar 6
- UV Transmittance sensor cleaned – Mar 6
- Unplugged EPT 9/10 scum systems – Mar 6 and 10

- EPT Scrubber bleach pump replaced – Mar 6
- Screen 4-8 carbon scrubber OOS for media change – Mar 8
- Transformer switch affecting Digester sequence, Square 2, and Boiler House 2 – Mar 9
- MOG-2715 unresponsive – called in supplier – Mar 9
- Labatts spilled 27 m3 of pH 12 liquid to collection system – no impacts observed at plant – Mar 10
- Membrane permeability is low – moved citric acid cleans up to next week – Mar 10
- Labatts spilled 0.83 m3 – no impact observed at plant – Mar 11
- Secondary 11 Cell 4 scum trough stuck – Mar 11
- Replaced RAS and WAS 11 – Mar 13
- Acid-cleaning lagoon pumphouse – Mar 13-15
- UV Channel 2 re-bulb complete, testing – Mar 14
- UV Channel 4 OOS for drain valve replacement – Mar 14
- Boiler 7 repaired – Mar 14
- Fermenter feed program issues – reset – Mar 14
- Membrane citric acid cleans – Mar 14-20
- Leak on RAS 1 suction piping – Mar 15
- Boiler 6 and 9 repaired – Mar 16
- Secondary 8 Cell 3 broken shear pin – repaired – Mar 16
- Filling EPT 11/12 Mar 17 – in full service Mar 18
- Fermenter Scrubber fan VFD overheated – E/I called in to replace cooling fan – Mar 19
- Addition of Ortho-P to drinking water began – Mar 20
- Hole in Sec 1 discharge pipe Mar 20 – Repaired Mar 21
- Outfall 30 sump level meter adjusted – Mar 21
- Gas Room 2 centre liquid ring compressor purged OOS – Mar 21
- Dig 8 level radar erratic readings, WR entered – Mar 23
- Scum tank cleaning – Mar 23
- Dig 2/3 plugging issues – Square 1 suction piping flushed – Mar 24
- UV Channel 4 mud valve complete – Mar 24
- EPT 11 scum plugged – Mar 24 – unplugged Mar 28
- EPT 12 east flights broken shear pin – Mar 25
- Primary 4 chain break Mar 27 – tank dewatered Mar 28 – Repaired Mar 29
- Compressor 101 purged out – discharge valve not holding – Mar 28
- Solids shutdown for Digester 4 crane setup – 1.5 hours – Mar 28
- EPT scrubber off for 1 hour to measure ductwork – Mar 28
- Screen 1 chain break, channel OOS – Mar 28
- EPT scum hoppers cleaned with vac truck – Mar 29
- Solids shutdown to work on utility water line – 3 hours – Mar 29
- Primary 10 broken cross collector shear pin – repaired – Mar 29
- RAS 5 failure Mar 29 – replaced Mar 30
- Blanket lifting observed in Secondary clarifiers Mar 29-30, shut supernatant return off
- North polymer mixing system plugged – Mar 30

April

- 3 secondary bypass events – April 11-12, 17, & 26
- 3 one-hour H_2S exceedance at Gold Bar Park AQMS
- Channel 2 influent meter giving erratic readings – Apr 2
- Voltus call – Apr 3, 13, & 18
- Troubleshooting Secondary TSS issues – April 1st ongoing
- Supernatant start up after acid clean – Apr 3
- Plant Solids Shutdown – Apr 4
- Ferm Scrubber bleach pump 65314 repaired – Apr 5
- Primary 4 drained for repair – Apr 5
- Capital Region supernatant flow set point set to 0.5 ML – Apr 6
- Prim 4 back in service – Apr 7
- Broken shear pins EPT 12 – Apr 9, 12, 15, 21, & 25
- Troubleshooting foaming in East Scrubber tower – Apr 12
- Sec 10 cross collector broken shear pin – Apr 15
- Primary 5/6 dewatered for cleaning/inspection – Apr 16
- New flow meter installed for south flare – Apr 18
- Grit Tank 6 dewatered for cleaning/inspection – Apr 18
- Supernatant off due to high ammonia – Apr 20 – started Apr 24
- Opted out of Voltus Apr 22 – Opted back in Apr 25
- Sec 1, Cell 2 broken shear pin – Apr 22
- Dig Sq 1 gas room mixing line, leaking gasket on valve on roof – repaired Apr 27
- UV planned power outage – 10 min – Apr 27
- Grit Tank 7 east horizontal auger tripping – shear pin keeps breaking – tank will need to come down – Apr 27
- Screen 7 O/S for inspection – back in service Apr 28
- Primary 5/6 inspection complete – back in service – Apr 28
- EPT 11 sprocket fell off – west flight drive – started to drain tank – Apr 30

May

- 6 secondary bypass events – May 8-9, May 11-12, May 23, May 29, May 30-31, & May 31-June 1
- Voltus Call – May 11 (3 calls, 2 shutdowns), May 15 (2 calls), & May 18
- Weir cleaning ongoing – May 1-4
- Dewatering EPT 11/12 for chain repair – May 1
- Broken shear pin EPT 10 – May 1, May 7
- Screen 8 O/S for inspection – May 3
- Backpulse flow control valve FCV8633 leaking air – affecting Maintenance Cleans – May 3
- Product water pump 26632 check valve failed – running as lead pump – May 5
- Fermenter Scrubber bleach pump PDP-65313 tube failure – May 8
- EPT 11/12 back in service – May 8
- Dewatering EPT 9/10 for chain repair – May 8
- Outfall 20 bypass event – static weir bypass – Composite samplers did not work – manual samples taken – May 8
- Main plant bypass – screened and unscreened – 900 MLD target met – May 8
- UV Channel 4 now set as Lag 3 – May 10
- Dye test ongoing Sec 1, 2, & 3 – May 9, 10, & 11

- Unplanned power outage – May 9
- Planned power outage – Switched power feeder back to Hardisty – May 10
- Grit Tank 6 back in service – May 12
- EPT 9/10 in service – May 13
- Grit Tank 7 isolated/dewatered for inspection – May 14
- Primary 7/8 dewatered for inspection – May 14
- Sec 7 O/S – drained for RAS pump/piping replacement – May 14
- Bleach transfer line to membrane from East Scrubber building leak – switched lines – May 15
- Sec 1, 2, & 3 dye test continued at 42 MLD – May 16, 17, & 18
- West Scrubber offline for water line tie-in – 4 hours – May 17
- EPT Scrubber shutdown for duct work and blower removal – May 17 & 18
- Broken shear pin Prim 8 – May 19
- Continue to thin out Bio 7 – May 19th
- Blend Tank transfer pump 15184 impeller replaced – May 23
- Sec 10 cross collector broken shear pin – May 24
- Ferm 3 TPS pump 28584 broken shear pin – May 24
- Outfall 10 flow meter failed (high flow) – May 26
- GRF ready for season – May 29
- Prim 7/8 back in service – May 31
- Grit Tank 7 back in service – May 31

June

- 9 secondary bypass events – May 31-June 1, June 13, June 14, June 14-16, June 16-17, June 17, June 18-22, June 24, & June 28
- 1 truck GRF – June 30
- Voltus Calls – June 2, 7, & 26
- Broken shear pin Prim 8 cross collector – June 1
- East Scrubber caustic pump 65323 replaced – June 1
- Sec 6, Cell 4 broken shear pin – June 1
- Sec 8, Cell 3 broken shear pin – June 3
- East/Ferm scrubbers off line for SPT shutdown 8 hrs – June 5
- DAF 6 poly pump repaired – June 7
- Sec 9 cross collector shear pin broken – June 8
- Opt out of Voltus June 8th
- Bio 7 cleaning started – June 9
- Supernatant off due to Ostara reactor draining – June 12 – restarted June 13
- Outfall 10 flow meter FI-4710 I/O error – flow maxed due to error – all UV channels in service due to false flow – June 13
- UV shutdown for breaker replacement – 4 hrs off line – June 14
- Outfall 30 flow meter failed – June 14
- Grit Tank 4 incline auger plugged – June 15 – unplugged June 20
- Grit Tank 5 pre-screen failed – using Grit Tank 5 for wet weather only – June 15
- Bio 2 Indense up and running – June 15
- Influent Channel 3 level transmitter failed LI4017 – replaced – June 18
- Broken shear pin EPT 12 west pass – June 18
- Ferm Scrubber bleach pump failed – June 19

- UV Channel 1 influent gate failed to close all the way – rotated channels so Channel 3 is in service and Channel 1 O/S – June 19
- RAS 5 failed – repaired – June 21
- Labatts called to report spill of 26.9 m3 with pH of 12.1 – June 24
- Sec 5 cross collector broken shear pin/repaired – June 25
- Pre-screen 3 broken chain – June 26
- Grit Tank 3/Screen 3 drained for chain replacement – June 27
- Primary 3 drained for inspection – June 27
- Grit Tank 5 draining for pre-screen chain repair – June 27
- Grit Tank 5 pre-screen repaired, Grit Tank 5 back in service June 28
- Grit Tank 5 influent gate closed for dry weather – incline auger jammed – June 29

July

- 10 secondary bypass events – July 1, 3, 10, 16, 18, 24, 26-27, 27, 28, & 30-31
- GRF – 5 trucks – July 6, 7, 21, 24, & 27
- Voltus Call – July 24
- Primary scum tank 7 lines plugged – July 3
- Outfall 10 backup sampler failed – July 5
- EPT 10 scum hopper discharge line plugged – July 5
- Blower 5 tripped – high bearing temp – July 6
- Sec 8 NW pass broken shear pin – July 7
- Opt out of Voltus due to Blower 5 not available – July 10 – Opt back in July 12 once we found out the issue with Blower 5
- Primary 3 back in service after inspection – July 12
- Plant solids shutdown – July 12
- Membrane air cycling valve failing – July 13
- Draining Sec 11 for chain/sprocket repair – July 13
- Sec 11 filling and back in service – July 16
- Grit Tank 5 pre-screen failed – July 16
- Cloverbar loading pump failed – July 16
- Sec weir cleaning started – July 17
- Grit Tank 7 broken shear pin east horizontal auger – July 18
- Membrane sampler replaced with new CPU – July 19
- Dig 6 gas lance valve leaking – greased to seal – July 20
- Dig 6 heat exchanger high pressure yearly cleaning complete – July 20
- GRF grit slurry pumps plugged – July 24
- InDense FE strainer plugged – July 26
- Broken shear pin Sec 8, Cell 4 – July 28
- RAS 9 discharge pipe leaking – patched – July 28
- Bio 7 seeding started – July 28
- Bio/Sec 7 back in full service – July 29
- Bio/Sec 11 O/S and dewatering for repair and inspection – July 30
- Membrane quills replaced – July 31
- Bio 11 VFA supernatant line plugged – July 31

August

- 5 secondary bypass events – Aug 8, 8-9, 9, 17-19, & 23-24
- Voltus Calls – Aug 2, 10, 28, & 29
- GRF – 5 trucks – Aug 1, 4 (x2), 21, & 23
- Sec 10, Cell 4 broken shear pin – Aug 1
- Ferm 4 transducer for supernatant level replaced – Aug 2
- Control room phones not working for 3 hours – Aug 3
- GRF program not working – Aug 4
- Course drum plugged at GRF – Aug 4
- Ferm 3 TPS 28586 pistons leaking sludge (off) – Aug 4
- Grit Tank 7 incline auger tripping on cascade – Aug 5
- Sec/Bio 11 back in service – Aug 6
- Chemscan 1174 leaking from inside the box – Aug 7
- GRF unplugged – Aug 8
- MLSS meter Bio 1 replaced – Aug 10
- Sec 5, Cell 4 broken shear pin – Aug 13
- RAS 1 pin hole leak on discharge – Aug 13
- Sec/Bio 9 O/S for inspection & repair of 4th pass channel – Aug 13
- West Scrubber off line for repairs – Aug 15
- EPT 9 west sludge collector drive failed – replaced – Aug 16
- Prim 7 broken shear pin – Aug 18
- RAS 8 pin hole leak – Aug 22
- Membrane shutdown for breaker replacement and contact tank inspection – Aug 22
- Membrane plant back on line – Aug 23
- Sec/Bio 9 back in service – Aug 27
- Influent Channel 2 and Grit Tank 5 dewatered for inspection of grit tank influent gate and pre-screen chain repair – Aug 27 – back in service Aug 27
- Instrument air leak crawl space of lab – Aug 28
- Bio/Sec 8 O/S and dewatered for RAS replacement and clarifier inspection – Aug 28
- Trying to drain Grit Tank 7 to see cause of shear pin breaking – influent gate will not seal – Aug 29
- Draining Influent Channel 3 with Grit Yank 7 to try to see why Grit Tank 7 influent gate will not seal – no luck as other gates are leaking – Aug 30
- DAF 3 broken shear pin – Aug 30

September

- 2 secondary bypass events – Sept 5-6 & 28-29
- 1 Voltus call – Sept 18
- 0 Trucks at GRF
- Fermenter 4 scum tank level indicator faulty – Sept 2
- Sec 2, Cell 5 broken shear pin – Sept 6
- Membrane Train 8 offline – cassettes to be moved to Train 5 – Sept 6
- Ferm Scrubber bleach pump 65313 over current fault – Sept 6
- Screen 2 chain broken – Grit Tank 2/Screen 2 O/S – Sept 7
- Membrane Train 5 back in service after cassettes moved – Sept 7
- Broken shear pin Prim 9 – east pass – Sept 10

- Sec 5, Cell 4 scum trough stuck forward – Sept 11
- PE sampler failed – Sept 12
- Primary/Dig power outage – Sept 12
- Filling Boiler House 1 – Sept 15
- Dewatered Channel 3 with Grit Tank 7 to get Grit Tank 7 influent closed – completed Sept 18
- Deregulated to 900 ML to repair Grit Tank 7 horizontal auger – Sept 18
- Boiler House 1 boiler start up for building heat – Sept 18
- Grit Tank 5 pre-screen gate rotork repaired – Sept 18
- Prim 8 cross collector broken shear pin – Sept 19
- West Scrubber bleach pump 65318 tube issue – Sept 21
- RAS 6 discharge leak patched – Sept 24
- Center blend tank recirc pump 15184 plugged – Sept 25
- Broken chain Prim 5 – Sept 26
- West Scrubber bleach pump 65318 cracked tubing – Sept 26
- Grit Tank 6 incline auger tripping in cascade – Sept 27
- West Scrubber bleach pump 65318 tube leaking again – Sept 29
- Grit Tank 7 back in service – plant back to 1200 ML – Sept 29

October

- Sec bypass events – 0 events for Oct
- GRF trucks – 0
- Voltus call – Oct 4
- Vehicle collision on HWY 14 resulted in 11.5 cubic yards of sanitary grit being released into the ditch in the NE corner of Hwy 14 and 834. A small amount of engine and hydraulic oil was also released in the same area. AEPA was notified of the spill. Reference number: 420685 – Oct 12
- Prim 8 scum tank plugged – Oct 1
- Prim 5 dewatered for chain repair and inspection – Oct 1
- West Scrubber bleach pump 65318 tube replaced – Oct 2
- North flare PMs complete – Oct 4
- Dewatered Grit Tank 2 to remove Screen 2 chain/scraper bars – Oct 4
- South flare PMs complete – Oct 5
- Prim 5 back in service – Oct 8
- DAF 3 pressure tank vent solenoid broken – removed – Oct 9
- Draining Bio/Sec 1 for chain tightening and inspection – Oct 9
- Prim 9 cross collector shear pin failed – repaired – Oct 11
- Product water pump 26632 check valve failed – Oct 11
- Sec/Bio 1 back in service – Oct 15
- DAF 3 dewatered for chain replacement – Oct 15
- Prim 4 dewatered for chain tightening and inspection – Oct 15
- U-Crew cleaning weirs – Oct 17/18/19
- Boiler house 2 expansion tank 2 drained/isolated for bladder replacement – Oct 19
- DAF 3 back to Ops after chain replacement – Oct 19
- Started to fil Sec/Bio 8 to have ready for RAS pump test after replacement – Oct 20
- Prim 4 back to Ops after repair – filling – Oct 20

- DAF 4 dewatered to have ready for chain replacement – Oct 22
- North blend tank pumped down to have ready for cleaning – Oct 23
- EPT scrubber O/S for 9 hours 7:30 a.m. to 4:30 p.m. for nozzle cleaning – Oct 24
- UV Channel 1 inlet gate rotork failure – switched channels – Oct 24
- North blend tank back in service after cleaning – Oct 25
- UV Channel 1 inlet gate rotork repaired – Oct 25
- DAF 4 back to Ops after chain replacement – Oct 26
- UV Channel 1 back in service as lead – Oct 26
- Prim 5, Cell 1 flights off rail – draining – Oct 30
- DAF 2 O/S for drive bearing replacement – Oct 30
- Broken shear pin Sec 6, Cell 5 – Oct 31
- DAF 2 back on line – Oct 31
- Labatt spill 32 cubic meters of liquid with pH of 11.5 – Oct 31

November

- Sec bypass events – 0 events for Nov
- GRF 1 truck Nov 1 – Shutdown for season Nov 2
- Voltus call – Nov 14, 16, & 26
- Prim 8 broken shear pin cross collector – Nov 6
- South blend tank drained for inspection and cleaning – Nov 7
- RAS 8 pump replacement complete – Nov 7
- Intruder on site – dayshift – Nov 7
- Prim 5 repair complete/back in service – Nov 8
- Sec/Bio 8 in service – Nov 8
- South blend tank back in service – Nov 8
- North blend tank heat exchanger blown gasket – O/S – Nov 8
- Both bleach pumps failed for Fermenter Scrubber – blower off 1 hour and both repaired within the 1 hour – Nov 9
- Sec 5, Cell 3 broken shear pin – Nov 11
- EPT 9 broken shear pin – Nov 12
- InDense bio mixers for Cell 1 & 2 off for InDense project – Nov 13
- Bio 6/Sec 6 O/S for RAS pump replacement – Nov 14
- Dig sludge redirected through train A to get ready for acid clean at Cloverbar – Nov 15
- EPT 11 broken shear pin cross collector – Nov 16
- Prim 6 broken shear pin cross collector – Nov 18
- Supernatant off to prepare for acid clean – Nov 20
- EPT 11/12 O/S to lower sludge blanket – available for wet weather events – Nov 22
- Ostara sump backing up – Nov 22
- Plant intruder night shift – Nov 22
- UV planned shutdown to switch power feed – Nov 22
- Security guard noticed NE fence was cut – copper cable stolen – Nov 24
- GRF winterized – Nov 28
- East Scrubber shutdown for Maintenance work – 12 hours – Nov 28
- Sec 11, Cell 7 two broken shear pins within 4 hours – Nov 29

December

- Sec bypass events – 0 events for Dec
- 1 dead duck found at UV
- GRF winter shutdown
- Voltus call – Dec 6
- Security incident intruder Back 40 – caught – Dec 3
- Grit Tank 4 out of service for inspection – Dec 3
- Switched membrane feed to Sec 11 – Dec 5
- Acid clean at Clover Bar started – pump house to D2 – Dec 5
- Utility water line leak by RAS 5 feeding seal water to Train A/B – repaired – Dec 9
- EPT 10 scum line plugged – Dec 10
- Train B sludge transfer pump check valve replaced – Dec 11
- Sec 10, Cell 1 broken shear pin – Dec 12
- EPT Scrubber off line for 8 hrs for Maintenance – Dec 12
- EPT 11/12 dewatered for cleaning and inspection – Dec 12
- Sec 6 cross collector broken shear pin – Dec 14
- Clean Harbours starting Cell 5 work to pump sludge to Cell 3E – Dec 15
- Supernatant on at 1.5 MLD – Arrow Utilities set at 0.3 MLD – Dec 18
- UV Channel 3 outlet gate rotork failed on torque limits – E/I came in to adjust – Dec 17
- Membrane sampler did not switch at midnight – Dec 19
- EPT Scrubber shutdown 8 hrs for Maintenance – Dec 19
- Intruder on site – fence cut – nothing stolen – Dec 19
- Supernatant flow increased to 2.8 MLD – Arrow Utilities set point at 0.6 MLD – Dec 20
- Prim 8 cross collector broken shear pin – Dec 23
- Membrane Train 7 air cycling valve failure – E/I called in – Dec 24
- EPT south poly pump flushed with mineral oil – north poly pump is plugged – Dec 28
- Sec 9 broken shear pin cross collector – Dec 28
- Ferm Scrubber bleach pump 65313 tube failure – Dec 30
- Prim 6 scum pump 19590 has broken belts – Dec 31
- West Scrubber bleach pump 65317 tube failure – Dec 31
- Prim 6 cross collector broken shear pin – Dec 31

Appendix D – Air Pollution Control System Data

Appendix D - Air Pollution Control System Data

Gold Bar Wastewater Treatment Plant
Daily Average Scrubber Report
January 2023

Date	East Scrubber				Fermenter Scrubber				West Scrubber				EPT Scrubber				GRF Scrubber				Grit 6/7 Building Scrubber	Screen 4-8 Building Scrubber	Dewatering Facility Scrubber
	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H2S In (ppm)	H2S Out (ppb)	Temperature In (°C)	Pressure In (kPa)	Pressure Out (kPa)	H_2S Out (ppm)	H_2S Out (ppb)	H_2S Out (ppb)	H_2S Out (ppb)
January 1, 2023	9.8	670.1	0.0	0.0	9.8	669.9	24.9	19994.3	9.8	669.1	2.7	0.0	9.8	680.3	1.5	361.5	23.0	0.1	0.0	0.1	0.0	486.1	
January 2, 2023	9.8	670.0	0.0	0.0	9.8	669.9	27.2	19994.6	9.8	669.7	2.1	0.0	9.8	680.0	1.5	362.1	22.8	0.1	0.0	0.1	0.0	369.0	
January 3, 2023	9.8	669.8	0.0	0.0	9.8	670.1	31.1	13758.8	9.8	669.8	2.0	0.0	9.8	680.0	2.1	320.7	22.7	0.1	0.0	0.1	0.0	346.9	
January 4, 2023	9.8	670.0	0.0	0.0	9.8	670.0	34.2	7225.5	9.8	668.9	2.7	0.0	9.8	680.1	2.0	364.6	22.2	0.1	0.0	0.1	0.0	489.2	
January 5, 2023	9.8	670.4	0.0	0.0	9.8	670.2	32.4	6938.8	9.8	670.0	2.2	0.0	9.8	680.4	2.0	359.9	22.1	0.1	0.0	0.1	0.0	388.3	
January 6, 2023	9.8	670.0	0.0	0.0	9.8	669.7	29.0	6217.5	9.8	669.5	2.3	0.0	9.8	680.0	2.2	339.3	21.9	0.1	0.0	0.1	0.0	505.1	
January 7, 2023	9.8	670.2	0.0	0.0	9.8	670.0	28.3	6072.5	9.8	669.4	2.4	0.0	9.8	680.2	2.2	324.2	21.9	0.1	0.0	0.1	0.0	462.0	
January 8, 2023	9.8	669.8	0.0	0.0	9.8	670.0	29.6	6709.6	9.8	669.6	2.4	0.0	9.8	680.0	2.4	383.6	21.9	0.1	0.0	0.1	0.0	422.0	
January 9, 2023	9.8	670.1	0.0	0.0	9.8	670.0	29.5	6716.4	9.8	670.1	1.9	0.0	9.4	719.0	1.5	221.8	21.8	0.1	0.0	0.1	0.0	278.4	
January 10, 2023	9.8	664.3	0.0	0.0	9.9	670.5	29.1	6210.3	9.8	669.8	2.1	0.0	9.1	714.2	4.4	714.1	21.6	0.1	0.0	0.1	0.0	286.4	
January 11, 2023	9.8	670.2	0.0	0.0	9.8	670.2	28.1	7489.0	9.8	669.7	3.0	0.0	9.9	677.5	2.6	178.8	21.9	0.1	0.0	0.1	0.0	336.6	
January 12, 2023	9.8	670.3	0.0	0.0	9.8	670.0	26.7	7488.4	9.8	670.3	2.7	0.0	9.8	680.1	2.3	459.1	21.9	0.1	0.0	0.1	0.1	416.3	
January 13, 2023	9.8	670.2	0.0	0.0	9.8	670.0	28.1	7080.3	9.8	669.9	2.1	0.0	9.8	680.0	1.9	388.6	21.7	0.1	0.0	0.1	0.0	339.1	
January 14, 2023	9.8	670.1	0.0	0.0	9.8	670.1	26.7	6941.4	9.8	669.5	2.7	0.0	9.8	680.0	2.1	442.7	21.8	0.1	0.0	0.1	0.0	577.3	
January 15, 2023	9.8	669.4	0.0	0.0	9.8	669.8	28.2	7524.4	9.8	669.1	3.2	0.0	9.8	680.1	2.6	589.1	21.6	0.1	0.0	0.1	0.0	553.8	
January 16, 2023	9.8	670.3	0.0	0.0	9.7	669.1	28.0	6053.2	9.8	669.2	3.5	0.0	9.8	680.0	2.5	557.7	21.8	0.1	0.0	0.1	0.0	500.1	Out of service
January 17, 2023	9.8	670.4	0.0	0.0	9.8	669.9	29.1	4617.3	9.8	669.8	2.9	0.0	9.8	680.1	2.4	531.2	21.7	0.1	0.0	0.1	0.3	483.3	
January 18, 2023	9.8	670.3	0.0	0.0	9.8	670.3	29.5	4687.9	9.8	670.4	2.4	184.8	9.8	680.1	1.8	382.1	21.1	0.1	0.0	0.1	0.5	328.0	
January 19, 2023	9.8	669.7	0.0	0.0	9.8	670.0	31.8	5801.7	9.8	669.4	2.1	0.0	9.8	679.9	1.9	404.3	20.8	0.1	0.0	0.1	0.0	290.0	
January 20, 2023	9.8	669.6	0.0	0.0	9.8	670.0	32.6	6655.1	9.8	670.1	2.3	0.0	9.8	680.0	2.0	443.0	21.4	0.1	0.0	0.1	0.0	307.5	
January 21, 2023	9.8	669.5	0.0	0.0	9.8	669.9	33.5	7035.8	9.8	668.1	5.7	0.0	9.8	680.0	3.4	891.0	21.3	0.1	0.0	0.1	0.0	450.3	
January 22, 2023	9.8	670.7	0.0	0.0	9.8	670.1	28.7	6064.0	9.8	669.1	5.3	0.0	9.8	680.0	2.5	623.8	21.5	0.1	0.0	0.1	0.0	343.5	
January 23, 2023	9.8	669.9	0.4	212.8	9.8	670.1	28.4	6082.3	11.9	502.5	2.0	0.0	9.8	680.0	3.0	769.0	21.8	0.1	0.0	0.1	0.0	483.2	
January 24, 2023	9.8	667.7	0.0	0.0	9.8	670.1	25.3	5359.3	11.3	530.3	2.7	12.0	9.8	679.3	2.9	791.5	21.3	0.1	0.0	0.1	0.0	575.3	
January 25, 2023	9.8	669.7	0.0	0.0	9.8	670.1	22.9	4785.7	9.8	667.8	5.4	0.0	9.8	680.0	2.6	790.6	21.6	0.1	0.0	0.1	0.0	455.6	
January 26, 2023	9.8	671.3	0.0	0.0	9.8	670.4	21.3	4559.5	9.8	670.3	2.0	0.0	9.8	680.1	1.0	235.0	21.7	0.1	0.0	0.1	0.0	128.1	
January 27, 2023	9.8	669.6	0.0	0.0	9.8	670.2	10.0	2034.1	9.7	666.4	2.0	0.0	9.8	680.1	0.8	172.7	21.7	0.1	3.4	0.1	0.0	38.7	
January 28, 2023	9.8	670.2	0.0	0.0	9.8	669.8	13.5	2648.2	9.8	669.9	3.5	0.0	9.8	679.9	2.2	646.9	21.3	0.1	7.6	0.1	0.0	153.5	
January 29, 2023	9.7	670.0	0.0	0.6	9.8	670.0	17.1	3468.4	9.8	669.6	4.5	0.0	9.8	679.9	2.7	870.3	20.4	0.1	4.7	0.1	0.0	345.1	
January 30, 2023	9.7	669.3	0.0	0.0	9.8	669.7	20.3	4224.1	9.8	669.7	4.5	0.0	9.8	679.9	2.1	674.8	22.1	0.1	0.0	0.1	0.0	222.6	
January 31, 2023	9.8	670.2	0.0	0.0	9.8	669.8	18.9	3881.3	9.8	669.8	4.2	0.0	9.8	679.9	2.4	778.7	21.8	0.1	0.0	0.1	0.3	228.7	
Avg	9.8	669.8	0.0	6.9	9.8	670.0	26.6	6913.5	9.9	659.6	2.9	6.3	9.8	682.3	2.3	495.9	21.7	0.1	0.5	0.1	0.0	373.9	N/A
Min	9.7	664.3	0.0	0.0	9.7	669.1	10.0	2034.1	9.7	502.5	1.9	0.0	9.1	677.5	0.8	172.7	20.4	0.1	0.0	0.1	0.0	38.7	N/A
Max	9.8	671.3	0.4	212.8	9.9	670.5	34.2	19994.6	11.9	670.4	5.7	184.8	9.9	719.0	4.4	891.0	23.0	0.1	7.6	0.1	0.5	577.3	N/A

Appendix D - Air Pollution Control System Data

Gold Bar Wastewater Treatment Plant
Daily Average Scrubber Report
February 2023

Date	East Scrubber				Fermenter Scrubber				West Scrubber				EPT Scrubber				GRF Scrubber				Grit 6/7 Building Scrubber	Screen 4-8 Building Scrubber	Dewatering Facility Scrubber
	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H2S In (ppm)	H2S Out (ppb)	Temperature In (°C)	Pressure In (kPa)	Pressure Out (kPa)	H_2S Out (ppm)	H_2S Out (ppb)	H_2S Out (ppb)	H_2S Out (ppb)
February 1, 2023	9.67	678.4	0.00	0.1	9.62	669.8	18.32	3839.7	9.79	669.0	3.74	0.0	9.80	680.0	2.4	749.8	21.6	0.08	-0.01	0.1	0.3	158.2	
February 2, 2023	9.79	670.5	0.00	0.0	9.81	670.0	19.35	3738.6	9.81	669.0	4.26	0.0	9.80	679.9	2.5	764.6	21.5	0.09	-0.02	0.1	0.0	286.3	
February 3, 2023	9.79	669.9	0.00	0.0	9.78	669.9	19.11	3910.2	9.80	669.2	4.80	0.0	9.80	679.9	2.7	862.2	21.7	0.07	-0.07	0.1	0.0	496.8	
February 4, 2023	9.80	669.9	0.00	0.0	9.79	669.8	18.37	3661.4	9.80	669.4	4.10	0.0	9.80	679.8	2.8	926.1	21.5	0.06	-0.02	0.1	0.0	431.5	
February 5, 2023	9.80	669.8	0.00	0.0	9.81	670.2	17.31	3351.4	9.80	668.8	4.13	0.0	9.80	680.0	5.3	1867.2	21.4	0.07	-0.02	0.1	0.0	597.5	
February 6, 2023	9.82	670.1	0.00	0.0	9.80	668.4	17.50	3488.6	9.80	669.3	4.50	0.0	9.81	680.2	4.5	1593.9	21.3	0.06	-0.02	0.1	0.0	380.3	
February 7, 2023	9.77	677.6	0.00	0.0	9.68	653.3	21.90	4879.0	9.80	667.8	5.53	0.0	9.80	680.5	2.2	744.0	21.3	0.07	-0.02	0.1	0.0	465.2	
February 8, 2023	9.81	670.2	0.00	0.0	9.80	669.8	21.78	4446.2	9.80	667.9	6.58	0.0	9.81	682.1	1.8	639.5	21.7	0.08	0.24	0.1	0.0	325.9	
February 9, 2023	9.81	676.3	0.00	0.0	9.82	670.5	16.11	3205.0	9.80	669.8	3.57	0.0	9.80	684.5	1.6	572.6	21.8	0.08	0.99	0.1	0.0	247.7	
February 10, 2023	9.80	670.0	0.00	0.0	9.80	670.3	13.81	2695.6	9.80	669.8	3.71	0.0	9.80	685.6	1.8	631.1	21.2	0.07	-0.02	0.1	0.0	268.9	
February 11, 2023	9.80	669.9	0.00	0.0	9.80	669.9	13.14	2524.8	9.80	665.2	4.57	0.0	9.80	651.8	2.3	935.3	21.5	0.07	-0.02	0.1	0.0	447.4	
February 12, 2023	9.80	670.1	0.00	0.0	9.80	669.8	15.22	2947.9	9.80	669.2	4.60	0.0	9.81	684.4	1.9	655.7	21.4	0.07	-0.02	0.1	0.0	448.0	
February 13, 2023	9.79	670.0	0.00	0.0	9.79	670.0	16.88	3182.4	9.80	669.5	4.09	0.0	9.80	680.0	2.1	755.9	19.1	0.05	-0.02	0.1	0.0	252.0	
February 14, 2023	9.81	670.0	0.00	0.0	9.77	669.8	19.51	3913.4	9.81	669.4	3.83	0.0	9.80	681.2	2.0	731.4	21.9	0.06	-0.02	0.1	0.0	279.6	Out of Service
February 15, 2023	9.80	670.0	0.00	0.0	9.80	669.8	15.50	2906.9	9.80	669.9	4.14	0.0	9.80	685.6	2.2	821.4	21.9	0.08	-0.02	0.1	0.0	242.7	
February 16, 2023	9.80	669.9	0.00	0.0	9.79	670.1	16.14	3123.7	9.80	670.4	3.22	0.0	9.80	680.8	2.3	894.9	21.5	0.06	-0.02	0.1	0.0	337.8	
February 17, 2023	9.80	670.0	0.00	0.0	9.80	669.7	18.98	3580.2	9.79	669.2	3.50	0.0	9.80	700.9	2.2	783.0	21.3	0.06	-0.03	0.1	0.0	367.4	
February 18, 2023	9.80	670.0	0.00	0.0	9.80	669.8	25.44	4683.3	9.79	667.0	6.64	0.0	9.69	698.0	2.8	1156.3	21.4	0.08	-0.02	0.1	0.0	445.7	
February 19, 2023	9.80	670.0	0.00	0.0	9.80	670.2	21.58	3947.9	9.80	668.0	6.20	0.0	9.79	694.0	2.7	1083.4	21.4	0.08	-0.02	0.1	0.0	378.1	
February 20, 2023	9.80	670.1	0.00	0.0	9.80	670.4	15.80	2906.4	9.80	668.4	5.52	0.0	9.85	688.3	2.5	926.4	21.6	0.08	-0.02	0.1	0.0	262.3	
February 21, 2023	9.80	670.1	0.00	0.0	9.80	669.9	16.20	3057.7	9.80	669.1	4.70	0.0	9.80	683.6	2.6	821.1	21.5	0.08	-0.01	0.1	0.0	95.4	
February 22, 2023	9.80	670.0	0.00	0.0	9.81	670.8	15.12	2945.2	9.78	668.1	3.49	0.0	9.81	662.1	4.3	671.9	21.0	0.08	-0.01	0.1	0.0	77.5	
February 23, 2023	9.70	668.9	0.00	0.1	9.80	669.3	7.03	1476.8	9.73	672.8	2.43	0.0	9.72	723.3	2.3	600.1	21.3	0.08	-0.02	0.1	0.0	70.8	
February 24, 2023	9.47	671.5	0.00	0.0	9.80	670.0	3.45	811.6	9.80	670.1	2.36	0.0	9.81	680.0	2.1	200.5	21.1	0.08	-0.02	0.1	0.0	185.3	
February 25, 2023	9.51	670.0	0.00	0.0	9.79	668.6	11.47	2366.0	9.80	669.3	3.44	0.0	9.91	690.7	3.0	534.6	21.5	0.08	-0.02	0.1	0.0	378.1	
February 26, 2023	9.50	670.0	0.00	0.0	9.79	669.5	21.60	3992.5	9.80	668.9	4.49	0.0	9.81	685.5	3.3	1976.5	21.7	0.08	-0.02	0.1	0.0	374.7	
February 27, 2023	9.50	670.1	0.00	0.0	9.80	670.1	22.03	3919.6	9.80	668.4	4.35	0.0	9.73	734.8	10.9	5005.5	21.8	0.08	-0.02	0.1	0.1	236.4	
February 28, 2023	9.50	670.0	0.00	0.0	9.80	670.3	20.15	3484.1	9.81	666.4	3.92	0.0	9.80	688.9	3.0	1129.4	21.6	0.08	-0.01	0.1	0.0	126.8	
Avg	9.74	670.8	0.00	0.0	9.79	669.3	17.10	3320.9	9.80	668.9	4.30	0.0	9.80	685.9	2.9	1036.9	21.4	0.07	0.03	0.1	0.0	309.4	N/A
Min	9.47	668.9	0.00	0.0	9.62	653.3	3.45	811.6	9.73	665.2	2.36	0.0	9.69	651.8	1.6	200.5	19.1	0.05	-0.07	0.1	0.0	70.8	N/A
Max	9.82	678.4	0.00	0.1	9.82	670.8	25.44	4879.0	9.81	672.8	6.64	0.0	9.91	734.8	10.9	5005.5	21.9	0.09	0.99	0.1	0.3	597.5	N/A

Appendix D - Air Pollution Control System Data

Gold Bar Wastewater Treatment Plant
Daily Average Scrubber Report
March 2023

Date	East Scrubber				Fermenter Scrubber				West Scrubber				EPT Scrubber				GRF Scrubber				Grit 6/7 Building Scrubber	Screen 4-8 Building Scrubber	Dewatering Facility Scrubber
	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H2S In (ppm)	H2S Out (ppb)	Temperature In (°C)	Pressure In (kPa)	Pressure Out (kPa)	H_2S Out (ppm)	H_2S Out (ppb)	H_2S Out (ppb)	H_2S Out (ppb)
March 1, 2023	9.49	670.1	0.00	0.0	9.80	670.7	18.72	3443.6	9.80	665.0	3.64	0.0	9.80	694.1	3.2	1164.2	21.7	0.08	-0.02	0.1	0.0	201.6	
March 2, 2023	9.47	670.5	0.00	0.0	9.80	669.9	19.47	3670.1	9.79	667.0	4.05	0.0	9.80	703.3	3.2	1173.6	21.3	0.08	-0.03	0.1	0.0	351.0	
March 3, 2023	9.50	670.0	0.00	0.0	9.80	670.0	19.45	3496.2	9.80	668.1	4.18	0.0	9.92	770.6	2.5	1012.6	21.4	0.08	-0.02	0.1	0.0	362.6	
March 4, 2023	9.50	669.9	0.00	0.0	9.80	670.0	19.26	3348.8	9.80	667.7	4.38	0.0	9.80	690.5	2.7	1107.5	21.5	0.08	-0.01	0.1	0.0	298.7	
March 5, 2023	9.50	670.0	0.00	0.0	9.80	670.1	18.58	3260.8	9.80	667.3	4.54	0.0	9.80	637.4	3.2	1277.0	21.5	0.08	-0.02	0.1	0.0	220.8	
March 6, 2023	9.51	670.0	0.00	0.0	9.80	667.5	18.08	3374.6	9.81	669.3	3.80	0.0	9.79	664.7	3.4	1287.1	21.9	0.08	-0.02	0.1	0.0	175.9	
March 7, 2023	9.50	670.1	0.00	0.0	9.80	670.1	18.96	3599.6	9.80	668.8	4.14	0.0	9.80	680.2	4.0	1396.8	22.0	0.08	-0.02	0.1	0.0	187.8	
March 8, 2023	9.50	670.0	0.00	0.0	9.80	669.9	17.72	3383.3	9.81	670.2	3.07	0.0	9.81	680.1	3.4	1226.6	21.7	0.08	-0.02	0.1	0.0	94.0	
March 9, 2023	9.50	669.9	0.00	0.0	9.80	669.9	18.75	3706.8	9.80	670.0	2.92	0.0	9.81	680.0	3.6	1329.6	21.7	0.08	-0.02	0.2	0.1	0.0	
March 10, 2023	9.50	670.0	0.00	0.0	9.80	670.0	19.48	3669.8	9.80	670.0	3.04	0.0	9.80	680.0	3.4	1269.1	21.7	0.08	-0.02	0.1	0.0	0.0	
March 11, 2023	9.50	669.9	0.00	0.0	9.80	669.8	19.63	3496.0	9.80	669.1	3.66	0.0	9.81	680.0	4.0	1511.1	21.6	0.08	-0.02	0.1	0.0	0.0	
March 12, 2023	9.50	670.0	0.00	0.0	9.80	670.0	19.33	3436.9	9.80	670.1	3.24	0.0	9.79	680.0	3.0	1098.2	21.5	0.08	-0.01	0.1	0.0	0.0	
March 13, 2023	9.50	670.1	0.00	0.0	9.80	670.3	16.90	3030.7	9.80	670.1	3.17	0.0	9.81	680.1	3.1	1166.6	21.9	0.09	-0.02	0.1	0.0	0.1	
March 14, 2023	9.50	670.0	0.00	0.0	9.79	669.6	17.67	3101.6	9.80	669.6	3.67	0.0	9.81	680.0	4.0	1495.2	21.4	0.08	-0.02	0.1	0.0	0.7	
March 15, 2023	9.50	669.9	0.00	0.0	9.80	670.2	16.95	2812.1	9.79	669.2	3.22	0.0	9.80	680.0	2.9	1063.9	21.4	0.08	-0.01	0.1	0.3	0.6	
March 16, 2023	9.50	670.1	0.00	0.0	9.79	669.7	16.35	2672.4	9.80	669.5	3.03	0.0	9.80	680.2	3.9	1476.7	21.5	0.08	-0.02	0.1	0.0	1.5	Out of Service
March 17, 2023	9.50	670.0	0.00	0.0	9.81	670.8	12.27	1911.8	9.80	669.7	2.33	0.0	9.80	680.1	3.3	1223.5	21.4	0.08	-0.02	0.1	0.0	0.2	
March 18, 2023	9.50	669.9	0.00	0.0	9.80	669.9	9.01	1415.8	9.80	669.9	2.12	0.0	9.79	679.5	2.2	841.4	21.5	0.07	-0.02	0.1	0.0	0.0	
March 19, 2023	9.50	669.9	0.00	0.0	9.81	670.0	9.37	1420.7	9.80	669.7	2.13	0.0	9.80	680.4	3.6	1438.0	21.5	0.07	-0.03	0.1	0.0	0.8	
March 20, 2023	9.50	670.0	0.00	0.0	9.81	670.0	9.06	1340.3	9.81	670.2	1.54	0.0	9.81	680.8	2.2	883.6	21.6	0.08	-0.03	0.1	0.4	0.1	
March 21, 2023	9.50	670.1	0.00	0.0	9.80	670.4	7.41	1074.7	9.80	669.7	1.07	0.0	9.80	680.1	0.8	313.9	21.7	0.08	-0.02	0.1	0.0	0.0	
March 22, 2023	9.50	672.3	0.00	0.0	9.80	667.9	6.87	1063.5	9.80	670.1	1.15	0.0	9.80	687.5	1.1	410.6	21.7	0.08	-0.02	0.1	0.0	0.0	
March 23, 2023	9.50	670.0	0.00	0.0	9.80	669.7	8.24	1360.8	9.80	670.2	1.23	0.0	9.80	680.3	1.0	386.3	21.4	0.08	-0.02	0.1	0.1	0.0	
March 24, 2023	9.50	670.0	0.00	0.0	9.80	670.3	6.08	975.3	9.80	670.2	0.89	0.0	9.80	680.4	0.7	266.3	21.3	0.08	-0.02	0.1	0.0	0.0	
March 25, 2023	9.50	669.8	0.00	0.0	9.80	669.8	5.87	915.9	9.80	669.6	2.03	0.0	9.80	680.4	3.5	1492.0	21.4	0.07	-0.03	0.1	0.0	1.4	
March 26, 2023	9.50	670.0	0.00	0.0	9.80	670.0	8.04	1226.7	9.80	669.0	3.13	0.0	9.79	679.9	3.9	1626.8	21.2	0.07	-0.02	0.1	0.0	6.6	
March 27, 2023	9.50	670.0	0.00	0.0	9.78	670.0	8.08	1217.7	9.81	670.0	2.71	0.0	9.80	680.0	3.6	1467.2	21.4	0.08	-0.02	0.1	0.0	5.3	
March 28, 2023	9.50	670.0	0.00	0.0	9.80	669.8	7.90	1222.5	9.80	669.6	3.32	0.0	9.78	681.6	4.3	1460.0	21.5	0.08	-0.03	0.1	0.1	13.9	
March 29, 2023	9.50	669.9	0.00	0.0	9.80	670.0	8.23	1200.9	9.80	670.1	3.40	0.0	9.80	680.0	3.7	1467.2	21.3	0.10	-0.02	0.1	0.0	8.4	
March 30, 2023	9.50	669.9	0.00	0.0	9.80	669.7	10.10	1503.9	9.80	669.6	2.93	0.0	9.80	679.8	3.7	1427.7	21.3	0.10	-0.03	0.1	0.0	17.7	
March 31, 2023	9.50	670.0	0.00	0.0	9.80	669.9	11.26	1649.1	9.80	668.9	4.08	0.0	9.80	680.3	4.2	1603.5	21.4	0.10	-0.03	0.1	0.0	44.1	
Avg	9.50	670.1	0.00	0.0	9.80	669.9	13.65	2354.9	9.80	669.3	2.96	0.0	9.80	683.0	3.1	1173.0	21.5	0.08	-0.02	0.1	0.0	64.3	N/A
Min	9.47	669.8	0.00	0.0	9.78	667.5	5.87	915.9	9.79	665.0	0.89	0.0	9.78	637.4	0.7	266.3	21.2	0.07	-0.03	0.1	0.0	0.0	N/A
Max	9.51	672.3	0.00	0.0	9.81	670.8	19.63	3706.8	9.81	670.2	4.54	0.0	9.92	770.6	4.3	1626.8	22.0	0.10	-0.01	0.2	0.4	362.6	N/A

Appendix D - Air Pollution Control System Data

Gold Bar Wastewater Treatment Plant
Daily Average Scrubber Report
April 2023

Date	East Scrubber				Fermenter Scrubber				West Scrubber				EPT Scrubber				GRF Scrubber				Grit 6/7 Building Scrubber	Screen 4-8 Building Scrubber	Dewatering Facility Scrubber
	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H2S In (ppm)	H2S Out (ppb)	Temperature In (°C)	Pressure In (kPa)	Pressure Out (kPa)	H_2S Out (ppm)	H_2S Out (ppb)	H_2S Out (ppb)	H_2S Out (ppb)
April 1, 2023	9.50	670.0	0.00	0.0	9.80	669.9	12.44	1724.2	9.80	669.4	3.90	0.0	9.80	679.9	4.6	1781.3	21.3	0.09	-0.02	0.1	0.0	45.0	
April 2, 2023	9.50	670.0	0.00	0.0	9.80	670.2	11.54	1591.8	9.80	669.4	3.89	0.0	9.80	680.0	4.5	1711.6	21.2	0.09	-0.02	0.1	0.0	42.8	
April 3, 2023	9.50	672.7	0.18	71.4	9.80	668.6	7.72	1469.5	9.80	669.7	3.49	69.8	9.80	680.1	3.6	1461.5	21.4	0.10	-0.02	0.1	142.6	101.0	
April 4, 2023	9.50	670.0	0.00	0.0	9.80	670.2	2.97	946.2	9.79	669.1	2.98	0.0	9.79	683.9	2.7	1288.1	21.1	0.10	-0.02	0.1	0.0	41.7	
April 5, 2023	9.50	669.8	0.00	0.0	9.80	671.0	3.32	1113.1	9.80	669.1	2.63	0.0	9.80	679.9	3.0	1415.7	21.4	0.10	-0.02	0.1	0.0	34.1	
April 6, 2023	9.50	670.2	0.00	0.0	9.80	670.0	3.60	1225.4	9.80	668.6	3.46	0.0	9.80	679.9	3.2	1541.0	21.4	0.09	-0.02	0.1	0.0	48.5	
April 7, 2023	9.50	669.9	0.00	0.0	9.80	669.8	3.92	1264.3	9.80	668.7	3.53	0.0	9.80	680.0	3.5	1720.2	21.3	0.07	-0.02	0.1	0.0	74.8	
April 8, 2023	9.50	669.8	0.00	0.0	9.80	669.8	4.24	1338.5	9.79	667.9	3.55	0.0	9.80	679.8	3.8	1812.0	21.3	0.07	-0.02	0.1	0.0	102.1	
April 9, 2023	9.50	670.0	0.00	0.0	9.80	670.2	3.90	1238.4	9.81	668.7	3.53	0.0	9.80	680.1	3.6	1677.3	21.1	0.07	-0.02	0.1	0.0	154.1	
April 10, 2023	9.50	669.9	0.00	0.0	9.80	669.8	3.78	1214.6	9.79	668.1	3.91	0.0	9.80	679.9	3.6	1687.2	20.9	0.07	-0.03	0.1	0.0	131.3	
April 11, 2023	9.50	670.6	0.00	0.0	9.80	670.3	3.89	1208.7	9.80	670.0	2.68	0.0	9.79	680.1	3.0	1466.7	21.2	0.07	0.05	0.1	0.0	113.8	
April 12, 2023	9.53	664.7	0.00	0.0	9.80	670.6	2.59	757.4	9.80	669.5	1.14	0.0	9.81	680.1	1.0	476.7	21.4	0.06	0.39	0.1	0.0	5.3	
April 13, 2023	9.53	648.6	0.00	0.0	9.80	668.9	2.25	684.2	9.80	669.0	2.75	0.0	9.80	679.5	2.9	1403.1	21.3	0.07	0.27	0.1	0.0	17.1	
April 14, 2023	9.49	670.8	0.00	0.2	9.80	669.0	4.20	1335.7	9.80	669.0	3.92	0.0	9.80	680.3	3.8	1877.9	21.0	0.08	0.27	0.1	0.0	42.2	
April 15, 2023	9.50	669.8	0.00	0.0	9.80	670.1	5.85	1828.2	9.80	667.9	4.68	0.0	9.80	680.1	4.1	1969.4	21.2	0.08	0.27	0.1	0.0	88.5	
April 16, 2023	9.50	669.9	0.00	0.0	9.81	670.0	5.36	1726.0	9.80	665.7	6.48	0.0	9.80	679.9	4.9	2438.6	21.1	0.07	0.27	0.1	0.0	181.6	Out of Service
April 17, 2023	9.50	670.5	0.00	0.0	9.80	670.0	4.95	1597.4	9.81	670.3	2.83	0.0	9.79	680.2	3.4	2353.4	20.6	0.06	0.24	0.1	0.0	83.9	
April 18, 2023	9.50	670.2	0.00	0.0	9.80	670.9	3.41	1022.3	9.81	669.2	1.19	0.0	9.81	680.2	0.0	1146.3	21.2	0.09	0.27	0.1	0.0	46.7	
April 19, 2023	9.50	671.5	0.00	0.0	9.81	668.2	2.76	871.5	9.70	675.6	1.23	0.0	9.79	672.2	1.7	1408.1	20.9	0.09	0.28	0.1	0.0	48.4	
April 20, 2023	9.50	670.1	0.00	0.0	9.80	670.0	2.30	728.7	9.81	669.8	1.43	0.0	9.80	679.9	2.7	1482.6	8.2	0.09	0.28	0.1	0.0	68.3	
April 21, 2023	9.50	670.1	0.00	0.0	9.80	670.1	2.24	713.0	9.80	670.3	1.50	0.0	9.80	679.9	2.5	1365.9	3.8	0.04	0.27	0.1	0.0	105.6	
April 22, 2023	9.50	669.7	0.00	0.0	9.80	669.6	2.69	867.0	9.80	669.9	1.69	0.0	9.80	680.2	2.2	1115.9	5.9	0.00	0.26	0.1	0.0	150.6	
April 23, 2023	9.50	669.5	0.00	0.0	9.80	669.6	3.46	1162.8	9.80	669.8	1.82	0.0	9.80	678.9	3.6	1994.2	9.9	-0.01	0.27	0.1	0.0	152.3	
April 24, 2023	9.50	669.9	0.00	0.0	9.80	669.9	3.72	1218.7	9.80	670.1	1.80	0.0	9.80	678.8	2.9	1533.2	12.6	-0.01	0.26	0.1	0.0	111.4	
April 25, 2023	9.50	669.9	0.00	0.0	9.80	670.3	2.66	745.2	9.77	668.1	1.35	0.0	9.81	680.1	2.6	1400.3	10.2	0.00	0.24	0.1	0.0	247.4	
April 26, 2023	9.50	671.0	0.00	0.0	9.80	670.1	2.97	835.9	9.80	669.6	1.85	0.0	9.78	679.6	2.9	1607.9	10.1	0.00	0.28	0.1	0.0	395.6	
April 27, 2023	9.50	669.1	0.00	0.0	9.80	670.3	2.54	702.9	9.80	669.9	1.50	0.0	9.81	681.1	2.8	1572.8	10.5	-0.01	0.27	0.1	0.0	290.5	
April 28, 2023	9.50	669.9	0.00	0.0	9.80	669.6	2.45	712.0	9.80	669.8	1.91	0.0	9.80	679.9	3.3	1854.0	14.4	-0.02	0.25	0.1	0.0	324.0	
April 29, 2023	9.50	670.0	0.00	0.0	9.80	669.9	2.68	707.6	9.80	669.6	2.06	0.0	9.80	679.8	3.9	2207.7	14.0	-0.01	0.25	0.1	0.0	451.5	
April 30, 2023	9.50	670.9	0.00	0.0	9.80	670.0	3.06	821.1	9.79	667.3	4.23	0.0	9.80	679.6	3.5	1890.4	16.2	-0.02	0.25	0.1	0.0	627.0	
Avg	9.50	669.3	0.01	2.4	9.80	669.9	4.12	1112.4	9.80	669.3	2.76	2.3	9.80	679.8	3.1	1622.0	17.3	0.05	0.17	0.1	4.8	144.2	N/A
Min	9.49	648.6	0.00	0.0	9.80	668.2	2.24	684.2	9.70	665.7	1.14	0.0	9.78	672.2	0.0	476.7	3.8	-0.02	-0.03	0.1	0.0	5.3	N/A
Max	9.53	672.7	0.18	71.4	9.81	671.0	12.44	1828.2	9.81	675.6	6.48	69.8	9.81	683.9	4.9	2438.6	21.4	0.10	0.39	0.1	142.6	627.0	N/A

Appendix D - Air Pollution Control System Data

Gold Bar Wastewater Treatment Plant
Daily Average Scrubber Report
May 2023

Date	East Scrubber				Fermenter Scrubber				West Scrubber				EPT Scrubber				GRF Scrubber				Grit 6/7 Building Scrubber	Screen 4-8 Building Scrubber	Dewatering Facility Scrubber
	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H2S In (ppm)	H2S Out (ppb)	Temperature In (°C)	Pressure In (kPa)	Pressure Out (kPa)	H_2S Out (ppm)	H_2S Out (ppb)	H_2S Out (ppb)	H_2S Out (ppb)
May 1, 2023	9.50	672.1	0.59	51.2	9.79	670.4	4.01	1099.6	9.81	666.1	9.49	0.0	9.80	683.8	2.8	1468.8	21.4	0.04	0.25	0.1	0.0	874.9	
May 2, 2023	9.51	672.1	0.00	0.0	9.80	670.3	4.78	1378.2	9.80	667.2	6.31	0.0	9.80	680.0	2.4	1237.8	21.5	0.06	0.25	0.1	0.0	495.4	
May 3, 2023	9.49	670.1	0.00	0.0	9.80	670.2	6.75	2871.5	9.81	667.3	6.50	0.0	9.80	680.1	2.9	1500.6	23.1	0.05	0.26	0.1	0.0	655.2	
May 4, 2023	9.51	669.8	0.00	0.0	9.80	670.6	5.82	2466.1	9.80	667.7	6.11	0.0	9.80	679.8	2.6	1387.2	24.2	-0.11	0.74	0.1	0.0	885.9	
May 5, 2023	9.50	670.2	0.00	0.0	9.79	668.7	8.45	3646.6	9.80	667.1	6.11	0.0	9.80	680.0	2.0	1090.2	22.0	-0.35	1.40	0.1	0.0	478.0	
May 6, 2023	9.50	670.0	0.00	0.0	9.80	670.2	10.30	4194.9	9.81	666.8	7.68	0.0	9.80	680.1	2.7	1615.4	21.9	-0.33	1.41	0.1	0.0	372.5	
May 7, 2023	9.50	670.0	0.00	0.0	9.82	671.2	7.80	3048.2	9.80	666.2	6.12	0.0	9.80	680.1	2.0	1187.9	22.1	-0.32	1.41	0.1	0.0	436.6	
May 8, 2023	9.49	672.7	0.05	0.0	9.79	669.9	6.94	3182.8	9.80	666.7	5.53	0.0	9.80	680.1	2.4	1409.1	22.5	-0.31	1.44	0.1	0.0	778.0	
May 9, 2023	9.56	676.0	0.14	0.0	9.80	671.9	4.97	2215.4	9.86	659.8	2.49	0.0	9.84	680.3	0.5	219.3	21.6	-0.04	0.57	0.1	0.0	226.7	
May 10, 2023	9.50	674.3	0.00	0.0	9.80	671.5	4.37	1750.2	9.83	658.6	4.09	0.0	9.86	678.4	1.0	501.0	18.0	-0.13	0.91	0.1	0.0	249.5	
May 11, 2023	9.45	668.8	0.06	0.0	9.76	669.8	4.64	1697.6	9.80	667.3	2.44	0.0	9.79	680.7	1.4	832.2	21.4	-0.33	1.37	0.1	0.0	299.5	
May 12, 2023	9.51	675.9	0.00	0.0	9.81	670.6	2.80	845.7	9.80	667.0	1.40	0.0	9.82	680.5	0.5	274.5	21.8	-0.33	1.48	0.1	0.0	194.3	
May 13, 2023	9.51	669.2	0.00	0.0	9.80	669.6	3.15	971.9	9.80	666.5	2.64	0.0	9.80	680.2	1.1	599.3	23.3	-0.34	1.41	0.1	0.0	437.8	
May 14, 2023	9.50	670.3	0.00	0.0	9.80	669.6	4.69	1565.7	9.80	666.9	2.84	0.0	9.80	673.9	1.5	805.0	23.1	-0.35	1.40	0.1	0.0	889.4	
May 15, 2023	9.50	669.6	0.00	0.0	9.80	670.0	4.58	1411.7	9.80	668.2	1.69	0.0	9.80	680.3	1.2	592.7	23.4	-0.34	1.40	0.1	0.0	629.7	
May 16, 2023	9.51	669.9	0.17	112.5	9.80	669.9	4.57	1481.2	9.80	666.5	2.18	0.0	9.80	679.8	1.9	982.8	21.0	-0.34	1.41	0.1	0.0	671.8	Out of Service
May 17, 2023	9.50	672.8	0.00	0.0	9.80	669.4	5.33	1800.5	10.15	613.2	4.22	17.8	9.17	676.4	1.4	497.3	21.3	-0.33	1.41	0.1	0.0	803.7	
May 18, 2023	9.50	669.8	0.00	0.0	9.80	670.1	5.44	1685.1	9.80	670.0	2.36	0.0	8.54	608.8	0.4	208.3	21.3	-0.33	1.42	0.1	0.0	1035.2	
May 19, 2023	9.48	669.9	0.00	0.0	9.80	669.9	5.39	1651.1	9.79	668.8	3.36	0.0	9.80	679.6	1.6	963.4	22.1	-0.33	1.42	0.1	0.0	1516.1	
May 20, 2023	9.51	670.4	0.00	0.0	9.80	670.3	5.58	1600.1	9.80	669.1	4.11	0.0	9.80	664.6	2.0	1174.0	21.3	-0.31	1.45	0.1	0.0	1934.1	
May 21, 2023	9.50	669.8	0.04	0.0	9.80	669.7	5.27	1485.3	9.80	668.9	4.06	0.0	9.80	659.5	2.0	1119.2	22.5	-0.31	1.45	0.1	0.0	1490.7	
May 22, 2023	9.49	668.6	0.13	0.0	9.80	670.0	6.31	1742.4	9.80	668.7	3.64	0.0	9.80	680.2	1.9	1049.0	21.1	-0.31	1.51	0.1	0.0	1579.7	
May 23, 2023	9.51	701.4	0.12	0.0	9.80	670.5	6.12	1689.2	9.80	670.0	2.32	0.0	9.81	676.1	1.8	1160.6	20.8	-0.30	1.48	0.1	0.0	868.1	
May 24, 2023	9.50	669.6	0.00	0.0	9.80	669.9	5.22	1453.1	9.79	669.2	2.98	191.8	9.80	680.0	1.4	827.6	21.4	-0.31	1.48	0.1	0.0	1278.8	
May 25, 2023	9.50	670.1	0.00	0.0	9.80	669.9	6.15	1848.7	9.80	643.8	3.32	0.0	9.80	679.6	1.7	1018.9	21.4	-0.30	1.49	0.1	0.0	1345.6	
May 26, 2023	9.50	669.5	0.04	0.0	9.80	670.0	6.56	1888.7	9.80	668.4	4.07	0.0	9.80	676.2	2.1	1302.0	21.8	-0.31	1.47	0.1	0.0	1929.6	
May 27, 2023	9.50	670.9	0.00	0.0	9.80	670.1	6.64	1911.1	9.80	669.2	3.32	0.0	9.80	679.9	1.6	932.4	22.5	-0.32	1.48	0.1	0.0	2095.0	
May 28, 2023	9.50	669.8	0.00	0.0	9.80	669.8	6.30	1756.7	9.80	668.5	3.44	0.0	9.80	679.7	1.5	862.1	21.4	-0.32	1.49	0.1	0.0	2003.0	
May 29, 2023	9.50	670.1	0.03	0.0	9.80	669.9	6.76	1960.0	9.80	668.2	4.73	0.0	9.80	675.1	2.6	1568.9	21.4	-0.38	1.42	0.0	0.0	1574.4	
May 30, 2023	9.48	664.6	0.13	0.0	9.80	667.6	6.98	1916.0	9.80	665.6	4.81	0.0	9.76	685.6	3.1	1817.7	20.2	-0.39	1.43	0.1	0.0	1763.1	
May 31, 2023	9.50	675.7	0.07	0.0	9.80	670.4	6.43	1603.1	9.80	670.1	2.58	0.0	9.59	522.6	4.1	2202.2	21.4	-0.30	1.49	0.1	0.0	848.4	
Avg	9.50	671.7	0.05	5.3	9.80	670.1	5.78	1929.6	9.81	664.8	4.10	6.8	9.73	671.0	1.9	1045.4	21.7	-0.27	1.26	0.1	0.0	988.4	N/A
Min	9.45	664.6	0.00	0.0	9.76	667.6	2.80	845.7	9.79	613.2	1.40	0.0	8.54	522.6	0.4	208.3	18.0	-0.39	0.25	0.0	0.0	194.3	N/A
Max	9.56	701.4	0.59	112.5	9.82	671.9	10.30	4194.9	10.15	670.1	9.49	191.8	9.86	685.6	4.1	2202.2	24.2	0.06	1.51	0.1	0.0	2095.0	N/A

Appendix D - Air Pollution Control System Data

Gold Bar Wastewater Treatment Plant
Daily Average Scrubber Report
June 2023

Date	East Scrubber				Fermenter Scrubber				West Scrubber				EPT Scrubber				GRF Scrubber				Grit 6/7 Building Scrubber	Screen 4-8 Building Scrubber	Dewatering Facility Scrubber
	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H2S In (ppm)	H2S Out (ppb)	Temperature In (°C)	Pressure In (kPa)	Pressure Out (kPa)	H_2S Out (ppm)	H_2S Out (ppb)	H_2S Out (ppb)	H_2S Out (ppb)
June 1, 2023	9.50	667.6	0.15	0.0	9.80	670.3	5.07	1368.8	9.81	669.2	1.60	0.0	9.83	680.5	1.1	581.1	21.1	-0.31	1.47	0.1	0.0	347.0	
June 2, 2023	9.50	671.1	0.12	0.0	9.80	669.7	4.47	994.5	9.79	667.8	3.74	0.0	9.80	679.9	1.8	1013.2	21.7	-0.32	1.49	0.1	0.0	1320.3	
June 3, 2023	9.51	670.4	0.05	0.0	9.80	670.1	5.07	1196.5	9.80	666.4	4.67	0.0	9.80	679.9	2.0	1130.8	21.5	-0.31	1.49	0.1	0.0	1724.3	
June 4, 2023	9.48	669.4	0.07	0.0	9.80	669.8	5.05	1147.7	9.79	666.3	5.26	0.0	9.80	679.7	2.0	1107.8	22.8	-0.32	1.46	0.1	0.0	1801.5	
June 5, 2023	9.43	684.8	0.20	0.0	9.54	663.4	9.61	1564.4	9.80	665.6	6.03	0.0	9.80	679.8	2.1	1180.6	20.7	-0.33	1.47	0.1	0.0	1703.0	
June 6, 2023	9.49	669.9	0.10	0.0	9.80	670.0	6.14	1950.0	9.80	665.5	6.04	0.0	9.79	679.6	2.5	1452.2	21.8	-0.33	1.46	0.1	0.0	2238.8	
June 7, 2023	9.50	670.0	0.28	0.0	9.80	669.8	6.29	1799.0	9.80	665.5	6.29	0.0	9.80	680.1	2.0	1142.8	23.3	-0.34	1.45	0.1	0.0	2107.8	
June 8, 2023	9.51	670.0	0.30	0.0	9.80	669.8	6.98	1832.2	9.80	664.9	7.09	0.0	9.80	679.5	2.3	1319.8	23.4	-0.34	1.46	0.1	0.0	2476.8	
June 9, 2023	9.50	669.8	0.35	0.0	9.80	670.1	7.01	1809.2	9.80	666.8	6.55	0.0	9.79	680.1	2.2	1216.0	23.9	-0.34	1.47	0.1	0.0	2279.1	
June 10, 2023	9.50	669.5	0.37	0.0	9.80	669.9	7.26	1854.5	9.80	667.4	6.25	0.0	9.80	680.0	2.4	1355.8	23.7	-0.33	1.47	0.1	0.0	2123.2	
June 11, 2023	9.48	670.3	0.37	0.0	9.80	669.9	8.12	1931.1	9.80	667.2	6.10	0.0	9.80	679.8	2.4	1329.3	22.8	-0.33	1.49	0.1	0.0	2312.1	
June 12, 2023	9.50	669.9	0.34	0.0	9.80	670.0	8.38	1842.1	9.80	665.8	7.20	200.2	9.79	680.1	2.1	1151.4	23.2	-0.33	1.47	0.1	0.0	3108.9	
June 13, 2023	9.50	675.8	0.25	0.0	9.80	667.3	8.25	1796.0	9.80	660.1	6.62	59.0	9.80	668.8	3.5	2124.3	22.9	-0.32	1.36	0.1	0.0	2322.5	
June 14, 2023	9.51	674.3	0.45	0.0	9.80	670.0	5.22	1039.8	9.81	665.9	4.38	0.0	9.96	674.5	2.8	1812.8	20.5	-0.32	1.39	0.1	0.0	1184.3	
June 15, 2023	9.50	670.8	0.00	0.0	9.80	670.6	3.51	692.5	9.80	669.9	0.00	0.0	9.80	684.4	0.2	177.7	21.2	-0.32	1.38	0.1	0.0	2.6	
June 16, 2023	9.49	669.1	0.01	0.0	9.80	669.2	2.03	286.8	9.80	669.4	0.22	0.0	9.80	680.7	0.4	324.7	21.5	-0.31	1.44	0.1	0.0	24.6	Out of Service
June 17, 2023	9.50	670.4	0.00	0.0	9.80	601.4	3.28	616.0	9.80	669.5	1.45	0.0	9.80	680.6	1.4	936.5	21.7	-0.31	1.38	0.1	0.0	107.0	
June 18, 2023	9.51	670.6	0.00	0.0	9.80	650.3	3.48	716.1	9.81	670.2	0.45	0.0	9.80	683.0	0.7	445.8	22.2	-0.30	1.25	0.1	0.0	24.6	
June 19, 2023	9.50	670.9	0.00	0.0	9.80	670.4	1.10	171.9	9.80	669.9	0.00	0.0	9.80	683.9	0.0	3.0	21.6	-0.30	1.35	0.1	0.0	4.4	
June 20, 2023	9.50	670.0	0.00	0.0	9.80	670.2	0.81	132.1	9.79	670.0	0.00	0.0	9.80	685.3	0.0	62.2	22.0	-0.30	1.34	0.1	0.0	16.0	
June 21, 2023	9.47	670.0	0.00	0.0	9.75	677.0	1.75	202.4	9.80	669.7	0.00	0.0	9.80	681.8	0.1	113.8	21.5	-0.31	1.43	0.1	0.0	11.2	
June 22, 2023	9.49	667.4	0.00	0.0	9.80	670.2	2.22	149.9	9.80	669.7	0.19	0.0	9.80	682.1	0.3	241.5	21.3	-0.32	1.42	0.1	0.0	14.4	
June 23, 2023	9.49	670.3	0.00	0.0	9.80	669.9	3.51	150.1	9.80	669.9	0.68	0.0	9.81	680.9	0.4	220.1	21.4	-0.32	1.43	0.1	0.0	40.6	
June 24, 2023	9.49	668.8	0.00	0.0	9.80	669.7	5.17	150.3	9.80	668.3	1.43	0.0	9.80	678.5	0.5	304.1	22.7	-0.33	1.41	0.1	0.0	105.2	
June 25, 2023	9.50	670.9	0.02	0.0	9.80	670.1	5.68	150.2	9.80	666.6	1.96	0.0	9.80	659.8	0.7	395.7	20.8	-0.33	1.43	0.1	0.0	189.9	
June 26, 2023	9.47	668.2	0.17	0.0	9.80	669.7	7.12	737.0	9.79	667.2	3.40	0.0	9.80	660.0	0.9	538.6	21.9	-0.32	1.41	0.1	0.0	559.0	
June 27, 2023	9.52	671.6	0.12	0.0	9.78	669.8	8.59	1791.0	9.80	665.7	4.09	0.0	9.80	671.1	1.1	668.3	22.7	-0.32	1.41	0.1	0.0	1094.9	
June 28, 2023	9.50	668.8	0.33	0.0	9.79	669.3	11.16	2642.6	9.48	663.5	4.09	0.0	9.80	667.0	1.9	1218.5	22.1	-0.34	1.42	0.1	0.0	790.6	
June 29, 2023	9.49	665.1	0.34	0.0	9.81	667.4	10.60	2080.8	9.80	665.1	5.11	0.0	9.76	669.7	1.3	804.5	23.5	-0.32	1.40	0.2	0.0	1226.3	
June 30, 2023	9.53	675.4	0.33	0.0	9.80	669.9	12.55	2684.4	9.80	665.8	5.18	0.0	9.80	679.3	1.6	907.9	22.9	-0.33	1.40	0.1	0.0	1088.4	
Avg	9.50	670.7	0.16	0.0	9.79	666.8	5.85	1182.7	9.79	667.2	3.54	8.6	9.80	677.7	1.4	842.7	22.1	-0.32	1.42	0.1	0.0	1078.3	N/A
Min	9.43	665.1	0.00	0.0	9.54	601.4	0.81	132.1	9.48	660.1	0.00	0.0	9.76	659.8	0.0	3.0	20.5	-0.34	1.25	0.1	0.0	2.6	N/A
Max	9.53	684.8	0.45	0.0	9.81	677.0	12.55	2684.4	9.81	670.2	7.20	200.2	9.96	685.3	3.5	2124.3	23.9	-0.30	1.49	0.2	0.0	3108.9	N/A

Appendix D - Air Pollution Control System Data

Gold Bar Wastewater Treatment Plant
Daily Average Scrubber Report
July 2023

Date	East Scrubber				Fermenter Scrubber				West Scrubber				EPT Scrubber				GRF Scrubber				Grit 6/7 Building Scrubber	Screen 4-8 Building Scrubber	Dewatering Facility Scrubber
	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H2S In (ppm)	H2S Out (ppb)	Temperature In (°C)	Pressure In (kPa)	Pressure Out (kPa)	H_2S Out (ppm)	H_2S Out (ppb)	H_2S Out (ppb)	H_2S Out (ppb)
July 1, 2023	9.56	668.0	0.09	0.0	9.78	669.4	16.86	4229.1	9.80	663.8	5.33	0.0	9.79	675.9	3.0	1858.5	20.5	-0.33	1.44	0.1	0.0	566.4	
July 2, 2023	9.49	673.0	0.00	0.0	9.83	670.8	12.46	3140.1	9.80	665.6	4.41	0.0	9.81	679.1	1.6	1012.3	21.1	-0.31	1.42	0.1	0.0	1058.7	
July 3, 2023	9.50	670.3	0.00	0.0	9.80	669.9	12.84	3343.4	9.79	664.8	4.94	0.0	9.79	673.6	2.2	1486.4	21.4	-0.31	1.40	0.1	0.0	944.7	
July 4, 2023	9.50	669.4	0.04	0.0	9.80	669.9	13.99	3548.4	9.80	663.8	6.53	0.0	9.81	679.6	1.7	1086.3	21.1	-0.31	1.44	0.1	0.0	1606.7	
July 5, 2023	9.49	669.8	0.25	74.6	9.80	669.9	14.58	3486.9	9.80	664.8	5.53	0.0	9.80	679.3	1.7	1036.5	22.0	-0.32	1.41	0.1	61.5	1226.8	
July 6, 2023	9.49	669.7	0.02	0.0	9.80	669.9	13.39	2796.9	9.80	664.9	6.21	0.0	9.80	679.4	2.0	1274.1	21.9	-0.32	1.41	0.1	0.0	646.6	
July 7, 2023	9.51	670.2	0.01	0.0	9.80	670.0	13.86	2839.6	9.80	665.7	6.78	0.0	9.80	678.9	2.0	1570.6	22.1	-0.32	1.41	0.1	0.0	877.3	
July 8, 2023	9.48	670.0	0.03	0.0	9.80	669.7	15.17	5478.9	9.80	663.7	6.97	0.0	9.80	678.6	2.1	1685.1	23.0	-0.31	1.41	0.1	0.0	983.2	
July 9, 2023	9.48	669.8	0.08	0.0	9.80	670.1	15.98	20580.8	9.79	664.8	7.45	0.0	9.80	679.4	2.1	1634.9	23.5	-0.32	1.40	0.1	0.0	752.2	
July 10, 2023	9.54	670.2	0.01	0.0	9.80	670.0	16.49	20040.8	9.81	663.4	7.94	0.0	9.80	675.8	2.3	1780.4	20.4	-0.32	1.40	0.1	0.0	780.5	
July 11, 2023	9.48	670.2	0.01	0.0	9.80	666.6	16.22	10832.6	9.81	666.7	7.14	0.0	9.80	678.1	2.4	1950.5	21.0	-0.33	1.41	0.1	0.0	1172.3	
July 12, 2023	9.48	669.5	0.03	0.0	9.79	669.5	16.28	3200.4	9.79	663.5	6.90	0.0	9.78	680.4	2.2	1662.3	22.3	-0.32	1.40	0.1	0.0	812.1	
July 13, 2023	9.51	670.6	0.00	0.0	9.80	670.3	17.07	3272.0	9.80	665.1	6.06	0.0	9.80	679.1	2.3	1732.0	21.4	-0.32	1.41	0.1	0.0	1173.6	
July 14, 2023	9.50	669.4	0.00	0.0	9.80	670.0	16.45	3216.7	9.80	665.3	7.67	0.0	9.80	672.9	2.3	1685.0	21.4	-0.22	1.00	0.1	0.0	1260.5	
July 15, 2023	9.47	670.5	0.01	0.0	9.80	670.1	17.86	3594.1	9.80	665.8	6.90	0.0	9.80	672.9	2.6	1890.0	20.0	-0.02	0.26	0.1	0.0	1248.9	
July 16, 2023	9.53	680.1	0.03	0.0	9.81	670.7	16.01	3238.6	9.81	668.8	2.61	0.0	9.80	618.2	2.9	2230.3	21.0	-0.02	0.22	0.1	0.0	531.2	Out of Service
July 17, 2023	9.49	668.9	0.02	0.0	9.81	669.1	14.48	2941.2	9.80	665.4	5.01	0.0	9.79	665.9	2.3	1846.6	21.3	-0.02	0.25	0.1	0.0	543.2	
July 18, 2023	9.50	672.0	0.00	0.0	9.81	671.1	11.06	2177.8	9.81	670.8	0.13	0.0	9.79	671.4	1.5	1177.2	20.1	-0.02	0.25	0.1	0.0	29.7	
July 19, 2023	9.49	668.5	0.00	0.0	9.77	670.2	8.43	1481.2	9.79	668.7	1.71	0.0	9.78	539.0	1.6	1181.2	20.7	0.08	0.32	0.1	0.0	147.2	
July 20, 2023	9.49	670.2	0.00	0.0	9.80	669.9	10.80	1787.9	9.80	667.2	4.13	0.0	9.80	678.4	2.1	2113.6	21.8	0.12	0.34	0.1	0.0	334.7	
July 21, 2023	9.49	669.4	0.00	0.0	9.80	669.9	11.48	1871.3	9.80	667.0	4.65	0.0	9.80	678.8	2.5	2307.4	22.8	-0.05	0.74	0.1	0.0	511.3	
July 22, 2023	9.52	669.8	0.00	0.0	9.80	669.9	11.95	1849.5	9.80	666.6	6.06	0.0	9.80	660.1	3.0	2851.8	23.4	-0.33	1.32	0.1	0.0	438.2	
July 23, 2023	9.50	670.3	0.00	0.0	9.80	669.9	12.46	2236.1	9.80	666.3	6.28	0.0	9.80	668.7	2.9	2441.8	22.7	-0.33	1.35	0.1	0.0	399.4	
July 24, 2023	9.51	672.9	0.03	0.0	9.80	670.6	13.04	2628.9	9.80	669.3	1.31	0.0	9.79	647.2	4.5	4218.9	23.2	-0.33	1.37	0.1	0.0	118.7	
July 25, 2023	9.50	668.8	0.00	0.0	9.52	660.8	10.86	1601.1	9.79	663.3	3.93	0.0	9.83	680.7	2.3	2142.6	21.1	-0.34	1.35	0.1	0.0	229.0	
July 26, 2023	9.52	674.9	0.06	0.0	9.79	667.5	11.37	2477.5	9.81	670.6	3.55	0.0	9.78	675.6	4.2	3970.9	20.9	-0.31	1.25	0.1	0.0	360.4	
July 27, 2023	9.50	668.7	0.00	0.0	9.80	670.2	9.79	1880.8	9.80	669.1	1.46	0.0	9.82	679.8	2.0	1663.5	21.6	-0.31	1.36	0.1	0.0	127.7	
July 28, 2023	9.49	669.8	0.00	0.0	9.80	670.0	10.53	1934.8	9.80	668.6	3.29	0.0	9.79	637.7	4.1	3894.1	21.7	-0.33	1.37	0.1	0.0	258.2	
July 29, 2023	9.50	669.7	0.00	0.0	9.80	669.8	11.70	2159.8	9.80	668.1	3.81	0.0	9.80	679.7	2.4	1967.6	21.7	-0.32	1.37	0.1	0.0	344.8	
July 30, 2023	9.49	667.2	0.04	0.0	9.80	669.8	12.94	2368.6	9.79	667.6	4.42	0.0	9.79	673.7	4.4	3748.9	22.2	-0.33	1.37	0.1	0.0	368.7	
July 31, 2023	9.51	672.7	0.00	0.0	9.80	670.3	13.15	2433.8	9.80	669.1	1.86	0.0	9.82	678.2	3.1	2940.8	21.3	-0.33	1.39	0.1	0.0	146.8	
Avg	9.50	670.5	0.02	2.4	9.79	669.5	13.53	4150.6	9.80	666.4	4.87	0.0	9.80	667.6	2.5	2065.9	21.6	-0.24	1.14	0.1	2.0	645.1	N/A
Min	9.47	667.2	0.00	0.0	9.52	660.8	8.43	1481.2	9.79	663.3	0.13	0.0	9.78	539.0	1.5	1012.3	20.0	-0.34	0.22	0.1	0.0	29.7	N/A
Max	9.56	680.1	0.25	74.6	9.83	671.1	17.86	20580.8	9.81	670.8	7.94	0.0	9.83	680.7	4.5	4218.9	23.5	0.12	1.44	0.1	61.5	1606.7	N/A

Appendix D - Air Pollution Control System Data

Gold Bar Wastewater Treatment Plant
Daily Average Scrubber Report
August 2023

Date	East Scrubber				Fermenter Scrubber				West Scrubber				EPT Scrubber				GRF Scrubber				Grit 6/7 Building Scrubber	Screen 4-8 Building Scrubber	Dewatering Facility Scrubber
	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H2S In (ppm)	H2S Out (ppb)	Temperature In (°C)	Pressure In (kPa)	Pressure Out (kPa)	H_2S Out (ppm)	H_2S Out (ppb)	H_2S Out (ppb)	H_2S Out (ppb)
August 1, 2023	9.49	670.1	0.00	0.0	9.79	669.6	15.14	2641.9	9.79	667.2	5.95	0.0	9.80	680.3	2.1	1834.9	22.0	-0.34	1.37	0.1	0.0	268.0	
August 2, 2023	9.51	668.6	0.03	0.0	9.80	669.9	16.57	2920.2	9.81	667.1	7.43	0.0	9.80	677.8	2.5	2117.9	21.2	-0.32	1.36	0.1	0.0	144.5	
August 3, 2023	9.49	670.6	0.00	0.0	9.79	669.8	17.10	3001.1	9.79	662.3	9.17	0.0	9.80	660.9	2.6	1656.0	21.2	-0.32	1.37	0.1	0.0	168.3	
August 4, 2023	9.50	669.7	0.00	0.0	9.80	669.8	18.42	3366.1	9.80	663.1	10.86	0.0	9.81	679.8	2.3	1093.8	21.5	-0.33	1.36	0.1	0.0	454.1	
August 5, 2023	9.50	669.8	0.00	0.0	9.80	669.9	20.04	3671.1	9.81	659.9	9.45	0.0	9.81	680.1	2.6	1246.2	21.4	-0.33	1.37	0.1	0.0	284.3	
August 6, 2023	9.50	669.8	0.00	0.0	9.80	670.0	19.58	3594.1	9.80	665.4	8.78	0.0	9.81	679.5	2.9	1401.5	21.7	-0.33	1.36	0.1	0.0	374.8	
August 7, 2023	9.50	669.8	0.00	0.0	9.80	669.9	20.06	3676.7	9.80	665.8	8.04	0.0	9.81	679.7	2.9	1416.2	21.8	-0.34	1.36	0.1	0.0	281.7	
August 8, 2023	9.50	676.9	0.12	0.0	9.80	670.2	21.83	4373.8	9.80	667.4	5.98	0.0	9.78	567.5	4.9	2852.1	20.1	-0.32	1.42	0.1	0.0	199.1	
August 9, 2023	9.51	655.7	0.00	0.0	9.79	669.7	19.24	3575.8	9.81	669.8	1.73	0.0	9.81	679.9	1.7	887.5	21.0	-0.31	1.37	0.1	0.0	32.0	
August 10, 2023	9.51	672.1	0.00	0.0	9.82	668.1	13.71	2289.9	9.80	669.8	1.44	0.0	9.82	687.5	0.6	361.3	20.9	-0.32	1.46	0.1	0.0	75.9	
August 11, 2023	9.50	670.0	0.00	0.0	9.80	669.8	12.87	2303.4	9.80	667.7	6.06	0.0	9.80	679.9	1.3	676.5	21.2	-0.34	1.35	0.1	0.0	129.1	
August 12, 2023	9.50	670.9	0.00	0.0	9.80	669.9	13.67	2340.9	9.80	667.0	7.58	0.0	9.81	677.2	1.7	879.6	20.9	-0.33	1.36	0.1	0.0	85.0	
August 13, 2023	9.48	669.6	0.00	0.0	9.80	669.7	15.18	2700.0	9.80	666.6	8.61	0.0	9.80	679.5	1.6	858.1	22.7	-0.33	1.35	0.1	0.0	179.6	
August 14, 2023	9.49	670.0	0.00	0.0	9.80	669.7	20.13	3618.0	9.80	665.1	10.97	0.0	9.80	679.5	1.9	925.3	22.5	-0.34	1.36	0.1	0.0	219.9	
August 15, 2023	9.51	667.6	0.07	0.0	9.80	669.9	25.19	4914.7	10.13	632.3	11.35	0.0	9.80	678.5	2.4	1216.2	22.4	-0.34	1.35	0.1	0.0	360.4	
August 16, 2023	9.51	671.5	0.05	0.0	9.80	670.3	20.23	3764.0	9.79	660.9	12.90	0.0	9.80	675.5	3.3	1751.6	21.6	-0.34	1.36	0.1	0.0	686.8	Out of Service
August 17, 2023	9.49	668.9	0.05	0.0	9.79	669.5	21.08	4041.9	9.80	660.5	14.99	0.0	9.78	644.0	4.7	2642.7	22.8	-0.33	1.34	0.1	0.0	742.4	
August 18, 2023	9.52	674.4	0.00	0.0	9.82	671.3	15.24	3098.3	9.82	671.2	0.46	0.0	9.82	659.8	3.4	1922.7	20.7	-0.31	1.42	0.1	0.0	21.3	
August 19, 2023	9.50	669.1	0.00	0.0	9.80	670.1	7.90	1279.9	9.80	669.3	0.46	0.0	9.81	679.6	0.3	252.3	21.5	-0.31	1.39	0.1	0.0	1.2	
August 20, 2023	9.50	669.8	0.00	0.0	9.79	669.7	9.53	1667.3	9.80	618.2	3.81	0.0	9.80	679.7	1.0	581.5	21.7	-0.32	1.38	0.1	0.0	2.6	
August 21, 2023	9.50	669.8	0.00	0.0	9.80	669.7	12.33	2213.0	9.80	668.0	5.96	0.0	9.80	628.1	1.5	862.7	21.8	-0.32	1.37	0.1	0.0	16.7	
August 22, 2023	9.50	669.9	0.00	0.0	9.80	669.7	15.58	3028.9	9.80	663.2	9.33	0.0	9.80	627.8	2.2	1204.4	20.9	-0.33	1.37	0.0	0.0	51.7	
August 23, 2023	9.50	670.2	0.00	0.0	9.80	669.8	18.58	4224.6	9.80	612.5	8.26	0.0	9.71	243.1	5.3	3220.0	20.6	-0.32	1.34	0.2	0.0	20.2	
August 24, 2023	9.48	672.4	0.01	0.0	9.79	668.5	15.26	3133.3	9.79	667.5	4.72	0.0	9.80	682.1	1.2	604.1	21.2	-0.32	1.33	0.1	0.0	3.6	
August 25, 2023	9.50	669.8	0.09	0.0	9.79	669.8	15.33	2672.2	9.80	666.6	8.28	0.0	9.80	678.7	1.7	845.1	21.1	-0.34	1.37	0.1	0.0	18.4	
August 26, 2023	9.49	670.2	0.23	0.0	9.80	669.8	17.55	3037.3	9.80	666.8	7.89	0.0	9.80	678.7	1.8	848.0	21.9	-0.33	1.36	0.1	0.0	0.4	
August 27, 2023	9.48	663.3	0.36	0.0	9.80	669.9	19.10	3452.4	9.81	667.3	6.88	0.0	9.80	678.3	2.2	1051.9	21.9	-0.32	1.37	0.1	0.0	2.8	
August 28, 2023	9.48	667.8	1.59	0.0	9.80	669.7	20.93	3986.7	9.79	664.5	5.30	0.0	9.80	677.4	2.6	1266.4	22.1	-0.33	1.37	0.1	0.0	1.5	
August 29, 2023	9.52	676.7	0.83	0.0	9.80	669.5	28.75	5380.5	9.80	665.3	12.26	0.0	9.80	677.6	2.5	1207.9	23.0	-0.32	1.36	0.1	0.0	3.5	
August 30, 2023	9.50	669.9	1.00	0.0	9.80	670.2	28.67	5417.5	9.80	663.7	11.62	0.0	9.80	675.8	3.4	1669.8	22.1	-0.32	1.35	0.1	0.0	12.5	
August 31, 2023	9.51	671.5	0.65	0.0	9.83	670.6	33.86	7401.0	9.80	662.5	10.73	0.0	9.80	677.1	3.2	1604.9	20.9	-0.32	1.36	0.1	0.0	153.7	
Avg	9.50	669.9	0.16	0.0	9.80	669.8	18.34	3444.7	9.81	661.4	7.65	0.0	9.80	655.8	2.4	1321.3	21.6	-0.33	1.37	0.1	0.0	161.2	N/A
Min	9.48	655.7	0.00	0.0	9.79	668.1	7.90	1279.9	9.79	612.5	0.46	0.0	9.71	243.1	0.3	252.3	20.1	-0.34	1.33	0.0	0.0	0.4	N/A
Max	9.52	676.9	1.59	0.0	9.83	671.3	33.86	7401.0	10.13	671.2	14.99	0.0	9.82	687.5	5.3	3220.0	23.0	-0.31	1.46	0.2	0.0	742.4	N/A

Appendix D - Air Pollution Control System Data

Gold Bar Wastewater Treatment Plant
Daily Average Scrubber Report
September 2023

Date	East Scrubber				Fermenter Scrubber				West Scrubber				EPT Scrubber				GRF Scrubber				Grit 6/7 Building Scrubber	Screen 4-8 Building Scrubber	Dewatering Facility Scrubber
	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H2S In (ppm)	H2S Out (ppb)	Temperature In (°C)	Pressure In (kPa)	Pressure Out (kPa)	H_2S Out (ppm)	H_2S Out (ppb)	H_2S Out (ppb)	H_2S Out (ppb)
September 1, 2023	9.50	669.8	0.49	0.0	9.80	669.6	27.25	6980.2	9.80	664.7	10.33	0.0	9.79	677.7	3.4	1686.0	21.5	-0.33	1.36	0.1	0.0	917.6	
September 2, 2023	9.50	670.7	0.51	0.0	9.80	669.9	25.23	5308.2	9.80	663.5	10.33	0.0	9.80	677.5	4.1	2144.2	21.2	-0.32	1.36	0.1	0.0	1034.3	
September 3, 2023	9.51	670.1	0.39	0.0	9.80	669.9	26.19	5414.9	9.80	666.3	8.90	0.0	9.80	677.4	3.4	1795.9	22.0	-0.31	1.36	0.1	0.0	522.0	
September 4, 2023	9.50	670.3	0.27	0.0	9.80	670.2	27.51	6102.9	9.81	665.4	7.27	0.0	9.80	674.3	3.4	1840.2	22.3	-0.30	1.36	0.1	0.8	318.6	
September 5, 2023	9.49	669.3	0.44	0.0	9.78	668.6	26.29	5401.4	9.78	662.0	11.46	0.0	9.78	539.1	7.3	4546.6	22.2	-0.29	1.37	0.1	0.5	622.1	
September 6, 2023	9.48	671.1	0.77	0.3	9.89	670.4	22.34	4127.6	9.81	665.6	8.93	0.0	9.83	638.3	2.9	1611.9	21.9	-0.29	1.44	0.1	0.0	553.7	
September 7, 2023	9.49	670.1	0.57	0.0	9.81	678.5	17.29	4885.2	9.80	665.5	11.69	256.1	9.80	677.1	2.7	1522.1	22.0	-0.31	1.36	0.1	0.0	1067.9	
September 8, 2023	9.49	670.4	0.45	0.0	9.80	669.5	17.22	6865.7	9.80	666.4	9.61	0.0	9.80	675.8	3.7	2090.8	21.6	-0.30	1.39	0.1	0.0	780.2	
September 9, 2023	9.50	670.1	0.46	0.0	9.80	670.2	22.79	6003.9	9.81	666.3	9.76	0.0	9.81	676.0	4.2	2303.3	21.8	-0.31	1.38	0.1	0.0	1229.1	
September 10, 2023	9.50	668.7	0.54	0.0	9.80	670.1	25.35	5513.6	9.80	666.5	9.33	0.0	9.80	676.6	3.7	1998.9	21.4	-0.30	1.37	0.1	0.0	967.6	
September 11, 2023	9.50	669.9	0.71	0.0	9.80	670.3	25.80	5535.4	9.80	665.4	12.25	0.0	9.80	676.3	3.9	2095.7	21.3	-0.31	1.37	0.1	0.0	1228.7	
September 12, 2023	9.48	670.7	0.59	0.0	9.77	667.2	31.85	7452.8	9.84	652.2	10.16	0.0	9.89	663.6	5.5	2621.4	20.2	-0.31	1.34	0.1	0.0	1113.9	
September 13, 2023	9.51	670.5	0.49	0.0	9.80	670.3	39.85	10002.3	9.81	664.8	9.44	0.0	9.80	676.2	3.5	1898.0	20.4	-0.30	1.44	0.1	0.0	375.0	
September 14, 2023	9.50	668.2	0.65	0.0	9.79	669.9	36.22	8781.9	9.80	665.4	10.57	0.0	9.79	672.8	3.9	2234.1	21.9	-0.31	1.42	0.1	0.0	334.8	
September 15, 2023	9.50	670.2	0.71	0.0	9.81	670.0	36.83	8643.3	9.80	664.9	11.13	0.0	9.80	672.9	4.3	2350.7	22.1	-0.30	1.37	0.1	10.2	49.5	Out of Service
September 16, 2023	9.50	671.5	0.71	0.0	9.80	670.1	34.86	8074.8	9.80	665.0	12.54	0.0	9.80	658.4	5.8	3181.6	21.9	-0.30	1.37	0.1	0.0	87.0	
September 17, 2023	9.48	662.1	0.97	0.0	9.80	670.2	36.80	8524.6	9.80	663.9	9.66	0.0	9.80	672.5	4.8	2594.3	21.8	-0.29	1.36	0.1	0.0	50.0	
September 18, 2023	9.52	675.6	1.55	7.6	9.80	668.4	33.92	8436.6	9.80	665.2	11.94	0.0	9.80	670.3	4.6	2532.8	22.4	-0.29	1.37	0.1	0.0	332.4	
September 19, 2023	9.50	670.0	0.71	0.0	9.80	670.0	34.05	8736.7	9.82	669.6	12.57	0.0	9.79	670.9	4.9	2591.7	22.1	-0.28	1.37	0.1	0.0	265.9	
September 20, 2023	9.49	671.4	0.49	0.0	9.80	669.7	33.34	9750.9	9.78	664.7	11.52	0.0	9.78	645.2	5.2	2658.6	22.2	-0.29	1.34	0.1	0.0	49.2	
September 21, 2023	9.50	669.8	0.48	0.0	9.79	669.5	33.87	9594.5	9.80	604.5	12.80	0.0	9.80	672.5	5.1	2524.6	22.0	-0.29	1.38	0.0	0.0	521.2	
September 22, 2023	9.49	669.2	0.61	0.0	9.81	670.2	24.02	9582.1	9.80	664.7	12.73	0.0	9.80	672.6	4.8	2277.2	22.0	-0.29	1.38	0.1	0.0	66.9	
September 23, 2023	9.50	670.1	0.70	0.0	9.80	670.1	13.58	8054.6	9.80	608.9	11.06	0.0	9.80	673.4	5.9	2801.8	21.1	-0.30	1.37	0.1	0.0	51.7	
September 24, 2023	9.50	670.5	0.54	0.0	9.80	670.2	18.94	7620.9	9.80	669.0	11.54	0.0	9.80	674.4	5.4	2563.8	21.5	-0.30	1.37	0.1	0.0	38.1	
September 25, 2023	9.50	669.8	0.54	0.0	9.80	669.6	23.49	7057.4	9.81	630.2	12.01	0.0	9.80	673.9	4.7	2275.6	21.8	-0.29	1.38	0.1	0.0	552.5	
September 26, 2023	9.50	670.3	0.58	0.0	9.80	670.0	27.02	1059.7	9.75	497.6	12.44	0.0	9.80	671.6	5.7	2752.0	21.2	-0.30	1.37	0.1	0.0	1690.1	
September 27, 2023	9.50	670.5	0.47	0.0	9.80	670.4	29.90	233.5	9.80	663.6	13.15	0.0	9.80	673.9	4.9	2404.8	22.0	-0.29	1.33	0.1	0.0	1974.2	
September 28, 2023	9.48	663.5	0.84	0.0	9.80	670.3	29.28	199.4	9.80	663.4	12.64	0.0	9.81	672.0	5.7	2806.1	22.0	-0.28	1.39	0.1	0.0	1575.8	
September 29, 2023	9.52	675.5	0.74	0.0	9.80	670.1	27.32	4765.3	9.79	663.6	8.96	0.0	9.80	595.0	5.1	2651.4	22.3	-0.28	1.39	0.1	0.0	522.6	
September 30, 2023	9.51	672.1	0.28	0.0	9.80	669.8	27.01	4612.2	9.80	665.4	8.69	0.0	9.80	672.3	4.8	2464.0	22.3	-0.27	1.39	0.1	0.0	1610.7	
Avg	9.50	670.1	0.61	0.3	9.80	670.1	27.85	6444.1	9.80	654.1	10.85	8.5	9.80	664.0	4.6	2394.0	21.7	-0.30	1.38	0.1	0.4	683.4	N/A
Min	9.48	662.1	0.27	0.0	9.77	667.2	13.58	199.4	9.75	497.6	7.27	0.0	9.78	539.1	2.7	1522.1	20.2	-0.33	1.33	0.0	0.0	38.1	N/A
Max	9.52	675.6	1.55	7.6	9.89	678.5	39.85	10002.3	9.84	669.6	13.15	256.1	9.89	677.7	7.3	4546.6	22.4	-0.27	1.44	0.1	10.2	1974.2	N/A

Appendix D - Air Pollution Control System Data

Gold Bar Wastewater Treatment Plant
Daily Average Scrubber Report
October 2023

Date	East Scrubber				Fermenter Scrubber				West Scrubber				EPT Scrubber				GRF Scrubber				Grit 6/7 Building Scrubber	Screen 4-8 Building Scrubber	Dewatering Facility Scrubber
	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H2S In (ppm)	H2S Out (ppb)	Temperature In (°C)	Pressure In (kPa)	Pressure Out (kPa)	H_2S Out (ppm)	H_2S Out (ppb)	H_2S Out (ppb)	H_2S Out (ppb)
October 1, 2023	9.50	670.0	0.25	0.0	9.80	669.8	30.04	8192.8	9.80	665.5	8.44	0.0	9.80	673.5	4.7	2360.9	22.2	-0.28	1.40	0.1	0.0	1666.7	
October 2, 2023	9.50	672.4	0.29	0.0	9.79	670.2	33.01	7723.2	9.78	663.2	8.99	0.0	9.80	676.8	4.6	2244.7	21.8	-0.28	1.37	0.1	0.0	1275.3	
October 3, 2023	9.50	670.2	0.30	0.0	9.81	670.2	32.96	3208.9	9.80	666.1	8.62	0.0	9.80	674.5	4.9	2397.7	22.2	-0.28	1.38	0.1	0.0	1584.8	
October 4, 2023	9.48	663.2	0.22	0.0	9.73	658.9	33.43	421.2	9.79	665.4	7.93	0.0	9.80	676.9	3.8	1907.4	21.9	-0.28	1.37	0.1	0.0	1091.2	
October 5, 2023	9.50	670.2	0.10	0.0	9.80	670.3	29.98	348.6	9.80	666.5	7.14	0.0	9.80	675.7	4.8	2404.3	21.9	-0.29	1.39	0.1	0.0	1126.0	
October 6, 2023	9.50	669.7	0.24	0.0	9.80	669.8	27.25	304.5	9.79	665.4	9.35	0.0	9.80	675.9	5.2	2534.9	22.0	-0.29	1.39	0.1	0.0	1808.1	
October 7, 2023	9.50	669.9	0.34	0.0	9.80	669.8	28.30	307.0	9.80	664.9	9.02	0.0	9.80	669.8	6.4	3066.7	21.6	-0.29	1.39	0.1	0.0	1758.8	
October 8, 2023	9.50	670.1	0.23	0.0	9.80	670.1	26.22	265.2	9.80	665.3	8.43	0.0	9.80	660.1	5.7	2669.1	21.3	-0.29	1.37	0.1	0.0	855.8	
October 9, 2023	9.49	669.4	0.29	0.0	9.80	670.1	26.09	266.1	9.79	665.6	7.39	0.0	9.80	650.3	4.6	2200.8	21.7	-0.29	1.38	0.1	0.0	272.5	
October 10, 2023	9.50	670.1	0.43	0.0	9.80	669.9	18.61	9078.2	9.80	664.3	11.50	0.0	9.80	650.1	5.1	2407.3	21.3	-0.22	1.24	0.1	0.0	704.7	
October 11, 2023	9.50	668.0	0.46	0.0	9.80	668.3	17.99	4296.0	9.80	664.3	13.78	0.0	9.80	646.2	6.0	2778.1	21.9	-0.30	1.41	0.1	0.0	1774.7	
October 12, 2023	9.50	670.2	0.41	0.0	9.80	670.1	25.31	4120.5	9.80	663.9	12.73	0.0	9.80	643.9	5.6	2021.9	22.0	-0.31	1.42	0.1	0.0	304.7	
October 13, 2023	9.50	670.4	0.32	0.0	9.80	670.2	25.29	4359.3	9.80	663.7	11.60	0.0	9.80	654.8	6.4	2848.8	22.2	-0.30	1.43	0.1	0.0	564.6	
October 14, 2023	9.50	670.2	0.25	0.0	9.80	670.1	23.16	3994.7	9.81	663.2	10.22	0.0	9.80	647.5	6.0	2745.9	22.3	-0.30	1.42	0.1	0.0	297.4	
October 15, 2023	9.50	669.6	0.20	0.0	9.80	670.0	23.75	4161.0	9.79	664.1	9.16	0.0	9.80	634.6	4.9	2627.5	21.7	-0.30	1.43	0.1	0.0	228.2	
October 16, 2023	9.52	673.6	0.32	69.4	9.80	669.4	24.50	4048.5	9.82	662.1	10.92	0.0	9.79	660.1	5.2	3051.0	22.1	-0.29	1.43	0.1	69.4	515.4	Out of Service
October 17, 2023	9.50	669.8	0.01	0.0	9.80	670.3	20.12	3855.0	9.80	665.2	9.29	196.1	9.80	677.2	4.6	3150.5	22.3	-0.29	1.42	0.1	0.0	1451.9	
October 18, 2023	9.50	670.2	0.01	0.0	9.80	670.2	17.96	3396.6	9.79	664.5	10.63	0.0	9.80	672.0	4.3	2979.7	21.6	-0.29	1.42	0.1	0.0	2110.2	
October 19, 2023	9.50	670.1	0.01	0.0	9.80	670.0	19.25	3521.2	9.81	663.5	12.11	0.0	9.80	678.2	4.0	2853.6	20.9	-0.31	1.41	0.1	0.0	1842.4	
October 20, 2023	9.50	670.3	0.00	0.0	9.80	670.0	17.59	5158.8	9.80	664.8	10.18	0.0	9.80	582.3	4.7	3392.7	20.9	-0.31	1.42	0.1	0.0	2267.3	
October 21, 2023	9.50	670.2	0.00	0.0	9.80	669.9	19.04	7659.2	9.80	664.5	8.46	0.0	9.79	602.8	4.3	3307.7	22.5	-0.29	1.42	0.1	0.0	1315.6	
October 22, 2023	9.50	670.0	0.00	0.0	9.80	669.9	19.61	7660.0	9.79	665.6	8.53	0.0	9.81	673.5	4.0	3160.7	22.6	-0.28	1.42	0.1	0.0	481.8	
October 23, 2023	9.50	670.0	0.00	23.7	9.81	670.4	18.58	5295.3	9.81	666.1	7.30	0.0	9.80	602.9	4.3	3458.5	23.2	-0.28	1.43	0.1	0.0	708.3	
October 24, 2023	9.50	669.9	0.00	0.2	9.80	669.8	13.59	2806.3	9.81	665.4	7.80	0.0	9.95	667.7	15.5	8950.6	23.2	-0.27	1.43	0.1	0.0	1673.0	
October 25, 2023	9.50	670.3	0.00	0.2	9.80	670.0	11.34	2266.3	9.80	666.6	7.95	0.0	9.80	678.8	3.2	2090.3	23.1	-0.28	1.44	0.1	0.0	1337.4	
October 26, 2023	9.68	677.3	0.01	4.2	9.80	670.0	11.83	2518.1	9.81	666.1	6.14	0.0	9.80	679.0	2.9	1913.1	23.1	-0.27	1.44	0.1	0.0	1299.2	
October 27, 2023	9.50	669.9	0.00	0.0	9.80	670.2	11.23	2510.7	9.79	665.9	6.40	0.0	9.80	677.8	3.4	2155.1	23.0	-0.28	1.43	0.1	0.0	622.6	
October 28, 2023	9.50	670.1	0.00	0.0	9.80	670.2	9.27	2322.3	9.81	666.6	6.52	0.0	9.80	679.0	3.4	2241.0	22.9	-0.28	1.43	0.1	0.0	179.1	
October 29, 2023	9.50	669.9	0.00	0.0	9.80	669.8	9.80	2355.9	9.79	667.1	5.89	0.0	9.80	670.6	2.8	1819.2	22.5	-0.28	1.44	0.1	0.0	151.1	
October 30, 2023	9.48	673.4	0.00	0.0	9.80	670.0	10.35	2278.1	9.79	667.5	4.85	0.0	9.82	666.4	2.7	1650.5	22.4	-0.28	1.44	0.1	0.0	52.0	
October 31, 2023	9.50	670.0	0.00	0.0	9.80	669.8	10.86	2117.6	9.80	666.1	5.76	0.0	9.81	678.1	3.6	2153.2	22.2	-0.28	1.43	0.1	0.0	0.0	
Avg	9.51	670.3	0.15	3.2	9.80	669.6	20.85	3574.7	9.80	665.1	8.81	6.3	9.81	659.9	4.9	2759.5	22.1	-0.29	1.41	0.1	2.2	1010.3	N/A
Min	9.48	663.2	0.00	0.0	9.73	658.9	9.27	265.2	9.78	662.1	4.85	0.0	9.79	582.3	2.7	1650.5	20.9	-0.31	1.24	0.1	0.0	0.0	N/A
Max	9.68	677.3	0.46	69.4	9.81	670.4	33.43	9078.2	9.82	667.5	13.78	196.1	9.95	679.0	15.5	8950.6	23.2	-0.22	1.44	0.1	69.4	2267.3	N/A

Appendix D - Air Pollution Control System Data

Gold Bar Wastewater Treatment Plant
Daily Average Scrubber Report
November 2023

Date	East Scrubber				Fermenter Scrubber				West Scrubber				EPT Scrubber				GRF Scrubber				Grit 6/7 Building Scrubber	Screen 4-8 Building Scrubber	Dewatering Facility Scrubber
	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H2S In (ppm)	H2S Out (ppb)	Temperature In (°C)	Pressure In (kPa)	Pressure Out (kPa)	H_2S Out (ppm)	H_2S Out (ppb)	H_2S Out (ppb)	H_2S Out (ppb)
November 1, 2023	9.53	689.6	0.00	0.0	9.80	670.0	10.14	1952.9	9.80	668.0	4.93	0.0	9.80	678.4	3.6	2247.7	22.1	-0.28	1.43	0.1	0.0	0.0	
November 2, 2023	9.50	670.1	0.00	0.0	9.80	669.8	10.27	2020.9	9.79	666.9	5.44	0.0	9.82	659.8	3.1	2203.7	22.2	-0.28	1.43	0.1	0.0	0.1	
November 3, 2023	9.50	670.0	0.00	0.0	9.80	669.8	9.12	1575.4	9.80	667.6	6.12	0.0	9.80	650.4	3.6	2711.2	22.2	-0.28	1.43	0.1	0.0	0.0	
November 4, 2023	9.50	670.1	0.00	0.0	9.80	670.1	8.10	1340.0	9.81	666.8	6.12	0.0	9.80	675.5	4.9	3446.7	22.0	-0.28	1.42	0.1	0.0	0.0	
November 5, 2023	9.50	670.1	0.00	0.0	9.80	670.1	7.78	1405.1	9.79	667.1	4.52	0.0	9.80	679.0	3.8	2752.9	22.2	-0.27	1.43	0.1	0.0	0.0	
November 6, 2023	9.50	669.9	0.00	0.0	9.80	669.9	8.23	1545.3	9.80	667.9	4.02	0.0	9.80	679.2	2.8	2070.8	22.2	-0.27	1.42	0.1	0.0	556.7	
November 7, 2023	9.50	670.1	0.00	0.0	9.80	670.0	9.32	1900.1	9.80	666.8	4.91	0.0	9.80	665.8	3.7	2731.3	21.7	-0.27	1.43	0.1	0.0	1313.0	
November 8, 2023	9.50	669.9	0.00	0.1	9.80	670.2	8.92	1618.5	9.80	667.5	3.94	0.0	9.80	661.0	3.1	2396.3	21.9	-0.34	1.19	0.1	0.0	927.6	
November 9, 2023	9.50	670.0	0.00	0.0	9.80	667.7	8.25	1395.0	9.77	659.1	3.84	0.0	9.66	668.7	3.1	2361.2	23.0	-0.52	0.76	0.1	0.0	922.0	
November 10, 2023	9.50	670.2	0.00	0.0	9.80	669.9	8.47	1507.4	9.79	667.5	4.38	0.0	9.80	678.3	3.1	2349.2	23.7	-0.59	0.83	0.1	0.0	816.6	
November 11, 2023	9.50	669.9	0.00	0.0	9.80	669.8	8.60	1554.0	9.80	667.3	5.33	0.0	9.80	677.8	4.1	2949.2	23.4	-0.59	0.83	0.1	0.0	986.7	
November 12, 2023	9.50	670.1	0.00	0.0	9.80	670.2	8.69	1553.5	9.80	666.5	5.86	0.0	9.80	679.0	3.2	2305.7	23.4	-0.60	0.83	0.1	0.0	930.0	
November 13, 2023	9.50	669.8	0.00	0.0	9.80	670.0	8.74	1671.0	9.81	666.6	5.96	0.0	9.80	678.0	3.8	2738.3	23.5	-0.60	0.83	0.1	0.0	984.2	
November 14, 2023	9.51	672.4	0.00	0.5	9.80	669.7	9.14	1845.0	9.79	666.7	6.05	0.0	9.75	670.5	3.8	2655.1	23.7	-0.59	0.82	0.1	0.0	871.3	
November 15, 2023	9.50	670.2	0.00	5.1	9.80	670.0	10.12	2214.7	9.80	666.2	5.91	0.0	9.80	674.6	4.0	2535.2	24.2	-0.59	0.83	0.1	0.0	366.3	
November 16, 2023	9.50	669.9	0.00	4.2	9.80	670.1	9.83	2134.7	9.80	665.7	6.64	0.0	9.80	674.3	4.1	2605.4	24.2	-0.58	0.83	0.1	0.0	346.8	Out of Service
November 17, 2023	9.50	670.1	0.00	0.9	9.80	669.8	10.20	2133.1	9.80	665.6	7.75	0.0	9.80	665.4	3.5	2092.0	23.2	-0.60	0.83	0.1	0.0	384.5	
November 18, 2023	9.50	670.0	0.00	0.1	9.80	670.1	10.58	2210.4	9.81	666.5	6.45	0.0	9.80	652.5	4.9	2948.4	23.4	-0.59	0.83	0.1	0.0	678.5	
November 19, 2023	9.50	670.0	0.00	0.0	9.80	670.0	9.67	2022.9	9.80	667.6	4.24	0.0	9.80	668.3	3.2	1948.4	23.5	-0.59	0.82	0.1	0.0	887.5	
November 20, 2023	9.50	670.0	0.00	0.0	9.79	669.9	10.17	2317.4	9.80	667.3	3.83	0.0	9.80	659.5	2.6	1581.7	23.6	-0.61	0.85	0.1	0.0	650.0	
November 21, 2023	9.50	670.0	0.00	0.1	9.77	670.0	11.05	2902.0	9.80	666.2	3.75	0.0	9.80	652.6	3.6	2313.2	24.0	-0.59	0.84	0.0	0.0	1000.3	
November 22, 2023	9.50	670.2	0.00	0.0	9.78	670.0	10.48	2623.4	9.80	666.0	4.96	0.0	9.80	661.5	3.3	2000.5	24.2	-0.54	0.80	0.1	0.0	899.8	
November 23, 2023	9.50	670.0	0.00	0.0	9.78	670.1	10.24	1937.9	9.80	666.2	4.50	0.0	9.80	690.4	4.2	2451.7	23.7	-0.50	0.77	0.1	0.0	757.5	
November 24, 2023	9.50	670.1	0.02	2.1	9.77	670.1	9.63	681.5	9.80	667.3	4.48	0.0	9.80	664.4	4.7	2854.6	23.9	-0.49	0.76	0.1	0.0	1010.6	
November 25, 2023	9.50	670.0	0.00	0.0	9.78	669.9	9.62	329.0	9.80	666.7	4.41	0.0	9.80	657.9	4.9	2264.9	23.5	-0.50	0.76	0.1	0.0	964.0	
November 26, 2023	9.50	670.0	0.00	0.0	9.78	669.9	11.16	373.5	9.80	667.1	4.79	0.0	9.80	656.7	5.3	39.5	23.6	-0.49	0.77	0.1	0.0	1271.5	
November 27, 2023	9.50	670.0	0.00	0.0	9.79	670.0	11.39	387.6	9.81	666.8	4.56	0.0	9.80	644.4	3.3	0.0	23.5	-0.49	0.77	0.1	0.0	935.7	
November 28, 2023	10.17	638.4	0.11	0.3	9.78	669.9	11.07	1638.6	9.80	666.1	4.86	0.0	9.80	668.5	3.6	0.0	23.4	-0.48	0.76	0.1	0.0	1129.0	
November 29, 2023	9.61	672.8	0.00	0.0	9.78	670.1	10.20	3889.8	9.79	665.6	4.06	0.0	9.81	679.6	3.3	0.0	23.4	-0.49	0.76	0.1	0.0	962.2	
November 30, 2023	9.50	672.4	0.00	0.0	9.79	670.8	8.48	2945.3	9.79	666.4	4.60	0.0	9.79	657.6	3.3	0.0	24.4	-0.48	0.76	0.1	0.0	563.0	
Avg	9.53	669.9	0.00	0.4	9.79	669.9	9.59	1787.5	9.80	666.5	5.04	0.0	9.79	667.7	3.7	2051.8	23.2	-0.48	0.96	0.1	0.0	703.8	N/A
Min	9.50	638.4	0.00	0.0	9.77	667.7	7.78	329.0	9.77	659.1	3.75	0.0	9.66	644.4	2.6	0.0	21.7	-0.61	0.76	0.0	0.0	0.0	N/A
Max	10.17	689.6	0.11	5.1	9.80	670.8	11.39	3889.8	9.81	668.0	7.75	0.0	9.82	690.4	5.3	3446.7	24.4	-0.27	1.43	0.1	0.0	1313.0	N/A

Appendix D - Air Pollution Control System Data

Gold Bar Wastewater Treatment Plant
Daily Average Scrubber Report
December 2023

Date	East Scrubber				Fermenter Scrubber				West Scrubber				EPT Scrubber				GRF Scrubber				Grit 6/7 Building Scrubber	Screen 4-8 Building Scrubber	Dewatering Facility Scrubber
	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H_2S In (ppm)	H_2S Out (ppb)	pH	ORP (mV)	H2S In (ppm)	H2S Out (ppb)	Temperature In (°C)	Pressure In (kPa)	Pressure Out (kPa)	H_2S Out (ppm)	H_2S Out (ppb)	H_2S Out (ppb)	H_2S Out (ppb)
December 1, 2023	9.50	670.0	0.00	0.0	9.80	670.0	8.82	2624.6	9.80	665.7	5.53	0.0	9.80	651.3	3.3	0.0	24.7	-0.46	0.74	0.1	0.0	459.6	
December 2, 2023	9.50	670.1	0.00	0.0	9.80	670.0	8.06	2358.8	9.80	667.2	5.23	0.0	9.80	653.3	1.9	0.0	24.6	-0.46	0.75	0.1	0.0	391.9	
December 3, 2023	9.50	669.9	0.00	0.0	9.80	669.8	7.70	2129.7	9.80	666.9	4.39	0.0	9.80	648.3	1.8	0.0	24.0	-0.47	0.75	0.1	0.0	276.0	
December 4, 2023	9.50	670.0	0.00	0.0	10.02	664.3	8.26	1964.3	9.80	666.9	4.91	0.0	9.86	660.8	1.8	688.3	23.8	-0.49	0.75	0.1	0.0	315.8	
December 5, 2023	9.50	670.0	0.17	70.8	9.80	668.9	10.24	3856.1	9.80	666.7	5.04	69.3	9.79	663.6	2.1	1647.8	23.4	-0.49	0.76	0.1	0.0	243.0	
December 6, 2023	9.50	670.0	0.00	0.0	9.80	670.0	11.51	3984.3	9.80	666.9	4.64	0.0	9.80	662.6	2.2	1716.6	23.4	-0.48	0.75	0.1	0.0	185.6	
December 7, 2023	9.50	670.2	0.00	0.0	9.80	669.9	11.92	4092.6	9.81	667.9	4.23	0.0	9.81	693.7	1.8	1348.2	23.5	-0.49	0.74	0.1	0.0	122.0	
December 8, 2023	9.50	670.0	0.00	0.0	9.80	669.9	12.51	4339.7	9.80	667.1	5.27	0.0	9.79	687.8	2.1	1819.1	24.6	-0.47	0.76	0.1	0.0	176.2	
December 9, 2023	9.50	669.9	0.00	0.0	9.80	670.7	11.40	3934.2	9.80	667.0	5.05	0.0	9.80	671.3	2.3	1720.9	24.7	-0.47	0.77	0.1	0.0	742.0	
December 10, 2023	9.50	670.0	0.00	0.0	9.80	669.1	12.41	4337.8	9.80	666.6	5.20	0.0	9.80	627.8	2.3	1625.2	24.2	-0.48	0.76	0.1	0.0	932.2	
December 11, 2023	9.49	672.8	0.00	0.0	9.80	671.3	14.09	4706.9	9.80	666.9	4.55	0.0	9.77	621.4	1.8	341.9	24.3	-0.48	0.76	0.1	0.0	752.6	
December 12, 2023	9.50	671.9	0.00	0.0	9.78	669.8	20.40	6826.9	9.80	666.2	5.38	0.0	9.91	652.9	4.5	0.0	24.3	-0.49	0.76	0.1	0.0	989.4	
December 13, 2023	9.50	670.1	0.00	0.0	9.80	670.5	23.06	7652.3	9.80	666.9	5.17	0.0	9.80	600.5	2.6	0.0	23.1	-0.40	0.68	0.1	0.0	543.6	
December 14, 2023	9.50	670.1	0.00	0.0	9.80	669.9	19.97	6346.0	9.80	665.9	5.04	0.0	9.85	669.9	3.0	154.0	23.3	-0.48	0.77	0.1	0.0	338.6	
December 15, 2023	9.50	670.2	0.00	0.0	9.80	670.1	20.20	6394.8	9.80	665.2	4.72	0.0	9.87	660.5	2.6	81.3	13.6	-0.19	0.50	0.1	0.0	123.6	
December 16, 2023	9.50	669.8	0.00	0.0	9.80	669.9	17.96	5401.2	9.80	588.5	5.14	0.0	9.80	654.7	3.3	0.5	2.5	0.01	0.26	0.1	0.0	137.5	Out of Service
December 17, 2023	9.50	669.9	0.00	0.0	9.80	670.1	18.52	5467.2	9.80	665.9	4.93	0.0	9.80	657.5	2.7	163.5	-0.9	0.02	0.26	0.1	0.0	106.3	
December 18, 2023	9.50	670.0	0.00	0.0	9.80	669.9	19.35	5671.7	9.80	666.2	4.80	0.0	9.81	661.4	2.2	0.0	-0.8	0.02	0.26	0.1	0.0	48.5	
December 19, 2023	9.50	670.2	0.00	0.0	9.80	669.9	17.89	4842.8	9.81	666.8	4.34	0.0	9.87	642.2	4.6	728.1	1.3	0.02	0.26	0.1	0.0	63.9	
December 20, 2023	9.50	670.1	0.00	0.0	9.80	670.2	15.98	7138.3	9.80	666.6	1.88	0.0	9.81	633.3	2.2	670.1	-1.0	0.02	0.26	0.0	0.0	129.2	
December 21, 2023	9.50	669.8	0.00	0.0	9.80	670.0	15.61	7286.4	9.80	665.6	0.15	0.0	9.80	665.1	9.8	2599.2	8.3	0.06	0.27	0.1	0.0	91.8	
December 22, 2023	9.50	670.1	0.00	0.0	9.80	670.0	6.97	1738.6	9.80	666.4	0.20	0.0	9.80	668.8	26.0	6327.5	21.5	0.12	0.28	0.1	0.0	78.7	
December 23, 2023	9.50	669.9	0.00	0.0	9.80	669.9	6.65	1714.8	9.80	666.5	0.11	0.0	9.80	665.4	23.2	5365.4	21.1	0.11	0.27	0.1	0.0	85.4	
December 24, 2023	9.50	670.1	0.00	0.0	9.80	670.1	6.12	1382.1	9.80	667.6	0.10	0.0	9.80	667.4	23.0	5563.5	20.5	0.13	0.28	0.1	0.0	58.7	
December 25, 2023	9.50	670.1	0.00	0.0	9.80	670.0	5.61	762.4	9.80	667.7	0.05	0.0	9.80	673.4	22.6	5342.5	20.8	0.13	0.28	0.1	0.0	35.5	
December 26, 2023	9.50	669.8	0.00	0.0	9.80	669.8	6.11	853.0	9.80	666.6	0.06	0.0	9.80	676.2	21.2	4839.2	21.0	0.12	0.28	0.1	0.1	52.7	
December 27, 2023	9.50	674.2	0.00	0.0	9.80	671.0	5.71	867.2	9.80	665.6	0.06	0.0	9.79	682.8	20.9	4750.2	20.7	0.12	0.28	0.1	0.0	55.7	
December 28, 2023	9.50	670.1	0.00	0.0	9.80	670.4	5.58	826.5	9.80	667.3	0.09	0.0	9.80	710.7	23.8	4875.3	20.9	0.12	0.28	0.1	0.0	74.5	
December 29, 2023	9.50	669.9	0.00	0.0	9.80	670.0	5.29	814.4	9.80	666.5	0.15	0.0	9.79	713.6	24.7	5240.9	21.1	0.12	0.28	0.1	0.0	46.1	
December 30, 2023	9.50	669.9	0.00	0.0	9.80	669.9	5.51	870.8	9.80	614.5	0.14	0.0	9.80	665.2	28.6	6745.3	20.8	0.12	0.27	0.1	0.0	53.5	
December 31, 2023	9.50	670.1	0.00	0.0	9.80	669.8	5.72	883.4	9.80	666.9	0.15	0.0	9.80	668.1	23.1	4940.6	20.8	0.12	0.28	0.1	1.9	54.3	
Avg	9.50	670.3	0.01	2.3	9.81	669.8	11.78	3615.2	9.80	662.4	3.12	2.2	9.81	662.3	9.6	2235.3	18.3	-0.18	0.49	0.1	0.1	250.5	N/A
Min	9.49	669.8	0.00	0.0	9.78	664.3	5.29	762.4	9.80	588.5	0.05	0.0	9.77	600.5	1.8	0.0	-1.0	-0.49	0.26	0.0	0.0	35.5	N/A
Max	9.50	674.2	0.17	70.8	10.02	671.3	23.06	7652.3	9.81	667.9	5.53	69.3	9.91	713.6	28.6	6745.3	24.7	0.13	0.77	0.1	1.9	989.4	N/A

Appendix E – Scrubber Chemicals

2023 Scrubber Bleach Usage (L as delivered 16% sodium hypochlorite solution)

	January	February	March	April	May	June	July	August	September	October	November	December
1	658	631	475	571	1077	598	1136	941	1260	1290	830	1077
2	771	596	743	576	949	834	992	989	1236	1271	900	1013
3	521	631	777	586	771	923	1059	882	1106	1241	1062	1010
4	827	678	773	628	823	1000	1160	1193	1066	1164	982	1564
5	762	690	783	652	885	953	1151	1195	1367	1070	715	956
6	655	719	580	680	1071	1034	1170	1176	1522	1263	778	878
7	873	742	719	726	911	1101	1222	1167	1477	1285	885	864
8	779	628	459	740	661	1047	1341	1180	1414	1163	838	901
9	581	583	555	759	584	927	1275	778	1408	1098	1081	885
10	567	466	601	764	480	930	1249	658	1336	1309	801	974
11	828	684	641	651	530	1002	1262	796	1437	1322	920	865
12	611	518	587	529	439	1031	973	822	1405	1360	929	859
13	558	615	539	574	531	1062	1077	968	1307	1189	868	1015
14	554	603	678	744	589	826	1114	957	1421	1344	1052	881
15	582	646	651	990	531	405	1183	1127	1483	1280	1007	918
16	786	563	658	1015	560	369	828	1168	1509	1052	1031	1027
17	826	670	573	808	521	515	916	1317	1436	1198	1068	974
18	585	861	479	435	558	511	555	561	1547	1187	1061	995
19	655	801	539	593	696	234	678	480	1099	1166	1014	893
20	590	699	471	594	755	143	836	670	1344	1078	864	1043
21	804	683	380	604	824	385	898	841	1409	1040	1005	869
22	1043	555	378	607	766	318	1036	959	1492	1024	889	911
23	539	476	360	681	640	486	1049	1013	1437	1049	1035	859
24	668	224	316	745	626	617	806	925	1440	995	917	852
25	717	616	375	675	708	633	635	1114	1411	911	940	843
26	480	687	459	723	780	731	786	1126	1478	933	1019	817
27	544	690	472	711	706	893	657	1176	1427	888	993	864
28	524	789	505	682	684	975	835	1298	1393	758	1124	888
29	488		464	775	851	1086	867	1592	1241	839	969	889
30	507		517	821	915	1098	939	1379	1228	893	976	975
31	613		574		631		682	1629		961		967
Total (L)	**20,499**	**17,744**	**17,085**	**20,641**	**22,054**	**22,666**	**30,367**	**32,078**	**41,135**	**34,622**	**28,553**	**29,326**

2023 Scrubber Caustic Usage (kg)

	January	February	March	April	May	June	July	August	September	October	November	December
1	71	104	84	74	116	94	130	137	131	136	115	106
2	79	102	97	66	121	95	113	129	157	133	117	100
3	52	89	92	80	104	93	114	140	132	122	113	92
4	70	111	101	99	102	101	120	139	130	129	99	123
5	80	104	97	89	106	92	124	129	125	119	106	90
6	71	92	73	92	111	99	106	130	157	123	98	91
7	112	92	108	80	91	109	105	121	150	132	98	96
8	79	98	77	86	80	104	120	127	144	126	86	92
9	54	94	69	86	83	98	111	128	139	124	104	89
10	57	86	84	89	87	102	116	116	130	119	95	84
11	74	92	89	101	93	108	113	112	134	128	87	90
12	81	86	105	98	96	113	103	117	129	132	107	95
13	73	96	68	91	84	123	106	123	134	120	90	88
14	74	87	105	106	98	101	120	125	140	118	96	105
15	68	85	87	101	75	102	109	129	144	129	112	94
16	70	86	91	98	90	87	106	118	180	103	93	98
17	129	89	95	91	84	84	107	131	164	105	102	95
18	102	100	83	105	89	82	129	92	157	124	99	88
19	93	96	87	68	89	81	127	101	150	105	89	94
20	86	96	85	94	91	65	127	88	157	116	87	81
21	110	96	87	79	89	86	129	88	146	111	84	102
22	119	79	69	84	91	89	121	98	156	110	87	78
23	61	78	72	70	101	92	116	109	139	115	95	104
24	82	42	81	87	86	106	124	111	152	137	111	88
25	97	91	63	97	90	77	116	122	143	103	104	85
26	95	88	79	118	88	105	115	130	147	85	105	83
27	126	95	71	100	89	104	125	125	145	94	101	83
28	105	102	76	105	87	95	122	133	136	83	101	90
29	72		60	106	92	107	118	148	135	87	96	93
30	112		81	110	102	115	134	127	132	91	102	89
31	106		70		99		130	145		100		88
Total (kg)	**2,661**	**2,557**	**2,585**	**2,748**	**2,906**	**2,907**	**3,658**	**3,769**	**4,312**	**3,557**	**2,976**	**2,874**

Appendix F – Odour Complaints

Appendix F - Odour Complaints

Date	Time	Location	Complaint Description	Call Back Details	Wind Direction	Scrubber Status	Maintenance Activities	Action Taken	Is GBWWTP the Likely Source (Y/N)	Consistent with EnviroSuite Model?
10/23/2023	N/A	4814-114 Ave NW	EPCOR received a message forwarded an Edmonton city counsellor outlining concerns from a customer regarding odour in their neighbourhood across the river from Gold Bar WWTP. Customer is also disappointed that EPCOR does not plan to cover The plant's 11 bioreactors and secondary clarifiers.	Called customer back on Oct 27 and left a voicemail requesting additional information regarding odour to help with investigation and to provide customer additional information regarding long term odour mitigation plans (including plant to cover primary clarifiers 5-8). Called again Oct 30 and left another voicemail. No response.	N/A	N/A	N/A	Insufficient date/time info to complete a comprehensive investigation.	N	N/A
10/22/2023	12:00-19:34	5303 109A Ave	AEPA agent was contacted by a customer with concerns about Air Emissions and Odour from the Gold Bar WWTP on October 22, 2023. AEPA Ref# 421109.	Customer was contacted directly by Sr Manager Operations on October 23, and EPCOR provide additional email follow up with additional information, including planned odour projects on October 24. Customer was also encouraged to report odour complaint to the EPCOR trouble line 780-412-4500 for a more rapid response.	From East	Operational	N/A	Investigation determined that the plant was operating normally at the time of the complaint. Given the close proximity of the address and the wind direction at the time of the complaint it is likely the plant was contributing to the odour observed by the customer. Customer was called back directly on October 23, and EPCOR provide additional email follow up with additional information, including planned odour projects on October 24. AEPA agent was copied on the email. 7 Day letter was also submitted to AEPA on October 27, 2023.	Y	N/A
10/8/2023	22:00-22:30	4524 109A Ave	Details of customer odour complaint: Very strong sewer smell Odour inside or outside: Outside… permeated the inside of her house Description of odour: Very strong sewer smell Odour intensity (scale from 1-10): 10 (Caller describes it as 30) Time noticed odour and for how long: Happened between 10PM and 10:30PM. Called in Oct 8 @ 10:59 PM. Is it a reoccurring issue? No. Happened this night.	Called back Customer on October 9. Customer indicated odour was on the inside the house . EPCOR representative indicated that operations at the plant were normal and odour control systems were operating, also since the wind was not coming from the plant that we would forward the complaint to the collection system operations group for further investigation.	From South	Operational	N/A	Investigation indicated that the wind was coming from south and not from the direction of the plant. There were no operational issues at the plant. the complaint was forwarded back to Collection System Operations for further investigation	N	N
10/8/2023	21:14	10808 43 ST NW	Details of customer odour complaint: Exceptionally strong sewer smell Odour inside or outside: Outside Description of odour: Sewer smell so strong he could not stay outside Odour intensity (scale from 1-10): 10 Time noticed odour and for how long: This evening. Called in Oct 8 @ 9:14 PM Is it a reoccurring issue? No. Exceptionally strong	Called back Customer on October 9. Customer indicated odour was on the inside the house . EPCOR representative indicated that operations at the plant were normal and odour control systems were operating, also since the wind was not coming from the plant that we would forward the complaint to the collection system operations group for further investigation.	From South	Operational	N/A	Investigation indicated that the wind was coming from south and not from the direction of the plant. There were no operational issues at the plant. the complaint was forwarded back to Collection System Operations for further investigation	N	N
10/1/2023	07:48	3814 111 Ave	Details of customer odour complaint: over the last couple months, the smells getting worse from the plant anytime there's any moisture in air. It gets worse. Would like a call back. Odour inside or outside – outside Description of odour: it's the plant smell Odour intensity (scale from 1-10): intensity at an 8 this morning. Time noticed odour and for how long: a year ago it started getting, Is it a reoccurring issue? Yes	Ops called and left message Monday Oct 2, 10am. Customer phoned back on Oct 4. Customer noted has experienced increased odour in evenings, when foggy or after a rain storm. Described smell as H2S/Rotten Egg. Customer commented on "open settling ponds" at GB being the source of odour. Ops rep informed them that there are plans to cover the primary clarifiers in coming years as well as new foul air capture at headworks. Confirmed with them the best way to report odour complaints is the EPCOR 4500 phone line.	From SW	Operational	N/A	SIA Beverly station had an exceedance around the same time as this complaint. This address is 2 blocks south of the SIA Station.	Y	Y

Appendix F - Odour Complaints

Date	Time	Location	Complaint Description	Call Back Details	Wind Direction	Scrubber Status	Maintenance Activities	Action Taken	Is GBWWTP the Likely Source (Y/N)	Consistent with EnviroSuite Model?
9/24/2023	15:20	10977 50 St - Parkland Trails	Details of customer odour complaint: Odour present on the Parkland trails near the waste water treatment plant Odour inside or outside: Outside Description of odour: Concerning foul odors from Gold Bar Waste Water Treatment Plant Odour intensity (scale from 1-10): Not provided Time noticed odour and for how long: Customer reported the issue to 311 at 3:20 PM on Sept. 24 Is it a reoccurring issue? Yes, the customer says this occurs weekly in the e-mail	Called back customer to get more details about the exact location on "Parkland Trails" where they experienced the odour. No answer, left a voicemail, and asked them to call back. Based on Envirosuite model, it is not conclusive with the limited information available.	From SW	Operational	N/A	Customer did not return call. With no specific location, unable to complete investigation.	N	N/A
9/14/2023	09:25	4804 109A Ave NW	Details of customer odour complaint: We have consistently smelt bad odours from the wastewater plant starting around 8:30 in the evning and usually until 10:30-11 starting Septermber 8th and it is still occuring. We can even have our windows open in our house. Odour : outside Description of odour: SEWAGE Odour intensity (scale from 1-10): 12 Time noticed odour and for how long: CONSISTENTLY EVERYDAY 8:30 PM TILL 11:00 PM SINCE SEPT 8 2023	Phoned the customer back and got their voicemail at 11:30 am Sept 4. Asked them to call back to confirm details of what they are experiencing and provide some more info. The times and dates they describde generally correlate with the overnight H2S exceedances we have been seeing on and off at the air quality monitoring station on gold bar park road.	Various	Operational	N/A	Customer did not return call. No abnormal activities going on at the plant.	N	Y
9/9/2023	09:00	4812 108A Ave	Customer called and left a voicemail regarding odours from the plant.	Phoned customer back on Sept 11.	From North	Operational	N/A	Customer is located just South of the plant. This complaint coincides with an H2S exceedance at the Gold Bar Bar Road AQMS on Saturday morning. The trajectory report from Envirosuite suggests that the wind was coming from the north (from the plant). The customer was very appreciative of the call back. We let them know that operations at the plant were stable over the weekend, but we too have been noticing more odour lately from the collection system, and that a similar thing happened last year around this time when the nights are colder and we have not had rain in a while. He confirmed they have noticed and uptick lately in odour. He even said – “I’m sure your new station will pick it up”. No unusual activities going on at the plant - all scubbers working normally. Informed customer that in the future that it is preferred to phone (780) 412-4500 for odour complaints because there are operators 24/7 and the complaint will get assigned and tracked.	Y	Y
8/29/2023	AM	5008 106 Ave	Details of customer odour complaint: Odour inside or outside OUTSIDE Description of odour: Burning/rotten Garbage Odour intensity (scale from 1-10): 10 Time noticed odour and for how long: really bad this morning Is it a reoccurring issue? Yes, but not this bad	Called customer back, but wrong number was recorded. Sent complaint back to DROPS Control for investigation.	From South	Operational	N/A	Ran Envirosuite model - shows wind coming from the South. Additionally, odour described does not match WWTP operations.	N	N

Appendix F - Odour Complaints

Date	Time	Location	Complaint Description	Call Back Details	Wind Direction	Scrubber Status	Maintenance Activities	Action Taken	Is GBWWTP the Likely Source (Y/N)	Consistent with EnviroSuite Model?
3/5/2023	13:09	5211 109A Ave	Odour inside or outside: Outside odour Description of odour: Sewer smell Odour intensity (scale from 1-10): Did not get this info Time noticed odour and for how long: A few days, but today the odour has been the strongest Is it a reoccurring issue? Yes	Called customer back Monday, March 6. Customer has lived in area for over 10 years. The customer noted that the odor was observed outdoors starting 12-1pm, entered their home and basement through the open garage door and persisted in their basement until about 4pm. Asked if they thought the odour could be coming from their drains in their basement, they said no. It does appear there is a combined sewer in front of their residence.	From NE	Operational	N/A	Scrubbers were running normally, no maintenance activities, no activity at AQMS during this period, no bypassing, no tanks drained. Called caller back to pass along info and forwarded complaint back to DROPS Control for investigation. Noted wind was coming from the direction of the plant.	N	N

Appendix G – Nutri-Gold Summary

Substance Loading Rates on Nutrigold Fields - 2023

Nutrigold Field #2023NW0155194					Loading Rate		Biosolids	Field Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	Ha	Tonnes/Ha	Substance	mg/Kg	Kg	Kg/Ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
18439.76	6.3	1174	140	57	20.6	TP	30546	35846	629				
						TN	31272	36698	644				
						NH3-N	21769	25546	448				
Landowner		Nathaniel Osteshiewski				As	5.8	6.81	0.119				
Legal Description		NW-01-55-19 W4				Cd	3.0	3.52	0.062	10424	1500	10182	600
Start Date		2-Jun-23				Cr	117	137.3	2.41	267	20	261	8
End Date		9-Jun-23				Cu	357	419	7.35	88	15	86	6
Soil Class		Class 1				Pb	43	50.5	0.885	727	20	710	8
Biosolids Type		Digested				Mn	332	390	6.84				
		Gravity Thickened				Hg	1.15	1.350	0.024	27193	3000	26562	1100
						Ni	61	71.6	1.256	513	100	501	40
						Se	29.7	34.85	0.611				
						Zn	739	867	15.2	42	40	41	4
						Co	17.8	20.9	0.4				

Nutrigold Field #2023NE3454194					Loading Rate		Biosolids	Field Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	Ha	Tonnes/Ha	Substance	mg/Kg	Kg	Kg/Ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
9652.13	22.38	2153.98	240	97	22.2	TP	29425	63381	653				
						TN	29600	63758	657				
						NH3-N	7197.5	15503	160				
Landowner		Dwayne Stach				As	5.0	10.77	0.111				
Legal Description		NE-34-54-19 W4				Cd	5.0	10.77	0.111	5920	1500	5885	600
Start Date		12-Jun-23				Cr	153.0	329.6	3.40	193	20	192	8
End Date		17-Jul-23				Cu	434.0	935	9.64	68	15	68	6
Soil Class		Class 1				Pb	60.0	129.2	1.332	493	20	490	8
Biosolids Type		Digested				Mn	355.0	765	7.88				
		Centrifudge Dewatered				Hg	1.5	3.188	0.033	20000	3000	19882	1100
						Ni	39.0	84.0	0.866	759	100	754	40
						Se	6.6	14.22	0.147				
						Zn	830.0	1788	18.4	36	40	35	4
						Co	7.0	15.1	0.2				

Appendix G - Nutri-Gold Summary

Nutrigold Field #2023SE0355194					Loading Rate		Biosolids	ield Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	Ha	Tonnes/Ha	Substance	mg/Kg	Kg	Kg/Ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
18718.56	6.21	1162	143	57.87	20.1	TP	30546	35482	613				
						TN	31272	36325	628				
						NH3-N	21769	25287	437				
Landowner		Bernie Pavich				As	5.8	6.74	0.116				
Legal Description		SE-03-55-19 W4				Cd	3.0	3.48	0.060	10424	1500	10182	600
Start Date		10-Jun-23				Cr	117	135.9	2.35	267	20	261	8
End Date		7-Jul-23				Cu	357	415	7.17	88	15	86	6
Soil Class		Class 1				Pb	43	49.9	0.863	727	20	710	8
Biosolids Type		Digested				Mn	332	386	6.66				
		Gravity Thickened				Hg	1.15	1.336	0.023	27193	3000	26562	1100
						Ni	61	70.9	1.224	513	100	501	40
						Se	29.7	34.50	0.596				
						Zn	739	858	14.8	42	40	41	4
						Co	17.8	20.7	0.4				

Nutrigold Field #2023SW1054184					Loading Rate		Biosolids	ield Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	Ha	Tonnes/Ha	Substance	mg/Kg	Kg	Kg/Ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
9237.21	6.06	560	110	44.5	12.6	TP	30546	17107	384				
						TN	31272	17514	394				
						NH3-N	21769	12192	274				
Landowner		Steve Beamer				As	5.8	3.25	0.073				
Legal Description		SW-10-54-18 W4				Cd	3.0	1.68	0.038	10424	1500	10182	600
Start Date		27-Jun-23				Cr	117	65.5	1.47	267	20	261	8
End Date		17-Jul-23				Cu	357	200	4.49	88	15	86	6
Soil Class		Class 1				Pb	43	24.1	0.541	727	20	710	8
Biosolids Type		Digested				Mn	332	186	4.18				
		Gravity Thickened				Hg	1.15	0.644	0.014	27193	3000	26562	1100
						Ni	61	34.2	0.768	513	100	501	40
						Se	29.7	16.63	0.374				
						Zn	739	414	9.3	42	40	41	4
						Co	17.8	9.97	0.22				

Appendix G - Nutri-Gold Summary

Nutrigold Field #2023SE2754194					Loading Rate		Biosolids	ield Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	Ha	Tonnes/Ha	Substance	mg/Kg	Kg	Kg/Ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
11160.98	6.01	672	90	36.4	20.7	TP	30546	20515	564				
						TN	31272	21003	577				
						NH3-N	21769	14620	402				
Landowner		Shawn Hazlett				As	5.8	3.90	0.107				
Legal Description		SE-27-54-19 W4				Cd	3.0	2.01	0.055	10424	1500	10182	600
Start Date		8-Jul-23				Cr	117	78.6	2.16	267	20	261	8
End Date		15-Jul-23				Cu	357	240	6.59	88	15	86	6
Soil Class		Class 1				Pb	43	28.9	0.793	727	20	710	8
Biosolids Type		Digested				Mn	332	223	6.13				
		Gravity Thickened				Hg	1.15	0.772	0.021	27193	3000	26562	1100
						Ni	61	41.0	1.126	513	100	501	40
						Se	29.7	19.95	0.548				
						Zn	739	496	13.6	42	40	41	4
						Co	17.8	12.0	0.3				

Nutrigold Field #2023NE1554194					Loading Rate		Biosolids	Field Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	Ha	Tonnes/Ha	Substance	mg/Kg	Kg	Kg/Ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
2526.99	22.16	553.11	140	57	9.8	TP	29425	16275	288				
						TN	29600	16372	289				
						NH3-N	7197.5	3981	70				
Landowner		Wayne Woldanski				As	5.0	2.77	0.049				
Legal Description		NE-15-54-19 W4				Cd	5.0	2.77	0.049	5920	1500	5885	600
Start Date		16-Aug-23				Cr	153.0	84.6	1.50	193	20	192	8
End Date		27-Aug-23				Cu	434.0	240	4.24	68	15	68	6
Soil Class		Class 3				Pb	60.0	33.2	0.586	493	20	490	8
Biosolids Type		Digested				Mn	355.0	196	3.47				
		Centrifudge Dewatered				Hg	1.5	0.819	0.014	20000	3000	19882	1100
						Ni	39.0	21.6	0.381	759	100	754	40
						Se	6.6	3.65	0.064				
						Zn	830.0	459	8.1	36	40	35	4
						Co	7.0	3.9	0.1				

Appendix G - Nutri-Gold Summary

Nutrigold Field #2023					Loading Rate		Biosolids	Field Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	Ha	Tonnes/Ha	Substance	mg/Kg	Kg	Kg/Ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
5468	23.48	1284	123	50	25.7	TP	29425	37782	756				
						TN	29600	38006	760				
						NH3-N	7197.5	9242	185				
Landowner		Brian Bettac				As	5.0	6.42	0.128				
Legal Description		NE-17-54-17 W4				Cd	5.0	6.42	0.128	5920	1500	5885	600
Start Date		29-Aug-23				Cr	153.0	196.5	3.93	193	20	192	8
End Date		8-Sep-23				Cu	434.0	557	11.15	68	15	68	6
Soil Class		Class 1				Pb	60.0	77.0	1.541	493	20	490	8
Biosolids Type		Digested				Mn	355.0	456	9.12				
		Centrifudge Dewatered				Hg	1.5	1.900	0.038	20000	3000	19882	1100
						Ni	39.0	50.1	1.002	759	100	754	40
						Se	6.6	8.47	0.169				
						Zn	830.0	1066	21.3	36	40	35	4
						Co	7.0	8.988	0.17976				

Nutrigold Field #2023					Loading Rate		Biosolids	ield Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	Ha	Tonnes/Ha	Substance	mg/Kg	Kg	Kg/Ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
4962	23.45	1164	150	61	19.1	TP	29425	34251	561				
						TN	29600	34454	565				
						NH3-N	7197.5	8378	137				
Landowner		Brian Bettac				As	5.0	5.82	0.095				
Legal Description		SW-21-54-17 W4				Cd	5.0	5.82	0.095	5920	1500	5885	600
Start Date		8-Sep-23				Cr	153.0	178.1	2.92	193	20	192	8
End Date		19-Sep-23				Cu	434.0	505	8.28	68	15	68	6
Soil Class		Class1				Pb	60.0	69.8	1.145	493	20	490	8
Biosolids Type		Digested				Mn	355.0	413	6.77				
		Centrifudge Dewatered				Hg	1.5	1.723	0.028	20000	3000	19882	1100
						Ni	39.0	45.4	0.744	759	100	754	40
						Se	6.6	7.68	0.126				
						Zn	830.0	966	15.8	36	40	35	4
						Co	7.0	8.148	0.133574				

Appendix H – Third Party Agricultural Summary

Substance Loading Rates on Nutrigold Fields - 2023

Nutrigold Field #2023SW2853184					Loading Rate		Biosolids	Field Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	Ha	Tonnes/Ha	Substance	mg/Kg	Kg	Kg/Ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
20134.71	6.14	1240	152	61	20.3	TP	30546	37872	621				
						TN	31272	38772	636				
						NH3-N	21769	26990	442				
Landowner		Ross Cossey				As	5.8	7.19	0.118				
Legal Description		SW-28-53-18-4				Cd	3.0	3.72	0.061	10424	1500	10182	600
Start Date		21-Jul-23				Cr	117	145.1	2.38	267	20	261	8
End Date		11-Aug-23				Cu	357	443	7.26	88	15	86	6
Soil Class		Class 1				Pb	43	53.3	0.874	727	20	710	8
Biosolids Type		Digested				Mn	332	412	6.75				
		Gravity Thickened				Hg	1.15	1.426	0.023	27193	3000	26562	1100
						Ni	61	75.6	1.240	513	100	501	40
						Se	29.7	36.82	0.604				
						Zn	739	916	15.0	42	40	41	4
						Co	17.8	22.1	0.4				

Nutrigold Field #2023SE0753184					Loading Rate		Biosolids	Field Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	Ha	Tonnes/Ha	Substance	mg/Kg	Kg	Kg/Ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
55671.91	5.99	3331	397	161	20.7	TP	30546	101755	632				
						TN	31272	104173	647				
						NH3-N	21769	72517	450				
Landowner		Bilan Land & Cattle Co. Ltd.				As	5.8	19.32	0.120				
Legal Description		SE-07-53-18-4				Cd	3.0	9.99	0.062	10424	1500	10182	600
Start Date		6-May-23				Cr	117	389.7	2.42	267	20	261	8
End Date		31-May-23				Cu	357	1189	7.39	88	15	86	6
Soil Class		Class 1				Pb	43	143.2	0.890	727	20	710	8
Biosolids Type		Digested				Mn	332	1106	6.87				
		Gravity Thickened				Hg	1.15	3.831	0.024	27193	3000	26562	1100
						Ni	61	203.2	1.262	513	100	501	40
						Se	29.7	98.94	0.615				
						Zn	739	2462	15.3	42	40	41	4
						Co	17.8	59.3	0.4				

Appendix H - Third Party Agricultural Summary

Nutrigold Field #2023SE2454194					Loading Rate		Biosolids	Field Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	Ha	Tonnes/Ha	Substance	mg/Kg	Kg	Kg/Ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
16960.5	5.81	994	123	50	19.9	TP	30546.2	30363	607				
						TN	31272	31084	622				
						NH3-N	21769	21638	433				
Landowner		Jason Boon				As	5.8	5.77	0.115				
Legal Description		SE-24-54-19 W4				Cd	3.0	2.98	0.060	10424	1500	10182	600
Start Date		11-Aug-23				Cr	117	116.3	2.33	267	20	261	8
End Date		22-Aug-23				Cu	357	355	7.10	88	15	86	6
Soil Class		Class 1				Pb	43	42.7	0.855	727	20	710	8
Biosolids Type		Digested				Mn	332	330	6.60				
		Gravity Thickened				Hg	1.15	1.143	0.023	27193	3000	26562	1100
						Ni	61	60.6	1.213	513	100	501	40
						Se	29.7	29.52	0.590				
						Zn	739	735	14.7	42	40	41	4
						Co	17.8	17.7	0.4				

Nutrigold Field #2023SW1455234					Loading Rate		Biosolids	Field Loading			Minimum		Minimum
Wet Tonnes	Ave. %TS	Dry Tonnes	Ac	Ha	Tonnes/Ha	Substance	mg/Kg	Kg	Kg/Ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
13411	6	807	130	53	15.3	TP	30546.2	24651	469				
						TN	31272	25237	480				
						NH3-N	21769	17568	334				
Landowner		Jason Lamoureux				As	5.8	4.68	0.089				
Legal Description		SW-14-55-23 W4				Cd	3.0	2.42	0.046	10424	1500	10182	600
Start Date		1-May-23				Cr	117	94.4	1.80	267	20	261	8
End Date		5-May-23				Cu	357	288	5.48	88	15	86	6
Soil Class		Class 1				Pb	43	34.7	0.660	727	20	710	8
Biosolids Type		Digested				Mn	332	268	5.09				
		Gravity Thickened				Hg	1.15	0.928	0.018	27193	3000	26562	1100
						Ni	61	49.2	0.936	513	100	501	40
						Se	29.7	23.97	0.456				
						Zn	739	596	11.3	42	40	41	4
						Co	17.8	14.4	0.3				

Appendix I – Non-Ag Biosolids Management Report

TETRA TECH

February 16, 2024

ISSUED FOR USE
FILE: ENW.BIOS03089-01
Via Email: DBartlett@epcor.com
olstad.co@gmail.com

Alberta Environment and Protected Areas
111 Twin Atria Building
4999 – 98 Avenue NW
Edmonton, AB T6B 2X3

Attention: Mohammad Raham, P.Eng.
Environmental Protection and Enhancement Act Team Lead
Capital District – Regulatory Assurance Division North

Subject: 2023 Summary Report on Dewatered Biosolids Application to Marginal Lands within Strathcona County (Authorization No. 639-32733-SLU) and within Sturgeon County (Authorization No. 639-32787-SLU)

1.0 INTRODUCTION

Tetra Tech Canada Inc. (Tetra Tech) was retained by Olstad & Company Ltd. (Olstad & Company) and EPCOR Water Services Inc. (EPCOR) to prepare the 2023 Summary Report for Dewatered Biosolids Application to Marginal Land. Biosolids application was completed in general accordance with the Alberta Environment and Protected Areas (EPA, formerly Alberta Environment [AENV]) 2001 Guidelines for the Application of Municipal Wastewater Sludges to Agricultural Lands (the Guidelines)[1] as a beneficial, non-agricultural use of biosolids.

Olstad & Company applied dewatered biosolids to two areas in 2023. The first area included one field located in Strathcona County near Josephburg, AB comprising approximately 71.4 hectares (ha) of land across two quarter sections (Figure 1). The second area included three fields in Sturgeon County near Gibbons, AB comprising approximately 120 ha of land within three quarter sections (Figures 2, 3, and 4). The fields were considered marginal lands as they are generally lower producing (due the lower soil pH).

The objective was to maximize the organic matter application from biosolids in an effort to increase the organic matter content of the soil without exceeding the maximum allowable nitrogen application rates. The increased soil organic matter content is expected to:

- Improve soil health through increased soil tilth and increased soil moisture holding capacity.
- Improve productivity through the application of crop nutrients in an environmentally sound manner.
- Improve productivity through increased crop response to chemical fertilizers in the future.

In an effort to increase the organic matter content of the soil, the biosolids application rate was limited by the volume of available biosolids and/or the maximum allowable nitrogen application rate (the most limiting of either total or ammonium nitrogen based on the dewatered biosolids analytical data) rather than the total solids content.

[1] Alberta Environment. 2001. Guidelines for the Application of Municipal Wastewater Sludges to Agricultural Lands. Municipal Program Development Branch. Environmental Services Division. Environmental Services. Edmonton, Alberta. Pub No. T/594. ISBN: 0-7785-1490-0.

Tetra Tech Canada Inc.
14940 - 123 Avenue
Edmonton, AB T5V 1B4 CANADA
Tel 780.451.2121 Fax 780.454.5688

2.0 REGULATORY APPROVALS

On behalf of Olstad & Company and EPCOR, Tetra Tech prepared Applications[2],[3] to EPA for Authorization to surface apply and incorporate Dewatered Biosolids (anaerobically digested sludge) from EPCOR's Clover Bar lagoons. Separate Letters of Authorization were sought for this project because the marginal lands were not eligible for inclusion under the normal Notification process described in section 4.6 of EPCOR Wastewater Approval No. 639-03-06. The marginal lands had a 0-30 centimetre (cm) average pH value less than 6.0, and as such, fell outside of the standard definition of agricultural lands as defined in the Guidelines and the permitted variance which allows application of biosolids to lands with a pH of 6.0 and higher[4].

On June 16, 2023, EPCOR submitted a Biosolids Stockpile Notification letter to EPA notifying the Director that, in accordance with section 4.6 of Environmental Protection and Enhancement Act (EPEA) Approval 639-03-06, EPCOR planned to stockpile municipal biosolids at SW 23-55-23 W4M within Sturgeon County. Due to crop logistics and landowner request, the stockpiling location was changed to the NW 14-55-23 W4M.

On September 6, 2023, EPCOR submitted a Biosolids Stockpile Notification letter to EPA, notifying the Director that, in accordance with section 4.6 of EPEA Approval 639-03-06, EPCOR planned to stockpile municipal biosolids at SE 07-54-21 W4M within Strathcona County.

On October 16, 2023, EPCOR received Authorization No. 639-32733-SLU to apply wastewater biosolids to the following quarter sections in Strathcona County:

- NW 07-54-21 W4M
- SW 07-54-21 W4M
- SE 07-54-21 W4M

On October 18, 2023, EPCOR received Authorization No. 639-32787-SLU to apply wastewater biosolids to the following quarter sections in Sturgeon County:

- NW 02-55-23 W4M
- SW 11-55-23 W4M
- NW 14-55-23 W4M
- NE 14-55-23 W4M
- SW 23-55-23 W4M

Stockpiling Notification letters and Application Authorization letters are attached in Appendix B.

[2] Tetra Tech Canada Inc. July 2023. Application for Authorization to Apply Dewatered Biosolids to Marginal Lands within Sturgeon County, Alberta. File: ENW.BIOS03089-01. Application No. 639-32787-SLU.

[3] Tetra Tech Canada Inc. September 2023. Application for Authorization to Apply Dewatered Biosolids to Marginal Lands within Strathcona County, Alberta. File: ENW.BIOS03089-01. Application No. 639-32733-SLU.

[4] Patterson, S. (Science and Technology Specialist, EPA). 2023. Email communication: Guideline variance for land applying biosolids to fields with a pH of 6.0 or greater – Revision. January 31, 2023.

3.0 APPROVAL CONDITIONS

The following approval conditions for both Authorization No. 639-32733-SLU and Authorization No. 639-32787-SLU were adhered to during completion of the 2023 dewatered biosolids application to marginal lands:

- All dewatered biosolids were stockpiled in accordance with the Alberta Environment and Parks Draft Dewatered Biosolids Stockpiling Guidelines for stockpiles to be used within nine months of placement.
  - All stockpiles were placed on snow free ground.
  - All stockpiles were located outside of areas with standing water or depressional areas.
  - Permission letters were obtained from the landowners authorizing biosolids stockpiling on their property.
  - Dewatered biosolids stockpiles were located in a cultivated field with no exposure to domestic animals.
  - All buffer distances were maintained between the dewatered biosolids stockpiles and the features listed in the draft guidelines.
- Biosolids were applied in accordance with the Guidelines.
- Dewatered biosolids were cultivated into the soil the same day of application, or within 24 hours of application.
- No biosolids were applied to frozen or snow-covered ground (Photo 4).
- No parcels of land that received biosolids in 2023 had received biosolids within the previous three years.
- Olstad & Company only used agricultural equipment (Photos 1, 2, and 3) to spread biosolids, and therefore was not required to obtain written approval from any pipeline authorities. No pipelines were crossed during hauling and stockpiling activities.
- A minimum 30 metre (m) buffer with no biosolids application was maintained around all wetlands and no biosolids were applied to areas where periodic flooding or ponding crosses onto an adjacent landowner's property.
- All equipment was well maintained and no biosolids were deposited or spilled onto public roadways.
- No releases, spills, or discharge of biosolids into a watercourse or onto land not designated to receive biosolids occurred.

4.0 BIOSOLIDS APPLICATION: AUTHORIZATION NO. 639-32733-SLU

In September 2023 dewatered biosolids were hauled to the SE 07-54-21 W4M in Strathcona County and in October 2023 dewatered biosolids were applied to SW 07-54-21 W4M and SE 07-54-21 W4M in accordance with Authorization No. 639-32733-SLU.

Olstad & Company and EPCOR did not apply biosolids to the NW 07-54-21 W4M due to limitations in the amount of dewatered biosolids available for application in 2023.

4.1 Landowner Information

The landowner is Chris Allam (780-777-4276). A signed acknowledgement and authorization letter from Chris Allam is attached in Appendix C.

4.2 Receiving Site Conditions

A summary of soil analytical results for the receiving site, prior to biosolids application, are provided in Table A. Within NW 07-54-21 W4M there is 20 ha which have 2-5% slopes, which make them Land Class 2, however this area did not receive biosolids in 2023. Figure 1 shows the biosolids application areas and buffer distances for Chris Allam's fields.

Table A: Marginal Lands 2020 Soil Analytical Results

Parameter	NW/SW/SE-07-54-21 W4M	NW-07-54-21 W4M
Area	125 ha (310 acres [ac])	20 ha (50 ac)
Surface pH (0-30 cm)	*5.99*	
Average pH (30-100 cm)	7.16	
Texture [1]	CL	
Slope %	<2	2-5
Depth to Potable Aquifer (m)	12.5	
Plant Available Nitrogen (kg/ha)	145	
Plant Available Phosphorus (kg/ha)	67	
Overall Land Class [2]	1	2

[1] CL = clay loam

[2] The overall land class shown is based on all classification parameters except the 0-30 cm surface pH. All marginal land fields shown have a 0-30 cm surface pH less than 6.0 and fall outside of the standard definition of agricultural lands.

4.3 Biosolids Characterization and Application Rate Calculations

EPCOR collects and analyses digested biosolids samples on a regular basis throughout the year and submits them to an accredited laboratory for analysis of percent total solids, total nitrogen (Total Kjeldahl Nitrogen, TKN), ammonium nitrogen (NH_4-N), total phosphorus, and trace elements. Dewatered biosolids analytical data from a sample collected June 10, 2023 was provided to Tetra Tech by EPCOR. This data was used to calculate preliminary biosolids application rates of 19.8 dry tonnes per hectare (dt/ha) for Class 1 land, 15.4 dt/ha for Class 2 land, and 8.8 dt/ha for Class 3 land in the September 2023 Authorization Application.

In accordance with the Authorization Applications submitted to EPA, EPCOR collected and analyzed additional dewatered biosolids samples prior to application. Daily samples collected in September 2023 during dewatered biosolids production indicated an average solids content of 24.3% in the material hauled and stockpiled on the SE 07-54-21 W4M in Strathcona County (Table 1).

Olstad & Company and EPCOR also proposed to collect samples of the stockpiled biosolids prior to application, as nitrogen losses in the stockpiled biosolids were expected between the stockpiling and application dates due to volatilization and mineralization. In addition to the sample collected on September 7, 2023 while stockpiling the dewatered biosolids, a composite sample of the stockpiled material on the SE 07-54-21 W4M was collected on September 19, 2023. The two samples were analyzed for trace element, total phosphorus, TKN, NH4-N, and available sulphate parameters. Analytical results are summarized in Table 1.

The average nitrogen (TKN and NH_4-N) concentrations of the samples collected during dewatered biosolids production (September 7 sample) and from the stockpile (September 19 sample) were used to calculate a final biosolids application rate based on the maximum allowable nitrogen application rate in order to maximize the organic matter application rate to these marginal lands. Application limits based on the total solids content was not applied to these marginal lands as this had the potential to limit the amount of organic matter applied.

A final calculated maximum biosolids application rate for the marginal lands described in Authorization No. 639-32733-SLU was 30.8 dt/ha for Class 1 land, 24.0 dt/ha for Class 2 land, and 13.7 dt/ha for Class 3 land (Table 2). Total nitrogen was the most limiting parameter for determination of the biosolids application rate.

4.4 Biosolids Application Results

A summary of biosolids application details is provided in Table B. Detailed biosolids application rate details are provided in Tables 3A and 3B.

Table B: 2023 Marginal Lands Biosolids Application Site Details

Legal Location	Land Class [1]	Allowable Rate (dt/ha)	Area (ha)	Total Applied (dt)	Application Rate (dt/ha)	Stockpiling Dates	Application Dates
NW 07-54-21 W4M	4 (2)	24.0	20	0	0	Not Applicable	Not Applied
NW 07-54-21 W4M	4 (1)	30.8	28	0	0	Not Applicable	Not Applied
SW 07-54-21 W4M	4 (1)	30.8	31.5	701	22.3	Not Applicable	October 15-16, 2023
SE 07-54-21 W4M	4 (1)	30.8	39.9	888	22.3	September 6-27, 2023	October 15-16, 2023

[1] All marginal land fields are land class 4 based on a 0-30 cm surface pH less than 6.0. The overall land class shown in brackets is based on all classification parameters except the 0-30 cm surface pH and is used to determine the allowable application rate based on the nitrogen content of the biosolids.

On the SW 07-54-21 W4M and SE 07-54-21 W4M quarters where the biosolids were applied, a final application rate of 22.3 dt/ha was achieved. The application rate on this field was limited by the total amount of biosolids available for application.

Biosolids were not applied to the NW 07-54-21 W4M quarter section due to the limited quantity of dewatered biosolids available for application.

5.0 BIOSOLIDS APPLICATION: AUTHORIZATION NO. 639-32787-SLU

In June, July, and August 2023 dewatered biosolids were hauled to the NW 14-55-23 W4M in Sturgeon County and in October 2023 dewatered biosolids were applied to fields in the NW 14-55-23 W4M, NE 14-55-23 W4M, and SW 23-55-23 W4M in accordance with Authorization No. 639-32787-SLU.

Olstad & Company and EPCOR decided to not apply biosolids to two fields (NW 02-55-23 W4M and SW 11-55-23 W4M) in 2023 due to Authorization Appendix Condition No. 4 requiring lime application prior to biosolids application.

5.1 Landowner Information

The landowner is Blair Nikiforuk (780-818-1028). A signed acknowledgement and authorization letter from Blair Nikiforuk is attached in Appendix C.

5.2 Receiving Site Conditions

A summary of soil analytical results for the receiving sites, prior to biosolids application, are provided in Table C. Figures 2, 3 and 4 show the biosolids application areas and buffer distances for Blair Nikiforuk's fields.

Table C: Marginal Lands 2022 Soil Analytical Results

Parameter	NW 14-55-23 W4M	NE 14-55-23 W4M	SW 23-55-23 W4M
Surface pH (0-30 cm)	*5.89*	*5.77*	*5.89*
Average pH (30-100 cm)	7.6	7.6	7.7
Texture [1]	CL	SL	SL
Slope %	1	<2	<2
Depth to Potable Aquifer (m)	11	11	11
Plant Available Nitrogen (kg/ha)	70	160	145
Plant Available Phosphorus (kg/ha)	40	101	116
Overall Land Class [2]	1	3	3

[1] CL = clay loam, SL = sandy loam

[2] The overall land class shown is based on all classification parameters except the 0-30 cm surface pH. All marginal land fields shown have a 0-30 cm surface pH less than 6.0 and fall outside of the standard definition of agricultural lands.

5.3 Biosolids Characterization and Application Rate Calculations

EPCOR collects and analyses digested biosolids samples on a regular basis throughout the year and submits them to an accredited laboratory for analysis of percent total solids, total nitrogen (Total Kjeldahl Nitrogen, TKN), ammonium nitrogen (NH_4-N), total phosphorus, and trace elements. Dewatered biosolids analytical data from a sample collected June 10, 2023 was provided to Tetra Tech by EPCOR. This data was used to calculate preliminary biosolids application rates of 19.8 dry tonnes per hectare (dt/ha) for Class 1 land, 15.4 dt/ha for Class 2 land, and 8.8 dt/ha for Class 3 land in the July 2023 Authorization Application.

In accordance with the Authorization Application submitted to EPA, EPCOR collected and analyzed additional dewatered biosolids samples prior to application. Daily samples collected in June, July, and August 2023 during dewatered biosolids production indicated an average solids content of 22.6% in the material hauled and stockpiled on the NW 14-55-23 W4M in Sturgeon County (Table 4).

Olstad & Company and EPCOR also proposed to collect samples of the stockpiled biosolids prior to application, as nitrogen losses in the stockpiled biosolids were expected between the stockpiling and application dates due to volatilization and mineralization. In addition to the sample collected on July 10, 2023 during stockpiling of the dewatered biosolids, two additional composite samples were collected on October 12, 2023 from the stockpiled material on the NW 14-55-23 W4M. All samples were analyzed for trace element, total phosphorus, TKN, NH4-N, and available sulphate parameters; analytical results are summarized in Table 4.

The average nitrogen (TKN and NH_4-N) concentrations of the samples collected during dewatered biosolids production (July 10 sample) and from the stockpile (October 12 samples) were used to calculate a final biosolids application rate based on the maximum allowable nitrogen application rate in order to maximize the organic matter application rate to these marginal lands. Application limits based on the total solids content was not applied to these marginal lands as this had the potential to limit the amount of organic matter applied.

A final calculated biosolids application rate for the marginal lands described in Authorization No. 639-32787-SLU was 46.7 dt/ha for Class 1 land, 36.3 dt/ha for Class 2 land, and 20.8 dt/ha for Class 3 land (Table 5). Ammonium nitrogen was the most limiting parameter for determination of the biosolids application rate.

5.4 Biosolids Application Results

A summary of biosolids application details is provided in Table D. Detailed biosolids application rate details are provided in Tables 6A, 6B, and 6C. The equipment used and the dewatered biosolids application spread pattern is shown on Photos 1 to 4.

Table D: 2023 Marginal Lands Biosolids Application Rate Details

Legal Location	Land Class [1]	Allowable Rate (dt/ha)	Area (ha)	Total Applied (dt)	Application Rate (dt/ha)	Stockpiling Dates	Application Dates
NW-14-55-23 W4M	4 (1)	46.7	27	574	21.1	June 22 to August 28, 2023	October 18-21, 2023
NE-14-55-23 W4M	4 (3)	20.8	49	881	18.1	Not Applicable	October 18-21, 2023
SW-23-55-23 W4M	4 (3)	20.8	44	900	20.7	Not Applicable	October 18-21, 2023

[1] All marginal land fields are land class 4 based on a 0-30 cm surface pH less than 6.0. The overall land class shown in brackets is based on all classification parameters except the 0-30 cm surface pH and is used to determine the allowable application rate based on the nitrogen content of the biosolids.

On the NE 14-55-23 W4M and SW 23-55-23 W4M quarters, biosolids application rates were maximized based on the available ammonium nitrogen content of the biosolids, with rates of 18.1 dt/ha and 20.7 dt/ha applied, respectively. These application rates were used in order to maximize the amount of organic matter applied to these sandy loam textured soils.

On the NW 14-55-23 W4M quarter where the biosolids were stockpiled, a final application rate of 21.1 dt/ha was achieved. The application rate on this field was limited by the total amount of dewatered biosolids available for application.

Biosolids were not applied to the NW 02-55-23 W4M and SW 11-55-23 W4M quarter sections in 2023. Approval condition 4 specified that these two quarters were not eligible to receive biosolids unless lime was applied prior to biosolids application. EPCOR and Olstad & Company made the decision to not apply biosolids rather than attempt to obtain a suitable supply of lime.

6.0 MONITORING PROGRAMS

No follow up sampling or analysis was completed in 2023.

As per Authorization No. 639-32733-SLU, post-application sampling and analysis for Alberta Tier 1[5] metals in the 0-15 cm and 15-30 cm depths will be conducted in 2024 in all land units where the pre-application soil pH was lower than 6.0 in the 0-30 cm depth and where dewatered biosolids were applied in 2023. These include:

- SW 07-54-21 W4M, Land Unit 2
- SE 07-54-21 W4M, Land Units 1, 2, and 3

As per Authorization No. 639-32787-SLU, post-application sampling and analysis for Alberta Tier 1 metals in the 0-15 cm and 15-30 cm depths will be conducted in 2024 in all land units where the pre-application soil pH was lower than 6.0 in the 0-30 cm depth and where dewatered biosolids were applied in 2023. These include:

- NW 14-55-23 W4M, Land Units 1 and 2
- NE 14-55-23 W4M, Land Units 2, 3, and 4
- SW 23-55-23 W4M, Land Units 1, 2, and 3

Olstad & Company and EPCOR will submit a follow-up dewatered biosolids application summary report including the Alberta Tier 1 metals monitoring results to the Director prior to February 28, 2025.

[5] Alberta Environment and Parks (AEP). 2022. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. AEP, Land Policy, 2022, No. 4

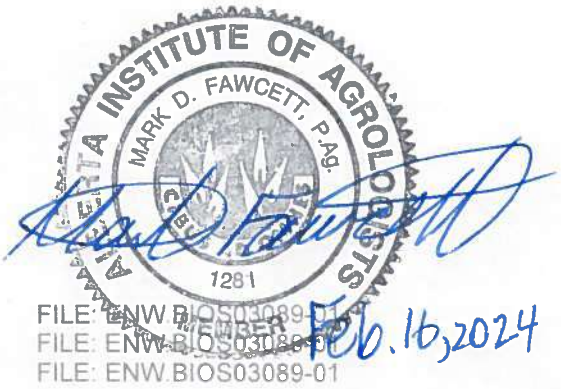
7.0 LIMITATIONS OF REPORT

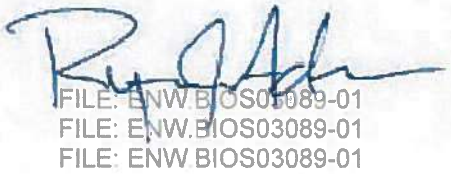
This report and its contents are intended for the sole use of Olstad & Company Ltd., EPCOR Water Services Inc., and their agents. Tetra Tech Canada Inc. (operating as Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Olstad & Company Ltd. and EPCOR Water Services Inc., or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this document is subject to the Limitations on the Use of this Document attached in Appendix A or Contractual Terms and Conditions executed by both parties.

8.0 CLOSURE

We trust this report meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
Tetra Tech Canada Inc.





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TABLES

Table 1: Dewatered Biosolids Laboratory Analysis - 2023 Application Year - SW/SE 07-54-21 W4M

Lab ID	Date 2023 Analytical	Average Solids Concentration %	Al[2]	Sb[2]	As[2]	Ba[2]	Be[2]	Sat Paste B[2]	Cd[2]	Cr[2]	Co[2]	Cu[2]	Fe[2]	Pb[2]	Mn[2]	Mo[2]	Ni[2]	Se[2]	Ag[2]	Sr[2]	Tl[2]	Sn[2]	Ti[2]	V[2]	Zn[2]	Hg[2]	K[2]	Total Phosphorus[2] mg/kg	Total Kjeldahl Nitrogen[2] (excluding NO_3-N) mg/kg	Ammonium Nitrogen (NH4-N)[2] mg/kg	Available Sulphate[2] mg/kg
			mg/kg					mg/L	mg/kg																						
GB-23-11216	September 7th, 2023	24.3[1]	9,480	2.6	4.7	308	0.3	<0.5	4.41	141	7.1	416	15,800	51.4	380	13.0	40.1	6.9	13.1	209	0.12	19.5	42.0	16.3	794	1.36	2,600	35900	23100	6300	2,520
GB-23-11578	September 19,2023	24.8	7,930	3.0	5.2	416	0.3	<0.5	4.64	127	6.2	508	13,100	53.3	300	16.1	36.6	6.6	14.2	241	0.12	25.7	49.7	16.5	902	1.77	2,400	23600	35300	6070	2,400
Average[3]		NA	**8,705**	**2.8**	**5.0**	**362**	**0.3**	**0.5**	**4.53**	**134**	**6.7**	**462**	**14,450**	**52.4**	**340**	**14.6**	**38.4**	**6.8**	**13.7**	**225**	**0.12**	**22.6**	**45.9**	**16.4**	**848**	**1.57**	**2,500**	**29750**	**29200**	**6185**	**2,460**
Minimum		NA	7,930	2.6	4.7	308	0.3	<0.5	4.41	127	6.2	416	13,100	51.4	300	13.0	36.6	6.6	13.1	209	0.12	19.5	42.0	16.3	794	1.36	2,400	23600	23100	6070	2,400
Maximum		NA	9,480	3.0	5.2	416	0.3	<0.5	4.64	141	7.1	508	15,800	53.3	380	16.1	40.1	6.9	14.2	241	0.12	25.7	49.7	16.5	902	1.77	2,600	35900	35300	6300	2,520
Standard Deviation		NA	1,096	0.3	0.4	76	0.0	NA	0.16	10	0.6	65	1,909	1.3	57	2.2	2.5	0.2	0.8	23	0.00	4.4	5.4	0.1	76	0.29	141	8697	8627	163	85

Notes:

The data was collected in 2023 and used to determine the application rates for 2023.

[1] Concentrations are the percent solids results after the daily field samples have been composited.

[2] Data presented as per the laboratory results. Reported concentrations are with respect to Dry Weight

[3] The detection limit was used to calculate the average for values reported less than the detection limit.

NA - Not Applicable.

Table 2: Municipal Biosolids Application Rate Calculations Worksheet - SW/SE 07-54-21 W4M

MUNICIPAL BIOSOLIDS QUALITY REPORT*

Biosolids Data [1]	Average (%)
Solids %	24.3
Total Nitrogen % [2]	2.92
Ammonium Nitrogen %	0.62
Total Phosphorus %	2.98

Average solids content of the dewatered biosolids transported to the Strathcona County fields.

Total nitrogen, ammonium nitrogen, total phosporous, and metal concentrations are an average of the September 7, 2023 and September 19, 2023 samples of stockpiled dewatered biosolids.

Notes:

[1] Dewatered biosolids analytical data provided by EPCOR.

[2] Total Kjeldahl Nitrogen (TKN).

* The Quality Report is taken from Alberta Environment (AENV) 2001 Guidelines for the Application of Municipal Wastewater Sludges to Agricultural Lands, Page 27.

Metal Concentration in Biosolids	Average Biosolids Data (µg/g)	Nitrogen Calculations			Phosphorus Calculations		
		Calculations[1] N:metal Ratio[3]	Guide Minimum[2]	Difference[5]	Calculations[1] P:metal Ratio[4]	Guide Minimum[2]	Difference[5]
Cd	4.53	6,446	1,500	4,946	6,567	600	5,967
Cr	134	218	20	198	222	8	214
Cu	462	63	15	48	64.4	6	58.4
Pb	52.4	557	20	537	568	8	560
Hg	1.57	18,599	3,000	15,599	18,949	1,100	17,849
Ni	38.4	760	100	660	775	40	735
Zn	848	34	10	24	35.1	4	31.1

Notes:

[1] N/metal ratio = [Total N (%) *10,000]/metal (µg/g) or P/metal ratio = [Total P (%) *10,000]/metal (µg/g).

[2] The Guide Minimums are stipulated in Table 1 of the 2001 AENV Wastewater Guidelines (page 17). Biosolids is unacceptable if either the nitrogen or phosphorus criterion is not met. Spiking biosolids with nitrogen or phosphorus to achieve these ratios is not permitted.

[3] N:metal ratio is calculated as the total Nitrogen % in the biosolids divided by the metal concentration.

[4] P:metal ratio is calculated as the total phosphorus % in the biosolids divided by the metal concentration.

[5] The difference value is the guide minimum subtracted from the recorded ratio for either nitrogen or phosphorus.

MUNICIPAL BIOSOLIDS PARAMETERS LIMITING APPLICATION RATE

Parameter[1]	Calculation Formula[2,3]	CLASS 1 - Digested[4]	Calculation Formula[2,3]	CLASS 2 - Digested[4]	Calculation Formula[2,3]	CLASS 3 - Digested[4]
Solids		25		20		10
Total N	90/total N (%)	30.8	70/total N (%)	24.0	40/total N (%)	13.7
NH_4-N (Injected)	20/NH_4-N (%)[5]	32.3	20/NH_4-N (%)[5]	32.3	15/NH_4-N (%)[5]	24.3
NH_4-N (Surface)	45/NH_4-N (%)[5]	72.8	35/NH_4-N (%)[5]	56.6	20/NH_4-N (%)[5]	32.3
Cd	1,500/[3*Cd(µg/g)]	110	1,100/[3*Cd(µg/g)]	81	800/[3*Cd(µg/g)]	59
Cr	100,000/[3*Cr (µg/g)]	249	75,000/[3*Cr (µg/g)]	187	50,000/[3*Cr (µg/g)]	124
Cu	200,000/[3*Cu (µg/g)]	144	150,000/[3*Cu (µg/g)]	108	100,000/[3*Cu (µg/g)]	72.2
Pb	100,000/[3*Pb (µg/g)]	636	75,000/[3*Pb (µg/g)]	477	50,000/[3*Pb (µg/g)]	318
Hg	500/[3*Hg (µg/g)]	106	400/[3*Hg (µg/g)]	85	200/[3*Hg (µg/g)]	42.5
Ni	25,000/[3*Ni (µg/g)]	217	19,000/[3*Ni (µg/g)]	165	12,000/[3*Ni (µg/g)]	104
Zn	300,000/[3*Zn (µg/g)]	118	200,000/[3*Zn (µg/g)]	79	150,000/[3*Zn (µg/g)]	59.0
Rate (t/ha)		30.8		24.0		13.7
Parameter Most Limiting[6]		Total N		Total N		Total N

Notes:

[1] The parameter is the name that is given to each row (i.e., solids, total N) and the name that is used to indicate which row is the most limiting.

[2] The calculation formulae for digested waste are taken from AENV 2001 Guidelines for the Application of Municipal Wastewater Sludges to Agricultural Lands, Page 28.

[3] Note that the laboratory reports metal analysis in units of mg/kg, which is the same as µg/g.

[4] The class relates to the site classification status where Class 1 is the most suitable, Class 2 the second most suitable, Class 3 more suitable than Class 4, and Class 4 is not at all suitable (fail).

[5] The AENV 2001 Guidelines for the Application of Municipal Wastewater Sludges to Agricultural Lands, Page 28 show the units for NH_4-N as µg/g. This is incorrect, units are NH_4-N(%) as shown in this table.

[6] The most limiting parameter relates to the lowest value for each class number and is calculated as per the given formula.

Table 3A: Dewatered Biosolids Application Results - 2023 Application Year - SW 07-54-21 W4M

Authorization No. 639-32733-SLI					Loading Rate	Biosolids	Field Loading		Minimum		Minimum	
Wet Tonnes	Ave. %TS	Dry Tonnes	Acres	Hectares	Tonnes/Ha	Substance	mg/Kg	Kg	Kg/Ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
2883	24.3	701	77.8	31.5	22.3	TP	29750	20863	663				
						TN	29200	20477	650				
						NH3-N	6185	4337	138				
Landowner		Chris Allam				As	5.0	3.51	0.111				
Legal Description		SW 07-54-21 W4M				Cd	4.53	3.18	0.101	6446	1500	6567	600
Stockpiling Date		September 6-27, 2023				Cr	134	94.0	2.98	218	20	222	8
Application Date		October 15-16, 2023				Co	6.7	4.7	0.1				
Soil Class		1				Cu	462	324	10.29	63	15	64	6
Biosolids Type		Digested, Centrifudge Dewatered				Pb	52.4	36.7	1.167	557	20	568	8
						Mn	340	238	7.57				
Biosolids Sample		GB-23-11216 - September 7, 2023				Hg	1.57	1.101	0.035	18599	3000	18949	1100
		GB-23-11578 - September 19, 2023				Ni	38.4	26.9	0.855	760	100	775	40
						Se	6.8	4.77	0.151				
						Zn	848	595	18.9	34	10	35	4

Note: The numbers shown may not add up due to rounding.

Table 3B: Dewatered Biosolids Application Results - 2023 Application Year - SE 07-54-21 W4M

Authorization No. 639-32733-SLI					Loading Rate	Biosolids	Field Loading		Minimum		Minimum	
Wet Tonnes	Ave. %TS	Dry Tonnes	Acres	Hectares	Tonnes/Ha	Substance	mg/Kg	Kg	Kg/Ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
3652	24.3	888	98.6	39.9	22.3	TP	29750	26427	663				
						TN	29200	25939	650				
						NH3-N	6185	5494	138				
Landowner		Chris Allam				As	5.0	4.44	0.111				
Legal Description		SE 07-54-21 W4M				Cd	4.53	4.02	0.101	6446	1500	6567	600
Stockpiling Date		September 6-27, 2023				Cr	134	119.0	2.98	218	20	222	8
Application Date		October 15-16, 2023				Co	6.7	6.0	0.1				
Soil Class		1				Cu	462	410	10.29	63	15	64	6
Biosolids Type		Digested, Centrifudge Dewatered				Pb	52.4	46.5	1.167	557	20	568	8
						Mn	340	302	7.57				
Biosolids Sample		GB-23-11216 - September 7, 2023				Hg	1.57	1.395	0.035	18599	3000	18949	1100
		GB-23-11578 - September 19, 2023				Ni	38.4	34.1	0.855	760	100	775	40
						Se	6.8	6.04	0.151				
						Zn	848	753	18.9	34	10	35	4

Note: The numbers shown may not add up due to rounding.

Table 4: Dewatered Biosolids Laboratory Analysis - 2023 Application Year - NW/NE 14-55-23 W4M and SW 23-55-23 W4M

Lab ID	Date 2023 Analytical	Average Solids Concentration %	Al[2]	Sb[2]	As[2]	Ba[2]	Be[2]	Sat Paste B[2]	Cd[2]	Cr[2]	Co[2]	Cu[2]	Fe[2]	Pb[2]	Mn[2]	Mo[2]	Ni[2]	Se[2]	Ag[2]	Sr[2]	Tl[2]	Sn[2]	Ti[2]	V[2]	Zn[2]	Hg[2]	K[2]	Total Phosphorus[2] mg/kg	Total Kjeldahl Nitrogen[2] (excluding NO_3-N) mg/kg	Ammonium Nitrogen (NH4-N)[2] mg/kg	Available Sulphate[2] mg/kg
			mg/kg					mg/L	mg/kg																						
GB-23-08795	July 10th, 2023	22.6 [1]	10,200	3.0	5.4	350	0.3	<0.5	5.31	121	6.6	468.0	15,900	52.8	350	15.5	38.1	7.2	13.1	223	0.13	27.2	40.2	16.6	902	1.4	3,400	29400	12500	7810	608
GB-23-12256	October 12, 2023	16.5	8,190	2.5	5.1	333	0.3	<0.5	3.13	60.7	6.3	443	14,700	33.7	310	14.3	36.7	6.9	7.4	192	0.13	21.9	43.2	16.0	809	1.09	2,800	24500	11500	10100	299
GB-23-12257	October 12, 2023	16.3	7,570	2.6	4.8	314	0.2	<0.5	3.11	61.0	6.1	457	13,300	33.1	290	15.1	36.9	7.0	6.9	197	0.12	23.8	39.4	14.7	853	1.14	2,900	24900	11500	11000	750
Average[3]		NA	**8,653**	**2.7**	**5.1**	**332**	**0.3**	**0.5**	**3.85**	**81**	**6.3**	**456**	**14,633**	**39.9**	**317**	**15.0**	**37.2**	**7.0**	**9.1**	**204**	**0.13**	**24.3**	**40.9**	**15.8**	**855**	**1.22**	**3,033**	**26267**	**11833**	**9637**	**552**
Minimum		NA	7,570	2.5	4.8	314	0.2	<0.5	3.11	61	6.1	443	13,300	33.1	290	14.3	36.7	6.9	6.9	192	0.12	21.9	39.4	14.7	809	1.09	2,800	24500	11500	7810	299
Maximum		NA	10,200	3.0	5.4	350	0.3	<0.5	5.31	121	6.6	468	15,900	52.8	350	15.5	38.1	7.2	13.1	223	0.13	27.2	43.2	16.6	902	1.42	3,400	29400	12500	11000	750
Standard Deviation		NA	1,375	0.3	0.3	18	0.1	NA	1.26	35	0.3	13	1,301	11.2	31	0.6	0.8	0.2	3.4	17	0.01	2.7	2.0	1.0	47	0.18	321	2721	577	1645	231

Notes:

The data was collected in 2023 and used to determine the application rates for 2023.

[1] Concentrations are the percent solids results after the daily field samples have been composited.

[2] Data presented as per the laboratory results. Reported concentrations are with respect to Dry Weight

[3] The detection limit was used to calculate the average for values reported less than the detection limit.

NA - Not Applicable.

Table 5: Municipal Biosolids Application Rate Calculations Worksheet - NW/NE 14-55-23 W4M and SW 23-55-23 W4M

MUNICIPAL BIOSOLIDS QUALITY REPORT*

Biosolids Data [1]	Average (%)
Solids %	22.6
Total Nitrogen % [2]	1.18
Ammonium Nitrogen %	0.96
Total Phosphorus %	2.63

Average solids content of the dewatered biosolids transported to the Sturgeon County fields

Total nitrogen, ammonium nitrogen, total phosporous, and metal concentrations are an average of the July 10, 2023 and October 12, 2023 samples of stockpiled dewatered biosolids

Notes:

[1] Dewatered biosolids analytical data provided by EPCOR.

[2] Total Kjeldahl Nitrogen (TKN).

* The Quality Report is taken from Alberta Environment (AENV) 2001 Guidelines for the Application of Municipal Wastewater Sludges to Agricultural Lands, Page 27.

Metal Concentration in Biosolids	Average Biosolids Data (µg/g)	Nitrogen Calculations			Phosphorus Calculations		
		Calculations[1] N:metal Ratio[3]	Guide Minimum[2]	Difference[5]	Calculations[1] P:metal Ratio[4]	Guide Minimum[2]	Difference[5]
Cd	3.85	3,074	1,500	1,574	6,823	600	6,223
Cr	81.0	146	20	126	324	8	316
Cu	456	26	15	11	57.6	6	51.6
Pb	39.9	297	20	277	658	8	650
Hg	1.22	9,699	3,000	6,699	21,530	1,100	20,430
Ni	37.2	318	100	218	706	40	666
Zn	855	14	10	4	30.7	4	26.7

Notes:

[1] N/metal ratio = [Total N (%) *10,000]/metal (µg/g) or P/metal ratio = [Total P (%) *10,000]/metal (µg/g).

[2] The Guide Minimums are stipulated in Table 1 of the 2001 AENV Wastewater Guidelines (page 17). Biosolids is unacceptable if either the nitrogen or phosphorus criterion is not met. Spiking biosolids with nitrogen or phosphorus to achieve these ratios is not permitted.

[3] N:metal ratio is calculated as the total Nitrogen % in the biosolids divided by the metal concentration.

[4] P:metal ratio is calculated as the total phosphorus % in the biosolids divided by the metal concentration.

[5] The difference value is the guide minimum subtracted from the recorded ratio for either nitrogen or phosphorus.

MUNICIPAL BIOSOLIDS PARAMETERS LIMITING APPLICATION RATE

Parameter[1]	Calculation Formula[2,3]	CLASS 1 - Digested[4]	Calculation Formula[2,3]	CLASS 2 - Digested[4]	Calculation Formula[2,3]	CLASS 3 - Digested[4]
Solids		25		20		10
Total N	90/total N (%)	76.1	70/total N (%)	59.2	40/total N (%)	33.8
NH_4-N (Injected)	20/NH_4-N (%)[5]	20.8	20/NH_4-N (%)[5]	20.8	15/NH_4-N (%)[5]	15.6
NH_4-N (Surface)	45/NH_4-N (%)[5]	46.7	35/NH_4-N (%)[5]	36.3	20/NH_4-N (%)[5]	20.8
Cd	1,500/[3*Cd(µg/g)]	130	1,100/[3*Cd(µg/g)]	95	800/[3*Cd(µg/g)]	69
Cr	100,000/[3*Cr (µg/g)]	412	75,000/[3*Cr (µg/g)]	309	50,000/[3*Cr (µg/g)]	206
Cu	200,000/[3*Cu (µg/g)]	146	150,000/[3*Cu (µg/g)]	110	100,000/[3*Cu (µg/g)]	73.1
Pb	100,000/[3*Pb (µg/g)]	835	75,000/[3*Pb (µg/g)]	627	50,000/[3*Pb (µg/g)]	418
Hg	500/[3*Hg (µg/g)]	137	400/[3*Hg (µg/g)]	109	200/[3*Hg (µg/g)]	54.6
Ni	25,000/[3*Ni (µg/g)]	224	19,000/[3*Ni (µg/g)]	170	12,000/[3*Ni (µg/g)]	108
Zn	300,000/[3*Zn (µg/g)]	117	200,000/[3*Zn (µg/g)]	78	150,000/[3*Zn (µg/g)]	58.5
Rate (t/ha)		46.7		36.3		20.8
Parameter Most Limiting[6]		NH4-N		NH4-N		NH4-N

Notes:

[1] The parameter is the name that is given to each row (i.e., solids, total N) and the name that is used to indicate which row is the most limiting.

[2] The calculation formulae for digested waste are taken from AENV 2001 Guidelines for the Application of Municipal Wastewater Sludges to Agricultural Lands, Page 28.

[3] Note that the laboratory reports metal analysis in units of mg/kg, which is the same as µg/g.

[4] The class relates to the site classification status where Class 1 is the most suitable, Class 2 the second most suitable, Class 3 more suitable than Class 4, and Class 4 is not at all suitable (fail).

[5] The AENV 2001 Guidelines for the Application of Municipal Wastewater Sludges to Agricultural Lands, Page 28 show the units for NH_4-N as µg/g. This is incorrect, units are NH_4-N(%) as shown in this table.

[6] The most limiting parameter relates to the lowest value for each class number and is calculated as per the given formula.

Table 6A: Dewatered Biosolids Application Results - 2023 Application Year - NW 14-55-23 W4M

Authorization No. 639-32787-SLU					Loading Rate	Biosolids	Field Loading		Minimum		Minimum	
Wet Tonnes	Ave. %TS	Dry Tonnes	Acres	Hectares	Tonnes/Ha	Substance	mg/Kg	Kg	Kg/Ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
2541	22.6	574	67	27	21.1	TP	26267	15086	554				
						TN	11833	6796	250				
						NH3-N	9637	5535	203				
Landowner		Blair Nikiforuk				As	5.1	2.9	0.1				
Legal Description		NW 14-55-23 W4M				Cd	3.85	2.21	0.08	3074	1500	6823	600
Stockpiling Date		June 22 - August 28, 2023				Cr	81.0	46.5	1.7	146	20	324	8
Application Date		October 18-21, 2023				Co	6.3	3.6	0.1				
Soil Class		1				Cu	456	262	10	26	15	58	6
Biosolids Type		Digested, Centrifudge Dewatered				Pb	39.9	22.9	0.8	297	20	658	8
						Mn	317	182	7				
Biosolids Sample		GB-23-08795 - July 10, 2023				Hg	1.22	0.70	0.03	9699	3000	21530	1100
		GB-23-12256 - October 12, 2023				Ni	37.2	21.4	0.8	318	100	706	40
		GB-23-12257 - October 12, 2023				Se	7.0	4.0	0.1				
						Zn	855	491	18	14	40	31	4

Note: The numbers shown may not add up due to rounding.

Table 6B: Dewatered Biosolids Application Results - 2023 Application Year - NE 14-55-23 W4M

Authorization No. 639-32787-SLU					Loading Rate	Biosolids	Field Loading		Minimum		Minimum	
Wet Tonnes	Ave. %TS	Dry Tonnes	Acres	Hectares	Tonnes/Ha	Substance	mg/Kg	Kg	Kg/Ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
3898	22.6	881	120	49	18.1	TP	26267	23141	476				
						TN	11833	10425	215				
						NH3-N	9637	8490	175				
Landowner		Blair Nikiforuk				As	5.1	4.5	0.1				
Legal Description		NE 14-55-23 W4M				Cd	3.85	3.39	0.07	3074	1500	6823	600
Stockpiling Date		June 22 - August 28, 2023				Cr	81.0	71.4	1.5	146	20	324	8
Application Date		October 18-21, 2023				Co	6.3	5.6	0.1				
Soil Class		3				Cu	456	402	8	26	15	58	6
Biosolids Type		Digested, Centrifudge Dewatered				Pb	39.9	35.2	0.7	297	20	658	8
						Mn	317	279	6				
Biosolids Sample		GB-23-08795 - July 10, 2023				Hg	1.22	1.07	0.02	9699	3000	21530	1100
		GB-23-12256 - October 12, 2023				Ni	37.2	32.8	0.7	318	100	706	40
		GB-23-12257 - October 12, 2023				Se	7.0	6.2	0.1				
						Zn	855	753	16	14	10	31	4

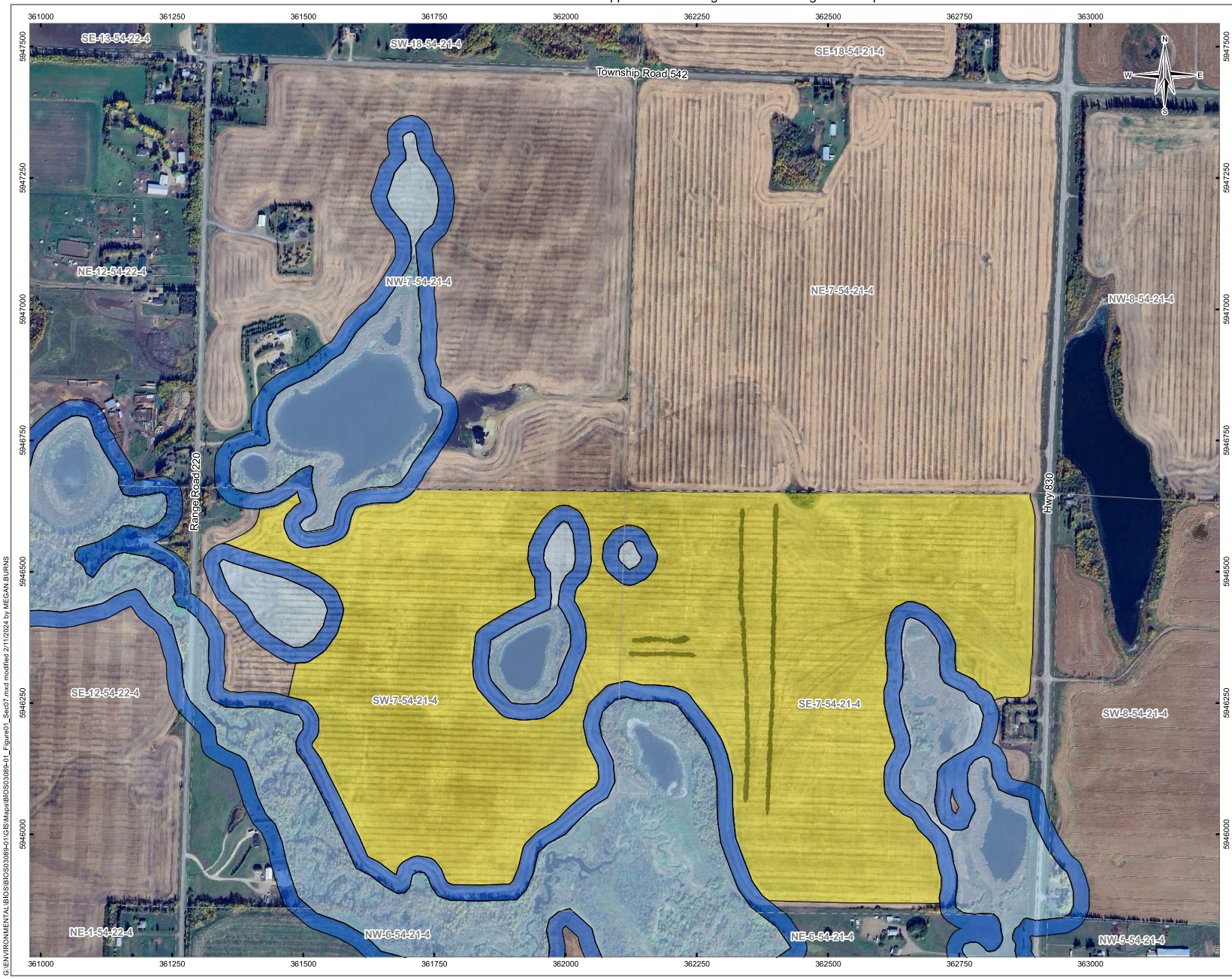
Note: The numbers shown may not add up due to rounding.

Table 6C: Dewatered Biosolids Application Results - 2023 Application Year - SW 23-55-23 W4M

Authorization No. 639-32787-SLU					Loading Rate	Biosolids	Field Loading		Minimum		Minimum	
Wet Tonnes	Ave. %TS	Dry Tonnes	Acres	Hectares	Tonnes/Ha	Substance	mg/Kg	Kg	Kg/Ha	N/TE	N/TE Ratio	P/TE	P/TE Ratio
3984	22.6	900	108	44	20.7	TP	26267	23652	543				
						TN	11833	10655	245				
						NH3-N	9637	8678	199				
Landowner		Blair Nikiforuk				As	5.1	4.6	0.1				
Legal Description		SW 23-55-23 W4M				Cd	3.85	3.47	0.08	3074	1500	6823	600
Stockpiling Date		June 22 - August 28, 2023				Cr	81.0	72.9	1.7	146	20	324	8
Application Date		October 18-21, 2023				Co	6.3	5.7	0.1				
Soil Class		3				Cu	456	411	9	26	15	58	6
Biosolids Type		Digested, Centrifudge Dewatered				Pb	39.9	35.9	0.8	297	20	658	8
						Mn	317	285	7				
Biosolids Sample		GB-23-08795 - July 10, 2023				Hg	1.22	1.10	0.03	9699	3000	21530	1100
		GB-23-12256 - October 12, 2023				Ni	37.2	33.5	0.8	318	100	706	40
		GB-23-12257 - October 12, 2023				Se	7.0	6.3	0.1				
						Zn	855	770	18	14	10	31	4

Note: The numbers shown may not add up due to rounding.

FIGURES



LEGEND

- Application Area
- Wetland Buffer (30 m)
- Wetland

NOTES
Base data source: Imagery provided by Google Earth; Airbus (2023)

STATUS
ISSUED FOR USE

2023 MARGINAL LANDS BIOSOLIDS APPLICATION

NW 07-54-21-W4
SW 07-54-21-W4
SE 07-54-21-W4

PROJECTION: UTM Zone 12	DATUM: NAD83				CLIENT: EPCOR
Scale: 1:7,000 (100 50 0 100 Metres)					TETRA TECH
FILE NO.: BIOS03089-01_Figure01_Sec07.mxd					
OFFICE: TI-VANC	DWN: MRB	CKD: SL	APVD: MF	REV: 0	Figure 1
DATE: February 11, 2024	PROJECT NO.: ENW.BIOS03089-01				

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LEGEND

- Application Area
- Wetland Buffer (30 m)
- Wetland

NOTES
Base data source: Imagery provided by AbaData (2022)

STATUS
ISSUED FOR USE

2023 MARGINAL LANDS BIOSOLIDS APPLICATION

NW 14-55-23-W4

PROJECTION	DATUM	CLIENT
UTM Zone 12	NAD83	EPCOR

Scale: 1:6,000
100 50 0 100
Metres

TETRA TECH

FILE NO. BIOS03089-01_Figure02_NW14.mxd

OFFICE	DWN	CKD	APVD	REV
Tt-VANC	MRB	SL	MF	0

DATE February 11, 2024
PROJECT NO. ENW.BIOS03089-01

Figure 2

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LEGEND

- Application Area
- Wetland Buffer (30 m)
- Wetland

NOTES
Base data source: Imagery provided by AbaData (2022)

STATUS
ISSUED FOR USE

2023 MARGINAL LANDS BIOSOLIDS APPLICATION

NE 14-55-23-W4

PROJECTION	DATUM	CLIENT
UTM Zone 12	NAD83	EPCOR

Scale: 1:6,000
100 50 0 100
Metres

TETRA TECH

FILE NO. BIOS03089-01_Figure03_NE14.mxd

OFFICE	DWN	CKD	APVD	REV
Tt-VANC	MRB	SL	MF	0

DATE February 12, 2024
PROJECT NO. ENW.BIOS03089-01

Figure 3

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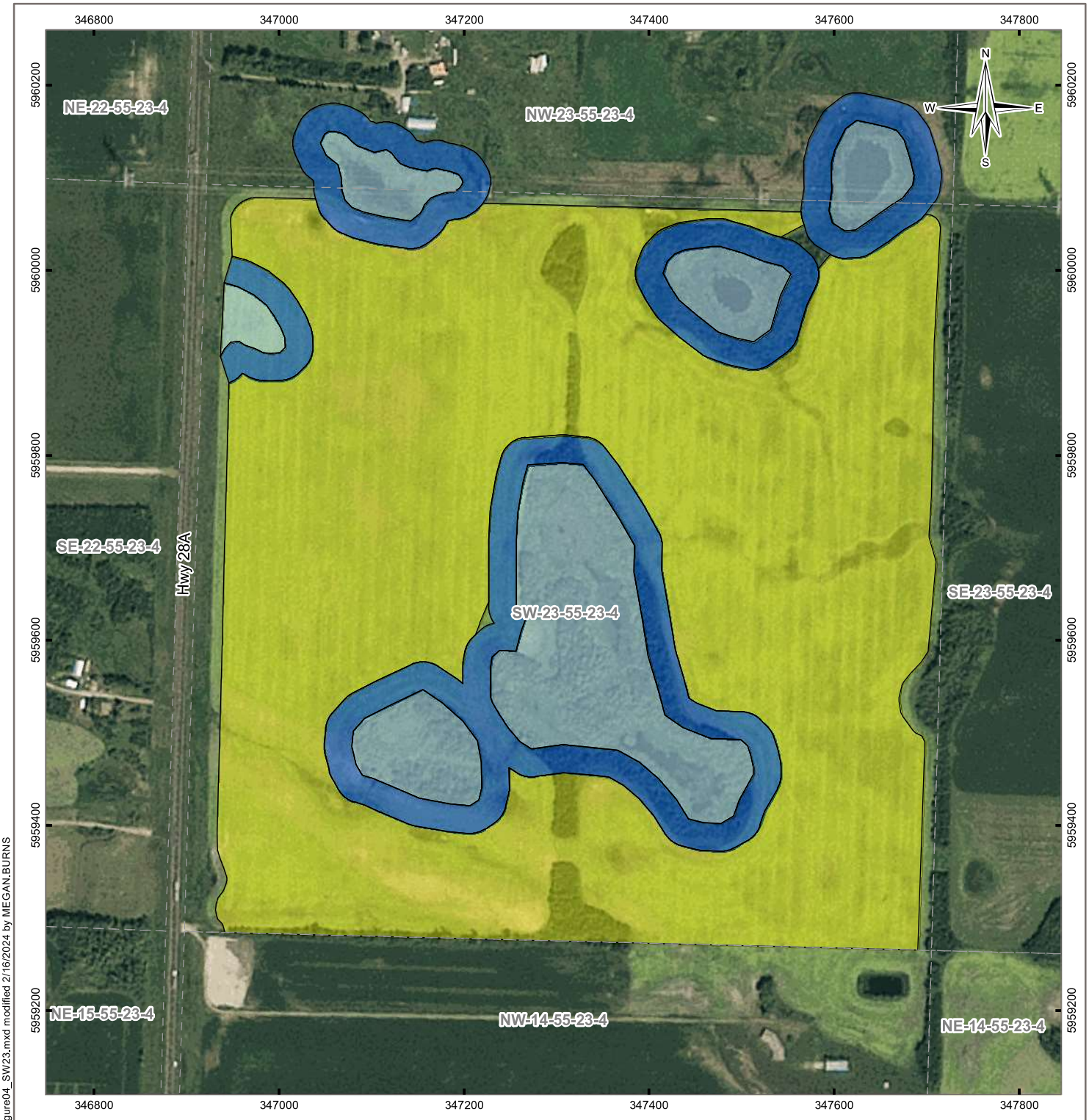

LEGEND

- Application Area
- Wetland Buffer (30 m)
- Wetland

NOTES
Base data source: Imagery provided by AbaData (2022)

STATUS
ISSUED FOR USE

2023 MARGINAL LANDS BIOSOLIDS APPLICATION

SW 23-55-23-W4

PROJECTION UTM Zone 12			**DATUM** NAD83		**CLIENT** EPCOR
Scale: 1:6,000 — 100 50 0 100 — Metres					TETRA TECH
FILE NO. BIOS03089-01_Figure04_SW23.mxd					
OFFICE Tt-VANC	**DWN** MRB	**CKD** SL	**APVD** MF	**REV** 0	**Figure 4**
DATE February 16, 2024	**PROJECT NO.** ENW.BIOS03089-01				

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SITE PHOTOGRAPHS

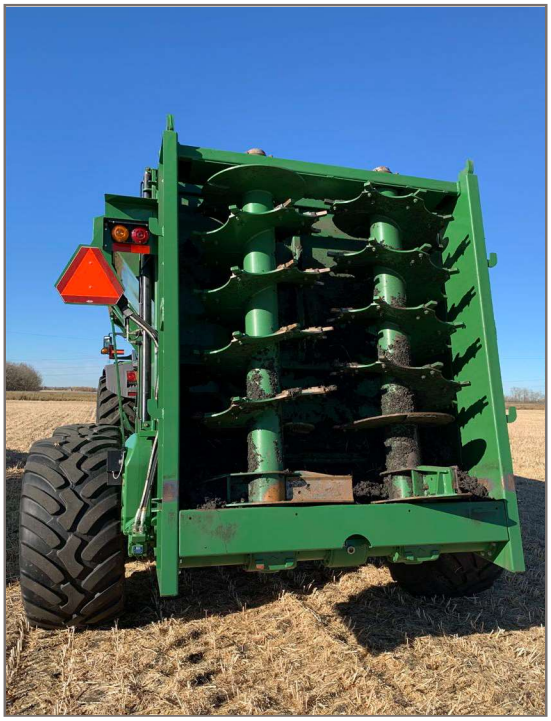


Photo 1: October 18, 2023. Agricultural spreader used to spread dewatered biosolids, cleaned prior to mobilization to Sturgeon County fields.

Photo 2: October 18, 2023. Agricultural spreader used to spread dewatered biosolids, cleaned prior to mobilization to Sturgeon County fields

Photo 3: October 18, 2023. Spreading dewatered biosolids on SW 23-55-23 W4M with agricultural spreader.

Photo 4: October 18, 2023. Spread pattern of dewatered biosolids on SW 23-55-23 W4M.

APPENDIX A

TETRA TECH'S LIMITATIONS ON THE USE OF THIS DOCUMENT

LIMITATIONS ON USE OF THIS DOCUMENT

NATURAL SCIENCES

1.1 USE OF DOCUMENT AND OWNERSHIP

This document pertains to a specific site, a specific development, and a specific scope of work. The document may include plans, drawings, profiles and other supporting documents that collectively constitute the document (the "Professional Document").

The Professional Document is intended for the sole use of TETRA TECH's Client (the "Client") as specifically identified in the TETRA TECH Services Agreement or other Contractual Agreement entered into with the Client (either of which is termed the "Contract" herein). TETRA TECH does not accept any responsibility for the accuracy of any of the data, analyses, recommendations or other contents of the Professional Document when it is used or relied upon by any party other than the Client, unless authorized in writing by TETRA TECH.

Any unauthorized use of the Professional Document is at the sole risk of the user. TETRA TECH accepts no responsibility whatsoever for any loss or damage where such loss or damage is alleged to be or, is in fact, caused by the unauthorized use of the Professional Document.

Where TETRA TECH has expressly authorized the use of the Professional Document by a third party (an "Authorized Party"), consideration for such authorization is the Authorized Party's acceptance of these Limitations on Use of this Document as well as any limitations on liability contained in the Contract with the Client (all of which is collectively termed the "Limitations on Liability"). The Authorized Party should carefully review both these Limitations on Use of this Document and the Contract prior to making any use of the Professional Document. Any use made of the Professional Document by an Authorized Party constitutes the Authorized Party's express acceptance of, and agreement to, the Limitations on Liability.

The Professional Document and any other form or type of data or documents generated by TETRA TECH during the performance of the work are TETRA TECH's professional work product and shall remain the copyright property of TETRA TECH.

The Professional Document is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of TETRA TECH. Additional copies of the Document, if required, may be obtained upon request.

1.2 ALTERNATIVE DOCUMENT FORMAT

Where TETRA TECH submits electronic file and/or hard copy versions of the Professional Document or any drawings or other project-related documents and deliverables (collectively termed TETRA TECH's "Instruments of Professional Service"), only the signed and/or sealed versions shall be considered final. The original signed and/or sealed electronic file and/or hard copy version archived by TETRA TECH shall be deemed to be the original. TETRA TECH will archive a protected digital copy of the original signed and/or sealed version for a period of 10 years.

Both electronic file and/or hard copy versions of TETRA TECH's Instruments of Professional Service shall not, under any circumstances, be altered by any party except TETRA TECH. TETRA TECH's Instruments of Professional Service will be used only and exactly as submitted by TETRA TECH.

Electronic files submitted by TETRA TECH have been prepared and submitted using specific software and hardware systems. TETRA TECH makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

1.3 STANDARD OF CARE

Services performed by TETRA TECH for the Professional Document have been conducted in accordance with the Contract, in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Professional judgment has been applied in developing the conclusions and/or recommendations provided in this Professional Document. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of the Professional Document.

If any error or omission is detected by the Client or an Authorized Party, the error or omission must be immediately brought to the attention of TETRA TECH.

1.4 DISCLOSURE OF INFORMATION BY CLIENT

The Client acknowledges that it has fully cooperated with TETRA TECH with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for TETRA TECH to properly provide the services contracted for in the Contract, TETRA TECH has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

1.5 INFORMATION PROVIDED TO TETRA TECH BY OTHERS

During the performance of the work and the preparation of this Professional Document, TETRA TECH may have relied on information provided by persons other than the Client.

While TETRA TECH endeavours to verify the accuracy of such information, TETRA TECH accepts no responsibility for the accuracy or the reliability of such information even where inaccurate or unreliable information impacts any recommendations, design or other deliverables and causes the Client or an Authorized Party loss or damage.

1.6 GENERAL LIMITATIONS OF DOCUMENT

This Professional Document is based solely on the conditions presented and the data available to TETRA TECH at the time the data were collected in the field or gathered from available databases.

The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site conditions present or variation in assumed conditions which might form the basis of design or recommendations as outlined in this report, at or on the development proposed as of the date of the Professional Document requires a supplementary investigation and assessment.

TETRA TECH is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

1.7 ENVIRONMENTAL ISSUES

The ability to rely upon and generalize from environmental baseline data is dependent on data collection activities occurring within biologically relevant survey windows.

It is incumbent upon the Client and any Authorized Party, to be knowledgeable of the level of risk that has been incorporated into the project design or scope, in consideration of the level of the environmental baseline information that was reasonably acquired to facilitate completion of the scope.

1.8 NOTIFICATION OF AUTHORITIES

TETRA TECH professionals are bound by their ethical commitments to act within the bounds of all pertinent regulations. In certain instances, observations by TETRA TECH of regulatory contravention may require that regulatory agencies and other persons be informed. The client agrees that notification to such bodies or persons as required may be done by TETRA TECH in its reasonably exercised discretion.

APPENDIX B

LETTERS OF AUTHORIZATION - BIOSOLIDS APPLICATION TO LAND

9504-49 Street,
Edmonton, Alberta
T6B 2M9 Canada
Epcor.com

September 6, 2023

Mr. Mohammad Rahman, P.Eng.
EPEA Team Leader
Capital District – RAD North
Alberta Environment and Protected Areas
111 Twin Atria Building
4999-98 Avenue
Edmonton, AB T6B 2X3

Re: 2023 Edmonton Wastewater Approval No. 639-03-06, Biosolids Stockpile Notification

Dear Mr. Rahman:

As per section 4.6 of approval number 639-03-06, this is a notification for an EPCOR land application of municipal biosolids stockpile location. The site is located SE 7-54-21 W4M. Attached is the site report and landowner acknowledgement.

Please contact me with any questions or clarifications at 780-718-2126.

Regards,

David Curran, P.Eng.
Biosolids Manager
Operations, Gold Bar WWTP

Cc: Deidre Bartlett, EPCOR
Larry Olstad, Olstad & Company

Regulatory Assurance Division
North Region – Capital District
111 Twin Atria Building
4999 98 Avenue
Edmonton AB T6B 2X3
Telephone: 780-427-7617
https://www.alberta.ca/environment-and-protected-areas.aspx

Date: October 16, 2023

File No.: 0202-639
Application No.: 639-32733-SLU

David Curran, P. Eng.
Manager Biosolids, Operations
EPCOR Water Services
9504 49 ST NW
Edmonton, AB T6B 2M9

Delivered Via E-mail to: dcurran@epcor.com

Dear Mr. Curran:

Re: Letter of Authorization – Biosolids Application to Land
EPCOR Water Services Inc. (EWSI) – Edmonton Wastewater System
***Environmental Protection and Enhancement Act (EPEA)* Approval No. 639-03-00**

Environment and Protected Areas (EPA) has reviewed the submission made by EPCOR Water Services Inc. (EWSI) dated September 12, 2023. EWSI is requesting an authorization to apply wastewater biosolids to lands located at the following quarter sections within the Strathcona County:

- NW 07-54-21 W4M
- SW 07-54-21 W4M
- SE 07-54-21 W4M

This Letter of Authorization is issued pursuant to the *Environmental Protection and Enhancement Act*, Wastewater and Storm Drainage Regulation 119/93, Section 8.

Please note, as per the Condition No.12 of the attached Appendix to this Letter of Authorization, the Approval Holder shall submit summary reports to the Director as described.

If you have any questions regarding this letter, please contact Mohammad M. Rahman at (780) 422-1721.

Sincerely,

Gerald Feschuk, P. Eng.
Designated Director under the Act

cc: Deidre Bartlett, Dbartlett@epcor.com
Mark Fawcett, mark.fawcett@tetratech.com
Mohammad M. Rahman, EPA

APPENDIX

1. The dewatered biosolids from the Edmonton Wastewater System shall be stockpiled in accordance with the Alberta Environment and Parks' Draft Dewatered Biosolids Stockpiling Guidelines (October 19, 2009, prepared by Sylvis Environmental Services Inc.).

2. The following parcels of land may receive biosolids from the Edmonton Wastewater System at a rate not exceeding the dry biosoilds per hectare of land as described below:

Land Description	Area (ha)	Classification	Application Rate (dt/ha)
NW 07-54-21 W4M	20	2	15.4
NW 07-54-21 W4M	125	1	19.8
SW 07-54-21 W4M			
SE 07-54-21 W4M			

3. Post sampling and analysis for Alberta Tier 1 metals shall be conducted for the land units where pre-application soil pH is lower than 6.0 in the 0-30 cm depth and lime is not added to adjust pH accordingly including NW 07-54-21, SW 07-54-21 W4M and SE 07-54-21 W4M.

4. Biosolids shall be applied in accordance with Alberta Environment's *Guidelines for the Application of Municipal Wastewater Sludges to Agricultural Lands*.

5. Land to which biosolids is applied shall be cultivated as soon as possible following the biosolids application.

6. Biosolids shall not be applied to soil that is frozen or snow covered.

7. Parcels of lands which have received biosolids within the past 3 years may only have biosolids applied to the portion of the parcel that was not completed during the prior application.

8. EWSI shall obtain written approval from the appropriate pipeline authority or authorities before any biosolids transport or spreading vehicles cross any pipeline or pipeline corridors located on the aforementioned parcels of land. Should permission not be obtained to travel over a pipeline or pipeline corridor then the area over the corridor must be marked and tanker travel over same prohibited.

9. Any parts of the aforementioned parcels of land which may be subject to periodic flooding or water ponding shall not receive biosolids if said flooding or ponding crosses onto an adjacent landowner's property.

10. Biosolids haulage and/or spreading vehicles shall be operated and maintained such that biosolids deposition on public roadways is minimized and does not create a public nuisance.

11. Any release, spill, or discharge into a watercourse or on land not designated to receive biosolids shall immediately be reported to the Environment and Protected Areas at 1-780-422-4505.

12. Following completion of the 2023 and 2024 biosolids spreading program, and no later than February 28, 2024, and 2025 respectively, EWSI shall submit biosoilds application summary report including the monitoring results to the Director.

13. This Letter of Authorization expires on June 30, 2024.

DATED October 16, 2023

Gerald Feschuk, P. Eng.
Designated Director under the Act

9504-49 Street,
Edmonton, Alberta
T6B 2M9 Canada
Epcor.com

June 16, 2023

Mr. Mohammad Rahman, P.Eng.
EPEA Team Leader
Capital District – RAD North
Alberta Environment and Protected Areas
111 Twin Atria Building
4999-98 Avenue
Edmonton, AB T6B 2X3

Re: 2023 Edmonton Wastewater Approval No. 639-03-06, Biosolids Stockpile Notification

Dear Mr. Rahman:

As per section 4.6 of approval number 639-03-06, this is a notification for an EPCOR land application of municipal biosolids stockpile location. The site is located SW 23-55-23 W4M. Attached is the site report and landowner acknowledgement.

Please contact me with any questions or clarifications at 780-718-2126.

Regards,

David Curran, P.Eng.
Biosolids Manager
Operations, Gold Bar WWTP

Cc: Deidre Bartlett, EPCOR
Larry Olstad, Olstad & Company

Alberta Environment and Protected Areas

Regulatory Assurance Division
North Region – Capital District
111 Twin Atria Building
4999 98 Avenue
Edmonton AB T6B 2X3
Telephone: 780-427-7617
https://www.alberta.ca/environment-and-protected-areas.aspx

Date: October 18, 2023

File No.: 0202-639
Application No.: 639-32787-SLU

David Curran, P. Eng.
Manager Biosolids, Operations
EPCOR Water Services
9504 49 ST NW, Edmonton

Delivered Via E-mail to: dcurran@epcor.com

Dear Mr. Curran:

Re: Letter of Authorization – Biosolids Application to Land
EPCOR Water Services Inc. (EWSI) – Edmonton Wastewater System
***Environmental Protection and Enhancement Act (EPEA)* Approval No. 639-03-00**

We are enclosing the Letter of Authorization to apply wastewater biosolids to lands located at:

- NW 02-55-23 W4M
- SW 11-55-23 W4M
- NW 14-55-23 W4M
- NE 14-55-23 W4M
- SW 23-55-23 W4M

in Sturgeon County as described in your submission dated September 22, 2023. This Letter of Authorization is issued pursuant to the *Environmental Protection and Enhancement Act* (EPEA), Wastewater and Storm Drainage Regulation 119/93, Section 8.

Please note, as per the Condition No.13 of the attached Appendix to this Letter of Authorization, the Approval Holder shall submit summary reports to the Director as described. The letter of Authorization 639-32557 SLU issued on September 12, 2023, is cancelled.

If you have any questions regarding this letter, please contact Mohammad M. Rahman at (780) 422-1721 or via email to Mohammad.m.rahman@gov.ab.ca.

Sincerely,

Gerald Feschuk, P. Eng.
Designated Director under the Act

cc: Deidre Bartlett, dbarlett@epcor.com
Mark Fawcett, mark.fawcett@tetratech.com
Mohammad M. Rahman, EPA

APPENDIX

1. The dewatered biosolids from the Edmonton Wastewater System shall be stockpiled in accordance with the Alberta Environment and Parks' Draft Dewatered Biosolids Stockpiling Guidelines (October 19, 2009, prepared by Sylvis Environmental Services Inc.).

2. The following parcels of land may receive biosolids from the Edmonton Wastewater System at a rate not exceeding the dry biosolids per hectare of land as described below:

Land Description	Area (ha)	Classification	Application Rate (dt/ha)
NW 02-55-23 W4M	65	1	19.8
SW 11-55-23 W4M	52	1	19.8
NW 14-55-23 W4M	32	1	19.8
NE 14-55-23 W4M	56	3	8.8
SW 23-55-23 W4M	52	3	8.8

3. Post application Alberta Tier 1 metals in the 0-15 cm and 15-30 cm depths shall be conducted for all applicable land units where pre-application soil pH is lower than 6.0 in the 0-30 cm depth and lime is not added to adjust pH, accordingly, including NW 14-55-23 W4M, NE 14-55-23 W4M and SW 23-55-23 W4M.

4. Biosolids shall not be applied in NW 02-55-23 W4M and SW 11-55-23 W4M unless the two fields are limed accordingly prior to biosolids being applied.

5. Biosolids shall be applied in accordance with Alberta Environment's *Guidelines for the* Application *of Municipal Wastewater Sludges to Agricultural Lands*.

6. Land to which biosolids is applied shall be cultivated as soon as possible following the biosolids application.

7. Biosolids shall not be applied to soil that is frozen or snow covered.

8. Parcels of lands which have received biosolids within the past 3 years may only have biosolids applied to the portion of the parcel that was not completed during the prior application.

9. EWSI shall obtain written approval from the appropriate pipeline authority or authorities before any biosolids transport or non-agricultural spreading vehicles cross any pipeline or pipeline corridors located on the aforementioned parcels of land. Should permission not be obtained to travel over a pipeline or pipeline corridor then the area over the corridor must be marked and tanker travel over same prohibited.

10. Any parts of the aforementioned parcels of land which may be subject to periodic flooding or water ponding shall not receive biosolids if said flooding or ponding crosses onto an adjacent landowner's property.

11. Biosolids haulage and/or spreading vehicles shall be operated and maintained such that biosolids deposition on public roadways is minimized and does not create a public nuisance.

12. Any release, spill, or discharge into a watercourse or on land not designated to receive biosolids shall immediately be reported to the Environment and Protected Areas at 1-780-422-4505.

13. Following completion of the 2023 and 2024 biosolids spreading program, and no later than February 28, 2024, and 2025 respectively, EWSI shall submit biosolids application summary report including the monitoring results to the Director.

14. This Letter of Authorization expires on June 30, 2024.

DATED: October 18, 2023

Gerald Feschuk, P. Eng.
Designated Director Under the Act

APPENDIX C

LANDOWNER ACKNOWLEDGEMENT

Fluid Movement

Box 1059,
Lamont, Alberta
T0B 2R0 Canada

Dear Sir/Madame:

Thank you for your interest in the Olstad & Company Ltd. ("OLSTAD") City to Soil program.

This letter is to confirm that you have requested that the agricultural land described as:

S½ 7-54-21-W4 NW7-54-21-W4

(the "Land") be considered a candidate site for the City to Soil program. As you know, the City to Soil program involves the application of biosolids to agricultural land in accordance with the Guidelines for the Application of Municipal Wastewater Sludges to Agricultural Lands (Alberta Environment March 2001).

If acceptable to you, please return a fully signed original of the enclosed Acknowledgement and Authorization to the attention of Larry Olstad at the above address or email a fully signed copy to olstad.co@gmail.com. The Acknowledgement and Authorization must be signed by all owners and lessees of the Land. Once the fully signed Acknowledgement and Authorization has been received, OLSTAD will commence its assessment of the Land to determine if the Land is an appropriate candidate site for the City to Soil program.

For further information about the Nutri-Gold program please call 780-940- 4803.

LARRY OLSTAD

Signature

May 24th

Date

ACKNOWLEDGEMENT AND AUTHORIZATION:

Re: Potential application of biosolids to agricultural land described

as 5½-7-54-21-W4 NW7-54-21-W4 (the "Lands)

In consideration of Olstad & Company Ltd. ("OLSTAD"}: (i) evaluating the Lands as a potential candidate site for the Nutri-Gold program; and (ii) potentially applying biosolids to the Lands (if the Lands are determined to be suitable and are selected for application of biosolids, all as decided by OLSTAD in its sole discretion), the undersigned hereby agree(s) as follows:

1. I/We [insert name of land owner(s) and lessee(s)], hereby certify that we are the registered owner(s)/lessee{s) of the Lands and hereby request that the Lands be considered a candidate site for the Nutri-Gold program.

2. I/We understand that the Guidelines for the Application of Municipal Wastewater Sludges to Agricultural Lands (Alberta Environment March 2001) (the "Guidelines") indicate as follows:

    a. biosolids application to agricultural land is intended for the production of forages, oil seeds, small grains (see the Guidelines for further recommendations), dried legumes (peas, beans, etc), trees and commercial sod;

    b. that no direct grazing be permitted on the Lands for a period of at least three years following application of biosolids; and

    c. that biosolids not be applied on land intended for production of root crops, tobacco and crops eaten raw (including without limitation fresh fruits and vegetables) or used in dairy farm pasturing.

3. I/We acknowledge and agree that any biosolids applied to or stockpiled on the Lands are provided on an as-is where-is basis and that OLSTAD disclaims all representations or warranties. express or implied, including without limitation any implied warranties of merchantability or fitness for any particular purpose.

4. I/We understand that there may be certain inherent risks associated with the application of biosolids to the Lands and I/we assume those risks. I/we hereby release and indemnify OLSTAD, its directors, officers, employees and affiliates from any losses, injuries, claims, demands, liabilities, damages or actions brought or made against OLSTAD, its directors, officers, employees or affiliates or which they may sustain or incur as a result of or in connection with the activities described herein, including without limitation performance of soil testing. the application of biosolids to the Lands and the stockpiling of biosolids on the Lands.

5. I/We hereby authorize OLSTAD, and its authorized agents, to enter upon the Lands in order to conduct soil testing to determine the suitability of the Lands for the City to Soil program and to communicate the results of this testing to third parties as may be required by law and for OLSTAD's administrative purposes.

6. If the Lands are determined to be suitable and are selected for the application of biosolids, I/We further authorize OLSTAD, and it authorized agents, to enter upon the Lands and apply the biosolids.

7. If OLSTAD has dewatered biosolids or lime that it wishes to stockpile on the Lands, I/We hereby authorize OLSTAD, and its authorized agents, to enter upon the Lands to stockpile the dewatered biosolids.

8. I/We understand that the City to Soil program is a program offered by OLSTAD at the sole discretion of OLSTAD as part of its biosolids management program and that OLSTAD may cancel, withdraw or adjust the application of biosolids at any time, without liability or notice, at OLSTAD's sole discretion.

9. I/We further agree that no compensation is payable by OLSTAD for the City to Soil program, including without limitation, for the soil testing, application of biosolids, stockpiling of biosolids/lime, or the cancellation, withdrawal or adjustment of any application of biosolids on the Lands.

10. I/We agree to advise OLSTAD if the ownership of the Lands changes or if the lessee(s) of the Lands change.

11. I/We agree to disclose that biosolids have been applied to the Lands to any potential purchaser or lessee of the Lands.

12. I/We agree that this Acknowledgement and Authorization will be valid for a period of three (3) years from the date of the final signature below.

13. I/We acknowledge that OLSTAD will be relying on the accuracy of and authorizations contained in the foregoing statements in performing the activities outlined herein, including without limitation soil testing, application of biosolids to the Lands and stockpiling of biosolids on the Lands.

14. This Acknowledgement and Authorization may be signed in any number of counterparts, each of which will be deemed to be an original and all of which taken together will be deemed to constitute one and the same document. Counterparts may be delivered in original form or by email and each copy will be deemed to be anoriginal.

15. I/We acknowledge that I/We understand that this agreement is exclusive and binding for 5 years and that no other biosolids may be applied or similar agreements can be entered into without the written permission of OLSTAD. I/We understand that this exclusive agreement is with OLSTAD and all Lands owned, rented or otherwise control are subject to this agreement with regards to any biosolids application for 5 years.

16. I/We acknowledge that I/We have read, understand and agree with all of the provisions of this Acknowledgement and Authorization, and acknowledge that I/We have had the opportunity to obtain independent legal advice with respect to it.

CHRIS ALAM
Print Name(s) (land owner(s))

Print Name(s) (lessee(s))

Signature

Signature

MAY 24/19
Date

Date

Chris. 780-777-4276
S½ 7-54-21-W4 & NW-7-54-21-W4

~~Chris Hardway.~~
~~780-222-9273~~

~~NW-7-54-21-W4~~ old pasture
~~S½ 7-54-21-W4~~ hay land ~~for after first cut~~

City to Soil
Delivered by Olstad & Company
Box 1059 Lamont, AB T0B 2R0

Dear Sir/Madam:

Re: Olstad & Company Ltd.- City to Soil Program Acknowledgement and Authorization

Thank you for your interest in the Olstad & Company Ltd. ("OLSTAD") City to Soil program.

This letter is to confirm that you have requested that the agricultural land described as:
N½ E&W NW2, SW11 55, 23 W4
~~S½~~ 14 55 23-W4 SW2355-23-W4 (the "Land")
be considered a candidate site for the City to Soil program. As you know, the City to Soil program involves the application of biosolids to agricultural land in accordance with the Guidelines for the Application of Municipal Wastewater Sludges to Agricultural Lands (Updated August 2009).

If acceptable to you, please return a fully signed original of the enclosed Acknowledgement and Authorization to the attention of Larry Olstad, Director at the above-noted mailing address or email to olstad.co@gmail.com.

The Acknowledgement and Authorization must be signed by all owners and lessees of the Land. Once the fully signed Acknowledgement and Authorization has been received, OLSTAD will commence its assessment of the Land to determine if the Land is an appropriate candidate site for the City to Soil program.

For further information about the City to Soil program please call Larry Olstad [780-940-4803].

Additional Notes:

Enclosure (1): Acknowledgement and Authorization Form

ACKNOWLEDGEMENT AND AUTHORIZATION

ication of biosolids to agricultural land described as:

55-23-W4 SW23-55-23-W4 (the "Lands").

Olstad & Company Ltd. ("OLSTAD") (I) evaluating the Lands as a potential candidate site for gram; and (ii) potentially applying biosolids to the Lands (if the Lands are determined to be selected for application of biosolids, all as decided by OLSTAD in its sole discretion), the by agree(s) as follows:

_____, hereby certify that we are the registered owner(s)/lessee(s) and hereby request that the Lands be considered a candidate site for the City to Soil program.

stand that the Guidelines for the Application of Municipal Wastewater Sludges to Agricultural lated August 2009) (the "Guidelines") indicate as follows:

solids application to agricultural land is intended for the production of forages, oil seeds, small ains (see the Guidelines for further recommendations), dried legumes (peas, beans, etc.), trees d commercial sod;

hat no direct grazing be permitted on the Lands for a period of at least three years following application of biosolids; and

that biosolids not be applied on land intended for production of root crops, tobacco and crops eaten raw (including without limitation fresh fruits and vegetables) or used in dairy farm pasturing.

acknowledge and agree that any biosolids applied to or stockpiled on the Lands are provided on an as-ere-is basis and that OLSTAD disclaims all representations or warranties, express or implied, including out limitation any implied warranties of merchantability or fitness for any particular purpose.

e understand that there may be certain inherent risks associated with the application of biosolids to the nds and I/we assume those risks. I/we hereby release and indemnify OLSTAD, its directors, officers, ployees and affiliates from any losses, injuries, claims, demands, liabilities, damages or actions brought made against OLSTAD, its directors, officers, employees or affiliates or which they may sustain or incur s a result of or in connection with the activities described herein, including without limitation performance of oil testing, the application of biosolids to the Lands and the stockpiling of biosolids on the Lands.

I/We hereby authorize OLSTAD, and its authorized agents, to enter upon the Lands at any time this Acknowledgement and Authorization is in effect, in order to conduct soil testing to determine the suitability of the Lands for the City to Soil program and to communicate the results of this testing to third parties as may be required by law and for OLSTAD's administrative purposes.

If the Lands are determined to be suitable and are selected for the application of biosolids, I/We further authorize OLSTAD, and its authorized agents, to enter upon the Lands and apply the biosolids.

7. If OLSTAD has dewatered biosolids that it wishes to stockpile on the Lands, I/We hereby authorize OLSTAD, and its authorized agents, to enter upon the Lands to stockpile the dewatered biosolids in accordance with OLSTAD's program requirements. If there are unforeseen circumstances, including a weather event, I/We agree that OLSTAD may leave the stockpiled biosolids on the Lands until it is safe and able, in OLSTAD's sole discretion, to spread and incorporate the material onto the Lands.

8. I/We understand that the City to Soil program is a program offered by OLSTAD at the sole discretion of OLSTAD as part of its biosolids management program and that OLSTAD may cancel, withdraw or adjust the application of biosolids at any time, without liability or notice, at OLSTAD's sole discretion.

9. I/We further agree that no compensation is payable by OLSTAD for the City to Soil program, including without limitation, for the soil testing, application of biosolids, stockpiling of biosolids, or the cancellation, withdrawal or adjustment of any application of biosolids on the Lands.

10. I/We agree to advise OLSTAD if the ownership of the Lands changes or if the lessee(s) of the Lands change.

11. I/We agree to disclose that biosolids have been applied to the Lands to any potential purchaser or lessee of the Lands.

12. I/We agree that this Acknowledgement and Authorization is effective from the date of the final signature below and will be valid for a period of three (3) years.

13. I/We acknowledge that OLSTAD will be relying on the accuracy of and authorizations contained in the foregoing statements in performing the activities outlined herein, including without limitation soil testing, application of biosolids to the Lands and stockpiling of biosolids on the Lands.

14. This Acknowledgement and Authorization may be signed in any number of counterparts, each of which will be deemed to be an original and all of which taken together will be deemed to constitute one and the same document. *Counterparts may be delivered in original form or by email or text message and each will be deemed to be an original.*

15. I/We acknowledge that this agreement is exclusive and binding for 5 years and that no other biosolids may be applied or that similar agreements can be entered into without any written permission from OLSTAD. I/We understand that this exclusive agreement is with OLSTAD and all lands owned, rented or otherwise are subject to this agreement with regards to any biosolids application for 5 years.

16. I/We acknowledge that if dewatered material is stockpiled on the land, it may remain on the land for up to 18 months after the completion of hauling before incorporation. OLSTAD will determine when the biosolids will be incorporated. OLSTAD is not responsible for any inconvenience or loss of revenue if stockpiles have to be farmed around.

17. I/We acknowledge that I/We have read, understand and agree with all of the provisions of this Acknowledgement and Authorization, and acknowledge that I/We have had the opportunity to obtain independent legal advice with respect to it.

Oct 6/2022
Date

Larry Olstad

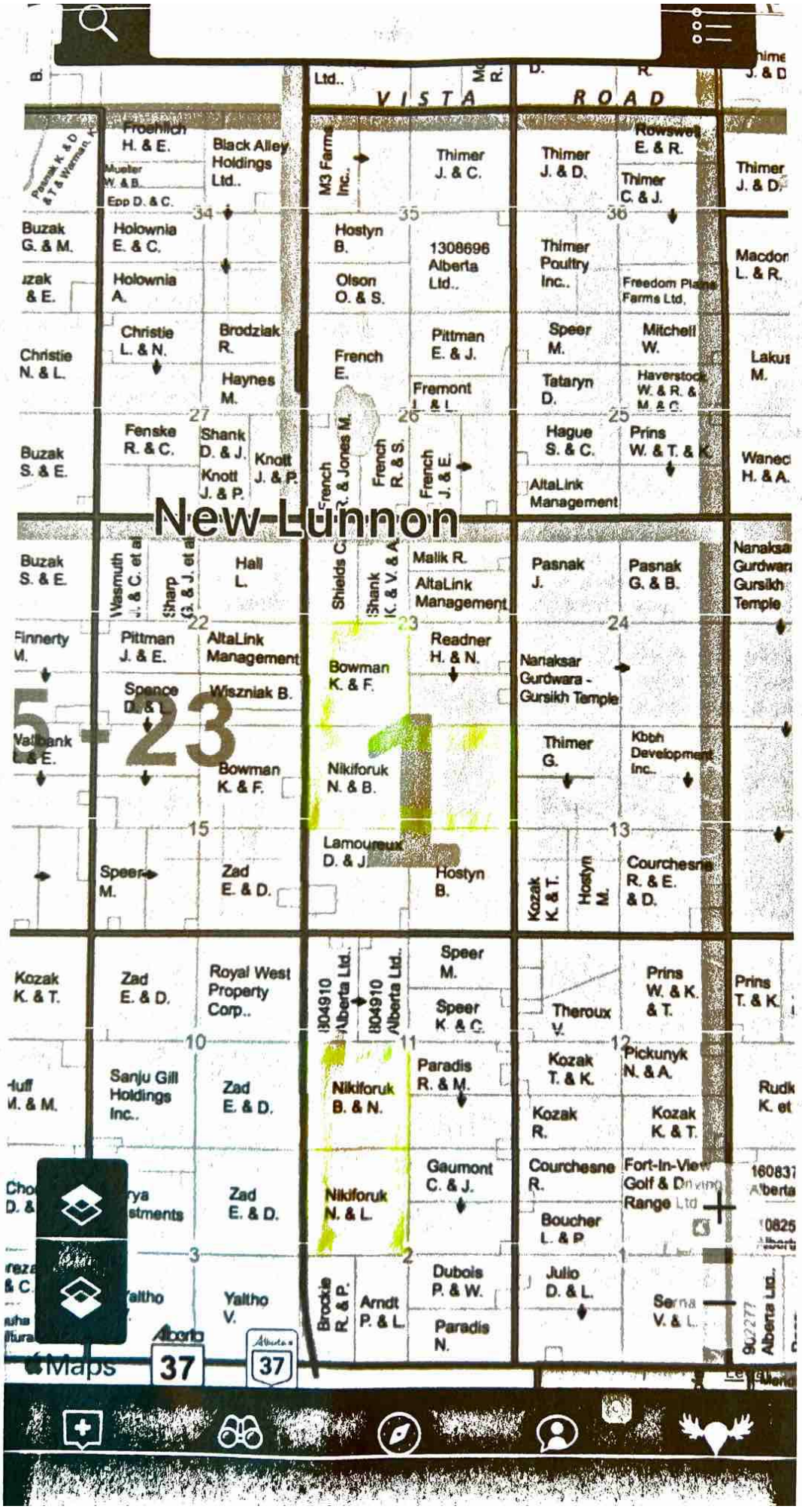
As described earlier
Legal Land Description

Blair Nikiforuk
Name: Landowner

Signature

780-818-1028
Phone Number

bnikiforc@gmail.com
Email


New Lunnon
5-23
VISTA
ROAD
Thimer J. & C.
Thimer J. & D.
Thimer C. & J.
Rowswell E. & R.
M3 Farms Inc..
Hostyn B.
1308696 Alberta Ltd..
Olson O. & S.
Thimer Poultry Inc..
Freedom Pigeon Farms Ltd.
Speer M.
Mitchell W.
Tataryn D.
Haverstock W. & R. & M. & C.
Hague S. & C.
Prins W. & T. & K.
AltaLink Management
Pittman E. & J.
Fremont J. & I.
French E.
French R. & S.
French J. & E.
French R. & Jones M.
Shank D. & J.
Knott J. & P.
Fenske R. & C.
Christie L. & N.
Brodziak R.
Haynes M.
Holownia E. & C.
Holownia A.
Buzak G. & M.
Buzak & E.
Buzak S. & E.
Christie N. & L.
Black Alley Holdings Ltd..
Froehlich H. & E.
Mueller W. & B.
Epp D. & C.
Pasnak K. & D. & T. & Werman, K.
Macdon L. & R.
Lakus M.
Wanec H. & A.
Nanaksar Gurdwara Gursikh Temple
Pasnak J.
Pasnak G. & B.
Malik R.
AltaLink Management
Shank K. & V. & A.
Shields C.
Readner H. & N.
Bowman K. & F.
Nanaksar Gurdwara - Gursikh Temple
Thimer G.
Kbbh Development Inc..
Nikiforuk N. & B.
Lamoureux D. & J.
Hostyn B.
Courchesne R. & E. & D.
Kozak K. & T.
Hostyn M.
Hall L.
Wasmuth J. & C. et al
Sharp G. & J. et al
Pittman J. & E.
AltaLink Management
Wiszniak B.
Bowman K. & F.
Zad E. & D.
Speer M.
Finnerty M.
Valbank & E.
Royal West Property Corp..
Zad E. & D.
Kozak K. & T.
Speer M.
Speer K. & C.
804910 Alberta Ltd.
804910 Alberta Ltd.
Prins W. & K. & T.
Prins T. & K.
Theroux V.
Pickunyk N. & A.
Kozak T. & K.
Kozak R.
Kozak K. & T.
Paradis R. & M.
Nikiforuk B. & N.
Gaumont C. & J.
Nikiforuk N. & L.
Courchesne R.
Fort-In-View Golf & Driving Range Ltd
Boucher L. & P
Julio D. & L.
Dubois P. & W.
Paradis N.
Arndt P. & L.
Brodie R. & P.
Sanju Gill Holdings Inc..
Zad E. & D.
Yaltho V.
Maps
Alberta 37
Alberta 37

Part II: Wastewater Collection System Report

EPCOR PROVIDING MORE

EPCOR Water Services
Edmonton, Alberta

2023
Annual Wastewater Collection System Report

SUBMITTED TO:

The Province of Alberta

Alberta Environment and Protected Areas (AEPA)

As per requirements of:

APPROVAL NO. 639-03-07

February – 2024

TABLE OF CONTENTS

2023 Overview

EPCOR Drainage Services provides wastewater and stormwater drainage services to City of Edmonton (the 'City') residents by planning, building, operating, and maintaining the pipes, tunnels, pump stations, and stormwater management facilities that make up the drainage network. In 2024, EPCOR and Drainage Services will be reorganized for reporting purposes as EPCOR Water Services (EWS). This realignment brings the full water cycle in to one organizational structure with the stated goal to realize operational, capital, planning and delivery synergies and efficiencies. This change will be reflected in the upcoming Approval renewal and 2024 reporting. For the 2023 report in order to avoid confusion and reflect the organizational alignment the organizational naming remains unchanged.

Project Management and Engineering are responsible for projects that are in the preliminary design or detailed design phase. They manage in-house engineering design, cost estimation, and drafting. Projects include new sewer infrastructure projects like tunnels, pipes, manholes, wetlands, and the coordination of sewer rehabilitation work.

Drainage construction is responsible for the in-house construction and emergency repairs on the collection systems. The rehabilitation construction team uses a wide variety of construction methods to rehabilitate the system and build for growth using open-cut and trenchless techniques. The customer construction group completes service connections, renews existing drainage assets, and completes emergency and high priority repairs.

Infrastructure like sewers and structures in the drainage system require ongoing maintenance. Drainage Services Operations — which includes pipeline maintenance, flow-control facilities, monitoring and compliance, and operations engineering — inspect and monitor drainage systems to ensure service to customers is maintained and to optimize the short-term maintenance required. They also reduce the possibility of customer sewer back-ups caused by service connection blockages and minimize disruptions to the public.

Drainage Services are supported by a number of other groups throughout EPCOR such as Public and Governmental Affairs, Supply Chain Management, Fleet and Equipment, Facilities and Finance.

Collection and conveyance of wastewater and stormwater is carried out through the drainage system which consists of sanitary and stormwater collection infrastructure.

The sanitary collection infrastructure includes more than 2,800 km of sanitary sewer, over 800 km of combined sanitary and storm sewer that connect all customers to sanitary trunk sewers. Sanitary trunks then deliver wastewater directly to the Gold Bar Wastewater Treatment Plant (WWTP).

A portion of the conveyance of wastewater is covered under a Wastewater Exchange Agreement between EPCOR and the Alberta Capital Region Wastewater Commission (ACRWC). The ACRWC Treatment Plant takes wastewater from Clareview in northeast Edmonton and from the Clover Bar Industrial Area. In exchange, the sanitary collection system conveys wastewater from the south members (City and County of Leduc, and the Town of Beaumont) for treatment at the Gold Bar WWTP.

The stormwater collection infrastructure includes over 3,300 km of storm sewer, 62,000 catch

basins, and 12,800 catch basin manholes. This stormwater collection infrastructure is connected to stormwater trunk sewers. Storm trunks then discharge stormwater to natural watercourses, i.e. creeks and the North Saskatchewan River, through one of 258 outfalls. Strategically placed within the stormwater collection system are 310 stormwater management facilities which provide flood prevention, peak-flow attenuation, and treatment through stormwater retention.

Between the sanitary/combined sewer system and stormwater system there are 95 pumpstations which ensure proper servicing to EPCOR's customers in Edmonton.

Drainage Services is fully committed to the protection of the environment and the health and safety of its employees, customers, and neighbours. Health and safety and the environment (HSE), including public health safety, is one of the top priorities of EPCOR. In order to continually improve our environmental performance, Drainage Services operates with an ISO 14001:2015 registered Environmental Management System (EMS). Following a successful surveillance audit in 2023, Drainage continued to maintain registration of an integrated management system that operates according to the ISO14001:2015 standard and the ISO 45001:2014 standard for Safety Management Systems.

As required by Approval #639-03-07, EPCOR - Drainage Services is submitting the 2023 Annual Wastewater Collection System Report.

This Annual Wastewater Collection System Report submission includes: 2023 Drainage Services Capital Program summary, Interconnection Control Strategy Annual Report, Environmental Monitoring results, Chemical usage, and Collection System Operational details.

TABLE 1: Summary of 2023 Completed Projects and Planned Major Rehabilitation Projects

Program/Project	Completion
Drainage System Expansion	
2021 Yellowhead Trail Freeway Conversion (Area 3)	Aug-2023
Servicing for Downtown Intensification (105 Sewer Lateral Project)	Dec-2023
2022 Safety Program	Apr-2024
Freeway Relocates (YHT)	Dec-2024
Drainage System Rehabilitation	
2019-2020 Pump Station Rehabilitation	Jun-2023
2022 Electrical Upgrades Pump Stations	Sep-2023
Outfall 80 Rehabilitation	Dec-2023
Outfall 154 Rehabilitation	Dec-2023
Large Trunk Sewer – NL2 Rehabilitation	Dec-2023
2022 Drill Drop Manhole (DDMH) Replacement Projects	Jan-2024
Glastonbury Sewer Subsidence Rehabilitation	Mar-2024
Void Rehabilitation near 122-Street & 51-Avenue	Apr-2024
2021 Drill Drop Manhole (DDMH) Replacement Projects	May-2024
151 South Large Trunk Rehabilitation	Sep-2024
Trestle #5	Sep-2024
Capital Line South LRT – Sewer Relocation	Nov-2024
Storm Trunk 85547 Rehabilitation	Nov-2024
Laurier Heights and Buena Vista Pump Station	Dec-2024
151-Street & 99-Avenue Sanitary Trunk Rehab – Phase II	Dec-2024
West Valley Line LRT Sewer Relocations	Dec-2024
Whitemud Drive & 106-Street Pump Station Upgrade	Dec-2024
2019-2020 Outfall Rehabilitation	Dec-2024
2021 Outfall Rehabilitation	Dec-2024
Pump Station #171 (Walterdale)	Dec-2024
2022-2024 Small Trunk Rehabilitation	Dec-2024
2022 Outfall Rehabilitation	Dec-2024
Sanitary-11 Double Barrel Rehabilitation – Phase 3	Dec-2024
2023 Drill Drop Manholes Rehabilitation	Dec-2024
Drill Drop Manhole 262262 Replacement	Dec-2024
Clover Bar Area High Priority Manhole Pipe Replacement	Dec-2024
Mill Creek High Priority Sewer Redirection	Dec-2024

MacKinnon Ravine Trunk Rehabilitation	Dec-2024
Small Trunk Program – NE Syphon Rehabilitation	Dec-2024
2021 Pump Station Rehabilitation	Dec-2025
2023 Outfall Rehabilitation	Dec-2025
2023 Pump Station Rehabilitation (Eastgate)	Dec-2025
2023 Pump Station Rehabilitation (Rundle Heights)	Dec-2025
Beaumaris Sanitary Sewer Installation	Dec-2026
Mill Creek Combined Trunk Rehabilitation	Dec-2026
Combined Trunk 94 Replacement	Dec-2026
Environmental Quality Enhance	
2022 Access Manhole	Apr-2023
2021 Budget LID on PLC	Oct-2023
Pump Station Optimization CapEx	Nov-2023
2022 Environmental Enhancement Program	Dec-2023
2023 Ventilation Control Program	Dec-2023
2021 Pump Station Enhancements	Feb-2024
Sanitary Catch Basin Lead Removal	Apr-2024
2022 Drop Structure Modifications	May-2024
2023 Environmental Monitoring	May-2024
LID on Commercial / Industrial Sites	Jun-2024
2023 Drop Structure Modifications	Jun-2024
2022-2023 Low Impact Development - Commercial	Jul-2024
2023 Access Manholes	Aug-2024
2022 CORe Odour Monitoring	Oct-2024
2022-2023 Low Impact Development – Public Land	Dec-2024
2023 Pump Station Enhancements	Dec-2024
King Edward Park OCF Repurposing	Dec-2024
Duggan Tunnel Replacement	Aug-2025
Flood Mitigation	
Ermineskin / Steinhauer Flood Mitigation	Dec-2023
Malcolm Tweddle & Edith Rogers Dry Ponds	Dec-2023
2020 Overland Drainage	Dec-2023
2023 Overland Drainage	Dec-2023
2022-2023 Proactive Geyser Mitigation – Ventilation Manhole	Dec-2023
2023 Culvert Replacements	Dec-2023

2022 Emergency Response Equipment	Feb-2024
2022-2023 Proactive Pipe Relining - Sanitary and Combined	Feb-2024
2021 SIRP Monitoring and Controls	Apr-2024
2022 SIRP Monitoring and Controls	Apr-2024
Gateway Boulevard Geyser Mitigation - Ventilation Manhole Installation	May-2024
2023 Proactive Pipe Relining - Sanitary and Combined	May-2024
2021 Outfalls and Automatic Gates	Nov-2024
2023 SIRP Monitoring and Controls	Nov-2024
Parkdale Dry Pond	Dec-2024
North Griesbach Pump Station	Dec-2024
Kenilworth Dry Pond	Dec-2025
Lauderdale West Dry Pond	Dec-2025
Ottewell Dry Pond and Sewer Separation	Dec-2025
SSSF Projects	
SESS SW4	Dec-2023

Interconnection Control Strategy

SUMMARY

In response to a requirement in the 1995 Approval to Operate (No. 95-MUN-117), Drainage Services prepared an Interconnection Control Strategy. Through this Strategy, EPCOR embarked on its mitigation and monitoring program in the context of “perpetual monitoring and assessment” (Figure 1).

An interconnection is designed to allow sanitary or combined sewage to overflow into the storm system, in order to relieve the sewer system under high flow conditions. Since 1998, a program has been in place to minimize the contamination of stormwater with sanitary sewage by monitoring, assessing and eliminating or mitigating all interconnections between the two systems. This will reduce the total loading of contaminants to the North Saskatchewan River.

Under the current Approval (639-03-07), issued in 2021, EPCOR intends to continue with the existing processes and reporting through the Wastewater System Operations Plan. This report presents summaries of: status and mitigation activities for known and newly discovered interconnections (I/Cs); results of the 2023 monitoring program; and status of the Interconnection Rectification Assessment project.

Interconnection Status

During 2023, no interconnections were found or closed. The I/C count for December 31, 2023 stands at 115 open I/Cs and 289 corrected sites (total 404).

Interconnection Monitoring

As of December 31, 2023, 106 of the 115 open I/Cs had monitoring devices. One dry weather overflows (DWO) was discovered in 2023.

Interconnection Rectification Assessment Project

Two consultants were hired in 2002 and 2003 to carry out the rectification assessment of about 90 and 40 sites, respectively. Their work focused mainly on active I/Cs and I/Cs with DWOs. Previous studies and monitoring data were utilized to quantify I/Cs activity, support sewer system assessment, and provide conceptual and preliminary design for remedial works. These assessment studies were completed in 2004 and EPCOR has been following up with the recommended mitigation work since. New focused, detailed assessment projects are ongoing as rectification projects are defined.

1.0 INTRODUCTION

An Interconnection Control Strategy was prepared by EPCOR in response to a requirement by Alberta Environment, as part of the 1995 Approval. This program to minimize the contamination of stormwater by sanitary sewage, has been in effect since 1998.

A key commitment of the Interconnection Control Strategy is perpetual monitoring and assessment for all unmitigated interconnections (see Figure 1). This consists of identification, maintenance of data, evaluation, monitoring, correction, elimination and mitigation.

The focus of interconnection monitoring activities is to collect information on the frequency and duration of discharges from all interconnection (I/C) sites. The evaluation of the data for all sites is the core component of the assessment. All sites are to be evaluated annually for further action. More detailed monitoring will be conducted at highly active sites. Corrective measures will be taken at inactive sites or active sites where sufficient data has been collected and analyzed indicating that they can be safely closed. Monitoring information will be used as the basis for decisions in terms of remedial activity.

As part of the current Approval (639-03-07) issued in 2021, the *Interconnection Identification and Control Strategy* is continuing to be a component of the *Wastewater Collection System Operations Plan*. The *Wastewater Collection System Monitoring Protocol* includes the collection of overflow data from open (active) interconnection sites. This Protocol was submitted to Alberta Environment in 2007 and has been maintained since.

Through the *Wastewater Collection System Operations Plan*, EPCOR has committed to continue with the Interconnection Control Strategy and annual reporting of the I/C status by February 28 of each year. The intent of the annual report is to document changes and status of the I/Cs, including any corrections or closures, and to provide an updated I/C database. The following documents the I/C status for 2023.

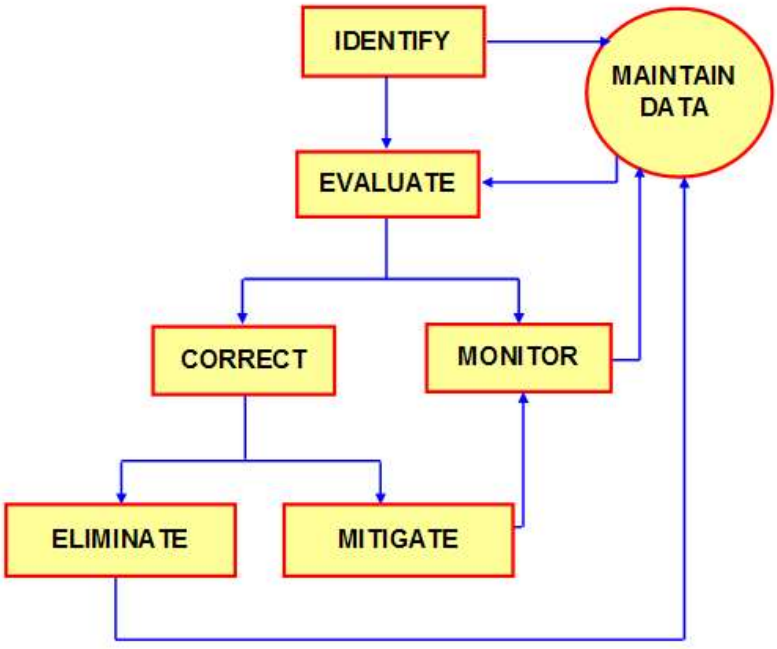


Figure 1 Interconnection Control Strategy Perpetual Monitoring and Assessment

2.0 MITIGATION MEASURES

On January 1, 2023 there were a total of 404 I/Cs. This consisted of 115 open I/Cs and 289 corrected (closed) I/Cs. No interconnections were found or closed in 2023. The I/C count for December 31, 2023 stands at 115 open I/Cs and 289 corrected sites (total 404).

The enclosed plan "2023 Status and DWO Locations" shows the locations of all of the open I/Cs in the city. A database of I/C sites is also included. Figure 2 shows the cumulative number of I/Cs over time.

2.1 CONSTRUCTION

The mitigation measures undertaken in 2023 include;

- Conceptual design work for an abandonment of an interconnection locations in the Queen Mary Park area was started.

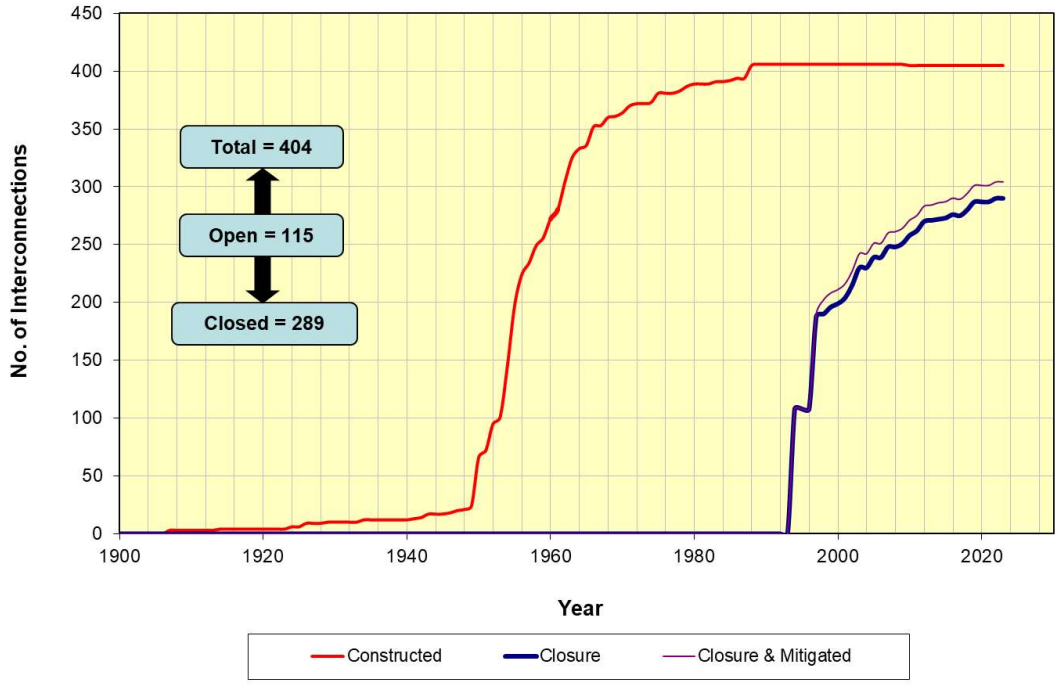


Figure 2 Cumulative Number of Interconnections

3.0 MONITORING AND ASSESSMENT RESULTS

In 2017, a project was initiated to replace the loggers at all monitored interconnection sites. Data collection from the old style of logger was completed by driving a vehicle past each site, sometimes having to stop in traffic and place an antenna through the manhole cover. The new loggers are now equipped with cellular communication and no longer require a 'drive-by' to retrieve data.

Benefits to upgrading the loggers include;

- Decrease the safety risk exposure of the contractor by not requiring vehicle based data collection
- Increased data collection frequency from weekly to every 6 hours
- More data streams collected including battery voltage, signal strength, and temperature.
- Cost reduction by using cellular technology. Labour costs of collecting data are eliminated which exceeded cellular service fees.
- Improved asset management as battery replacement can be planned to occur at the correct time, not too early or too late. Other data streams help diagnose other problems as well.
- Sites not accessible by vehicle can now have sensors and loggers installed.

In the Interconnection Control Strategy, EPCOR committed to perpetual monitoring and assessment of all I/Cs. As of December 31, 2023, 106 of the 115 I/Cs had crest gauge type monitors equipped with cellular data loggers.

The rectification studies completed in the past, alongside the historical activity data for the I/C sites sets a well-defined history to draw on to inform management decisions on a go forward basis.

3.1 DRY WEATHER OVERFLOWS (DWOS)

In 2023, 13 investigations of possibly overflowing sites were made with 1 Dry Weather Overflow discovered. This was reported to AEPA upon discovery.

3.2 INTERCONNECTION SITE ACTIVITY CHARACTERISTICS SUMMARY

As shown in Table 1 below, about 3% of the sites were found to have dry weather overflows each year during monitoring from 1997 to 2021, with an average of 1% over the past 5 years. These are the events of critical concern to the environment. Although only 1% of the sites experience dry weather overflow in a given year, different sites overflow each year. A total of 29% of the known open I/Cs (34 sites) have had a dry weather overflow event.

Table A: Interconnection Site Activity Characteristics Summary

Year	Known I/C Sites	I/C Sites Monitored	Dry Weather Overflow	Rainfall Correlated	Inactive Sites	Unverified Overflows
1997	186	182	N/A	65	109	8
1998	188	179	3	72	64	43
1999	188	176	6	48	92	29
2000	186	173	6	36	76	56
2001	185	174	7	37	75	55
2002	179	161	6	29	110	16
2003	167	153	5	34	102	12
2004	155	139	5	64	51	19
2005	150	131	9	16	88	18
2006	151	131	5	39	70	17
2007	142	126	2	21	87	16
2008	142	126	3	25	75	24
2009	141	127	2	10	81	28
2010	133	118	3	17	72	26
2011	129	118	3	---	---	---
2012	121	113	4	---	---	---
2013	121	113	1	---	---	---
2014	124	113	2	---	---	---
2015	123	112	0	---	---	---
2016	120	112	0	---	---	---
2017	121	68	4	---	---	---
2018	116	93	4	---	---	---
2019	117	103	3	---	---	---
2020	117	110	2	---	---	---
2021	117	110	1	---	---	---
2022	115	106	0	---	---	---
2023	115	106	1	---	---	---
Average	**143**	**129**	**3**	**37**	**82**	**26**
Proportion of Monitored Sites			**2.6%**	**28%**	**64%**	**20%**

4.0 RECTIFICATION ASSESSMENT PROJECT SUMMARY

Two consultants were hired in 2002 and 2003 to carry out the second phase of a large-scale Interconnection Rectification Assessment project. The first project included about 90 I/C sites and the second included about 40 sites. Their work was focused mainly on active and DWO I/Cs. This work identified many I/Cs that could be closed if funds are available.

Previous studies and monitoring data collected between 1998 and 2003 were utilized to quantify interconnection activity, support sewer system assessment, and provide conceptual and preliminary design for remedial works. Major work requirements for this rectification assessment included:

- Perform sewer system data collection and field surveys
- Carry out sewer condition and hydraulic assessment
- Evaluate various remedial measures
- Develop conceptual and preliminary design plans
- Provide Cost estimates

A computer model called MOUSE (Model For Urban Sewers) developed by DHI (Danish Hydraulics Institute) was employed in these studies to simulate the existing system and recommend remedial measures under various wet weather flow conditions. Simulation results such as hydraulic grade line and by-pass volume were summarized and evaluated to ensure that an improved level of control can be achieved, and that proposed improvements would not cause other system problems.

These two assessment projects were completed in 2004 and we have been following up with construction of the recommended mitigation works since that time. The assessments identified a long list of construction works that will absorb the funding for the next several years. New assessment projects will commence once this construction is largely complete.

In 2018, a review of select neighbourhoods was done in addition to the rectification detailed design works. Further recommendations for interconnection closure work has been developed beyond the conceptual design phase. EPCOR will evaluate these recommendations alongside infrastructure plans of other programs such as neighbourhood rehab and the Stormwater Integrated Resource Plan (SIRP).

Interconnection Database
December 31, 2023

IC Site#	Plan	IC MH#	CADAS-TRAL	SAN_MH	STRM_MH	STREET	AVENUE	OF_ NUM	IC_ AGE	SAN_ AGE	STRM_ AGE	ICTYPE	Delete date	COR-RECTED	OF_ LOC1	OF_ LOC2	OF_ DIA	NHOOD	COUNT
ACTIVE INTERCONNECTIONS																			
12	97-177	241869	313225	046	T3	146	SUMMIT D	30	71	30	49	HIGH PIPE		FALSE	RIVER	LEFT	1650	Crestwood	1
14	96-041	315813	313224	803		W142	S. SUMMI	30	61	55	61	OVERFLOW		FALSE	RIVER	LEFT	1650	Glenora	2
15	97-174	256174	343204	880		136	S102	138	43	43		OVERFLOW		FALSE	CREEK	LEFT	375	Glenora	3
16	96-040	239447	313223	801		ST GEORGE		122	55	29	55	LOW PIPE		FALSE	RIVER	LEFT	200	Glenora	4
17	97-176	239449	313223	802		E135	SVICTORI	123	43					FALSE					5
18	96-085	255955	343203	813	435	134	ST GEOR	124	64	29	64	HIGH PIPE		FALSE	CREEK	LEFT	200	Glenora	6
19	96-084	255954	343203	812	404	133	ST GEOR	126	55	55	55	OVERFLOW		FALSE	CREEK	LEFT	200	Glenora	7
20	96-086	316420	343203	826		132	TWEEDSM	134	49	29	49	OVERFLOW/WEIR		FALSE	CREEK	LEFT	200	Glenora	8
21	96-088	255983	343203	839		E132	S103	273	54					FALSE				Glenora	9
25	97-128	255832	343202	820	445	W123	102	46	50	52	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	10
26	97-127	255697	343202	827	456	W122	102	46	50	9	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	11
27	97-126	255840	343202	832	506	W121	102	46	50	78	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	12
28	97-125	255512	343201	805	402	W120	102	46	50	90	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	13
29	97-124	255520	343201	816	411	W119	102	46	50	13	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	14
30	97-123	255525	343201	830	416	W118	102	46	50	12	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	15
31	97-120	255534	343201	843	425	W117	102	46	50	11	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	16
32	97-119	255539	343201	855	431	W116	102	46	50	11	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	17
33	97-118	255562	343201	884	448	W114	102	46	50	8	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	18
34	97-117	265676	343605	805	805	W113	102	46	50	8	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	19
35	97-116	265685	343605	817	430	W112	102	46	50	8	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	20
36	97-115	265684	343605	821	412	112	102	46	50	30	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	21
37	97-114	265754	343605	833	414	111	102	46	50	46	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	22
38	97-113	265728	343605	801	405	114	N101	46	50	7	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	23
39	97-112	245736	343605	803	406	114	S101	46	50	7	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	24
41	97-142	245620	313625	871		W113	99	46	50	10	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	25
46	97-141	245582	313625	839	410	113	S99	46	50	13	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	26
48	97-145	255558	343201	869	440	116	S101	46	54	7	54	LOW PIPE		FALSE	RIVER	LEFT	1275	Oliver	27
49	97-122	257004	343606	803		114	104	46	50	27	50	LOW PIPE/WEIR		FALSE	RIVER	LEFT	1275	Oliver	28
50	97-109	256913	343210	835	404	W116	106	54	64	64	64	LOW PIPE		FALSE	RIVER	LEFT	3000	Queen Mary Park	29
53	96-090	266055	343625			110 ST	N111 AVE	54	55					FALSE				Prince Rupert	30
60	97-129	272723	373220		401	W120	129	31	55	55	55	OVERFLOW		FALSE	RIVER	LEFT	2400	Calder	31
75	97-099	263753	343622		416	W87	114	56	56	56	13	OVERFLOW		FALSE				Parkdale	32
76	97-098	263758	343622		422	W86	114	56	56	56	13	OVERFLOW		FALSE				Parkdale	33
78	97-096	263708	343621		401	W83	114	56	56	56	13	OVERFLOW		FALSE				Parkdale	34
79	97-095	263716	343621		406	W82	114	56	56	56	13	OVERFLOW		FALSE				Parkdale	35
80	97-080	261662	343621		423	W80	113	56	56	56	13	OVERFLOW		FALSE				Cromdale	36
81	97-078	261672	343621		430	W79	113	56	56	56	13	OVERFLOW		FALSE				Cromdale	37
83	97-081	261660	343621		422	W80	114	56	56	56	13	OVERFLOW		FALSE				Edmonton Northlan	38

IC Site#	Plan	IC MH#	CADAS-TRAL	SAN_MH	STRM_MH	STREET	AVENUE	OF_ NUM	IC_ AGE	SAN_ AGE	STRM_ AGE	ICTYPE	Delete date	COR-RECTED	OF_ LOC1	OF_ LOC2	OF_ DIA	NHOOD	COUNT
94	96-008	227272	283606	803	412	110	57	22	52	46	52	LOW PIPE		FALSE	RIVER	RIGHT	1500	Pleasantview	39
95	96-010	227234	283615		420	111	S61	22	54	54	54	OVERFLOW		FALSE	RIVER	RIGHT	1500	Pleasantview	40
106		224867	283221		445	112	N76	22	54	47	54	OVERFLOW		FALSE	RIVER	RIGHT	1500	Parkallen	41
107	96-007	224927	283221	813	448	112	N75	22	86	48	54	LOW PIPE		FALSE	RIVER	RIGHT	1500	McKernan	42
110	97-021	242851	313212	009	471	SASK DR	89	23D	53	48	50	LOW PIPE/WEIR		FALSE	RIVER	RIGHT	375	Windsor Park	43
111	97-022	242711	313212	008	443	W120	89	23D	53	49	50	LOW PIPE		FALSE	RIVER	RIGHT	375	Windsor Park	44
113	97-029	228112	283625		429	109	73	22	54	14	54	OVERFLOW		FALSE	RIVER	RIGHT	1500	McKernan	45
114	96-018	227757	283616	842		109	67	22	51	46	51	OVERFLOW		FALSE	RIVER	RIGHT	1500	Parkallen	46
116	96-009	227604	283615		406	109	65	22	54	49	54	OVERFLOW		FALSE	RIVER	RIGHT	1500	Parkallen	47
119	96-013	227636	283615		431	109	62	22	54	49	54	OVERFLOW		FALSE	RIVER	RIGHT	1500	Parkallen	48
120	97-045	227702	283615	842		109	61	22	54	54	54	DUAL		FALSE	RIVER	RIGHT	1500	Pleasantview	49
134	97-195	229993	313601	861	473	89	S77	44	55	49	55	LOW PIPE		FALSE	RIVER	RIGHT	3800	King Edward Park	50
135	96-059	246571	313601	859	471	91	S77	44	55	28	55	LOW PIPE/WEIR		FALSE	RIVER	RIGHT	3800	King Edward Park	51
139	96-053	229990	313601	828	435	91	S80	44	55	28	55	LOW PIPE/WEIR		FALSE	RIVER	RIGHT	3800	King Edward Park	52
143	96-064	243161	313610	859		93	S83	116	55	39	55	OVERFLOW/WEIR		FALSE	CREEK	RIGHT	750	Bonnie Doon	53
147	96-066	243180	313610	867	437	87	S83	116	50	50	50	LOW PIPE/WEIR		FALSE	CREEK	RIGHT	750	Bonnie Doon	54
149	96-051	243858	313601	802	403	89	82	254	52	50	52	LOW PIPE		FALSE	CREEK	RIGHT	1050	Bonnie Doon	55
151	97-004	246539	313601	820		89	S81	44	55	46	55	LOW PIPE		FALSE	RIVER	RIGHT	3800	King Edward Park	56
153	97-003	246506	313601		460	89	S78	44	55	28	55	LOW PIPE		FALSE	RIVER	RIGHT	3800	King Edward Park	57
154	96-025	229777	283621	804	436	87	76	44	55	49	54	LOW PIPE/WEIR		FALSE	RIVER	RIGHT	3800	King Edward Park	58
155	96-060	246574	313601	864	477	87	S77	44	55	49	55	LOW PIPE/WEIR		FALSE	RIVER	RIGHT	3800	King Edward Park	59
156	96-058	246570	313601	857		87	77	44	55	49	55	LOW PIPE/WEIR		FALSE	RIVER	RIGHT	3800	King Edward Park	60
159	97-211	251618	314005		423	85	S80	44	55	55	49	OVERFLOW		FALSE				King Edward Park	61
161	97-210	251792	314005		432	85	S79	44	55	55	49	OVERFLOW		FALSE				King Edward Park	62
162	97-209	251797	314005		437	85	S78	44	55	55	49	OVERFLOW		FALSE				King Edward Park	63
164	97-205	251779	314005	804	408	83	S82	44	55	49	55	OVERFLOW/WEIR		FALSE	RIVER	RIGHT	3800	King Edward Park	64
176	97-001	244348	313621	811	409	87	98	52	52	52	52	OVERFLOW		FALSE	RIVER	RIGHT	900	River Valley Rivers	65
177	97-218	244318	313621	809	406	88	98	52	52	52	52	HIGH PIPE		FALSE	RIVER	RIGHT	900	River Valley Rivers	66
178	97-217	244347	313621	804	401	92	98	256	52	52	52	OVERFLOW		FALSE	RIVER	RIGHT	500	Cloverdale	67
179	97-214	244406	313622	807	420	97	N97	50	69	68	69	OVERFLOW		FALSE	RIVER	RIGHT	1500	Cloverdale	68
180 (n/m)	97-161	244671	313617	808	418	103	97	46	50	5	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Rossdale	69
181	97-159	245429	313624	869	447	104	S98	46	41	7	41	LOW PIPE		FALSE	RIVER	LEFT	1275	Rossdale	70
182 (n/m)	97-158	245174	313617	807	416	104	97	46	50	5	50	LOW PIPE		FALSE	RIVER	LEFT	1275	Downtown	71
183 (n/m)	97-157	245040	313617	805		105	97	46	50					FALSE				Rossdale	72
184	97-156	245170	313617	806		106	97	46	70					FALSE				Rossdale	73
185	97-138	262096	343603	913	442	99	101	243	50	8		LOW PIPE		FALSE	RIVER	LEFT	1980	Downtown	74
191	97-002	246377	313613	813		100	SASK DR	188	52	12	52	CHAMBER		FALSE	RIVER	RIGHT	1200	Strathcona	75
193	97-014	246787	313608	848	405	102	85	37	79	13	79	HIGH PIPE		FALSE	RIVER	RIGHT	900	Strathcona	76
194	97-013	246808	313608	863	406	102	83	37	79	35	79	HIGH PIPE		FALSE	RIVER	RIGHT	900	Strathcona	77
195	97-012	246799	313608	876	407	102	84	37	79	35	79	HIGH PIPE		FALSE	RIVER	RIGHT	900	Strathcona	78

IC Site#	Plan	IC MH#	CADAS-TRAL	SAN_MH	STRM_MH	STREET	AVENUE	OF_ NUM	IC_ AGE	SAN_ AGE	STRM_ AGE	ICTYPE	Delete date	COR-RECTED	OF_ LOC1	OF_ LOC2	OF_ DIA	NHOOD	COUNT
198	97-152a	244681	313617	024	818	105	S96	47	52	23	52	DUAL		FALSE	RIVER	LEFT	1050	Rossdale	79
199	97-151	245068	313617	818	502	105	96	47	52	23	52	LOW PIPE		FALSE	RIVER	LEFT	1050	Rossdale	80
200	97-146	245204	313613	821	443	101	94	188	52	11	52	LOW PIPE		FALSE	RIVER	RIGHT	1200	Rossdale	81
201	97-148	245013	313613	802	416	101	S94	145	52	11	52	OVERFLOW/WEIR		FALSE	RIVER	LEFT	300	Rossdale	82
202	97-163	245209	313618	805		100A	97	46	50					FALSE				Rossdale	83
204	97-221	245216				E101	96	45	57					FALSE				Rossdale	84
220	96-006	242107	313201	807	438	113	L. N. 79	22	54	47	54	LOW PIPE		FALSE	RIVER	RIGHT	1500	Parkallen	85
221		227702	283615			109	61	22	54	54	54	OVERFLOW/WEIR		FALSE	RIVER	RIGHT		Pleasantview	86
224		243209				89	83	116	56			LOW PIPE		FALSE				Bonnie Doon	87
226		245511	313625	801		111	97	46	50	5	50	HIGH PIPE		FALSE	RIVER	LEFT	1275	Oliver	88
234		246738	313614			102 (Tommy Bank	Saskatche	37	71					FALSE				Strathcona	89
235		262142	343603			100	S. Jasper A	47	26					FALSE				Downtown	90
238		246111	313608			101	81	37	79					FALSE				Ritchie	91
240 (n/m)		255527				119	S102	46	71					FALSE				Oliver	92
244 (n/m)		263246				102	110	54	68					FALSE				Central McDougall	93
245 (n/m)		263247				102	110	54	68					FALSE				Central McDougall	94
249		242945	313218			Hawrelak Park		27	66					FALSE				Hawrelak Park	95
250 (03,n/m)		255647				W114	N101	46	88					FALSE				Oliver	96
254 (03,n/m)		245584				112	98	46	50					FALSE				Oliver	97
255 (03)		245344				104	98	46	50					FALSE				Downtown	98
258 (03)		247763	313614			103	Sask. Dr	37	71					FALSE				River Valley Walter	99
265 (06, n/m)		240896				137	82	21	65			DUAL		FALSE				Laurier Heights	100
266 (08)		244346	313621	814	401	92	S98	256	46	46	46	LOW PIPE		FALSE	RIVER	RIGHT	500	Cloverdale	101
267 (09)		243667				92	98	256						FALSE	RIVER	RIGHT		Cloverdale	102
268 (09)		244163				Mill Creek		44						FALSE				Mill Creek Ravine N	103
269 (13, n/m)		261579				78	111	203				LOW PIPE		FALSE				River Valley Kinnai	104
273		330340				122	39A	2				DUAL		FALSE	Whitemud	RIGHT		Aspen Gardens	105
274		258480				123	112	31				LOW PIPE		FALSE				Inglewood	106
275		282732				37	122	88				LOW PIPE		FALSE				Beacon Heights/Be	107
276 (19)		243786	9343602			96A	98	51				TRANSVERSE WEIR		FALSE				Cloverdale	108
277 (19)		231393				111A	50	2				Dual MH with WEIR		FALSE	Whitemud	RIGHT		Malmo Plains	109
278 (19)		287019				W71	130	74				LOW PIPE		FALSE	RIVER	LEFT		Balwin	110
279 (19)		287020				W70	130	74				LOW PIPE		FALSE	RIVER	LEFT		Balwin	111
280 (19)		287021				W69	130	74				LOW PIPE		FALSE	RIVER	LEFT		Balwin	112
281 (19)		286503				W70	129	74				LOW PIPE		FALSE	RIVER	LEFT		Balwin	113
282 (19)		286554				W69	129	74				LOW PIPE		FALSE	RIVER	LEFT		Balwin	114
283 (19)		286508				70	N127	74				LOW PIPE		FALSE	RIVER	LEFT		Balwin	115

IC Site#	Plan	IC MH#	CADAS-TRAL	SAN_MH	STRM_MH	STREET	AVENUE	OF_ NUM	IC_ AGE	SAN_ AGE	STRM_ AGE	ICTYPE	Delete date	COR-RECTED	OF_ LOC1	OF_ LOC2	OF_ DIA	NHOOD	COUNT
CLOSED INTERCONNECTIONS																			
			344416	809		E34	N102	71	66	66	66	COMMON		TRUE	RIVER	LEFT	1200	Rundle Heights	1
			344416	808		35	102	71	66	66	66	COMMON		TRUE	RIVER	LEFT	1200	Rundle Heights	2
			344416	807		36	102	71	66	66	66	COMMON	######	TRUE	RIVER	LEFT	1200	Rundle Heights	3
			344020		411	37	103	71	66	66	66	COMMON	######	TRUE	RIVER	LEFT	1200	Rundle Heights	4
			344416	803		E34	103	71	66	66	66	COMMON		TRUE	RIVER	LEFT	1200	Rundle Heights	5
			374011	011	420	W38	123	88	80	80	80	HIGH PIPE	######	TRUE	CREEK	LEFT	1350	Bergman	6
			374414	PW		HOOKE RD	HERMITA(	74	64	64	64	PUMPWELL		TRUE	RIVER	LEFT	7620	Canon Ridge	7
			344023	869		55	S ADA BL\	62	65	65	65	OVERFLOW	######	TRUE	RIVER	LEFT	1200	River Valley Highla	8
			343621		417	W81	114		56	56	13	OVERFLOW		TRUE					9
			343602	832		94	CAMERON	148	51	51	51	DUAL	######	TRUE	RIVER	LEFT	450	Riverdale	10
			343602	831		W94	CAMERON	148	51	51	51	DUAL	######	TRUE	RIVER	LEFT	450	Riverdale	11
			343602	830		E95	CAMERON	148	51	51	51	DUAL	######	TRUE	RIVER	LEFT	450	Riverdale	12
			343602	829		E95	CAMERON	148	51	51	51	DUAL	######	TRUE	RIVER	LEFT	450	Riverdale	13
			343610	804	404	88	102	53	52	50	52	LOW PIPE	######	TRUE	RIVER	LEFT	675	Riverdale	14
			343610	810	405	87	102	53	67	52	67	LOW PIPE	######	TRUE	RIVER	LEFT	675	Riverdale	15
			343609	868	411	89	ROWLAN[	152	43	11	42	LOW PIPE	######	TRUE	RIVER	LEFT	450	Riverdale	16
			343609	874		88	104	155B	24	10	24	LOW PIPE	######	TRUE	RIVER	LEFT	600	Riverdale	17
			343609	873		88	104	155A	24	10	24	HIGH PIPE	######	TRUE	RIVER	LEFT	600	Riverdale	18
			343602	858	435	94	ROWLAN[	148	42	11	42	LOW PIPE	######	TRUE	RIVER	LEFT	450	River Valley Kinnai	19
			373602	835	411	89	117	56	14	14	14	CHAMBER	######	TRUE	RIVER	LEFT	1950	Parkdale	20
			373601		429	N RACE TRK	NORTHLA	56	64	64	64	OVERFLOW	######	TRUE	RIVER	LEFT	1950	Edmonton Northlan	21
			373601		411	E80	S116	56	57	57	57	OVERFLOW CHA	######	TRUE	RIVER	LEFT	1950	Edmonton Northlan	22
			373619	802		86	127	74	58	58	58	DROP MANHOLE	######	TRUE	RIVER	LEFT	7620	Killarney	23
			373919	410		90	127	74	58	58	58	LOW PIPE TEE	######	TRUE	RIVER	LEFT	7620		24
			373601	870	411	E80	116	56	57	57	57	CHAMBER	######	TRUE	RIVER	LEFT	1950	Parkdale	25
			343617	835		105	KINGSWA	54	68	68			######	TRUE	RIVER	LEFT	3000	Central McDougall	26
			343211		418	116	107	54	72	72	72	MEMBRANE HOI	######	TRUE	RIVER	LEFT	3000	Queen Mary Park	27
			343605	811		113	102	46	50	30	50	OVERFLOW	######	TRUE	RIVER	LEFT	1275	Oliver	28
			343201	874	441	W115	102	46	50	8	50	LOW PIPE	######	TRUE	RIVER	LEFT	1275	Oliver	29
			343605	001	T1	114	N103	46	64	64	50	LOW PIPE TEE	######	TRUE	RIVER	LEFT	1275	Oliver	30
			343223	007		E133	S116	31	54	54	54	COMMON		TRUE	RIVER	LEFT	2400	Woodcroft	31
			373215	802		143	N YELLOV	30	61	61	61	COMMON		TRUE	RIVER	LEFT	1650	Brown Industrial	32
			373224	007		ST ALBERT	130	31	66	66	66	COMMON		TRUE	RIVER	LEFT	2400	Bonadventure Indu	33
			373215	801		149	SYELLOW	31	63	63	63	COMMON		TRUE	RIVER	LEFT	2400	Brown Industrial	34
			373219		427	W124	129	31	55	55	55	OVERFLOW	######	TRUE	RIVER	LEFT	2400	Calder	35
			373219		417	W126	129	31	55	55	55	OVERFLOW	######	TRUE	RIVER	LEFT	2400	Calder	36
			433202	PW		E DUNLUCE	161	75	78	78	78	PUMPWELL	######	TRUE	RIVER	LEFT	2250	Calder	37
			343603	854	417	100	101	48	26	5	26	LOW PIPE	######	TRUE	RIVER	LEFT	1500	Downtown	38
			343602	049		96	GRIERSO	49	62	62	62	OVERFLOW CHA	######	TRUE	RIVER	LEFT	1200	Downtown	39

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			343603	862		100	101	48	70	66	50	OVERFLOW	######	TRUE	RIVER	LEFT	1500	Downtown	40
			313613	PW		101	S94	145	52	11	52	PUMPWELL	######	TRUE	RIVER	LEFT	300	Rossdale	41
			313618	821	443	101	94	145	52	11	52	LOW PIPE	######	TRUE	RIVER	LEFT	300	Rossdale	42
			313618	836	OF	E100	95	241	57	57	57	OVERFLOW		TRUE	RIVER	LEFT	375	Rossdale	43
			313617	007	479	106	95	42	85	85	58	LOW PIPE	######	TRUE	RIVER	LEFT	600	Downtown	44
			313617	504		103	96	47	52	33	52	OVERFLOW	######	TRUE	RIVER	LEFT	1050	Rossdale	45
			313616	803	402	110	97	46	50	15	50	LOW PIPE	######	TRUE	RIVER	LEFT	1275	Oliver	46
			313617	805	414	106	97	46	50	5	50	LOW PIPE	######	TRUE	RIVER	LEFT	1275	Downtown	47
			313617	806	415	105	97	46	50	5	50	LOW PIPE	######	TRUE	RIVER	LEFT	1275	Downtown	48
			313624	905	417	BELLAMY H	N97	46	50	50	50	LOW PIPE	######	TRUE	RIVER	LEFT	1275	Rossdale	49
			313617	838	419	102	97	46	50	5	50	LOW PIPE		TRUE	RIVER	LEFT	1275	Rossdale	50
			313618	802	402	101	97	46	50	5	50	LOW PIPE	######	TRUE	RIVER	LEFT	1275	Rossdale	51
			313618	805	405	100A	97	46	50	5	50	LOW PIPE	######	TRUE	RIVER	LEFT	1275	Rossdale	52
			313618	806	OF	100	97	45	50	5	50	OVERFLOW/WE	######	TRUE	RIVER	LEFT	600	Rossdale	53
			313625	843		112	98	46	50	5	50	LOW PIPE TEE	######	TRUE	RIVER	LEFT	1275	Downtown	54
			313623	827		W100	99	109	7	5	7	LOW PIPE TEE	######	TRUE	RIVER	RIGHT	500	Rossdale	55
			313623	828	511	100	99	109	7	5	7	LOW PIPE	######	TRUE	RIVER	RIGHT	500	Rossdale	56
			313623	828	511	100	99	109	7	7	7	LOW PIPE	######	TRUE	RIVER	RIGHT	500	Rossdale	57
			313623	831	OF	SW LOW LVL	BRIDGE	48	29	5	29	HOLE		TRUE	RIVER	LEFT	1500	Rossdale	58
			313617	873	417	BELLAMY RD	97	46	62	62	50	LOW PIPE	######	TRUE	RIVER	LEFT	1275	Rossdale	59
			313623	819	497	E100	MCDONAL	48	57	10	29	LOW PIPE		TRUE	RIVER	LEFT	1500	Downtown	60
			343214	801		137	N108	31	53	53	53	DUAL		TRUE	RIVER	LEFT	2400	North Glenora	61
			343213	4		133	N109A	31	52	52	52	HIGH PIPE		TRUE					62
			343218	819		133	N110A	31	52	52	52	LOW PIPE		TRUE					63
			343214	29		139	N107A	31	52	52	52	LOW PIPE		TRUE					64
			343214	56		135	N107A	31	52	52	52	LOW PIPE		TRUE					65
			343213	18		133	107A	31	52	52	52	LOW PIPE		TRUE					66
			343208	826		E132	STONY PLAIN RD		48	48	15			TRUE					67
			343202	17		125	SJASPER	46	34			PUMPWELL	######	TRUE					68
			313224	811		W139	RAVINE D	30	61	55	61	OVERFLOW		TRUE	RIVER	LEFT	1650	River Valley Capito	69
			313223	PW		ST GEORGE	VICTORIA	123	64	29	55	PUMPWELL	######	TRUE	CREEK	LEFT	200	Glenora	70
			343203	SOF		W132	TWEEDSM	135	50	50	50	OUTFALL		TRUE	CREEK	LEFT	100	Glenora	71
			343203	839		E132	S103	125	54	54		DUAL	######	TRUE	CREEK	LEFT	200	Glenora	72
			343204	841		139	101		65	65	51		######	TRUE					73
			342823	PW		163	116	18	75	74	75	PUMPWELL	######	TRUE	RIVER	LEFT	2400	Norwester Industria	74
			372810	PW		154	123	18	80	80	80	PUMPWELL	######	TRUE	RIVER	LEFT	2400	Mitchell Industrial	75
			342807	014		170	105	18	75	75	75	OVERFLOW	######	TRUE	RIVER	LEFT	2400	McNamara Industri	76
			312820	PW		151	N94	29	58			PUMPWELL	######	TRUE	RIVER	LEFT	1650	Sherwood	77
			282819	PW		WOLF WIL R	WOLF WIL	13	75	75	75	PUMPWELL	######	TRUE	RIVER	LEFT	1950	Westridge	78
			252420	PW		E WEDGEWOO	WEAVER	257	88			PUMPWELL	######	TRUE	CREEK	LEFT	900	Wedgewood Heigh	79
			313204	075		BV RD	81	21	59	57	58	LOW PIPE TEE	######	TRUE	RIVER	LEFT	1350	Laurier Heights	80
			313204	PW		BV RD	VAL VIEW	21	58	57	58	PUMPWELL	######	TRUE	RIVER	LEFT	1350	Parkview	81

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			313204	803		N BV RD	VAL VIEW	21	60	60	60	COMMON	######	TRUE	RIVER	LEFT	1350	Parkview	82
			313207	085		VAL VIEW C		21	60	60	60	COMMON		TRUE	RIVER	LEFT	1350	Parkview	83
			313207	511		VAL VIEW C		21	60	60	60	COMMON		TRUE	RIVER	LEFT	1350	Parkview	84
			313207	087		VAL VIEW C		21	60	60	60	COMMON		TRUE	RIVER	LEFT	1350	Parkview	85
			313208	003		VAL VIEW C		21	60	60	60	COMMON		TRUE	RIVER	LEFT	1350	Parkview	86
			313208	002		VAL VIEW C		21	60	60	60	COMMON		TRUE	RIVER	LEFT	1350	Parkview	87
			313208	001		VAL VIEW C		21	60	60	60	COMMON		TRUE	RIVER	LEFT	1350	Parkview	88
			313207	088		E136	VAL VIEW	21	60	60	60	COMMON		TRUE	RIVER	LEFT	1350	Parkview	89
			313204	077		VAL VIEW C	86	21	60	60	60	COMMON		TRUE	RIVER	LEFT	1350	Parkview	90
			313204	076		VAL VIEW C	86	21	60	60	60	COMMON		TRUE	RIVER	LEFT	1350	Parkview	91
			344018		414	W65A	109	65	57	56	57	FLOW SPLIT		TRUE	RIVER	RIGHT	900	Capilano	92
			344007	850		W FULTON D	106	58	59	59	59	DROP MANHOLE	######	TRUE	RIVER	RIGHT	1350	Fulton Place	93
			344007	467		E CAPILANO	106	58	59	59	59	CHAMBER	######	TRUE	RIVER	RIGHT	1350	Capilano	94
			313601	858		85	82	254	52	49	52		######	TRUE	CREEK	RIGHT	1050	Bonnie Doon	95
			313622	819	408	96A	98	51	60	26	60	OVERFLOW/WE	######	TRUE	RIVER	RIGHT	600	Cloverdale	96
			313621	802	401	92	98	256	59	46	59	LOW PIPE	######	TRUE	RIVER	RIGHT	500	Cloverdale	97
			313602	848		W94	S81	254	83	58	83	DROP MANHOLE	######	TRUE	CREEK	RIGHT	1050	Mill Creek Ravine	98
			283620		436	91	70	92B	54		61	OUTFALL - NEVER WAS I		TRUE	CREEK	RIGHT	750	Mill Creek Ravine	99
			283620		457	90	70	192	54			OUTFALL - NEVER WAS I		TRUE	CREEK	RIGHT	300	Mill Creek Ravine	100
			283621		415	91	72	191	54		54	OUTFALL - NEVER WAS I		TRUE	CREEK	RIGHT	525	Mill Creek Ravine	101
		229761?	283621		450	W87	73	93	56		56	OUTFALL - NEVER WAS I		TRUE	CREEK	RIGHT	675	Mill Creek Ravine	102
			283620		420	91	66	91	54	54	54	OUTFALL - NEVER WAS I		TRUE	CREEK	RIGHT	750	Mill Creek Ravine	103
			283611		419	92	63	194	54	54		OUTFALL - NEVER WAS I		TRUE	CREEK	RIGHT	750	Mill Creek Ravine	104
			283611		423	91	63	193	61		54	OUTFALL - NEVER WAS I		TRUE	CREEK	RIGHT	300	Mill Creek Ravine	105
		229112?	283611		416	90	65	91B	54	54		OUTFALL - NEVER WAS I		TRUE	CREEK	RIGHT	600	Mill Creek Ravine	106
		229130?	283611		433	90	65	91A	54	54	54	OUTFALL - NEVER WAS I		TRUE	CREEK	RIGHT	900	Mill Creek Ravine	107
			283621		413	W93	67	195	54			OUTFALL - NEVER WAS I		TRUE	CREEK	RIGHT	750	Mill Creek Ravine	108
			283610	004	403	92	60	90	68	68	68	LOW PIPE	######	TRUE	CREEK	RIGHT	750	Coronet Industrial	109
			283610		403	92	60	90	68	68	68	LOW PIPE	######	TRUE	CREEK	RIGHT	750	Coronet Industrial	110
			313609	867	TUN	92	84	116	55	30	55	OUTFALL	######	TRUE	CREEK	RIGHT	750	Mill Creek Ravine	111
			313614	835	463	N QE RD		39	55	55	55	LOW PIPE	######	TRUE	RIVER	RIGHT	600	River Valley Walter	112
			313614	PW		E104	N SASK D	37	56	56	51	PUMPWELL	######	TRUE	RIVER	RIGHT	900	River Valley Walter	113
			313614	PW		E104	N SASK D	37	56	56	51	PUMPWELL	######	TRUE	RIVER	RIGHT	900	River Valley Walter	114
			313614	003		102	SASK RIV	38	56	56	56	CHECK VALVE	######	TRUE	RIVER	RIGHT	750	River Valley Walter	115
			313613	424		LAVIGNE RD	91	188	88	90				TRUE	RIVER	RIGHT	1200	River Valley Walter	116
			313219	PW		118	SASK DR	32	53	53	53	PUMPWELL	######	TRUE	RIVER	RIGHT	1200	Windsor Park	117
			313219		446	116	N SASK D	32	55	40	55	LOW PIPE TEE	######	TRUE	RIVER	RIGHT	1200	Windsor Park	118
			283619	803	403	97	S71	92B	60	50	60	LOW PIPE	######	TRUE	CREEK	RIGHT	750	Hazeldean	119
			283625	840	428	E111	73	22	54	48	54	LOW PIPE/WEIR	######	TRUE	RIVER	RIGHT	1500	McKernan	120
			283221	818		112	74	22	54	49	54	OVERFLOW	######	TRUE	RIVER	RIGHT	1500	McKernan	121
			283221	808		112	N76	22	47	47	47	OVERFLOW	######	TRUE	RIVER	RIGHT	1500	McKernan	122
			283219	801		BELGRAVIA	N68	22	59	59	59	COMMON	######	TRUE	RIVER	RIGHT	1500	Lendrum Place	123

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			253221	038		113A	46	2	63	63	63	COMMON	######	TRUE	CREEK	RIGHT	2100	Malmo Plains	124
			253221	502		112	46	2	63	63	63	COMMON		TRUE	CREEK	RIGHT	2100	Malmo Plains	125
			253221	040		111A	46	2	63	63	63	COMMON		TRUE	CREEK	RIGHT	2100	Malmo Plains	126
			253221	505		111A	N46	2	63	63	63	COMMON		TRUE	CREEK	RIGHT	2100	Malmo Plains	127
			253221	022		111A	S48	2	63	63	63	COMMON		TRUE	CREEK	RIGHT	2100	Malmo Plains	128
			253625		496	111A	N48	2	63	63	63	COMMON		TRUE	CREEK	RIGHT	2100	Malmo Plains	129
			253221	806		W111A	48	2	63	63	63	COMMON	######	TRUE	CREEK	RIGHT	2100	Malmo Plains	130
			253221	807		W111A	48	2	63	63	63	COMMON	######	TRUE	CREEK	RIGHT	2100	Malmo Plains	131
			253221	808		W111A	48	2	63	63	63	COMMON	######	TRUE	CREEK	RIGHT	2100	Malmo Plains	132
			253221	504		113A	46	2	63	63	63	COMMON		TRUE	CREEK	RIGHT	2100	Malmo Plains	133
			253212	051		E121	FAIRWAY	2	66	66	66	COMMON		TRUE	CREEK	RIGHT	2100	Aspen Gardens	134
			253212	489		E121	FAIRWAY	2	66	66	66	COMMON		TRUE	CREEK	RIGHT	2100	Aspen Gardens	135
			253212	053		E121	FAIRWAY	2	66	66	66	COMMON		TRUE	CREEK	RIGHT	2100	Aspen Gardens	136
			253219	808		ASPEN DR	40	2	63	63	63	COMMON	######	TRUE	CREEK	RIGHT	2100	Aspen Gardens	137
			253219	055		ASPEN DR	N40	2	63	63	63	COMMON		TRUE	CREEK	RIGHT	2100	Aspen Gardens	138
			253219	056		ASPEN DR	N40	2	63	63	63	COMMON		TRUE	CREEK	RIGHT	2100	Aspen Gardens	139
			253219	054		ASPEN DR	S41A	2	63	63	63	COMMON		TRUE	CREEK	RIGHT	2100	Aspen Gardens	140
			253219	053		ASPEN DR	S41A	2	63	63	63	COMMON		TRUE	CREEK	RIGHT	2100	Aspen Gardens	141
			253219		480	ASPEN DR	41A	2	63	63	63	COMMON		TRUE	CREEK	RIGHT	2100	Aspen Gardens	142
			253219	052		ASPEN DR	N41A	2	63	63	63	COMMON		TRUE	CREEK	RIGHT	2100	Aspen Gardens	143
			253219	057		ASPEN DR	N41A	2	63	63	63	COMMON		TRUE	CREEK	RIGHT	2100	Aspen Gardens	144
			253202		466	WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	145
			253202		465	WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	146
			253202		468	WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	147
			253202		464	WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	148
			253202		467	WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	149
			253203	018		WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	150
			253203		424	WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	151
			253203	022		WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	152
			253203	021		WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	153
			253203	020		WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	154
			253203	019		WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	155
			253203		423	WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	156
			253208	019		WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	157
			253208		417	WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	158
			253208		416	WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	159
			253208	016		WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	160
			253208	015		WESTBRK		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	161
			253208		413	WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	162
			253208	013		WESTBRK	FAIRWAY	1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	163
			253208	012		WESTBRK	W FAIRW/	1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	164

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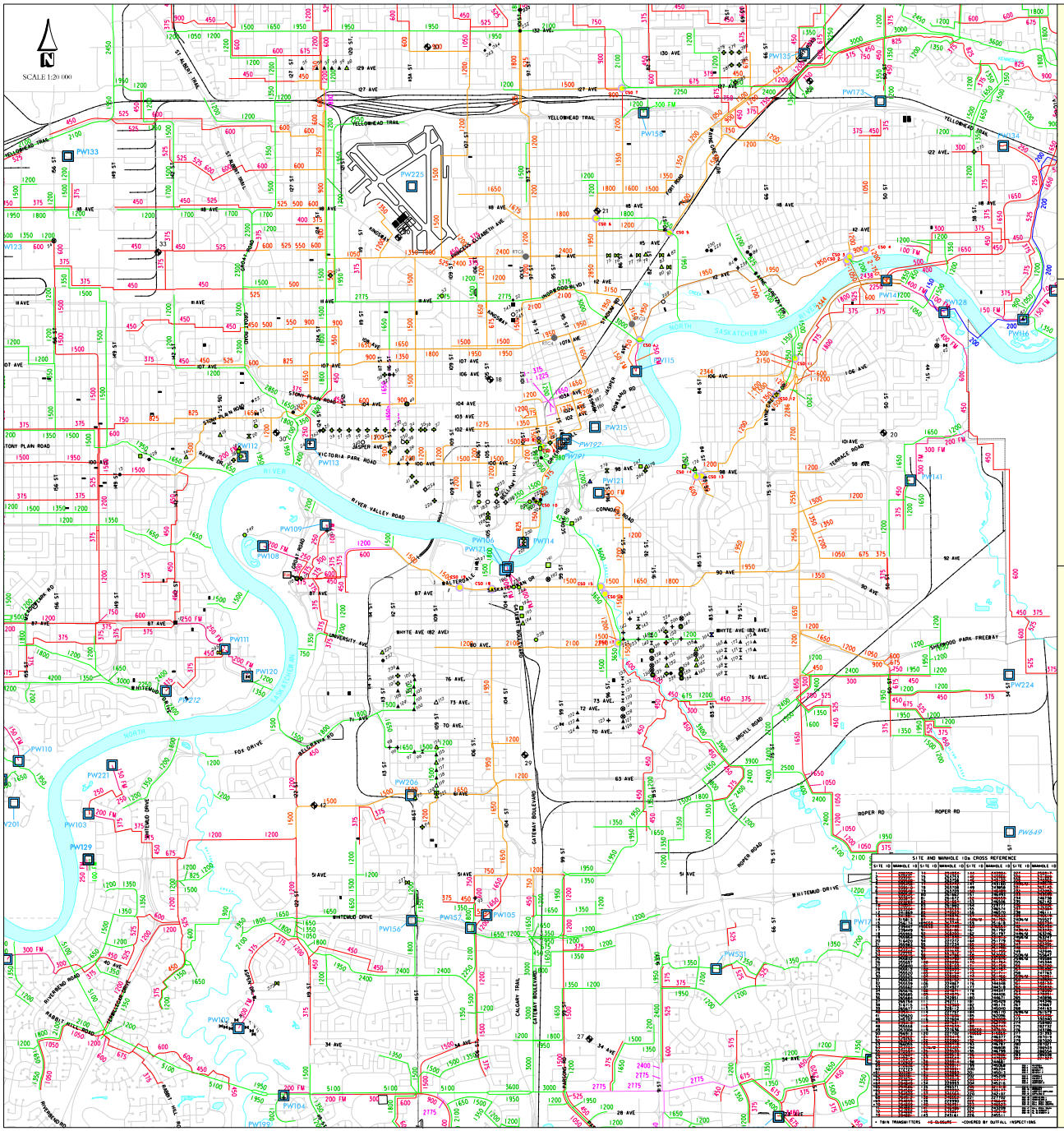
			253208		410	WESTBRK	W FAIRW/	1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	165
			253208	010		WESTBRK DR		1	62	62	62	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	166
			253208	001	401	WESTBRK	MARLBOR	1	64	64	61	HIGH PIPE	######	TRUE	CREEK	RIGHT	900	Westbrook Estate	167
			253213		422	MARLBORO R		1	66	66	66	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	168
			253214	006		MARLBORO R		1	66	66	66	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	169
			253214	005		MARLBORO R		1	66	66	66	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	170
			253214	004		MARLBORO R		1	66	66	66	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	171
			253213	038		MARLBORO R		1	66	66	66	COMMON		TRUE	CREEK	RIGHT	900	Westbrook Estate	172
			282810	002	403	E WHITEMUD	58	12	74	71	72	HIGH PIPE	######	TRUE	RIVER	RIGHT	750	River Valley Whiter	173
			282811	011	405	FORT EDM		14	70	70	70	PUMPWELL	######	TRUE	RIVER	RIGHT	1050	River Valley Whiter	174
			252819	PW		RODNEY CR		101	80			PUMPWELL	######	TRUE	RIVER	RIGHT	1500	Rhatigan Ridge	175
			253613	801		101	N39	9	75	75	66	COMMON	######	TRUE	RIVER	RIGHT	5100	Strathcona Industri	176
			253618	801		101	S41	9	66	66	66	COMMON	######	TRUE	RIVER	RIGHT	5100	Strathcona Industri	177
			253602	012		W97	30	9	75	75	75	MEMBRANE HOI	######	TRUE	RIVER	RIGHT	5100	Parsons Industrial	178
			253602	013		97	30	9	75	75	75	MEMBRANE HOI	######	TRUE	RIVER	RIGHT	5100	Parsons Industrial	179
			253602	014		E97	30	9	75	75	75	MEMBRANE HOI	######	TRUE	RIVER	RIGHT	5100	Parsons Industrial	180
			253603		445		30	9	71			MEMBRANE HOI	######	TRUE	RIVER	RIGHT	5100	Parsons Industrial	181
			253203		412	E125	29A	9	78	78	78		######	TRUE	RIVER	RIGHT	5100	Blue Quill Estates	182
						E101	96		57				######	TRUE					183
						100	90		52					TRUE					184
							n. Borden Park		56					TRUE					185
146 (98)	97-207	243102	313610	856	438	87	S84	116	56	56	56	LOW PIPE/WEIR		TRUE	CREEK	RIGHT	750	Bonnie Doon	186
160 (98)	96-054	246554	313601	836	424	85	79	44	55	49	55	LOW PIPE/WEIR		TRUE	RIVER	RIGHT	3800	King Edward Park	187
152 (98)	96-048	246559	313601	842	447	89	S79	44	55	53	55	LOW PIPE		TRUE	RIVER	RIGHT	3800	King Edward Park	188
222 (98)		246649	313602	876		94	81	254	55	22	55	OVERFLOW		TRUE	CREEK	RIGHT	1050	Mill Creek Ravine	189
137 (99)	96-056	246564	313601	850	457	91	S78	44	55	28	55	LOW PIPE/WEIR		TRUE	RIVER	RIGHT	3800	King Edward Park	190
138 (99)	96-055	246552	313601	840	445	91	S79	44	55	53	55	LOW PIPE/WEIR		TRUE	RIVER	RIGHT	3800	King Edward Park	191
145 (99)	96-063	243986	313610	852		93	S84	116	55	30	50	OVERFLOW/WEIR		TRUE	CREEK	RIGHT	750	Bonnie Doon	192
231 (99)		255784	343209			127	Villa Ave		88					TRUE					193
232 (99)		278099	403604			101	132		54					TRUE					194
233 (99)		293599	403604			101	134		54					TRUE					195
127 (00)	96-022	229524	283619	809		95	S71	92B	60	50	60	OVERFLOW		TRUE	CREEK	RIGHT	750	Hazeldean	196
126 (00)	96-024	229513	283619	817		95	S70	92B	60	50	60	OVERFLOW		TRUE	CREEK	RIGHT	750	Hazeldean	197
142 (00)	96-061	243861	313602	883	431	94	82	245	52	50	52	LOW PIPE		TRUE	RIVER	RIGHT	225	Mill Creek Ravine	198
23 (01)	96-089	256682	343208	826		132	S. Stony P	129	50	28	50	FLOW SPLIT		TRUE	CREEK	LEFT	250	Glenora	199
115 (01)	96-017	227606	283616		437	109	66	22	54	49	54	OVERFLOW		TRUE	RIVER	RIGHT	1500	Parkallen	200
123 (01)	96-020	229418	283618	815		98	L..S. 71	92B	61	50	61	OVERFLOW		TRUE	CREEK	RIGHT	750	Hazeldean	201
129 (01)	96-031	229911	283621	856	448	95	72	191	54	50	54	LOW PIPE/WEIR		TRUE	CREEK	RIGHT	525	Hazeldean	202
197 (01)	97-020	247820		820	504	Walterdale Rd.	Queen Elizabeth Hill		52					TRUE				River Valley Walter	203
112 (02)	97-024	242968	313219	006		118	EDINBOR	32	53	53	53	LOW PIPE		TRUE	RIVER	RIGHT	1200	Windsor Park	204
237 (02)		242084	313201			113	N78		54					TRUE					205
2 (02)	97-051	209501	253208	801		WESTBRK DR		1	88	62	62	DUAL		TRUE	CREEK	RIGHT	900	Westbrook Estate	206

IC Site#	Plan	IC MH#	CADAS-TRAL	SAN_MH	STRM_MH	STREET	AVENUE	OF_ NUM	IC_ AGE	SAN_ AGE	STRM_ AGE	ICTYPE	Delete date	COR-RECTED	OF_ LOC1	OF_ LOC2	OF_ DIA	NHOOD	COUNT
3 (02)	97-052	209500	253207	802		WESTBRK DR		1	88	62	62	DUAL		TRUE	CREEK	RIGHT	900	Westbrook Estate	207
4 (02)	97-053	209498	253207	801		WESTBRK DR		1	88	62	62	DUAL		TRUE	CREEK	RIGHT	900	Westbrook Estate	208
5 (02)	97-055	209510	253208	804		MARLBORO R		1	88	66	66	DUAL		TRUE	CREEK	RIGHT	900	Westbrook Estate	209
6 (02)	97-056	209548	253208	803		MARLBORO R		1	88	66	66	DUAL		TRUE	CREEK	RIGHT	900	Westbrook Estate	210
7 (02)	97-057	209545	253208	802		MARLBORO R		1	88	66	66	DUAL		TRUE	CREEK	RIGHT	900	Westbrook Estate	211
8 (02)	97-058	303873	253213	801		MARLBORO R		1	88	66	66	DUAL		TRUE	CREEK	RIGHT	900	Westbrook Estate	212
133 (02)	96-026	229869	283622	806	409	95	76	100	55	14	55	OVERFLOW/WEIR		TRUE	CREEK	RIGHT	300	Ritchie	213
196 (02)	97-224	247806	313614	006		E104	N SASK D	38	56	56	51	DUAL		TRUE	RIVER	RIGHT	750	River Valley Walter	214
10 (03)	97-179	240041	313207	013		142	BUENA VI	24	58	57	58	HIGH PIPE		TRUE	RIVER	LEFT	1500	Parkview	215
22 (03)	96-087	255979	343203	836		E132	N103	130	54	54	54	DUAL		TRUE	CREEK	LEFT	300	Glenora	216
24 (03)	97-171	255675	343202	16		125	SJASPER	46	34			LOW PIPE		TRUE					217
55 (03)	97-136	272597	373219		421	W125	129	31	55	55	55	OVERFLOW		TRUE	RIVER	LEFT	2400	Calder	218
56 (03)	97-133	272607	373219		433	W123A	129	31	55	55	55	OVERFLOW		TRUE	RIVER	LEFT	2400	Calder	219
58 (03)	97-131	272633	373219		449	W122	129	31	55	55	55	OVERFLOW		TRUE	RIVER	LEFT	2400	Calder	220
77 (03)	97-097	263772	343622		433	W84	114		56	56	13	OVERFLOW		TRUE					221
82 (03)	97-079	261664	343621		429	W79	114		56	56	13	OVERFLOW		TRUE					222
91 (03)	97-194	268186	344011	801	412	43	106B	105	58	58	58	LOW PIPE/WEIR		TRUE	RIVER	RIGHT	1500	Gold Bar	223
92 (03)	97-193	268200	344011	802		E42	106B	105	58	58	58	DUAL		TRUE	RIVER	RIGHT	1500	Gold Bar	224
93 (03)	97-069	231340	253624	005	405	106	N47	2	63	61	63	LOW PIPE		TRUE	CREEK	RIGHT	2100	Empire Park	225
40 (03)	97-143	239392	313625	816	402	114	100	46	50	7	50	LOW PIPE		TRUE	RIVER	LEFT	1275	Oliver	226
229 (03)		270363	344005				n. Borden Park		56					TRUE					227
257 (03)		245306				100	McDonald		57					TRUE				Downtown	228
260 (03)		240920				Buena Vista Rd	81		58					TRUE					229
84 (05)	97-225	270533		207533		W72	113		57					TRUE					230
96 (05)	97-030	227748	283616		425	110	N66	22	54	50	54	OVERFLOW/WEIR		TRUE	RIVER	RIGHT	1500	Parkallen	231
97 (05)	96-015	227670	283616		415	111	L. S. 67	22	54	50	54	OVERFLOW		TRUE	RIVER	RIGHT	1500	Parkallen	232
100 (05)	96-034	228096	283625		415	111	72	22	54	47	54	OVERFLOW		TRUE	RIVER	RIGHT	1500	McKernan	233
101 (05)	96-036	228103	283625		421	111	73	22	54	48	54	OVERFLOW		TRUE	RIVER	RIGHT	1500	McKernan	234
102 (05)	97-033	228099	283625		420	111	74	22	54	48	54	OVERFLOW		TRUE	RIVER	RIGHT	1500	McKernan	235
103 (05)	97-034	228154	283625		407	111	75	22	54	48	54	OVERFLOW		TRUE	RIVER	RIGHT	1500	McKernan	236
104 (05)	97-035	228082	283625		426	111	76	22	54	47	54	OVERFLOW		TRUE	RIVER	RIGHT	1500	McKernan	237
261 (05)		238144				151	95		58					TRUE					238
130 (07)	96-029	229891	283622	829	470	95	73	100	55	47	55	OVERFLOW/WEIR		TRUE	CREEK	RIGHT	300	Ritchie	239
166 (07)	97-199	251790	314005	817	430	81	S80	44	55	49	55	OVERFLOW/WEIR		TRUE	RIVER	RIGHT	3800	King Edward Park	240
105 (07)	96-038	228152	283625	802	401	111	N76	22	54	47	54	LOW PIPE		TRUE	RIVER	RIGHT	1500	McKernan	241
108 (07)	96-004	224871	283221		451	112	N73	22	54	47	54	OVERFLOW		TRUE	RIVER	RIGHT	1500	McKernan	242
109 (07)	96-005	224875	283221		454	112	N72	22	54	49	54	OVERFLOW		TRUE	RIVER	RIGHT	1500	McKernan	243
236 (07)		242092	313201			112	S78		86			OVERFLOW		TRUE				Parkallen	244
263 (07)		278090				105	130		59					TRUE				Lauderdale	245
121 (07)	96-019	229419	283618	816		99	70	92B	61	50	61	DUAL		TRUE	CREEK	RIGHT	750	Hazeldean	246
54 (07)	97-180	254704	342821	025	410	156	116	18	75	58	75	LOW PIPE/WEIR		TRUE	RIVER	LEFT	2400	Alberta Park Indust	247
264 (05, n/m)		278091				105	130		59					TRUE				Lauderdale	248
206 (09)	97-213	243177	313610	866		W87	S83		49			LOW PIPE		TRUE				Bonnie Doon	249
168 (03)	97-197	252003	314005	828	438	81	S78	44	55	49	55	OVERFLOW/WEIR		TRUE	RIVER	RIGHT	3800	King Edward Park	250
174 (03)	97-203	251466	314004	816	412	77	S81	44	56	50	56	OVERFLOW		TRUE	RIVER	RIGHT	3800	King Edward Park	251
158 (10)	97-212	251782	314005		416	85	S81		55	55	49	OVERFLOW		TRUE					252
47 (10)	97-144	239410	313221	815		115	100	46	54	30	54	OVERFLOW		TRUE	RIVER	LEFT	1275	Oliver	253

IC Site#	Plan	IC MH#	CADAS-TRAL	SAN_MH	STRM_MH	STREET	AVENUE	OF_NUM	IC_AGE	SAN_AGE	STRM_AGE	ICTYPE	Delete date	COR-RECTED	OF_LOC1	OF_LOC2	OF_DIA	NHOOD	COUNT
122 (10)	97-027	229960	283623	833		98	S72	92B	61	49	61	OVERFLOW		TRUE	CREEK	RIGHT	750	Hazeldean	254
125 (10)	96-023	229520	283619	806	402	96	S71	92B	60	50	60	LOW PIPE		TRUE	CREEK	RIGHT	750	Hazeldean	255
131 (10)	96-028	229883	283622	821	426	95	74	100	55	14	55	OVERFLOW/WEIR		TRUE	CREEK	RIGHT	300	Ritchie	256
132 (10)	96-027	229875	283622	812	420	95	75	100	55	14	55	OVERFLOW/WEIR		TRUE	CREEK	RIGHT	300	Ritchie	257
124 (n/m) (10)	97-028	229422	283618	819		98	S70	92B	61	50	61	OVERFLOW		TRUE	CREEK	RIGHT	750	Hazeldean	258
165 (11)	97-200	251786	314005	813	459	81	S81	44	55	50	55	OVERFLOW		TRUE	RIVER	RIGHT	3800	King Edward Park	259
171 (11)	96-075	251791	314005	818	431	79	S80	44	56	50	56	OVERFLOW/WEIR		TRUE	RIVER	RIGHT	3800	King Edward Park	260
172 (11)	97-201	251787	314005	813	422	79	S81	44	56	50	56	OVERFLOW		TRUE	RIVER	RIGHT	3800	King Edward Park	261
230 (n/m) (12)		270510	344005				n. Borden Park		56					TRUE				Edmonton Northlan	262
243 (n/m) (12)		263242				102	111		68					TRUE				Central McDougall	263
167 (12)	97-198	251795	314005	824	435	81	S79	44	55	49	55	OVERFLOW		TRUE	RIVER	RIGHT	3800	King Edward Park	264
169 (12)	97-196	231975	314005	832	443	81	S77	44	55	52	55	OVERFLOW/WEIR		TRUE	RIVER	RIGHT	3800	King Edward Park	265
170 (12)	96-078	251796	314005	826	436	79	S79	44	56	49	56	OVERFLOW/WEIR		TRUE	RIVER	RIGHT	3800	King Edward Park	266
173 (12)	97-204	251711	314004	808	404	77	S82	44	56	50	56	OVERFLOW		TRUE	RIVER	RIGHT	3800	King Edward Park	267
175 (12)	97-202	251758	314004	826	415	77	S80	44	56	50	56	OVERFLOW		TRUE	RIVER	RIGHT	3800	King Edward Park	268
128 (13) OF 2010-103	96-030	229914	283622	855	457	95	71	92B	60	50	60	LOW PIPE/WEIR		TRUE	CREEK	RIGHT	750	Hazeldean	269
272 (14) RPN 0016		255496				W115	102							TRUE				Oliver	270
157	96-045	246533	313601	815	421	87	81	44	55	49	55	LOW PIPE		TRUE	RIVER	RIGHT	3800	King Edward Park	271
140 (16) OF 2011-23	96-046	246491	313601	818	425	91	S81	44	55	22	55	OVERFLOW/WEIR		TRUE	RIVER	RIGHT	3800	King Edward Park	272
262 (05, closed '16)		255832				W123	102	46	47					TRUE				Oliver	273
259 (03, closed '16)		270391				73	N112	56	56					TRUE				Virginia Park	274
57 (18)	97-132	272618	373219		440	W123	129	31	55	55	55	OVERFLOW		TRUE	RIVER	LEFT	2400	Calder	275
59 (18)	97-130	272636	373219		452	W121	129	31	55	55	55	OVERFLOW		TRUE	RIVER	LEFT	2400	Calder	276
136 (18)	96-057	229992	313601	856	464	91	77	44	55	28	55	LOW PIPE/WEIR		TRUE	RIVER	RIGHT	3800	King Edward Park	277
141 (18)	97-005	246486	313601	806	415	91	S82	44	55	31	55	OVERFLOW/WEIR		TRUE	RIVER	RIGHT	3800	King Edward Park	278
150 (18)	96-044	246489	313601	809		89	S82	44	55	46	55	LOW PIPE		TRUE	RIVER	RIGHT	3800	King Edward Park	279
98 (19)	96-002	224786	283220	807	418	112A	67	22	54	54	54	LOW PIPE		TRUE	RIVER	RIGHT	1500	Parkallen	280
99 (19)	96-001	224790	283220	811	421	112	67	22	51	51	51	LOW PIPE		TRUE	RIVER	RIGHT	1500	Parkallen	281
117 (19)	96-011	227631	283615		428	109	64	22	54	50	54	OVERFLOW		TRUE	RIVER	RIGHT	1500	Parkallen	282
118 (19)	96-012	227633	283615		429	109	63	22	54	49	54	OVERFLOW		TRUE	RIVER	RIGHT	1500	Parkallen	283
144 (19)	96-062	243904	313609	869	870	W93	L. S. 84	116	55	30	55	LOW PIPE		TRUE	CREEK	RIGHT	750	Bonnie Doon	284
163 (19)	97-208	231913	314005		442	85	S77	44	55	55	49	OVERFLOW		TRUE				King Edward Park	285
223		246523	313601	814		93	81	22	55			LOW PIPE		TRUE				Bonnie Doon	286
52 (22)	97-107	263239	343617	857		102	111	54	68	14	68	FLOW SPLIT		TRUE	RIVER	LEFT	3000	Spruce Avenue	287
51 (22)	97-108	256922	343210	846	412	W115	106	54	83	64	83	LOW PIPE		TRUE	RIVER	LEFT	3000	Queen Mary Park	288
284 (22)		221327				172A	76							TRUE				Callingwood	289

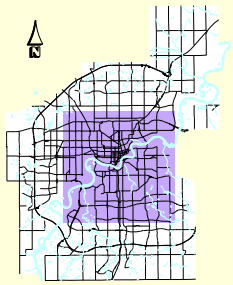
IC Site#	Plan	IC MH#	CADAS-TRAL	SAN_MH	STRM_MH	STREET	AVENUE	OF_ NUM	IC_ AGE	SAN_ AGE	STRM_ AGE	ICTYPE	Delete date	COR-RECTED	OF_ LOC1	OF_ LOC2	OF_ DIA	NHOOD	COUNT
Removed from database (emergency pump overflow)																			
1 (02)	97-070	208392	253203	007	412	125	29A	1	76			LOW PIPE			CREEK	RIGHT	900	Blue Quill Estates	
9 (02)	97-059	223283	282810	PW	403	E WHITEMUD	58	12	72	70	72	PUMPWELL			RIVER	RIGHT	750	River Valley Whitemud	
11 (02)	97-187	223504	283223	006		S133	BV RD	21	58	59	58	DUAL			RIVER	LEFT	1350	Laurier Heights	
87 (02)	97-072	270916	344416	053	469	29	102	71	66	66	66	OVERFLOW			RIVER	LEFT	1200	Rundle Heights	
Removed from database (does not exist)																			
227 (03)		256917	343211		407	116	106	54	72	72	72	DROP MANHOLE STRUCTURE			RIVER	LEFT	3000	Queen Mary Park	
228 (03)		241889	343205		436	145	SUMMIT D	30	50						RIVER	LEFT	1650	Crestwood	
239 (03)		246519				89	S77												
241 (03)		265734				113	102												
242 (03)		265734				113	102												
85 (04)	97-226	270523		270523		E71	113		51										
86 (04)	97-227	270376		270376		E71	113		51										
203 (04)	97-170	244717	313618	806	407	100	97	45	50	5	50	LOW PIPE			RIVER	LEFT	600	Rossdale	
205 (04)	97-220	321318				E101	96		85										
225 (n/m) (04)		245210	313623			100	97		50										
248 (n/m) (04)		266011				W109	111		68										
256 (03,n/m) (04)		262720				96	103		49										
Removed from database (discharge back to combined system)																			
186 (04)	97-082	262009	343609	815	814	95	101	152	49	7	49	LOW PIPE			RIVER	LEFT	450	Boyle Street	
187 (04)	97-083	262749	343609	810	402	95	102A	152	49	7	49	LOW PIPE			RIVER	LEFT	450	Boyle Street	
188 (04)	97-084	262747	343609	809	401	95	103	152	49	7	49	LOW PIPE			RIVER	LEFT	450	Boyle Street	
246 (n/m) (04)		262534				W105	106		69										
247 (n/m) (04)		262495				W106	106		69										
192 (n/m) (10)	97-015	246867	313613	843	412	100	89	188	53	53	53	LOW PIPE/WEIR			RIVER	RIGHT	1200	River Valley Walterdale	
270 (13)		270548				60E	112											Highlands	
271 (13)		284287				57E	112											Highlands	

Notes:
(n/m) = not monitored
(xx) indicates the year of discovery or closure of the I/C (if known)



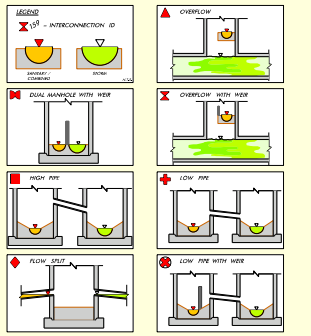
INTERCONNECTION CONTROL STRATEGY

2023 STATUS & DWO LOCATIONS



LOCATION PLAN
(NOT TO SCALE)

INTERCONNECTION (I/C) TYPES



OTHER TYPES

- CHAMBER
- PUMPWELL / CHAMBER
- CSO
- NON-DEFINED OPEN
- RAINGAUGE
- FLOW MONITOR
- RTC - REAL TIME CONTROL STRUCTURE
- 1200 - PIPE SIZE AND FLOW DIRECTION
- NON-DEFINED CLOSED

INTERCONNECTION ACTIVITY CLASSIFICATION

- DRY WEATHER OVERFLOW (DWO)
- MONITORED CELLULAR INTERCONNECTION
- PLANNED LOGGER UPDATE
- IC CLOSURE
- IC COVERED BY OTHER INSPECTIONS
- IC AFFECTED BY LRT CONSTRUCTION

EPCOR PROVIDING MORE

DMA : IC21SUM.DGN FEB. 2022

Storm and CSO Volumes and Loadings

This section is submitted in compliance with Section 4.4.10 and 6.3.3 of the Approval No. 639-03-07 for the one year period ending December 31, 2023. The monthly volumes discharged to the North Saskatchewan River (NSR) are indicated in Figures 1 and 2 for the following locations:

- 30 Avenue Storm Outfall
- Groat Road Storm Outfall
- Quesnell Storm Outfall
- Kennedale Storm Outfall
- Rat Creek CSO
- Highlands CSO
- Capilano CSO
- Cromdale CSO
- Strathearn CSO

Estimated and measured storms volumes are indicated on Figure 3. Total monitored CSO volumes are indicated on Figure 4. A tabular summary of the flow volumes and estimations of total monthly volumes discharged is also included (Table 2). Of the sites reported, the storm and combined system contribute 99.6% and 0.4% of the volume, respectively.

In previous years, flow volumes from Mill Creek were reported as a percentage (75.2%) of the measured volumes at the mouth of Mill Creek to account for flows originating from upstream of the City of Edmonton. EPCOR is working to improve estimates of stormwater volumes entering Mill Creek and other urban tributaries; however, for this year's report, flow volumes for Mill Creek are reported as the entire measured volume.

The total (measured and estimated) flow volume discharged from the storm sewer system to the NSR are tributaries in 2023 was 151.3 million m^3 - a 20.0% increase compared to the 2022 volume of 126.0 million m^3. A portion of this increase (5.1 million m^3) is due to the revised calculation of flows from Mill Creek in 2023, but the rest of the increase is due to 2023 being a wetter year. The 2023 flow volumes from the 30th Avenue, Groat Road, Quesnell, and Kennedale storm outfalls were 7.0, 3.2, 15.6, and 10.0 million m^3, respectively. The volume of flows from Mill Creek originating inside the City limits was 20.5 million m^3.

For the combined sewer system, the total CSO flow volume discharged to the NSR in 2023 was 608,473 m^3 - a 145.8% increase compared to the 2022 volume of 247,514 m^3. This large increase is the result of 2023 being a wetter year than 2022. The 2023 flow volumes from the Rat Creek, Highlands, Capilano, Cromdale, and Strathearn CSOs, were 476,276; 126,475; 3,441; 948; and 1,333 m^3, respectively.

Water quality samples were obtained for the majority of the significant discharge events during the year. As well, a total of 79 dry-weather (baseflow) water quality samples were obtained from the storm sewer system. Table 3 provides a tabular summary of calculated flow-weighted mean monthly and annual concentrations for different constituents and the number of events sampled for water quality analysis.

In accordance with our Approval requirements, total monthly loadings to the North Saskatchewan River have been calculated for the above sites. Summaries of measured loads and estimated total loads for the City of Edmonton's storm and combined sewer system are included in Table 4. The reported loads were calculated using daily constituent concentrations, including storm sewer

baseflow data, and the measured or estimated flow volumes. The combined storm and CSO total loading to the NSR consists of about 12,168 tonnes of total suspended solids (TSS), 1,243 tonnes of biochemical oxygen demand (BOD), 48 tonnes of total phosphorous (TP), 154 tonnes of nitrite and nitrate (NO_2 + NO_3), 64 tonnes of ammonia (NH_3), 247 tonnes of total Kjeldahl nitrogen (TKN), 23,619 tonnes of chloride and 47,311 x 10^{12} MPN of *E. coli*. Summaries of the Rat Creek CSO concentration statistics are shown in Table 5.

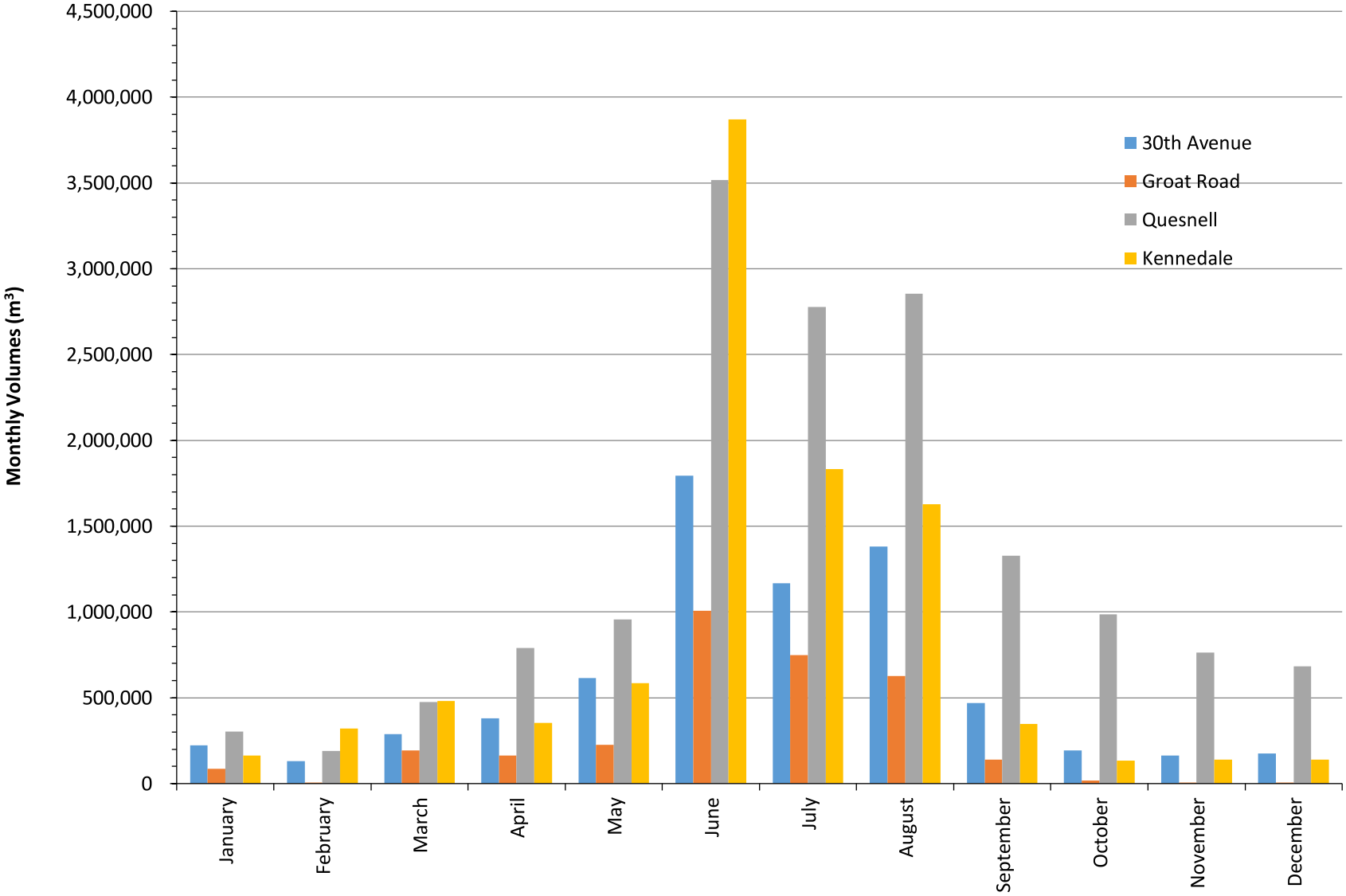


Figure 1: Total (Measured + Estimated) Storm Volume in 2023

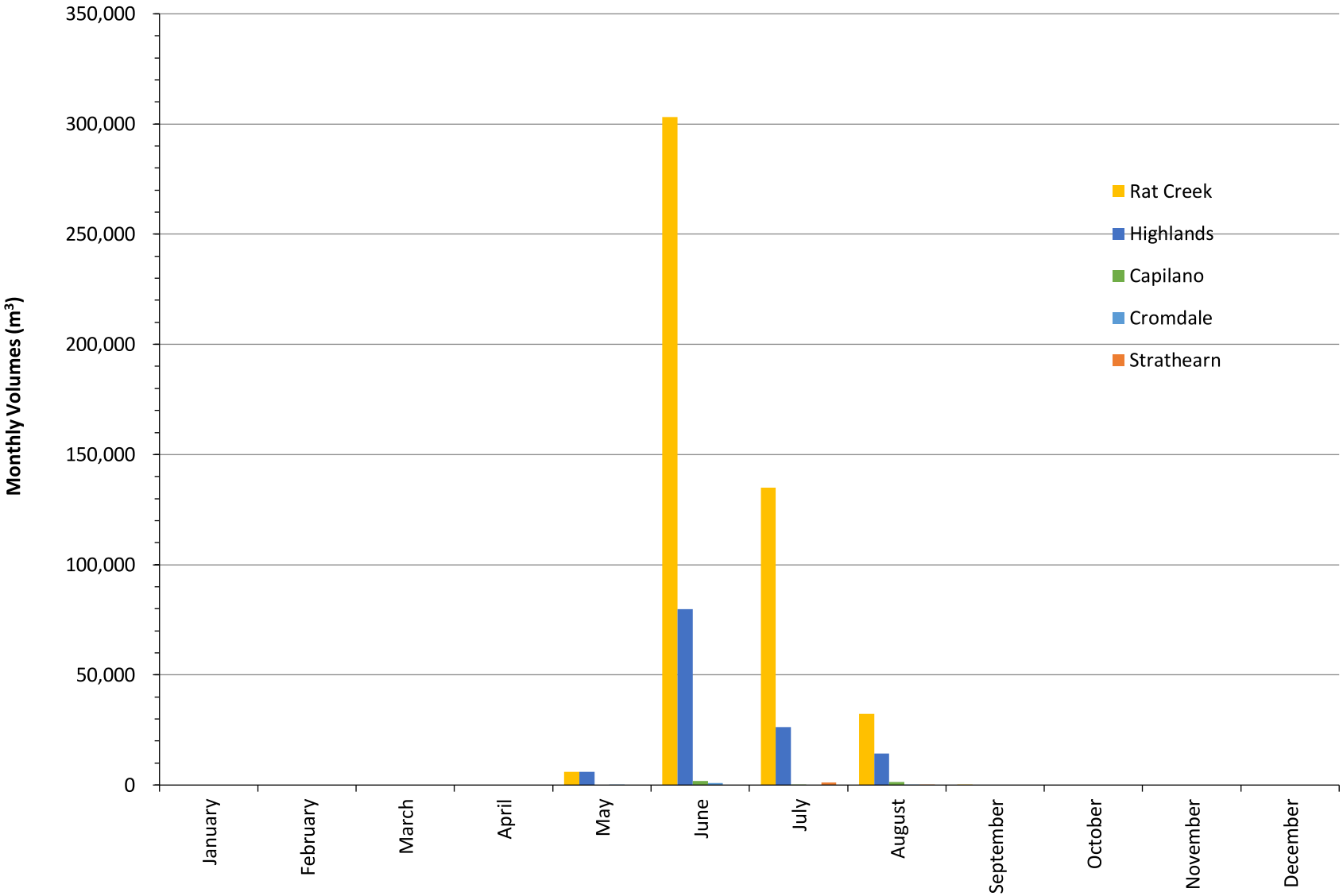


Figure 2: Total (Measured + Estimated) CSO Volumes in 2023

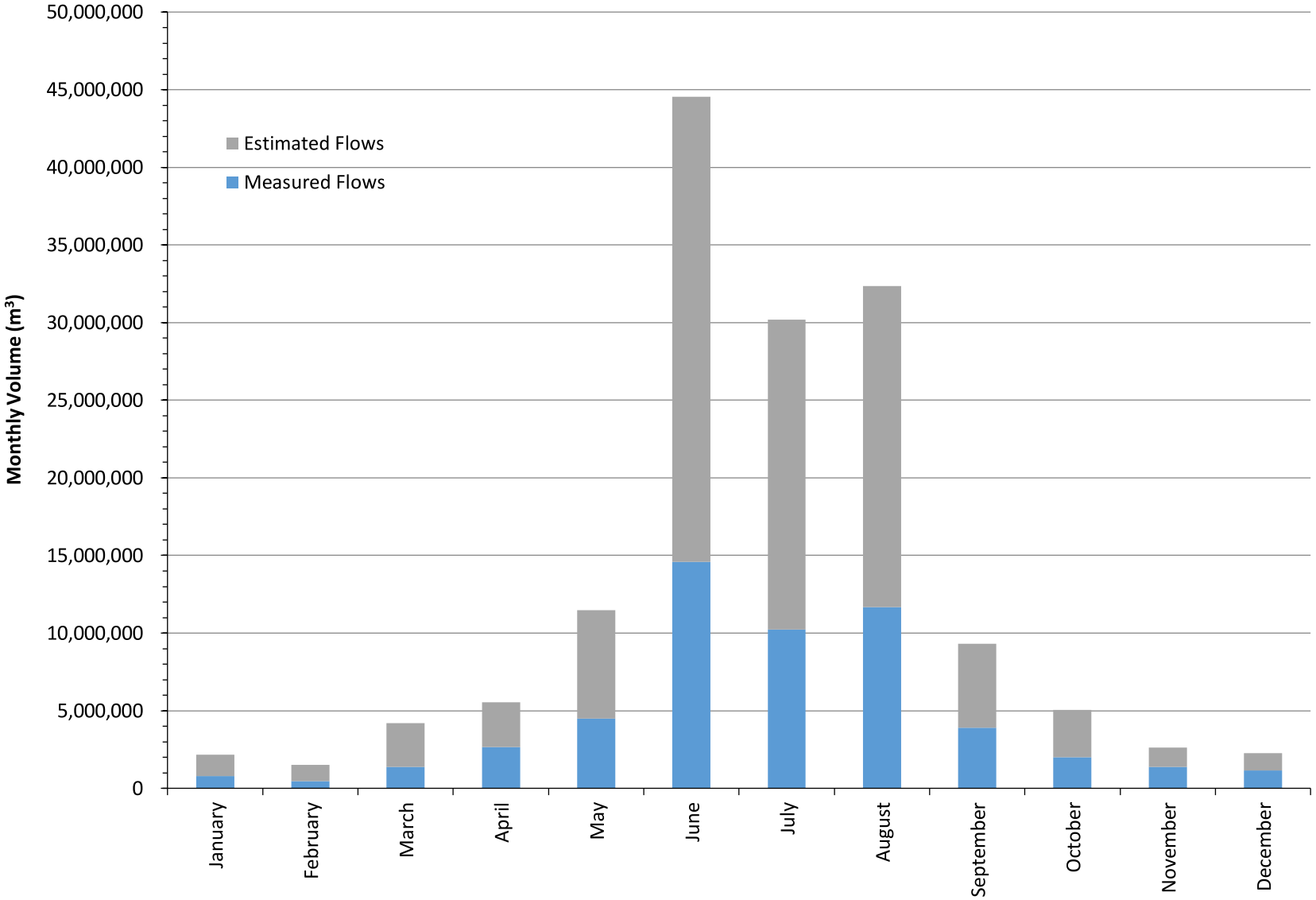


Figure 3: Total Storm (Measured + Unmonitored) Volumes in 2023 (All Storm Outfalls and Creeks)

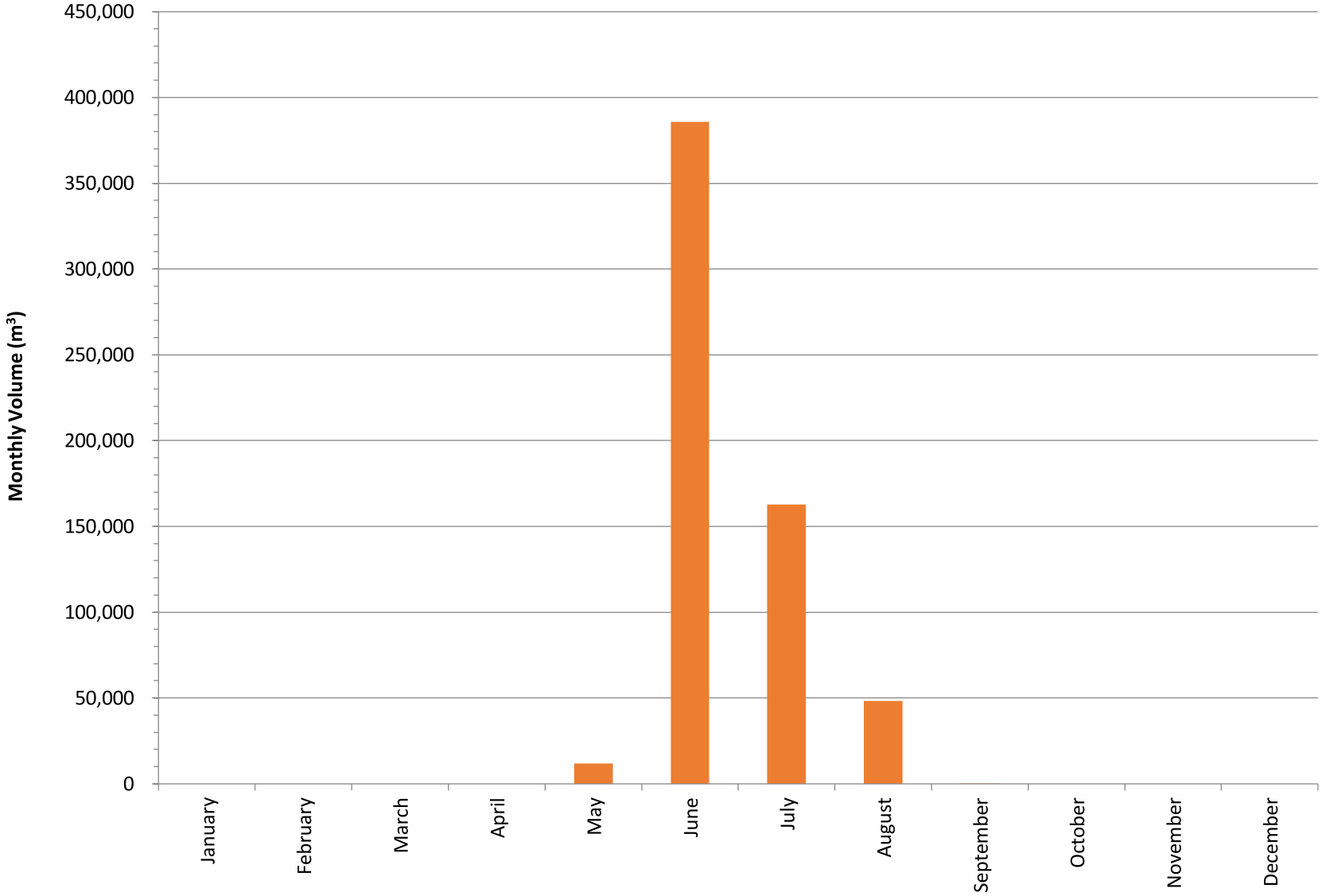


Figure 4: Total Monitored CSO Volume in 2023

Table 2: 2023 Annual Discharge Volumes (in Cubic Meters)

	Storm Outfalls				CSO Outfalls				
Month	**30th Avenue**	**Groat Road**	**Quesnell**	**Kennedale**	**Rat Creek**	**Highlands**	**Capilano**	**Cromdale**	**Strathearn**
January	222,169	86,139	303,947	164,739	0	0	0	0	0
February	130,945	6,354	190,083	321,643	0	0	0	0	0
March	287,038	193,428	475,031	481,880	0	0	0	0	0
April	380,884	163,807	791,108	353,127	0	0	0	0	0
May	614,441	224,910	956,029	586,279	5,930	5,961	0	9	0
June	1,794,240	1,007,418	3,515,845	3,871,661	303,087	79,865	1,804	851	0
July	1,166,127	748,058	2,775,934	1,831,537	134,945	26,316	229	0	1,206
August	1,380,552	627,727	2,853,754	1,627,369	32,287	14,333	1,409	88	127
September	470,534	139,860	1,327,410	347,386	27	0	0	0	0
October	193,790	18,406	987,002	133,611	0	0	0	0	0
November	164,537	4,659	762,596	140,380	0	0	0	0	0
December	175,686	4,858	681,845	141,094	0	0	0	0	0
Total	**6,980,944**	**3,225,625**	**15,620,584**	**10,000,704**	**476,276**	**126,475**	**3,441**	**948**	**1,333**

	Measured Flows		[3]Unmonitored Flows		Total Flow	
Month	**[1]Storm Outfalls**	**[2]CSO Outfalls**	**Storm Outfalls**	**CSO Outfalls**	**Storm Outfalls**	**CSO Outfalls**
January	779,741	0	1,374,667	0	2,154,408	0
February	467,475	0	1,034,966	0	1,502,440	0
March	1,393,482	0	2,791,995	0	4,185,477	0
April	2,657,540	0	2,885,176	0	5,542,716	0
May	4,493,033	11,900	6,997,378	0	11,490,410	11,900
June	14,584,263	385,606	29,965,534	0	44,549,796	385,606
July	10,215,393	162,697	19,975,636	0	30,191,029	162,697
August	11,674,516	48,243	20,692,056	0	32,366,571	48,243
September	3,899,826	27	5,417,096	0	9,316,922	27
October	2,020,670	0	3,038,988	0	5,059,658	0
November	1,368,503	0	1,250,586	0	2,619,090	0
December	1,159,687	0	1,120,735	0	2,280,422	0
Total	**54,714,128**	**608,473**	**96,544,812**	**0**	**151,258,940**	**608,473**

Note: [1]Measured Storm flows are actual flow volumes measured from Storm outfalls: 30th Ave, Quesnell, Groat Road, Kennedale Storm/STS/Wetland, Belgravia, Mill Creek (factored).

[2]Measured CSO flows are actual flow volumes measured from CSOs: Rat Creek, Capilano, Highlands, Cromdale, and Strathearn.

[3]Unmonitored flow volumes include estimates from monitored sites when measurements not available in addition to other remaining sites.

Table 3: Calculated Flow-Weighted Mean Monthly and Annual Constituent Concentrations for 2023

Total Suspended Solids (mg/L)

	Storm Outfalls				CSO Outfalls			No. of Samples	
Month	**30th Avenue**	**Groat Road**	**Quesnell**	**Kennedale**	**Rat Creek**	**Highlands**	**Capilano**	**Storm**	**CSO**
January	65	97	87	7	-	-	-	9	0
February	31	25	11	14	-	-	-	8	0
March	143	178	122	33	-	-	-	25	0
April	145	404	117	53	-	-	-	18	0
May	350	706	190	244	725	928	-	25	3
June	42	111	58	28	181	181	8	56	2
July	102	177	64	48	576	603	807	60	3
August	88	137	54	36	458	458	458	45	1
September	47	136	63	27	458	-	-	26	0
October	26	92	16	29	-	-	-	12	0
November	7	14	6	10	-	-	-	9	0
December	60	5	4	5	-	-	-	9	0
Mean Annual FWC =	**98**	**192**	**64**	**46**	**318**	**335**	**245**	**302**	**9**

Mean Annual FWC for all Storm = **77**

Mean Annual FWC for all CSO = **321**

Biochemical Oxygen Demand (mg/L)

	Storm Outfalls				CSO Outfalls			No. of Samples	
Month	**30th Avenue**	**Groat Road**	**Quesnell**	**Kennedale**	**Rat Creek**	**Highlands**	**Capilano**	**Storm**	**CSO**
January	13	13	12	3	-	-	-	9	0
February	8	9	5	4	-	-	-	8	0
March	16	18	13	8	-	-	-	25	0
April	23	22	14	12	-	-	-	18	0
May	25	28	13	18	215	237	-	25	2
June	6	10	4	4	49	50	3	56	2
July	14	16	5	7	140	151	209	57	3
August	29	10	5	6	72	72	72	42	1
September	12	32	6	8	72	-	-	25	0
October	4	25	3	7	-	-	-	11	0
November	11	7	5	5	-	-	-	9	0
December	16	3	4	3	-	-	-	9	0
Mean Annual FWC =	**16**	**15**	**6**	**6**	**79**	**82**	**45**	**294**	**8**

Mean Annual FWC for all Storm = **9**

Mean Annual FWC for all CSO = **79**

Table 3: Calculated Flow-Weighted Mean Monthly and Annual Constituent Concentrations for 2023 (Cont.)

Total Phosphorus (mg/L)

	Storm Outfalls				CSO Outfalls			No. of Samples	
Month	**30th Ave**	**Groat Road**	**Quesnell**	**Kennedale**	**Rat Creek**	**Highlands**	**Capilano**	**Storm**	**CSO**
January	0.2	0.7	0.4	0.4	-	-	-	9	0
February	1.5	0.1	0.4	0.2	-	-	-	8	0
March	0.8	1.0	0.5	0.5	-	-	-	25	0
April	1.2	0.9	0.4	0.5	-	-	-	22	0
May	0.6	1.2	0.6	0.5	4.1	4.4	-	25	4
June	0.4	0.3	0.2	0.2	1.4	1.5	0.1	57	3
July	1.3	0.4	0.2	0.2	2.7	2.8	3.3	64	3
August	0.1	0.3	0.2	0.2	1.8	1.8	1.8	48	2
September	0.2	0.8	0.4	0.2	17.1	-	-	26	1
October	0.7	0.8	0.3	0.2	-	-	-	12	0
November	1.0	0.2	0.3	0.2	-	-	-	9	0
December	23.2	0.1	0.3	0.2	-	-	-	9	0
Mean Annual FWC =	**0.6**	**0.5**	**0.3**	**0.2**	**1.9**	**1.9**	**1.0**	**314**	**13**

Mean Annual FWC for all Storm = **0.3**

Mean Annual FWC for all CSO = **1.9**

Nitrite + Nitrate (mg/L)

	Storm Outfalls				CSO Outfalls			No. of Samples	
Month	**30th Ave**	**Groat Road**	**Quesnell**	**Kennedale**	**Rat Creek**	**Highlands**	**Capilano**	**Storm**	**CSO**
January	2.0	0.7	1.6	1.9	-	-	-	9	0
February	2.2	0.8	0.9	1.0	-	-	-	8	0
March	1.0	0.4	0.7	0.7	-	-	-	25	0
April	1.6	0.9	0.8	0.7	-	-	-	22	0
May	1.5	0.8	1.0	0.5	0.5	0.6	-	25	4
June	1.6	0.7	0.7	0.9	2.2	2.1	0.0	57	3
July	1.5	0.8	0.7	0.7	0.4	0.4	0.4	64	3
August	1.0	0.6	0.8	0.8	0.3	0.3	0.3	48	2
September	3.0	0.6	1.2	0.8	0.0	-	-	26	1
October	4.9	1.0	1.2	1.6	-	-	-	12	0
November	3.6	1.3	1.3	1.5	-	-	-	9	0
December	2.7	1.1	1.3	2.6	-	-	-	9	0
Mean Annual FWC =	**1.7**	**0.7**	**0.9**	**0.9**	**1.6**	**1.5**	**0.2**	**314**	**13**

Mean Annual FWC for all Storm = **1.0**

Mean Annual FWC for all CSO = **1.5**

Table 3: Calculated Flow-Weighted Mean Monthly and Annual Constituent Concentrations for 2023 (Cont.)

Ammonia Nitrogen (mg/L)

	Storm Outfalls				CSO Outfalls			No. of Samples	
Month	**30th Ave**	**Groat Road**	**Quesnell**	**Kennedale**	**Rat Creek**	**Highlands**	**Capilano**	**Storm**	**CSO**
January	0.5	1.0	0.8	1.4	-	-	-	9	0
February	0.9	1.5	2.5	1.0	-	-	-	8	0
March	0.9	0.8	0.8	1.8	-	-	-	25	0
April	1.2	0.8	0.7	1.0	-	-	-	22	0
May	1.2	1.0	0.7	0.5	9.4	9.5	-	25	4
June	0.4	0.2	0.1	0.2	4.7	4.8	0.3	57	3
July	1.3	0.3	0.1	0.2	5.0	5.1	5.5	64	3
August	3.4	0.3	0.2	0.3	2.0	2.0	2.0	48	2
September	0.7	0.5	0.3	0.5	21.2	-	-	26	1
October	0.4	0.5	0.3	0.2	-	-	-	12	0
November	3.2	0.7	0.3	0.1	-	-	-	9	0
December	3.4	1.0	0.4	0.4	-	-	-	9	0
Mean Annual FWC =	**1.4**	**0.4**	**0.3**	**0.4**	**4.7**	**4.8**	**1.3**	**314**	**13**

Mean Annual FWC for all Storm = **0.6** Mean Annual FWC for all CSO = **4.7**

Total Kjeldahl Nitrogen (mg/L)

	Storm Outfalls				CSO Outfalls			No. of Samples	
Month	**30th Ave**	**Groat Road**	**Quesnell**	**Kennedale**	**Rat Creek**	**Highlands**	**Capilano**	**Storm**	**CSO**
January	2.1	3.1	2.9	2.6	-	-	-	9	0
February	2.3	2.5	4.0	2.2	-	-	-	8	0
March	3.7	4.0	2.7	3.4	-	-	-	25	0
April	3.8	4.2	2.5	3.0	-	-	-	22	0
May	3.9	4.7	2.7	3.0	21.2	20.8	-	25	4
June	1.2	1.3	1.0	1.2	8.2	8.3	0.4	57	3
July	3.2	1.6	1.1	1.4	15.3	15.2	17.2	64	3
August	6.6	1.4	1.0	1.4	8.7	8.6	8.6	48	2
September	2.1	2.7	1.7	1.5	74.4	-	-	26	1
October	1.5	2.5	0.9	1.5	-	-	-	12	0
November	3.8	1.4	1.0	1.2	-	-	-	9	0
December	4.3	1.6	1.0	1.3	-	-	-	9	0
Mean Annual FWC =	**3.3**	**2.0**	**1.3**	**1.6**	**10.4**	**10.3**	**4.9**	**314**	**13**

Mean Annual FWC for all Storm = **1.9** Mean Annual FWC for all CSO = **10.3**

Table 3: Calculated Flow-Weighted Mean Monthly and Annual Constituent Concentrations for 2023 (Cont.)

Chloride (mg/L)

	Storm Outfalls				CSO Outfalls			No. of Samples	
Month	**30th Ave**	**Groat Road**	**Quesnell**	**Kennedale**	**Rat Creek**	**Highlands**	**Capilano**	**Storm**	**CSO**
January	598	383	524	662	-	-	-	9	0
February	2,462	3,990	1,050	1,157	-	-	-	8	0
March	560	432	483	656	-	-	-	25	0
April	312	324	768	395	-	-	-	22	0
May	118	89	552	130	56	60	-	25	4
June	64	32	106	78	27	27	1	57	3
July	85	55	75	57	23	23	24	64	3
August	99	40	79	69	21	21	21	48	2
September	146	66	107	121	71	-	-	26	1
October	262	149	115	171	-	-	-	12	0
November	278	277	111	203	-	-	-	9	0
December	532	368	141	396	-	-	-	9	0
Mean Annual FWC =	**202.9**	**102.0**	**189.8**	**168.3**	**25.9**	**27.2**	**10.6**	**314**	**13**

Mean Annual FWC for all Storm = **178.4** Mean Annual FWC for all CSO = **26.1**

E. coli (MPN/100 mL)

	Storm Outfalls				CSO Outfalls			No. of Samples	
Month	**30th Ave**	**Groat Road**	**Quesnell**	**Kennedale**	**Rat Creek**	**Highlands**	**Capilano**	**Storm**	**CSO**
January	8,428	9,394	17,379	9,774	0	0	0	9	0
February	17,985	135,844	8,745	9,804	0	0	0	8	0
March	24,410	21,704	31,785	4,299	0	0	0	25	0
April	79,876	27,150	11,755	7,520	-	0	-	22	0
May	62,599	14,077	11,953	11,593	-	-	-	26	4
June	27,860	10,958	9,349	7,794	-	-	-	58	3
July	425,072	16,680	15,517	11,166	5,814	1,358	13	64	3
August	796,717	13,194	10,337	7,815	2	3	9	47	2
September	77,593	25,953	5,128	10,500	90	0	0	27	1
October	5,236	21,509	5,244	10,094	-	0	-	11	0
November	53,678	13,598	18,992	295	-	-	-	9	0
December	14,191	651	2,680	584	-	-	-	9	0
Mean Annual FWC =	**254,200**	**15,307**	**11,300**	**8,475**	**1,620,035**	**1,668,208**	**1,115,356**	**315**	**13**

Mean Annual FWC for all Storm = **58,200** Mean Annual FWC for all CSO = **1,627,220**

FWC (mg/L) = Flow weighted concentration = 1000 x Constituent load (kg) / Volume (m3) per site for a monthly or annual period

Concentrations for unsampled flows were estimated or interpolated

No. of samples includes wet-weather and baseflow sampling. QA/QC samples not included in totals.

'-' - Concentration could not be calculated due to no flow present.

Table 4: Constituent Loads for 2023

Total Suspended Solids (kg)

	Storm Outfalls						Creeks					CSO Outfalls					
Month	30th Ave Storm	Groat Rd. Storm	Quesnell Storm	Kennedale Storm	Monitored Storm Sub-Total	Remaining Storm	Mill Creek	Whitemud Creek	Horsehills Creek	Wedgewood Creek	**Total Storm**	Rat Creek CSO	Highlands CSO	Capilano CSO	AEP CSO Sub-Total	Remaining CSO	**Total CSO**
January	14,343	8,353	26,372	1,211	50,279	60,049	14,138	32,462	10,971	7,131	**175,031**	0	0	0	0	0	**0**
February	4,049	156	2,118	4,576	10,899	7,538	1,449	3,951	1,335	868	**26,040**	0	0	0	0	0	**0**
March	41,031	34,458	58,035	15,724	149,248	172,435	40,031	92,908	31,400	20,408	**506,430**	0	0	0	0	0	**0**
April	55,385	66,156	92,185	18,884	232,609	260,317	93,448	151,354	51,153	33,246	**822,127**	0	0	0	0	0	**0**
May	215,125	158,855	181,366	143,105	698,451	1,096,721	634,522	613,651	204,791	100,050	**3,348,186**	4,298	5,530	0	9,828	197	**10,025**
June	76,114	111,541	204,800	109,869	502,324	766,325	215,200	489,649	130,796	85,155	**2,189,449**	54,784	14,433	14	69,232	2,086	**71,318**
July	118,511	132,305	178,764	88,505	518,085	884,391	317,671	451,575	135,737	86,495	**2,393,953**	77,764	15,866	185	93,814	1,876	**95,691**
August	121,777	85,810	154,455	59,315	421,357	685,749	256,945	390,975	94,158	80,337	**1,929,519**	14,787	6,565	645	21,997	660	**22,657**
September	22,007	18,983	83,152	9,280	133,422	138,628	86,969	122,926	26,609	23,885	**532,439**	12	0	0	12	0	**12**
October	5,073	1,688	15,471	3,826	26,057	26,302	12,572	18,248	6,063	3,623	**92,864**	0	0	0	0	0	**0**
November	1,083	66	4,585	1,368	7,102	3,970	1,865	2,456	830	539	**16,761**	0	0	0	0	0	**0**
December	10,568	24	2,659	750	14,001	10,198	2,615	5,571	1,883	1,224	**35,491**	0	0	0	0	0	**0**
Total	**685,067**	**618,394**	**1,003,962**	**456,411**	**2,763,834**	**4,112,623**	**1,677,423**	**2,375,725**	**695,727**	**442,959**	**12,068,291**	**151,646**	**42,393**	**844**	**194,883**	**4,819**	**199,703**

Total Load From Storm and CSO = 12,267,994

Biochemical Oxygen Demand (kg)

	Storm Outfalls						Creeks					CSO Outfalls					
Month	30th Ave Storm	Groat Rd. Storm	Quesnell Storm	Kennedale Storm	Monitored Storm Sub-Total	Remaining Storm	Mill Creek	Whitemud Creek	Horsehills Creek	Wedgewood Creek	**Total Storm**	Rat Creek CSO	Highlands CSO	Capilano CSO	AEP CSO Sub-Total	Remaining CSO	**Total CSO**
January	2,944	1,096	3,647	561	8,247	9,133	2,071	4,909	1,659	1,078	**27,098**	0	0	0	0	0	**0**
February	1,041	59	944	1,327	3,370	2,329	458	1,224	414	269	**8,065**	0	0	0	0	0	**0**
March	4,668	3,532	6,172	3,628	18,000	18,671	4,769	10,203	3,448	2,241	**57,333**	0	0	0	0	0	**0**
April	8,730	3,649	11,068	4,397	27,845	26,447	13,132	16,600	5,610	3,646	**93,281**	0	0	0	0	0	**0**
May	15,514	6,393	12,271	10,269	44,449	71,871	40,056	41,021	11,864	6,199	**215,460**	1,277	1,412	0	2,689	54	**2,743**
June	10,117	10,337	14,135	17,162	51,751	78,357	23,924	50,685	13,354	8,646	**226,717**	14,978	3,998	5	18,981	572	**19,553**
July	16,697	12,315	14,212	13,610	56,833	85,510	30,277	43,597	13,869	8,322	**238,408**	18,939	3,984	48	22,971	459	**23,430**
August	40,373	6,114	13,640	9,076	69,203	59,137	25,554	36,864	8,553	7,435	**206,745**	2,325	1,032	101	3,458	104	**3,562**
September	5,612	4,440	7,964	2,620	20,635	16,795	10,826	17,926	3,595	3,392	**73,170**	2	0	0	2	0	**2**
October	839	452	2,664	934	4,888	4,789	2,319	3,347	1,118	667	**17,129**	0	0	0	0	0	**0**
November	1,791	31	4,107	770	6,698	3,988	1,809	2,446	827	537	**16,305**	0	0	0	0	0	**0**
December	2,740	17	2,790	478	6,025	3,950	1,001	2,156	729	474	**14,334**	0	0	0	0	0	**0**
Total	**111,064**	**48,436**	**93,612**	**64,832**	**317,945**	**380,978**	**156,196**	**230,979**	**65,041**	**42,908**	**1,194,047**	**37,520**	**10,427**	**154**	**48,101**	**1,189**	**49,290**

Total Load From Storm and CSO = 1,243,337

Total Phophorus (kg)

	Storm Outfalls						Creeks					CSO Outfalls					
Month	30th Ave Storm	Groat Rd. Storm	Quesnell Storm	Kennedale Storm	Monitored Storm Sub-Total	Remaining Storm	Mill Creek	Whitemud Creek	Horsehills Creek	Wedgewood Creek	**Total Storm**	Rat Creek CSO	Highlands CSO	Capilano CSO	AEP CSO Sub-Total	Remaining CSO	**Total CSO**
January	95	57	112	58	323	313	70	168	57	37	**968**	0	0	0	0	0	**0**
February	35	1	67	49	153	110	21	58	20	13	**374**	0	0	0	0	0	**0**
March	195	184	231	230	840	820	204	446	151	98	**2,560**	0	0	0	0	0	**0**
April	236	154	339	167	896	836	420	526	178	116	**2,971**	0	0	0	0	0	**0**
May	469	262	554	318	1,604	2,566	1,544	1,395	442	244	**7,795**	24	26	0	50	1	**51**
June	393	321	671	710	2,095	3,228	942	2,079	553	358	**9,256**	437	116	0	553	17	**569**
July	639	299	612	402	1,953	2,857	1,058	1,513	456	296	**8,133**	364	73	1	438	9	**446**
August	1,489	197	592	317	2,596	2,623	1,114	1,476	355	299	**8,463**	58	25	2	85	3	**88**
September	158	110	483	71	820	855	523	743	160	142	**3,244**	0	0	0	0	0	**0**
October	83	14	287	28	412	491	207	296	94	60	**1,560**	0	0	0	0	0	**0**
November	129	1	223	24	377	231	105	142	48	31	**933**	0	0	0	0	0	**0**
December	160	1	208	31	399	258	65	141	48	31	**941**	0	0	0	0	0	**0**
Total	**4,082**	**1,601**	**4,378**	**2,406**	**12,468**	**15,188**	**6,274**	**8,983**	**2,561**	**1,725**	**47,199**	**883**	**240**	**3**	**1,126**	**29**	**1,155**

Total Load From Storm and CSO = 48,354

Table 4: Constituent Loads for 2023 (Cont.)

Nitrite + Nitrate (kg)

	Storm Outfalls						Creeks					CSO Outfalls					
Month	30th Ave Storm	Groat Rd. Storm	Quesnell Storm	Kennedale Storm	Monitored Storm Sub-Total	Remaining Storm	Mill Creek	Whitemud Creek	Horsehills Creek	Wedgewood Creek	**Total Storm**	Rat Creek CSO	Highlands CSO	Capilano CSO	AEP CSO Sub-Total	Remaining CSO	**Total CSO**
January	435	64	483	308	1,289	1,042	223	555	187	122	**3,418**	0	0	0	0	0	**0**
February	286	5	169	337	798	546	102	285	96	63	**1,890**	0	0	0	0	0	**0**
March	293	77	321	349	1,039	882	253	491	166	108	**2,939**	0	0	0	0	0	**0**
April	597	142	658	259	1,657	1,376	1,052	988	334	217	**5,623**	0	0	0	0	0	**0**
May	903	188	973	283	2,347	4,069	2,589	1,954	622	409	**11,991**	3	4	0	7	0	**7**
June	2,855	724	2,531	3,522	9,633	15,007	4,506	9,617	2,602	1,743	**43,108**	667	171	0	839	25	**864**
July	1,732	634	2,001	1,228	5,595	9,070	3,450	4,927	1,504	979	**25,524**	59	12	0	71	1	**73**
August	1,357	375	2,380	1,341	5,453	9,927	4,335	5,463	1,316	1,094	**27,587**	9	4	0	13	0	**13**
September	1,417	85	1,641	285	3,429	4,218	2,490	2,640	682	537	**13,995**	0	0	0	0	0	**0**
October	958	19	1,193	215	2,386	2,903	1,231	1,700	533	346	**9,098**	0	0	0	0	0	**0**
November	587	6	1,005	213	1,811	1,087	503	670	226	147	**4,444**	0	0	0	0	0	**0**
December	479	5	880	367	1,731	977	242	532	180	117	**3,778**	0	0	0	0	0	**0**
Total	**11,900**	**2,324**	**14,237**	**8,706**	**37,167**	**51,105**	**20,973**	**29,820**	**8,449**	**5,881**	**153,395**	**739**	**191**	**1**	**930**	**27**	**957**

Total Load From Storm and CSO = 154,352

Ammonia Nitrogen (kg)

	Storm Outfalls						Creeks					CSO Outfalls					
Month	30th Ave Storm	Groat Rd. Storm	Quesnell Storm	Kennedale Storm	Monitored Storm Sub-Total	Remaining Storm	Mill Creek	Whitemud Creek	Horsehills Creek	Wedgewood Creek	**Total Storm**	Rat Creek CSO	Highlands CSO	Capilano CSO	AEP CSO Sub-Total	Remaining CSO	**Total CSO**
January	103	89	251	227	670	529	118	284	96	62	**1,759**	0	0	0	0	0	**0**
February	117	10	478	310	916	657	127	345	116	76	**2,237**	0	0	0	0	0	**0**
March	261	153	404	845	1,663	1,221	315	668	226	147	**4,239**	0	0	0	0	0	**0**
April	456	132	561	360	1,509	1,166	863	827	279	182	**4,825**	0	0	0	0	0	**0**
May	743	221	659	301	1,924	3,263	1,985	1,662	506	319	**9,659**	56	56	0	112	2	**115**
June	631	228	505	840	2,204	3,578	1,121	2,359	612	383	**10,257**	1,434	382	0	1,816	55	**1,871**
July	1,546	258	402	435	2,640	2,343	895	1,178	374	221	**7,652**	675	134	1	810	16	**827**
August	4,683	205	463	479	5,830	2,364	937	1,346	303	274	**11,053**	66	29	3	97	3	**100**
September	347	76	395	179	997	853	542	642	158	129	**3,321**	1	0	0	1	0	**1**
October	71	9	314	26	420	506	215	303	96	61	**1,600**	0	0	0	0	0	**0**
November	524	3	245	13	785	453	197	275	93	60	**1,865**	0	0	0	0	0	**0**
December	599	5	281	54	939	613	156	335	113	74	**2,230**	0	0	0	0	0	**0**
Total	**10,081**	**1,387**	**4,958**	**4,070**	**20,496**	**17,546**	**7,471**	**10,222**	**2,973**	**1,989**	**60,697**	**2,231**	**602**	**5**	**2,837**	**76**	**2,913**

Total Load From Storm and CSO = 63,610

Total Kjeldahl Nitrogen (kg)

	Storm Outfalls						Creeks					CSO Outfalls					
Month	30th Ave Storm	Groat Rd. Storm	Quesnell Storm	Kennedale Storm	Monitored Storm Sub-Total	Remaining Storm	Mill Creek	Whitemud Creek	Horsehills Creek	Wedgewood Creek	**Total Storm**	Rat Creek CSO	Highlands CSO	Capilano CSO	AEP CSO Sub-Total	Remaining CSO	**Total CSO**
January	470	263	875	435	2,044	1,917	438	1,031	349	227	**6,006**	0	0	0	0	0	**0**
February	295	16	761	713	1,786	1,239	241	651	220	143	**4,280**	0	0	0	0	0	**0**
March	1,056	766	1,295	1,617	4,733	4,269	1,104	2,337	790	513	**13,746**	0	0	0	0	0	**0**
April	1,458	693	1,972	1,074	5,196	4,548	2,623	2,977	1,006	654	**17,004**	0	0	0	0	0	**0**
May	2,395	1,063	2,538	1,748	7,744	12,400	7,387	6,702	2,055	1,160	**37,447**	126	124	0	250	5	**255**
June	2,214	1,307	3,347	4,461	11,329	17,395	5,228	11,206	2,998	1,964	**50,121**	2,479	659	1	3,139	95	**3,233**
July	3,753	1,185	2,965	2,491	10,393	14,080	5,276	7,385	2,252	1,450	**40,837**	2,062	400	4	2,466	49	**2,515**
August	9,072	869	2,732	2,205	14,877	12,360	5,498	7,347	1,730	1,485	**43,299**	281	123	12	416	12	**429**
September	975	372	2,224	537	4,109	3,864	2,389	3,446	739	658	**15,206**	2	0	0	2	0	**2**
October	287	46	922	200	1,456	1,681	736	1,024	326	207	**5,431**	0	0	0	0	0	**0**
November	618	6	763	167	1,554	871	390	533	180	117	**3,645**	0	0	0	0	0	**0**
December	749	8	690	180	1,626	1,020	258	557	188	122	**3,771**	0	0	0	0	0	**0**
Total	**23,343**	**6,595**	**21,083**	**15,828**	**66,849**	**75,644**	**31,570**	**45,196**	**12,833**	**8,700**	**240,792**	**4,949**	**1,306**	**17**	**6,272**	**161**	**6,434**

Total Load From Storm and CSO = 247,226

Table 4: Constituent Loads for 2023 (Cont.)

Chloride (kg)

	Storm Outfalls						Creeks					CSO Outfalls					
Month	30th Ave Storm	Groat Rd. Storm	Quesnell Storm	Kennedale Storm	Monitored Storm Sub-Total	Remaining Storm	Mill Creek	Whitemud Creek	Horsehills Creek	Wedgewood Creek	**Total Storm**	Rat Creek CSO	Highlands CSO	Capilano CSO	AEP CSO Sub-Total	Remaining CSO	**Total CSO**
January	132,761	32,950	159,119	108,977	433,807	371,304	86,228	200,127	67,637	43,959	**1,203,062**	0	0	0	0	0	**0**
February	322,379	25,350	199,668	372,201	919,597	633,243	122,504	332,169	112,264	72,963	**2,192,740**	0	0	0	0	0	**0**
March	160,800	83,628	229,544	315,877	789,848	648,245	179,080	358,450	121,146	78,736	**2,175,505**	0	0	0	0	0	**0**
April	118,803	53,031	607,451	139,602	918,886	720,497	611,286	537,421	181,634	118,048	**3,087,772**	0	0	0	0	0	**0**
May	72,227	20,031	527,736	76,490	696,484	1,168,308	783,135	439,935	155,903	136,326	**3,380,091**	329	357	0	686	14	**700**
June	114,885	32,347	370,972	303,016	821,219	1,368,962	430,546	896,753	236,291	152,965	**3,906,737**	8,257	2,181	2	10,441	315	**10,755**
July	99,418	41,434	208,191	104,999	454,043	803,882	315,064	439,769	133,744	87,429	**2,233,931**	3,070	605	5	3,680	74	**3,754**
August	136,590	24,976	225,499	112,163	499,228	954,398	419,523	487,940	119,589	97,916	**2,578,593**	665	294	29	988	30	**1,018**
September	68,745	9,295	141,751	42,125	261,916	331,762	196,303	194,134	52,579	40,142	**1,076,836**	2	0	0	2	0	**2**
October	50,756	2,744	113,529	22,797	189,826	282,435	125,932	164,206	50,907	33,547	**846,853**	0	0	0	0	0	**0**
November	45,747	1,289	84,455	28,442	159,934	90,164	41,420	55,473	18,748	12,185	**377,925**	0	0	0	0	0	**0**
December	93,543	1,790	96,147	55,931	247,411	139,968	36,228	76,669	25,912	16,841	**543,029**	0	0	0	0	0	**0**
Total	**1,416,654**	**328,865**	**2,964,062**	**1,682,619**	**6,392,200**	**7,513,170**	**3,347,248**	**4,183,045**	**1,276,354**	**891,057**	**23,603,074**	**12,323**	**3,437**	**37**	**15,797**	**432**	**16,228**

Total Load From Storm and CSO = 23,619,303

E. coli (MPN x 10^{12})

	Storm Outfalls						Creeks					CSO Outfalls					
Month	30th Ave Storm	Groat Rd. Storm	Quesnell Storm	Kennedale Storm	Monitored Storm Sub-Total	Remaining Storm	Mill Creek	Whitemud Creek	Horsehills Creek	Wedgewood Creek	**Total Storm**	Rat Creek CSO	Highlands CSO	Capilano CSO	AEP CSO Sub-Total	Remaining CSO	**Total CSO**
January	19	8	53	16	96	87	19	46	16	10	**274**	0	0	0	0	0	**0**
February	24	9	17	32	80	56	11	29	10	6	**192**	0	0	0	0	0	**0**
March	70	42	151	21	284	319	79	174	59	38	**952**	0	0	0	0	0	**0**
April	304	44	93	27	468	411	338	303	102	67	**1,690**	0	0	0	0	0	**0**
May	385	32	114	68	599	1,076	656	472	152	97	**3,052**	151	148	0	299	6	**305**
June	500	110	329	302	1,241	1,931	566	1,275	335	210	**5,559**	4,166	1,100	1	5,267	159	**5,426**
July	4,957	125	431	205	5,717	1,683	676	895	269	178	**9,418**	2,667	539	6	3,212	64	**3,276**
August	10,999	83	295	127	11,504	1,000	520	704	170	141	**14,039**	731	322	32	1,085	33	**1,117**
September	365	36	68	36	506	188	123	175	39	35	**1,066**	2	0	0	2	0	**2**
October	10	4	52	13	79	106	51	70	23	14	**342**	0	0	0	0	0	**0**
November	88	1	145	0	234	105	52	66	22	14	**493**	0	0	0	0	0	**0**
December	25	0	18	1	44	31	7	17	6	4	**108**	0	0	0	0	0	**0**
Total	**17,746**	**494**	**1,765**	**848**	**20,852**	**6,994**	**3,096**	**4,226**	**1,203**	**815**	**37,186**	**7,716**	**2,110**	**38**	**9,864**	**261**	**10,126**

Total Load From Storm and CSO = 47,311

Table 5: 2023 Rat Creek CSO Concentration Statistics

Month	Days with CSO Flows	TSS Mean (mg/L)	TSS Maximum (mg/L)	TSS Minimum (mg/L)	BOD Mean (mg/L)	BOD Maximum (mg/L)	BOD Minimum (mg/L)	TP Mean (mg/L)	TP Maximum (mg/L)	TP Minimum (mg/L)	*E. coli* Geo Mean (MPN/100 mL)	*E. coli* Maximum (MPN/100 mL)	*E. coli* Minimum (MPN/100 mL)
January	0	-	-	-	-	-	-	-	-	-	-	-	-
February	0	-	-	-	-	-	-	-	-	-	-	-	-
March	0	-	-	-	-	-	-	-	-	-	-	-	-
April	0	-	-	-	-	-	-	-	-	-	-	-	-
May	4	815.0	1180.0	510.0	228.0	264.0	192.0	5.6	8.3	3.6	2,577,865	2,820,000	2,400,000
June	6	180.5	181.0	180.0	54.0	63.0	45.0	2.2	4.6	1.3	1,500,177	1,920,000	1,340,000
July	6	525.0	960.0	140.0	129.5	262.0	52.0	2.5	3.8	1.4	1,867,867	2,760,000	1,440,000
August	3	458.0	458.0	458.0	72.0	72.0	72.0	4.5	10.0	1.8	3,264,179	6,870,000	2,250,000
September	1	458.0	458.0	458.0	72.0	72.0	72.0	17.1	17.1	17.1	6,490,000	6,490,000	6,490,000
October	0	-	-	-	-	-	-	-	-	-	-	-	-
November	0	-	-	-	-	-	-	-	-	-	-	-	-
December	0	-	-	-	-	-	-	-	-	-	-	-	-

Month	Days with CSO Flows	NH_3 Mean (mg/L)	NH_3 Maximum (mg/L)	NH_3 Minimum (mg/L)	NO_3+NO_2 Mean (mg/L)	NO_3+NO_2 Maximum (mg/L)	NO_3+NO_2 Minimum (mg/L)	TKN Mean (mg/L)	TKN Maximum (mg/L)	TKN Minimum (mg/L)	Chloride Mean (mg/L)	Chloride Maximum (mg/L)	Chloride Minimum (mg/L)
January	0	-	-	-	-	-	-	-	-	-	-	-	-
February	0	-	-	-	-	-	-	-	-	-	-	-	-
March	0	-	-	-	-	-	-	-	-	-	-	-	-
April	0	-	-	-	-	-	-	-	-	-	-	-	-
May	4	12.9	18.2	8.9	0.4	0.7	0.1	29.1	40.1	20.6	73.875	97.6	49
June	6	5.1	5.9	4.4	1.6	2.6	0.1	11.5	20.9	7.4	29.6	36.3	26.6
July	6	4.9	6.0	4.6	0.4	0.5	0.4	14.4	17.7	7.6	22.8	24.4	21.7
August	3	7.4	18.2	2.0	0.2	0.3	0.0	20.5	44.2	8.6	33.066667	58.2	20.5
September	1	21.2	21.2	21.2	0.0	0.0	0.0	74.4	74.4	74.4	71.3	71.3	71.3
October	0	-	-	-	-	-	-	-	-	-	-	-	-
November	0	-	-	-	-	-	-	-	-	-	-	-	-
December	0	-	-	-	-	-	-	-	-	-	-	-	-

Note: Number of samples might not equal to number of CSO events due to sampler malfunction and extended sampling event.

TABLE 6: List of Certified Wastewater Collection System Operators

Certified Wastewater Collection System Operators per Level of WWC Certification:

(1) Operators Level IV WWC Certified
(8) Operators Level III WWC Certified
(47) Operators Level II WWC Certified
(38) Operators Level I WWC Certified

Name	Title	WWC Certification Level
Fechner, Frank	Operations Engineer	IV
Bertin, Wendy	Engineering Technologist	III
Charrupi, Carlos	Maintenance Repairman I	III
Gunderson, John	Engineering Technologist	III
L'Heureux, Robin	Engineering Technologist	III
Lukenbill, Durward (Dylan)	Tradesman (Millwright 2)	III
McConnell, Peter	Drainage System Network Operator	III
Murphy, Steven	Drainage System Combo Operator	III
Powell, Ryan	Tradesman (Millwright 2)	III
Ambrosio, Jeffrey	Sewer Substructure Inspector	II
Aniskou, Evgeni	Engineering Technologist	II
Bishop, Shawn	Labour Foreman 3	II
Bronca, Robert	Labour Foreman 3	II
Brownoff, Nicholas	Tradesman (Millwright 2)	II
Coburn, Arthur	Drainage System Troubleman	II
Cuglietta, Carmine	Labour Foreman 3	II
Dowds, Alexander	Drainage System Combo Operator	II
Ewing, Nicole	Engineering Technologist	II
Fehr, Brittany	Engineering Technologist	II
Ferenac, Nikola	Labour Foreman 3	II
Forrest, Scott	Labourer 3	II
Fraser, Gordon	Labourer 2	II
Gawreletz, Kevin	Drainage System Troubleman	II
Goodine, John	Tradesman (Millwright 2)	II
Goonewardane, Anton	Equipment Operator 3	II
Guidoccio, Natalino	Drainage System Serviceman	II
Guidoccio, Nicholas	Labourer 3	II
Hammond, Richard	Drainage System Combo Operator	II
Hao, Yufu (Owen)	Industrial Wastewater Inspection Coordinator	II
Hogan, Alex	Engineering Technologist	II
Lawson, Linsey	Engineering Technologist	II

Lirazan, Warren	Drainage System Combo Operator	II
Macrury, Robert	Drainage System Troubleman	II
Manao, Manuel	Sewer Substructure Inspector	II
McKay, Brandy	Engineering Technologist	II
Miller, Wade	Tradesman (Millwright 2)	II
Montague, Thomas (Ian)	Labour Foreman 3	II
Nelson, Tim	Manager, Environmental Investigators	II
Persaud, Shawna	Equipment Operator 3	II
Pinder, Cristan	Industrial Wastewater Investigator	II
Purcell, Graham	Drainage System MTV Operator	II
Rivard, Shaune	Drainage System Troubleman	II
Samarasinghe, Kalutota	Labourer 2	II
Santrau, Alex	Tradesman (Millwright)	II
Schlacht, Shawn	Labour Foreman 3	II
Sedurante, Benjamin	Drainage System Troubleman	II
Sigstad, Lane	Tradesman (Millwright 2)	II
Shang, Michael	Drainage System Serviceman	II
Slonetzky, Tyler	Sewer Substructure Inspector	II
Soni, Rohit	Planner (FCF Maintenance)	II
Sorenson, Melvin	Labour Foreman 1	II
Sorenson, Tim	Labour Foreman 3	II
To, Alan	Labourer 2	II
Underhay, Dominic	Drainage System Combo Operator	II
Webster, Kenneth	Labour Foreman 3	II
Yang, Guang	Drainage System Combo Operator	II
Aspden, Kate	Engineering Technologist	I
Bandaralage, Upul Pe	Drainage System Combo Operator	I
Banister, Daniel	Industrial Wastewater Investigator	I
Barthel, Scott	Labourer 3	I
Bennet, Jay	Drainage System Serviceman	I
Bracha, Terra	Maintenance Repairman I	I
Braunig, Alex	Drainage System MTV Operator	I
Buck, Kerri	Engineering Technologist	I
Burk, Bradley	Labourer 3	I
Burns, Russel	Drainage System Combo Operator	I
Byrd, Jeff	Labourer 3	I

Byrne, Philip	Maintenance Repairman I	I
Campbell, Brent	Labour Foreman 1	I
Casella, Carmen	Labour Foreman 3	I
Dilts, Scott	Drainage System Combo Operator	I
Divino, Patrick	Drainage System Serviceman	I
Draghici, Courtney	Drainage System Combo Operator	I
Hay, Luke	Labourer 3	I
Hyshka, Anthony	Water Meter Installer 2	I
Knapton, Dayna	Drainage System MTV Operator	I
Lahaie, Ryan	Tradesman (Millwright)	I
Liao, Leslie	Tradesman (Millwright)	I
Masson, Sheldon	Drainage System Combo Operator	I
McCulloch, Mitch	Labourer 3	I
McHale, Ken	Drainage System Combo Operator	I
Nakpangi, Valene	Engineering Technologist	I
Nikapitiyawithana, Amith	Labourer 3	I
Rahal, Osman	Engineering Technologist	I
Rosell, Brandon	Maintenance Repairman 1	I
Runco, Frank	Drainage System Combo Operator	I
Ryley, Paul	Maintenance Repairman 1	I
Sandhu, Sangram	Labourer 3	I
Sheppard, Cody	Tradesman (Millwright)	I
Teslak, Leanne	Industrial Wastewater Investigator	I
Trudel, Tyler	Labourer 2	I
Valentini, Marco	Maintenance Repairman 1	I
Weiss, Dallas	Labourer 3	I
Wolfe, Brent	Drainage System Combo Operator	I

Note: The above table is the list of certified wastewater collection system operators as of December 31, 2023.

TABLE 7: 2023 Annual Product Usage at Pump Stations			
The Biomaxx Canada OXYN8 solution is used for odor control at sanitary pump stations.			
Pump Station	**Month**	**Product**	**Total Addition (L)**
PW213 Trumpeter	January	Biomaxx Canada OXYN8	1817
PW227 Chappelle Garden	January	Biomaxx Canada OXYN8	738
PW233 Edgemont II	January	Biomaxx Canada OXYN8	760
PW227 Chappelle Garden	February	Biomaxx Canada OXYN8	2880
PW213 Trumpeter	March	Biomaxx Canada OXYN8	962
PW227 Chappelle Garden	March	Biomaxx Canada OXYN8	3649
PW233 Edgemont II	March	Biomaxx Canada OXYN8	1374
PW213 Trumpeter	April	Biomaxx Canada OXYN8	3685
PW227 Chappelle Garden	April	Biomaxx Canada OXYN8	5543
PW233 Edgemont II	April	Biomaxx Canada OXYN8	3934
PW213 Trumpeter	May	Biomaxx Canada OXYN8	2938
PW227 Chappelle Garden	May	Biomaxx Canada OXYN8	5481
PW233 Edgemont II	May	Biomaxx Canada OXYN8	1756
PW213 Trumpeter	June	Biomaxx Canada OXYN8	3941
PW227 Chappelle Garden	June	Biomaxx Canada OXYN8	5558
PW233 Edgemont II	June	Biomaxx Canada OXYN8	2754
PW213 Trumpeter	July	Biomaxx Canada OXYN8	1992
PW227 Chappelle Garden	July	Biomaxx Canada OXYN8	4234
PW233 Edgemont II	July	Biomaxx Canada OXYN8	703
PW227 Chappelle Garden	August	Biomaxx Canada OXYN8	4430
PW233 Edgemont II	August	Biomaxx Canada OXYN8	2971
PW227 Chappelle Garden	September	Biomaxx Canada OXYN8	2227
PW233 Edgemont II	September	Biomaxx Canada OXYN8	3154
PW227 Chappelle Garden	October	Biomaxx Canada OXYN8	924
PW227 Chappelle Garden	November	Biomaxx Canada OXYN8	3984
PW233 Edgemont II	November	Biomaxx Canada OXYN8	2919
PW227 Chappelle Garden	December	Biomaxx Canada OXYN8	5729
PW233 Edgemont II	December	Biomaxx Canada OXYN8	159

Total Usage (L): 81,196

TABLE 8: 2023 Annual Usage of Reward® Herbicide

Date of Application	Stormwater Management Facility	Quantity Used (L)
01-Jun-23	Trumpeter #3 (13120-209 Street NW)	19
06-Jul-23	Ambleside #5 (1264-Ainslie Way SW)	19
14-Jul-23	MacTaggart #3 (4032-MacTaggart Drive NW)	11

Total Number of Applications: 3

Total Usage (L): 49

TABLE 9: 2023 Usage of Bright Dye

The use of Bright Dye in the **Field Operations** section is related to the identification of cross-connections in the collection system. The **Monitoring & Compliance** usage supports enforcement activities associated with Drainage By-law 19627 (EPCOR) and Drainage By-Law 18093 (City of Edmonton) and investigations of industrial and commercial customers.

Date Tested	Location of Test	Department / Section	Tests per Location	Bright Dye Usage (ml)
05-Jan-23	360-Huntington Hill NW	Monitoring & Compliance	1	25
10-Jan-23	11202-48 Avenue NW	Monitoring & Compliance	1	25
07-Feb-23	13880-110A Avenue NW	Monitoring & Compliance	1	20
07-Feb-23	132 - Fairway Drive NW	Monitoring & Compliance	1	15
17-Feb-23	14915 Stony Plain Road NW	Monitoring & Compliance	1	30
30-Mar-23	11028-135 Street NW	Monitoring & Compliance	1	25
31-Mar-23	11534-122 Street NW	Monitoring & Compliance	1	25
13-Apr-23	14915 Stony Plain Road NW	Monitoring & Compliance	1	25
20-Apr-23	12112-67 Street NW	Monitoring & Compliance	1	25
24-Apr-23	11028-135 Street NW	Monitoring & Compliance	1	25
11-May-23	11028-135 Street NW	Monitoring & Compliance	1	25
18-May-23	15917-88B Avenue NW	Monitoring & Compliance	1	25
18-May-23	15916-88B Avenue NW	Monitoring & Compliance	1	25
18-May-23	15921-88B Avenue NW	Monitoring & Compliance	1	25
18-May-23	15923-88B Avenue NW	Monitoring & Compliance	1	50
18-May-23	15926-88B Avenue NW	Monitoring & Compliance	1	50
18-May-23	8851-159A Street NW	Monitoring & Compliance	1	50
18-May-23	15924-88B Avenue NW	Monitoring & Compliance	1	50
13-Jun-23	9250-41 Avenue NW	Monitoring & Compliance	1	280

27-Jun-23	10604-60 Avenue NW	Monitoring & Compliance	1	25
29-Jun-23	15924-88B Avenue NW	Monitoring & Compliance	2	50
13-Jul-23	9859-78 Avenue NW	Monitoring & Compliance	2	50
01-Aug-23	10136-143 Street NW	Monitoring & Compliance	1	10
08-Aug-23	10136-143 Street NW	Monitoring & Compliance	1	100
08-Aug-23	10138-143 Street NW	Monitoring & Compliance	1	75
08-Aug-23	10140-143 Street NW	Monitoring & Compliance	1	75
23-Aug-23	17-Riverside Crescent NW	Monitoring & Compliance	1	15
31-Oct-23	21-Marlboro Road NW	Monitoring & Compliance	1	50
31-Oct-23	34-Marlboro Road NW	Monitoring & Compliance	1	75
31-Oct-23	39-Marlboro Road NW	Monitoring & Compliance	1	50
31-Oct-23	43-Marlboro Road NW	Monitoring & Compliance	1	25
31-Oct-23	49-Marlboro Road NW	Monitoring & Compliance	1	50
31-Oct-23	56-Marlboro Road NW	Monitoring & Compliance	1	75
31-Oct-23	60-Marlboro Road NW	Monitoring & Compliance	1	75
01-Nov-23	32-Marlboro Road NW	Monitoring & Compliance	1	75
01-Nov-23	36-Marlboro Road NW	Monitoring & Compliance	1	25
01-Nov-23	40-Marlboro Road NW	Monitoring & Compliance	1	50
01-Nov-23	41-Marlboro Road NW	Monitoring & Compliance	1	50
01-Nov-23	44-Marlboro Road NW	Monitoring & Compliance	1	50
01-Nov-23	47-Marlboro Road NW	Monitoring & Compliance	1	75
01-Nov-23	62-Marlboro Road NW	Monitoring & Compliance	1	50
02-Nov-23	19-Marlboro Road NW	Monitoring & Compliance	1	50
02-Nov-23	23-Marlboro Road NW	Monitoring & Compliance	1	25
02-Nov-23	25-Marlboro Road NW	Monitoring & Compliance	1	50
02-Nov-23	29-Marlboro Road NW	Monitoring & Compliance	1	25
02-Nov-23	45-Marlboro Road NW	Monitoring & Compliance	1	50
02-Nov-23	38-Marlboro Road NW	Monitoring & Compliance	1	75
02-Nov-23	46-Marlboro Road NW	Monitoring & Compliance	1	25
02-Nov-23	50-Marlboro Road NW	Monitoring & Compliance	1	50
02-Nov-23	66-Marlboro Road NW	Monitoring & Compliance	1	100
06-Nov-23	35-Marlboro Road NW	Monitoring & Compliance	1	25
21-Nov-23	12163-68 Street NW	Monitoring & Compliance	1	15
22-Nov-23	63-Fairway Drive NW	Monitoring & Compliance	1	25
22-Nov-23	58-Marlboro Road NW	Monitoring & Compliance	1	50
23-Nov-23	44-Fairway Drive NW	Monitoring & Compliance	1	50
23-Nov-23	48-Fairway Drive NW	Monitoring & Compliance	1	50
23-Nov-23	50-Fairway Drive NW	Monitoring & Compliance	1	50
23-Nov-23	54-Fairway Drive NW	Monitoring & Compliance	1	50
23-Nov-23	60-Fairway Drive NW	Monitoring & Compliance	1	50
23-Nov-23	63-Fairway Drive NW	Monitoring & Compliance	1	50

23-Nov-23	64-Fairway Drive NW	Monitoring & Compliance	1	50
23-Nov-23	65-Fairway Drive NW	Monitoring & Compliance	1	50
23-Nov-23	69-Fairway Drive NW	Monitoring & Compliance	1	50
23-Nov-23	72-Fairway Drive NW	Monitoring & Compliance	1	50
23-Nov-23	7210-144 Avenue NW	Monitoring & Compliance	1	25
27-Nov-23	44-Fairway Drive NW	Monitoring & Compliance	1	50
28-Nov-23	49-Fairway Drive NW	Monitoring & Compliance	1	50
28-Nov-23	58-Fairway Drive NW	Monitoring & Compliance	1	50
28-Nov-23	68-Fairway Drive NW	Monitoring & Compliance	1	50
28-Nov-23	47-Marlboro Road NW	Monitoring & Compliance	1	75
28-Nov-23	61-Fairway Drive NW	Monitoring & Compliance	1	50
29-Nov-23	15924-88B Avenue NW	Monitoring & Compliance	1	50
04-Dec-23	52-Fairway Drive NW	Monitoring & Compliance	1	50
04-Dec-23	44-Fairway Drive NW	Monitoring & Compliance	1	75
04-Dec-23	53-Fairway Drive NW	Monitoring & Compliance	1	50
04-Dec-23	51-Fairway Drive NW	Monitoring & Compliance	1	75
04-Dec-23	59-Fairway Drive NW	Monitoring & Compliance	1	50
04-Dec-23	62-Fairway Drive NW	Monitoring & Compliance	1	75
07-Dec-23	56-Westbrook Drive NW	Monitoring & Compliance	1	75
07-Dec-23	3812-Aspen Drive NW	Monitoring & Compliance	1	50
07-Dec-23	70-Fairway Drive NW	Monitoring & Compliance	1	50
07-Dec-23	62-Westbrook Drive NW	Monitoring & Compliance	1	50
08-Dec-23	12107-39 Avenue NW	Monitoring & Compliance	1	75
08-Dec-23	12108-39 Avenue NW	Monitoring & Compliance	1	100
08-Dec-23	12116-39 Avenue NW	Monitoring & Compliance	1	125
11-Dec-23	3907-Aspen Drive NW	Monitoring & Compliance	1	50
11-Dec-23	46-Fairway Drive NW	Monitoring & Compliance	1	50
11-Dec-23	47-Fairway Drive NW	Monitoring & Compliance	1	50
12-Dec-23	12408-40 Avenue NW	Monitoring & Compliance	1	50
12-Dec-23	3904-121 Street NW	Monitoring & Compliance	1	75
12-Dec-23	12112-39 Avenue NW	Monitoring & Compliance	1	100
12-Dec-23	12103-39 Avenue NW	Monitoring & Compliance	1	100
12-Dec-23	12116-39 Avenue NW	Monitoring & Compliance	1	125
12-Dec-23	12111-39 Avenue NW	Monitoring & Compliance	1	125
12-Dec-23	12115-39 Avenue NW	Monitoring & Compliance	1	125
13-Dec-23	67-Fairway Drive NW	Monitoring & Compliance	1	75
13-Dec-23	75-Westbrook Drive NW	Monitoring & Compliance	1	50
13-Dec-23	42-Marlboro Road NW	Monitoring & Compliance	1	50
14-Dec-23	68-Marlboro Road NW	Monitoring & Compliance	1	75
14-Dec-23	58-Westbrook Drive NW	Monitoring & Compliance	1	75
18-Dec-23	2915-16 Street NW	Monitoring & Compliance	1	75

19-Dec-23	2824-16 Street NW	Monitoring & Compliance	1	75
19-Dec-23	2811-16 Street NW	Monitoring & Compliance	1	100
22-Dec-23	27-Marlboro Road NW	Monitoring & Compliance	1	50
22-Dec-23	13859-110A Avenue NW	Monitoring & Compliance	1	50
22-Dec-23	13855-110A Avenue NW	Monitoring & Compliance	1	50
22-Dec-23	13868-110A Avenue NW	Monitoring & Compliance	1	50

Total Number of Tests: 109
Total Usage (mL): 5,985

TABLE 10: 2023 Usage of De-Icing Product

Date	Outfall Number	Directly Affected Watercourse	Number of Applications	Total Amount of De-Icing Product Applied (Kg)
03-Jan-23	52	North Sask. River	1	100
03-Jan-23	57	North Sask. River	2	100
03-Jan-23	65	North Sask. River	1	50
03-Jan-23	121	North Sask. River	1	50
05-Jan-23	78	Goldbar Creek	2	100
05-Jan-23	N/A	North Sask. River	1	40
05-Jan-23	65	North Sask. River	2	60
05-Jan-23	59	North Sask. River	1	90
05-Jan-23	156	Fulton Creek	1	40
06-Jan-23	31	North Sask. River	1	40
06-Jan-23	87	Kennedale Ravine	1	60
06-Jan-23	23D	North Sask. River	1	40
06-Jan-23	52	North Sask. River	1	60
09-Jan-23	3	Whitemud Creek	1	50
09-Jan-23	4	Whitemud Creek	1	100
09-Jan-23	1	Whitemud Creek	1	40
09-Jan-23	274	Blackmud Creek	3	70
10-Jan-23	274	Blackmud Creek	1	50
10-Jan-23	263	Blackmud Creek	2	100
10-Jan-23	277	Blackmud Creek	1	70
10-Jan-23	265	Whitemud Creek	2	120
11-Jan-23	65	North Sask. River	2	90
12-Jan-23	87	Kennedale Ravine	1	80
12-Jan-23	71	North Sask. River	2	100

13-Jan-23	59	North Sask. River	1	20
13-Jan-23	268	North Sask. River	1	50
13-Jan-23	267	North Sask. River	1	50
16-Jan-23	46	North Sask. River	1	10
16-Jan-23	109	North Sask. River	1	30
16-Jan-23	47	North Sask. River	2	140
16-Jan-23	108	North Sask. River	1	50
16-Jan-23	31	North Sask. River	1	20
16-Jan-23	195	Mill Creek South	1	100
16-Jan-23	192	Mill Creek South	1	40
17-Jan-23	21	North Sask. River	2	130
17-Jan-23	118	North Sask. River	1	50
17-Jan-23	15	North Sask. River	1	70
17-Jan-23	183	North Sask. River	1	20
17-Jan-23	182	North Sask. River	1	30
17-Jan-23	132	Ramsay Ravine	1	20
17-Jan-23	125	Ramsay Ravine	1	50
18-Jan-23	119	Westridge Ravine	2	120
18-Jan-23	257	Wedgewood Creek	2	120
18-Jan-23	298	North Sask. River	1	80
18-Jan-23	136	Ramsay Ravine	1	20
18-Jan-23	138	Ramsay Ravine	1	20
18-Jan-23	126	Ramsay Ravine	1	30
18-Jan-23	124	Ramsay Ravine	1	20
18-Jan-23	123	Ramsay Ravine	1	20
19-Jan-23	101	North Sask. River	2	110
19-Jan-23	123A	Ramsay Ravine	1	30
20-Jan-23	314	North Sask. River	1	80
20-Jan-23	23C	North Sask. River	1	40
20-Jan-23	30	North Sask. River	1	20
20-Jan-23	29	North Sask. River	1	40
20-Jan-23	24	North Sask. River	1	40
23-Jan-23	249	Mill Creek South	1	40
23-Jan-23	192	Mill Creek South	1	40
23-Jan-23	71	North Sask. River	1	60
24-Jan-23	264	Blackmud Creek	1	90
24-Jan-23	59	North Sask. River	1	80
24-Jan-23	268	North Sask. River	1	50
24-Jan-23	267	North Sask. River	1	50
24-Jan-23	71	North Sask. River	1	50

25-Jan-23	257	Wedgewood Creek	2	100
25-Jan-23	148	North Sask. River	1	50
25-Jan-23	108	North Sask. River	1	40
25-Jan-23	47	North Sask. River	1	40
25-Jan-23	109	North Sask. River	1	40
26-Jan-23	119	North Sask. River	1	20
26-Jan-23	182	North Sask. River	1	30
26-Jan-23	183	North Sask. River	1	30
26-Jan-23	132	Ramsay Ravine	1	20
26-Jan-23	125	Ramsay Ravine	1	40
27-Jan-23	277	North Sask. River	1	80
30-Jan-23	139	Ramsay Ravine	1	50
30-Jan-23	136	Ramsay Ravine	1	20
30-Jan-23	138	Ramsay Ravine	1	20
31-Jan-23	124	Ramsay Ravine	1	40
31-Jan-23	123	Ramsay Ravine	1	40
31-Jan-23	123A	Ramsay Ravine	1	30
31-Jan-23	31	North Sask. River	1	30
31-Jan-23	30	North Sask. River	1	50
01-Feb-23	101	North Sask. River	2	120
01-Feb-23	314	North Sask. River	1	80
01-Feb-23	29	North Sask. River	1	60
01-Feb-23	24	North Sask. River	1	40
02-Feb-23	23D	North Sask. River	1	30
02-Feb-23	249	Mill Creek South	1	40
02-Feb-23	195	Mill Creek South	1	30
02-Feb-23	192	Mill Creek South	1	40
03-Feb-23	207	Blackmud Creek	1	50
03-Feb-23	277	Blackmud Creek	1	70
03-Feb-23	264	Blackmud Creek	1	50
03-Feb-23	274	Blackmud Creek	1	20
03-Feb-23	275	Blackmud Creek	1	60
06-Feb-23	265	Whitemud Creek	2	50
06-Feb-23	277	Whitemud Creek	1	10
06-Feb-23	65	North Sask. River	1	40
07-Feb-23	57	North Sask. River	1	30
07-Feb-23	156	Fulton Creek	1	40
08-Feb-23	77	Goldbar Creek	1	20
08-Feb-23	65	North Sask. River	1	20
08-Feb-23	183	North Sask. River	1	30

08-Feb-23	182	North Sask. River	1	30
08-Feb-23	132	Ramsay Ravine	1	30
09-Feb-23	125	Ramsay Ravine	1	30
09-Feb-23	139	Ramsay Ravine	1	20
09-Feb-23	136	Ramsay Ravine	1	20
09-Feb-23	138	Ramsay Ravine	1	10
09-Feb-23	126	Ramsay Ravine	1	40
09-Feb-23	124	Ramsay Ravine	1	20
09-Feb-23	123	Ramsay Ravine	1	20
10-Feb-23	123A	Ramsay Ravine	1	30
10-Feb-23	31	North Sask. River	1	40
10-Feb-23	30	North Sask. River	1	40
10-Feb-23	29	North Sask. River	1	30
14-Feb-23	24	North Sask. River	1	40
14-Feb-23	87	Kennedale Ravine	1	40
14-Feb-23	71	North Sask. River	1	50
16-Feb-23	268	North Sask. River	1	30
16-Feb-23	267	North Sask. River	1	40
16-Feb-23	148	North Sask. River	1	40
17-Feb-23	108	North Sask. River	1	30
17-Feb-23	47	North Sask. River	1	30
17-Feb-23	109	North Sask. River	1	30
17-Feb-23	46	North Sask. River	1	20
17-Feb-23	118	North Sask. River	1	20
17-Feb-23	21	North Sask. River	1	20
02-Mar-23	65	North Sask. River	1	120
03-Mar-23	195	Mill Creek South	1	40
03-Mar-23	65	North Sask. River	1	40
03-Mar-23	77	Goldbar Creek	1	30
06-Mar-23	65	North Sask. River	1	60
06-Mar-23	3	Whitemud Creek	1	60
06-Mar-23	3A	Whitemud Creek	1	60
06-Mar-23	249	Mill Creek South	1	60
06-Mar-23	78	Goldbar Creek	1	60
06-Mar-23	77	Goldbar Creek	1	40
07-Mar-23	139	Ramsay Ravine	1	50
07-Mar-23	132	Ramsay Ravine	1	10
07-Mar-23	125	Ramsay Ravine	1	40
07-Mar-23	136	Ramsay Ravine	1	20
07-Mar-23	126	Ramsay Ravine	1	40

07-Mar-23	124	Ramsay Ravine	1	20
07-Mar-23	123	Ramsay Ravine	1	20
07-Mar-23	123A	Ramsay Ravine	1	30
07-Mar-23	183	North Sask. River	1	30
07-Mar-23	182	North Sask. River	1	30
07-Mar-23	138	Ramsay Ravine	1	10
08-Mar-23	30	Ramsay Ravine	1	40
08-Mar-23	20	Ramsay Ravine	1	20
08-Mar-23	29	Ramsay Ravine	1	20
08-Mar-23	24	Ramsay Ravine	1	80
13-Mar-23	65	North Sask. River	1	70
13-Mar-23	194	Mill Creek South	1	80
13-Mar-23	195	Mill Creek South	1	40
14-Mar-23	52	North Sask. River	1	20
14-Mar-23	57	North Sask. River	1	30
14-Mar-23	156	Fulton Creek	1	40
15-Mar-23	78	Goldbar Creek	1	40
15-Mar-23	77	Goldbar Creek	1	20
15-Mar-23	65	North Sask. River	1	20
16-Mar-23	192	Mill Creek South	1	30
16-Mar-23	118	North Sask. River	1	60
17-Mar-23	15	North Sask. River	1	40
17-Mar-23	119	Westridge Ravine	1	40
17-Mar-23	257	Wedgewood Creek	1	50
17-Mar-23	298	North Sask. River	1	30
20-Mar-23	87	Kennedale Ravine	1	20
21-Mar-23	268	North Sask. River	1	20
21-Mar-23	267	North Sask. River	1	20
21-Mar-23	148	North Sask. River	1	20
21-Mar-23	108	North Sask. River	1	20
21-Mar-23	47	North Sask. River	1	30
21-Mar-23	109	North Sask. River	1	20
21-Mar-23	46	North Sask. River	1	10
22-Mar-23	183	North Sask. River	1	20
22-Mar-23	182	North Sask. River	1	20
22-Mar-23	132	Ramsay Ravine	1	30
22-Mar-23	125	Ramsay Ravine	1	30
22-Mar-23	139	Ramsay Ravine	1	50
22-Mar-23	136	Ramsay Ravine	1	30
22-Mar-23	138	Ramsay Ravine	1	10

22-Mar-23	126	Ramsay Ravine	1	50
23-Mar-23	124	Ramsay Ravine	1	30
23-Mar-23	123	Ramsay Ravine	1	20
23-Mar-23	123A	Ramsay Ravine	1	40
23-Mar-23	31	North Sask. River	1	10
23-Mar-23	29	Ramsay Ravine	1	20
23-Mar-23	24	Ramsay Ravine	1	30
24-Mar-23	195	Mill Creek South	1	20
27-Mar-23	192	Mill Creek South	1	30
27-Mar-23	118	North Sask. River	1	110
28-Mar-23	21	North Sask. River	1	30
28-Mar-23	15	North Sask. River	1	50
29-Mar-23	119	Westridge Ravine	1	60
29-Mar-23	257	Wedgewood Creek	2	80
29-Mar-23	52	North Sask. River	1	20
30-Mar-23	153	North Sask. River	1	20
30-Mar-23	58	North Sask. River	1	50
30-Mar-23	156	Fulton Creek	1	40
30-Mar-23	77	Goldbar Creek	1	10
03-Apr-23	118	North Sask. River	1	70
03-Apr-23	132	Ramsay Ravine	1	30
03-Apr-23	125	Ramsay Ravine	1	10
04-Apr-23	182	North Sask. River	1	10
04-Apr-23	136	Ramsay Ravine	1	10
04-Apr-23	138	Ramsay Ravine	1	10
04-Apr-23	126	Ramsay Ravine	1	20
05-Apr-23	123A	Ramsay Ravine	1	20
05-Apr-23	24	North Sask. River	1	20
11-Apr-23	118	North Sask. River	1	20
13-Apr-23	121	North Sask. River	1	20
26-Oct-23	18	North Sask. River	1	18

Total Number of Applications: 233
Total Usage (Kg): 9,248

TABLE 11: 2023 Operational Issues - Drainage Services

Date of Occurrence	Location	Incident Description	Type	AEPA Reference Number
05-Jan-23	48-Avenue & 104A-Street NW	Sample results of the stormwater from a storm manhole (MH231365) located in the Empire Park neighborhood were received and reviewed by EPCOR Drainage Monitoring & Compliance. The results of the sample (E. coli = 2,200,000 CFU/100mL) collected on January 3rd confirmed that untreated wastewater was entering the storm collection system thru a cross-connection. The untreated wastewater from this cross-connection would release into Whitemud Creek thru storm Outfall #2 (OF211035). Drainage investigators have confirmed a cross-connection at 4835-104A Avenue NW. A Notice to Comply was issued to the property owners to discontinue the release of restricted waste (untreated wastewater) into the storm sewerage system. This release was reported to AEPA by EPCOR Drainage – Monitoring & Compliance. A written report was issued to AEPA on January 12, 2023.	Reportable-3rd Party Release	408332
11-Jan-23	2551-Hewes Way NW	Coolant (approx. 2L) was released from an ETS bus into a private storm catch basin at the Mill Woods Transit Center. EPCOR Drainage investigators observed that the coolant was contained within the catch basin and there was no release into the EPCOR storm collection system. A 3rd party environmental company (GFL Environmental) was mobilized to the site to removed contaminants from the impacted catch basin and surrounding area. This release was reported to AEPA by the City of Edmonton. A written report was issued to AEPA on January 16, 2023.	Reportable-3rd Party Release	408547
12-Jan-23	3203-103 Avenue NW	Untreated wastewater (unknown volume) was released into the storm collection system from a sanitary manhole (MH270913) overflow. A dual-pipe was discovered to have partially failed which redirected a portion of the sanitary flow at this location to the storm collection system. The untreated wastewater from this overflow would release into the storm collection system thru storm Outfall #71 (OF270996). EPCOR equipment was mobilized to this site to remove material from the manhole, thereby stopping the release of untreated wastewater to the storm collection system. EPCOR is in the process of implementing a permanent repair that will prevent potential reoccurrence of this issue. This release was reported to AEPA by EPCOR Drainage – Monitoring & Compliance. A written report was issued to AEPA on January 20, 2023.	Reportable-Internal	408624
25-Jan-23	36-Avenue & -106A Street NW	Hydraulic fluid (approx. 2L) was released from a City of Edmonton – Roadways vehicle into a storm catch basin (CB305523). EPCOR Drainage investigators observed that the hydraulic fluid was contained within the catch basin and there was no release of contaminants into the EPCOR storm collection system. A 3rd party environmental company (GFL Environmental) was mobilized to the site to removed contaminants from the impacted catch basin and surrounding area. This release was reported to AEPA by the City of Edmonton. A written report was issued to AEPA on January 31, 2023.	Reportable-3rd Party Release	408986
25-Jan-23	9423-149 Street NW	During the excavation of a trench at an EPCOR Drainage Construction site, a gas detector sent off an alarm for benzene (10ppm). The site was shut down and the trench aired out. The potentially contaminated soil was excavated from the trench and taken to GFL Environmental for disposal. This event was reported to AEPA. A written report was issued to AEPA on February 6, 2023.	Reportable-3rd Party Release	409132
25-Jan-23	15134-127 Street NW	Gasoline (approx. 0.5L) was released into a private storm catch basin from a public vehicle accident. EPCOR Drainage investigators observed a sheen of hydrocarbons in the private catch basin and a trace of hydrocarbons in the EPCOR storm collection system. A 3rd party environmental company (Renew Services) was mobilized to the site to removed contaminants from the impacted catch basin and surrounding area. This release was reported to AEPA by City of Edmonton – Fire Services. A written report was issued to AEPA on February 1, 2023.	Reportable-3rd Party Release	409014

26-Jan-23	8501-70 Avenue NW	EPCOR Drainage Investigators responded to a public report of hydrocarbons coming from storm Outfall #196 (OF385992) located in the Mill Creek Ravine. Warm temperatures and rain in recent days had led to a period of sustained snow melt and increased runoff at this location. There is a large contributing area upstream of this location that includes industrial, commercial facilities, roadways and parking lots. The amount of sheen observed in the creek was consistent with typical first flush roadway runoff, rather than a large point source release. EPCOR verified that no third party releases had been reported upstream of this area of Mill Creek. Additional upstream inspections of the system were completed and no point source release was identified. EPCOR deployed hydrocarbon adsorbent booms at the mouth of the outfall, then moved downstream and placed another set of booms across Mill Creek. EPCOR returned on January 27, 2023 and removed the hydrocarbon booms from the downstream location as no sheen or odour were present. This release was reported to AEPA. A written report was issued to AEPA on February 2, 2023.	Reportable-3rd Party Release	409045
27-Jan-23	9806-93A Avenue NW	During the construction of a new pedestrian bridge in the Mill Creek Ravine, inspections were completed of the collection system infrastructure adjacent to the project boundaries. An inspection of a 600mm combined sewer pipe (PIP#86046) revealed a deflection in the pipe. No release to the environment was observed from the deflected pipe or from the surrounding sections of the collection system. Physical inspection of the area has indicated no physical or visual evidence of surface discharges or subsidence at this location. Additional flow and level monitoring with alarms have been installed upstream and downstream of this location to monitor the 600 mm pipe. Contingency bypass planning is in place in the event of complete failure of the pipe section. EPCOR is currently working to design and implement an appropriate plan to repair or replace the failed section of the pipe or re-design the collection system in the area. This event was reported to AEPA by EPCOR Drainage to provide awareness of a potential system issue. A written report was issued to AEPA on February 3, 2023.	Reportable-Internal	409061
31-Jan-23	11510- 153 Avenue NW	Hydraulic fluid (approx. 1L) was released from a zamboni at the City of Edmonton - Castle Downs arena. City of Edmonton (COE) staff scraped up the ice / hydraulic fluid and placed the contaminants near a shop interceptor. As the ice melted, the contaminated material entered into the interceptor. COE staff used absorbent pads to remove the hydraulic fluid from the interceptor. There was no release of hydraulic fluid to the storm / sanitary collection system. This release was reported to AEPA by the City of Edmonton. AEPA has not requested a written report.	Reportable-3rd Party Release	409152
01-Feb-23	5545-89 Street NW	Sample results of the stormwater discharge from a private manufacturing company (Edmonton Exchanger) were received and reviewed by EPCOR Drainage - Monitoring & Compliance. The results of the sample exceeded Bylaw 19627 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for Chemical Oxygen Demand at 758 mg/L, Cadmium at 0.0007 mg/L, Chromium at 0.996 mg/L, Copper at 0.45 mg/L, Lead at 0.036 mg/L, Nickel at 0.722 mg/L, Oil & Grease at 20 mg/L and Zinc at 1.87 mg/L. The original sample from the company was collected on January 25, 2023 by Drainage investigators. A Notice to Comply was issued to the company on February 1, 2023. This Notice requires the company to discontinue the release of restricted waste into the sewerage system. This release was reported to AEPA by the company. A written report was issued to AEPA on February 6, 2023.	Reportable-3rd Party Release	409243
02-Feb-23	8631-Stadium Road NW	Hydraulic fluid (approx. 75L) was released from an industrial laundry company (Canadian Linen & Uniform Service). The release was contained within a floor sump at the facility and was cleaned-up by the company using absorbent material from a spill kit. There was no release of hydraulic fluid to the storm / sanitary collection system. This release was reported to AEPA by the company. AEPA has not requested a written report.	Reportable-3rd Party Release	409220
14-Feb-23	14490-157 Street NW	Diesel fuel (approx. 550L) was released into a private storm catch basin located at Highlands Moving & Storage Ltd. EPCOR Drainage investigators responded to the fuel theft incident and observed diesel fuel leading from a company truck into a nearby private storm catch basin. The investigators confirmed that the release was contained within the catch basin and had not entered the EPCOR storm collection system. A 3rd party environmental company (GFL Environmental) was mobilized to the site to removed contaminants from the impacted catch basin and surrounding area. This release was reported to AEPA by the company. Originally, AEPA had requested a written report. However, AEPA waived the requirement for the written report as the company was able to get the impacted catch basin cleaned and the release had not migrated downstream.	Reportable-3rd Party Release	409648

26-Feb-23	9307-118 Avenue NW	Gasoline (approx. 140L) was released into a private storm catch basin located at the Popular Bakery. EPCOR Drainage investigators responded to the AEPA report of a fuel theft incident and observed a release of gasoline leading into a private storm catch basin. The investigators confirmed that the release was contained within the catch basin and had not entered the EPCOR storm collection system. A 3rd party environmental company was mobilized to the site to removed contaminants from the impacted catch basin and surrounding area. This release was reported to AEPA by City of Edmonton – Fire Services. AEPA has not requested a written report.	Reportable-3rd Party Release	409947
01-Mar-23	105-Avenue & 170-Street NW	During a regularly scheduled inspection of a double barrel trunkline an EPCOR crew identified a leak of untreated wastewater from the sanitary trunk line (PIP66420) into the adjacent storm trunk line (PIP66449). On March 2nd Drainage crews patched up the leak using cement grout and the release of untreated wastewater into the storm collection system was stopped. This release was reported to AEPA. A written report was issued to AEPA on March 8, 2023.	Reportable-Internal	410094
08-Mar-23	80-Avenue & 95A-Street NW	EPCOR Drainage completed a maintenance project within Storm Outfall #249 (OF339887) located along the Mill Creek Ravine. TC Infrastructure Services Ltd. (TC) was contracted to conduct the maintenance work. Turbidity/total suspended sediment (TSS) water quality monitoring was required for the duration of instream work. Project activity resulted in a number of sediment laden water releases as identified by the turbidity monitoring program. These releases occurred over a number of days from March 8, 2023 to March 15, 2023. Elevated turbidity/TSS is a major risk associated with in-stream work and a plan and mitigations were in place to monitor and adjust operations accordingly. Although the durations of elevated turbidity/TSS were relatively short, all exceedances were reported to Alberta Environment and Protected Areas (AEPA) by the EPCOR environmental consultant. Contractor modified operations on the advice of the consultant to reduce and/or mitigate the impacts of the turbidity releases. These releases were reported to AEPA. A written report was issued to AEPA for each reference number.	Reportable-Internal	410410 410446 410488 410489 410559 410608 410609 410651
17-Mar-23	8117-Davies Road NW	Sample results of the shop interceptor discharge (unknown volume) from a private machine shop (CNC Machining) were received and reviewed by EPCOR Drainage - Monitoring & Compliance. The results of the sample exceeded Bylaw 19627 Appendix B Restricted Wastes Applicable to Sanitary and Combined Sewers for Zinc at 241 mg/L and Nickel at 101 mg/L. The original sample from the company was collected on March 9, 2023 by Drainage investigators. A Notice to Comply was issued to the company to discontinue the release of hazardous / restricted waste to the sanitary sewer system. This release was reported to AEPA by the company. A written report was not requested by AEPA.	Reportable-3rd Party Release	410661
18-Mar-23	85-Street & 70-Avenue NW	EPCOR Drainage investigators responded to an AEPA report of a visible sheen downstream of the Mill Creek Outfall #196 (OF385992). Investigators arrived on site and reported a faint hydrocarbon odor, but no hydrocarbon sheen at the location provided by AEPA. A light white sheen was observed on the surface of Mill Creek, downstream of the reported location. The investigators deployed an absorbent boom downstream of the white sheen. Samples were collected and the results indicated no hydrocarbon exceedances. As a precaution EPCOR left absorbent booms in place to collected any trace hydrocarbons from spring runoff and will periodically re-inspect this location and replace the booms as required. With temperatures ranging from 5C to -5C around the day of the investigation, the sheen was likely associated with urban runoff. As a precaution EPCOR left absorbent booms in place to collected any trace hydrocarbons from spring runoff and will periodically re-inspect this location and replace the booms as required. This release was reported to AEPA. A written report was issued to AEPA on March 24, 2023.	Reportable-3rd Party Release	410702
22-Mar-23	10727-132 Street NW	Transmission fluid (approx. 1L) was released into a storm catch basin (MH257360) by a private resident. EPCOR Industrial Wastewater Investigators observed that the transmission fluid was contained within the catch basin and there was no release of contaminants into the storm collection system An absorbent boom was placed in the catch basin to remove any contaminants. The investigators also advised the resident that they should not be repairing vehicles on a roadway near a storm catch basin. This release was reported to AEPA by the resident. A written report was not requested by AEPA.	Reportable-3rd Party Release	410867
26-Mar-23	12907-112 Street NW	Gasoline (approx. 5L) was released from a fuel theft incident at the City of Edmonton - Grand Trunk Leisure Centre. The City of Edmonton – Fire Services responded to this event and removed contaminants from the spill site. EPCOR Drainage investigators observed that there	Reportable-3rd Party Release	411019

		was no evidence that the fuel entered the storm collection system. This release was reported to AEPA by the City of Edmonton. A written report was not requested by AEPA.		
29-Mar-23	7104-91 Street NW	Hydraulic fluid (approx. 10L) was released into the storm collection system from a City of Edmonton grader. EPCOR Drainage investigators observed that an active hydrocarbon sheen was flowing down the roadway towards a nearby storm catch basin (CM230284). A 3rd party environmental company (Nor-Alta) was mobilized to the site to removed contaminants from the impacted storm collection system and surrounding area. This release was reported to AEPA by the City of Edmonton. A written report was issued to AEPA on April 5, 2023.	Reportable-3rd Party Release	411110
05-Apr-23	11028-135 Street NW	Untreated wastewater (unknown volume) was released into the storm collection system from a cross-connection at a private residence. EPCOR Drainage investigators confirmed the cross-connection thru verified sample results and dye testing. A Notice to Comply was issued to the homeowner to locate and repair the cross-connection. This release was reported to AEPA by EPCOR Monitoring & Compliance. A written report was issued to AEPA on April 12, 2023.	Reportable-3rd Party Release	411364
06-Apr-23	776-Welsh Drive SW	Diesel fuel (approx. 5L) was released into a storm catch basin (CB444190) from a vehicle slip tank. City of Edmonton – Fire Services responded to this event and used absorbent material to clean-up the spill site and impacted catch basin. EPCOR Drainage investigators observed that the fuel had been contained within the catch basin and there was no release into the storm collection system. This release was reported to AEPA by City of Edmonton – Fire Services. A written report was not requested by AEPA.	Reportable-3rd Party Release	411429
11-Apr-23	1109-162 Street NW	Fuel (approx. 5L) was released into the storm collection system (CB480601) from a private residence. EPCOR Drainage investigators responded to this incident and used absorbent material to contain the fuel at the spill site. A 3rd party environmental company (GFL Environmental) was called in to clean the impacted storm collection system. The investigators confirmed that no contaminants had entered the downstream Glenridding SWMF #1 (SWM480673). A Notice to Comply was issued to the property owner to discontinue the release of prohibited waste into the sewerage system. This release was reported to AEPA by City of Edmonton – Fire Services. A written report was not requested by AEPA.	Reportable-3rd Party Release	411539
14-Apr-23	16707-121 Avenue NW	Untreated wastewater (unknown volume) was released into the storm collection system at the UFA Petroleum Agency. EPCOR Drainage investigators responded to this incident and observed that a surcharging private sanitary manhole was releasing into a nearby private catch basin. A 3rd party company (GFL Environmental) was called-in to release the blockage and clean the spill site / impacted storm catch basin. A Notice to Comply was issued to the company to discontinue the release of restricted / prohibited waste into the storm sewerage system. This release was reported to AEPA by the company. A written report was issued to AEPA on April 17, 2023.	Reportable-3rd Party Release	411694
15-Apr-23	14406-103 Avenue NW	Restricted wastewater (approx. 17 cubic meters) was released into the storm collection system from a private residence. EPCOR Drainage investigators responded to this incident and observed that a contractor was pumping wastewater from a flooded basement onto an alleyway that was releasing into a storm catch basin (CB345503). The results of sample collected by the investigators exceeded Bylaw 19627 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for Ammonia - Nitrogen at 3.98 mg/L and Biochemical Oxygen Demand at 211 mg/L. EPCOR equipment was mobilized to the site to clean-up the spill and impacted storm catch basin. A Notice to Comply was issued to the homeowner to discontinue the release of restricted waste into the sewerage system. This release was reported to AEPA by the contractor. A written report was requested by AEPA.	Reportable-3rd Party Release	411721
17-Apr-23	5404-59 Avenue NW	Sample results of the stormwater discharge from the City of Edmonton (COE) SE district yard facility were received and reviewed by COE Engineering Services. The results of the sample exceeded Bylaw 19627 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for Chemical Oxygen Demand at 678 mg/L and Cadmium at 0.002 mg/L. The original sample from the SE district yard facility was collected on April 4, 2023 by COE Environmental Technologists. This release was reported to AEPA by the City of Edmonton. A written report was issued to AEPA on April 24, 2023.	Reportable-3rd Party Release	411798
17-Apr-23	14402-114 Avenue NW	Sample results of the stormwater discharge from the City of Edmonton (COE) NW district yard facility were received and reviewed by COE Engineering Services. The results of the sample exceeded Bylaw 19627 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for Chemical Oxygen Demand at 218 mg/L, Cadmium at 0.0013 mg/L, Lead at 0.048 mg/L	Reportable-3rd Party Release	411800

		and Zinc at 0.48 mg/L. The original sample from the NW district yard facility was collected on April 4, 2023 by COE Environmental Technologists. This release was reported to AEPA by the City of Edmonton. A written report was issued to AEPA on April 24, 2023.		
17-Apr-23	13003-56 Street NW	Sample results of the stormwater discharge from the City of Edmonton (COE) NE district yard facility were received and reviewed by COE Engineering Services. The results of the sample exceeded Bylaw 19627 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for Chemical Oxygen Demand at 515 mg/L and Cadmium at 0.001 mg/L. The original sample from the NE district yard facility was collected on April 4, 2023 by COE Environmental Technologists. This release was reported to AEPA by the City of Edmonton. A written report was issued to AEPA on April 24, 2023.	Reportable-3rd Party Release	411799
19-Apr-23	5985-South Terwillegar Boulevard NW	EPCOR Drainage responded to a public report of dead fish at the South Terwillegar #2 SWMF (SWMF447233). An EPCOR Drainage crew was dispatched to the site and confirmed that a large number of dead fish were present and appeared to have died sometime during the winter. Several Drainage workers were dispatched to the SWMF to collect and dispose of the fish carcasses (approx. 70Kg) at the City of Edmonton – Waste Management Centre. AEPA has been notified of this incident. A Fish Kill Form has been forwarded to AEPA as per their request.	Reportable-Internal	N/A
26-Apr-23	8760-80 Avenue NW	Untreated wastewater (unknown volume) was released thru an interconnection (IC-151). A blockage occurred in a combined line sewer pipe, which then released untreated wastewater thru the interconnection into the nearby storm manhole (MH246493). EPCOR Drainage equipment was mobilized to the site and released the blockage. It has been confirmed that during dry weather flow, the storm line at this location flows into the combined sewer system and on to the Gold Bar Wastewater Treatment Plant for treatment. This release was reported to AEPA. A written report was issued to AEPA on May 3, 2023.	Reportable-Internal	412126
28-Apr-23	12030-28 Street NE	Ethylene glycol (approx. 5L) was released into a private storm catch basin from a private company (The Curbinator). EPCOR Drainage investigators responded to this incident confirmed that the release was contained within the catch basin. The Curbinator cleaned up the impacted catch basin and surrounding area. There was no release of ethylene glycol to the storm / sanitary collection system. This release was reported to AEPA by the property owner. A written report was issued to AEPA on May 2, 2023.	Reportable-3rd Party Release	412190
29-Apr-23	118-Avenue & 129-Street NW	Ethylene glycol (approx. 5L) was released into a storm catch basin (CB276259) from a vehicle accident. EPCOR Drainage investigators responded to this incident and confirmed that the catch basin drains into a storm sewer (PIP53856), which releases downstream into a combined line which leads to the Gold Bar Wastewater Treatment Plant for treatment. This release was reported to AEPA by City of Edmonton – Fire Services. A written report was not requested by AEPA.	Reportable-3rd Party Release	412227
03-May-23	13215-97 Street NW	Motor oil (approx. 10L) was released into a private storm catch basin from an environmental company (GFL Environmental) truck. EPCOR Drainage investigators observed that the release was contained within the catch basin sump. A vactor unit from a 3rd party environmental company (GFL Environmental) cleaned the impacted catch basin and surrounding area. There was no release of motor oil to the storm collection system. This release was reported to AEPA by the company. A written report was not requested by AEPA.	Reportable-3rd Party Release	412409
04-May-23	34-Avenue & 111-Street NW	During the excavation of the Duggan Tunnel - Shaft #102 location, an EPCOR contractor (Michels Canada) encountered soil with high salinity. Multiple composite samples were taken and it was found out that the exceedances were throughout the depth of the shaft (0m - 20.5m below surface). The contractor has engaged GFL Environmental for the disposal of the contaminated soil. This event was reported to AEPA by the contractor. A written report was not required by AEPA.	Reportable-3rd Party Release	412483
08-May-23	168-Ambleside Drive SW	EPCOR Drainage investigators responded to a report of a visible sheen at the Ambleside #2 SWMF (SWM438970). Investigators arrived on site and observed a hydrocarbon sheen on the surface of the water that was likely due to recent rainfall washing hydrocarbons into the pond. EPCOR Drainage investigators collected a sample from the pond and submitted it for laboratory analysis (BTEX, E.coli, Oil & Grease, N-NH3, pH, TP, and TSS). The results indicated no hydrocarbon exceedances. As a precaution, an absorbent boom was placed on the outlet structure for the facility. This event was reported to AEPA. A written report was issued to AEPA on May 15, 2023.	Reportable-3rd Party Release	412715
10-May-23	119-Avenue & 76-Street NW	Coolant (approx. 20L) was released into a storm catch basin (CB279133) from a City of Edmonton bus. EPCOR Drainage investigators observed that the release was contained within the catch basin sump. A 3rd party environmental company (GFL Environmental) was called	Reportable-3rd Party Release	412785

		in to clean the impacted catch basin and surrounding area. There was no release of coolant into the storm collection system. This release was reported to AEPA by the City of Edmonton. A written report was not requested by AEPA.		
12-May-23	6126-Rosenthal Way NW	Hydraulic fluid (approx. 5L) was released into a storm catch basin (MH497056) from a City of Edmonton street sweeper. EPCOR Drainage investigators observed that the release was contained within the catch basin sump. A 3rd party environmental company (GFL Environmental) was called in to clean the impacted catch basin and surrounding area. There was no release of hydraulic fluid into the storm collection system. This release was reported to AEPA by the City of Edmonton. A written report was issued to AEPA on May 19, 2023.	Reportable-3rd Party Release	412928
16-May-23	63-Avenue & 99-Street NW	Diesel fuel (approx. 60L) was released into a storm catch basin (CB230154) from a vehicle accident. EPCOR Drainage investigators observed that the fuel had been released from the catch basin into the storm collection system. A 3rd party environmental company (GFL Environmental) was called in to clean the impacted storm collection system and surrounding area. This release was reported to AEPA by the City of Edmonton – Fire Services. A written report was not requested by AEPA.	Reportable-3rd Party Release	413160
17-May-23	4303-78 Avenue NW	Sample results of the stormwater discharge from a commercial business complex were received and reviewed by EPCOR Drainage - Monitoring & Compliance. The results of the sample exceeded Alberta Environment hazardous waste limits for Nickel at 52.7 mg/L. The results also exceeded Drainage Bylaw 19627 (Appendix C) limits for COD, metals and Oil & Grease. The original sample from the catch basin was collected on May 11, 2023 by Drainage investigators. A Notice to Comply was issued to the condo board of this business complex to discontinue the release of restricted waste into the sewerage system. This release was reported to AEPA by EPCOR Monitoring & Compliance. A written report was issued to AEPA on May 25, 2023.	Reportable-3rd Party Release	413283
18-May-23	11601-68 Avenue NW	Untreated wastewater (unknown volume) was released into the storm collection system at the University of Alberta – South Campus. EPCOR Drainage investigators responded to this incident and observed that a surcharging private sanitary manhole was releasing untreated wastewater into a nearby storm catch basin (CB225377). A 3rd party company was called in to release the blockage and clean the spill site / impacted storm catch basin. The wastewater from this catch basin would have released downstream to the North Saskatchewan river at Outfall #22 (OF225043). This release was reported to AEPA. A written report was issued to AEPA on May 19, 2023.	Reportable-3rd Party Release	413350
21-May-23	1320-99 Street NW	Untreated wastewater (unknown volume) was released into the storm collection system from a business complex. EPCOR Drainage investigators responded to this incident and observed that a surcharging private sanitary manhole was releasing untreated wastewater into a nearby private storm catch basin. A 3rd party company (Pro Essentials Service Inc.) was called in to release the blockage and clean the spill site / impacted storm catch basin. This release was reported to AEPA by the property manager. A written report was issued to AEPA on May 26, 2023.	Reportable-3rd Party Release	413496
25-May-23	9250-41 Avenue NW	Untreated wastewater / stone cutting sediment (unknown volume) was released into the storm collection system from a stone cutting company (MGS Company). EPCOR Drainage investigators responded to this incident and confirmed that a cross-connection exists at this location. EPCOR will be assisting the company to access the extent of the cross-connection. A Notice to Comply was issued to the property owner to discontinue the release of prohibited waste into the sewerage system. The Notice also requires that a sediment barrier be installed on the storm catch basins within the facility yard or that stone cutting waste is stored a significant distance from any catch basins. This release was reported to AEPA by the company. A written report was issued to AEPA on June 1, 2023.	Reportable-3rd Party Release	413753
26-May-23	4524-209 Street NW	Motor oil (approx. 5L) was released into a storm catch basin (CB432619) from a damaged private vehicle. EPCOR Drainage investigators observed that the oil had been released from the catch basin into the storm collection system. A 3rd party environmental company (GFL Environmental) was called in to clean the impacted storm collection system and surrounding area. A Notice to Comply was issued to the vehicle owner to discontinue the release of restricted waste into the sewerage system. This release was reported to AEPA by the vehicle owner. A written report was not requested by AEPA.	Reportable-3rd Party Release	413825
27-May-23	4611-209 Street NW	Carpet cleaning wastewater (approx. 5-50L) was released into a storm catch basin (CB432617) from Town & Country Premium Carpet Care. EPCOR Drainage investigators observed that the wastewater had been released from the catch basin into the storm collection system. An EPCOR vactor unit was called in to clean the impacted storm collection system and surrounding area. A Notice to Comply was	Reportable-3rd Party Release	413883

		issued to the company to discontinue the release of restricted waste into the sewerage system. This release was reported to AEPA by EPCOR Monitoring & Compliance. A written report was issued to AEPA on June 2, 2023.		
27-May-23	15531-37 Street NW	Untreated wastewater (unknown volume) was released into the storm collection system at the Cineplex Odeon Theater. EPCOR Drainage investigators responded to this incident and observed that a surcharging private sanitary manhole was releasing untreated wastewater into a nearby private storm catch basin. An EPCOR vactor unit was called in to release a grease blockage in the sanitary line and clean the spill site / impacted storm collection system. The wastewater from this catch basin would have released downstream to the Ebbers #1 SWMF (SWM488328). A Notice to Comply was issued to the property management company to discontinue the release of restricted waste into the sewerage system. This release was reported to AEPA by the property management company. A written report was issued to AEPA on May 31, 2023.	Reportable-3rd Party Release	413836
31-May-23	9449-49 Street SW	Motor oil / industrial soap wastewater (approx. 200L) was released into a private catch basin from ABB Industrial Solutions Inc. EPCOR Drainage investigators observed that the wastewater had been released from the catch basin into the storm collection system. The investigators checked for a possible downstream release at storm Outfall #76 (OF266945) and did not detect any abnormal flow, sheen, foaming or odors. A Notice to Comply was issued to the company to discontinue the release of other than permitted matter (equipment waste water) into the storm sewerage system. This release was reported to AEPA by the company. A written report was issued to AEPA on June 7, 2023.	Reportable-3rd Party Release	414052
01-Jun-23	4143-93 Street NW	Sample results of the stormwater discharge from a private machine shop (Apollo Machine & Welding Ltd) were reviewed and reported by EPCOR Drainage - Monitoring & Compliance. The results of the sample exceeded Bylaw 19627 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for Chemical Oxygen Demand at 227 mg/L, Cadmium at 0.00335 mg/L, Lead at 0.131 mg/L, Nickel at 0.0819 mg/L, Oil & Grease at 19 mg/L, pH at 9.09 and Zinc at 1.9 mg/L. The original sample from the company's private catch basin was collected on May 25, 2023 by Drainage investigators. A Notice to Comply was issued to the company to discontinue the release of restricted waste into the sewerage system. This release was reported to AEPA by the company. A written report was issued to AEPA on June 5, 2023.	Reportable-3rd Party Release	414099
01-Jun-23	Whitemud Drive & Rainbow Valley Bridge NW	Paint (< 5L) was released into Whitemud Creek from an unknown source. During routine sample collection, an EPCOR technologist observed paint residue, paint can and a paint roller in the creek. EPCOR Drainage Investigators responded to this release and removed the paint residue / contaminants from the creek using absorbent booms. This event was reported to AEPA. A written report was issued to AEPA on June 8, 2023.	Reportable-3rd Party Release	414125
06-Jun-23	14402-114 Avenue NW	Sample results of the stormwater discharge from the City of Edmonton (COE) NW district yard facility were received and reviewed by COE Engineering Services. The results of the sample exceeded Bylaw 19627 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for Chemical Oxygen Demand at 504 mg/L, E. coli at 11000 CFU/100mL, Cadmium at 0.0009 mg/L, Lead at 0.044 mg/L and Zinc at 0.383 mg/L. The original sample from the NW district yard facility was collected on May 23, 2023 by COE Environmental Technologists. This event was reported to AEPA by the City of Edmonton. A written report was issued to AEPA on June 8, 2023.	Reportable-3rd Party Release	414304
06-Jun-23	5404-59 Avenue NW	Sample results of the stormwater discharge from the City of Edmonton (COE) SE district yard facility were received and reviewed COE Engineering Services. The results of the sample exceeded Bylaw 19627 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for Chemical Oxygen Demand at 507 mg/L and Cadmium at 0.004 mg/L. The original sample from the SE district yard facility was collected on May 23, 2023 by COE Environmental Technologists. This release was reported to AEPA by the City of Edmonton. A written report was issued to AEPA on June 8, 2023.	Reportable-3rd Party Release	414303
06-Jun-23	17420-Stony Plain Road NW	A concrete slurry (approx. 5L) was released into a private storm catch basin by a general contractor (Logical Expressions Inc.). EPCOR Drainage investigators responded to this incident and confirmed that the release was contained within the catch basin sump. The contractor cleaned up the impacted catch basin and surrounding area. There was no release of concrete slurry into the storm collection	Reportable-3rd Party Release	414313

		system. A Notice to Comply was issued to the contractor to discontinue the release of prohibited waste into the sewerage system. This release was reported to AEPA. A written report was issued to AEPA on June 13, 2023.		
07-Jun-23	3315-64 Avenue NW	Sample results of the stormwater discharge from a recycling company (Eagle Tech Recycling) were reviewed and reported by EPCOR Drainage - Monitoring & Compliance. The results of the sample exceeded Bylaw 19627 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for Chemical Oxygen Demand at 1650 mg/L Cadmium at 0.00104 mg/L, Copper at 0.287 mg/L, Lead at 0.133 mg/L, Oil and Grease at 447 mg/L and Zinc at 0.43 mg/L. The original sample was collected on May 31, 2023 by Drainage investigators. A Notice to Comply was issued to the company to discontinue the release of restricted waste into the storm sewerage system. This release was reported to AEPA. A written report was issued to AEPA on June 14, 2023.	Reportable-3rd Party Release	414407
15-Jun-23	1074-103A Street SW	Gasoline (approx. 60L) was released from a fuel theft incident at a commercial parking lot. The City of Edmonton – Fire Services responded to this event and removed contaminants from the spill site using absorbent booms. EPCOR Drainage investigators observed that there was no gasoline contaminants inside a nearby storm catch basin. There was no release to the storm / sanitary collection system. This release was reported to AEPA by City of Edmonton – Fire Services. A written report was not requested by AEPA.	Reportable-3rd Party Release	414913
16-Jun-23	13718-150 Avenue NW	Motor oil (approx. 5L) was released into the storm collection system from a tow truck (Rival Towing Ltd). EPCOR Drainage investigators observed that recent rainfall had migrated the oil into a nearby storm catch basin (CB388059). The investigators placed absorbent booms around the catch basin to contain the release and City of Edmonton - Roadways was contacted to further clean the spill site. The investigators checked the downstream Skyview SWMF (SWM373005) and no sign of hydrocarbon contaminants was observed. This release was reported to AEPA. A written report was not requested by AEPA.	Reportable-3rd Party Release	414982
17-Jun-23	17404-90 Avenue NW	Coolant (approx. 5L) was released into the storm collection system from a City of Edmonton bus located at the West Edmonton Mall transit station. EPCOR Drainage investigators confirmed that recent rainfall had migrated the coolant into a nearby storm catch basin (CB236026). A 3rd party environmental company (GFL Environmental) was called in to clean the impacted catch basin and surrounding area. This release was reported to AEPA by the City of Edmonton. A written report was not requested by AEPA.	Reportable-3rd Party Release	414988
18-Jun-23	867-Millbourne Road East NW	Unknown hydrocarbons (approx. 1L) were released into the storm collection system from a private residence. EPCOR Drainage investigators observed that auto parts were stored outside at this residence and recent rainfall had migrated hydrocarbons into a nearby storm catch basin (CB218436). The investigators placed absorbent booms around the catch basin to contain and remove contaminants from the release site. This release was reported to AEPA by EPCOR Drainage Services. A written report was not requested by AEPA.	Reportable-3rd Party Release	414982
28-Jun-23	100-Claireview LRT Station NW	Coolant (approx. 2L) was released into a storm catch basin from a City of Edmonton bus located at the Clareview transit station. EPCOR Drainage investigators responded to this incident and confirmed that the release was contained within the catch basin (MH298533). A 3rd party environmental company (GFL Environmental) was called in to clean the impacted catch basin and surrounding area. There was no release of coolant into the storm collection system. This release was reported to AEPA by the City of Edmonton. A written report was not requested by AEPA.	Reportable-3rd Party Release	415583
28-Jun-23	5404-59 Avenue NW	Sample results of the sanitary discharge from the City of Edmonton (COE) SE district yard facility were received and reviewed by COE Engineering Services. The results of the sample exceeded Bylaw 19627 Appendix B Restricted Wastes Applicable to Sanitary and Combined Sewers for Sulphides at 3.66 mg/L. The original sample from the SE district yard facility was collected on June 7, 2023 by EPCOR Monitoring & Compliance. This release was reported to AEPA by the City of Edmonton. A written report was not requested by AEPA.	Reportable-3rd Party Release	415570
03-Jul-23	220-Abbottsfield Road NW	Coolant (approx. 5L) was released into the storm collection system from a private vehicle at a condominium parking lot. EPCOR Industrial Wastewater Investigators observed that no contaminants were visible in a nearby storm catch basin (MH353026). It is likely that recent rainfall washed any contaminants from the catch basin into the storm collection system and thru Outfall #73 (OF287813). The investigators placed absorbent material on the parking lot to absorb any contaminants. This release was reported to AEPA. A written report was not requested by AEPA.	Reportable-3rd Party Release	415800
06-Jul-23	5404-59 Avenue NW	Sample results of the stormwater discharge from the City of Edmonton (COE) SE district yard facility were received and reviewed by COE Engineering Services. The results of the sample exceeded Bylaw 19627 Appendix C and Bylaw 18093 Schedule B Restricted Wastes	Reportable-3rd Party	415956

		Applicable to Storm Sewers and Watercourses for Chemical Oxygen Demand at 193 mg/L, Cadmium at 0.0010 mg/L and E.coli at > 6000 CFU/100ml. The original sample from the SE district yard facility was collected on June 15, 2023 by COE Environmental Technologists. This event was reported to AEPA by the City of Edmonton. A written report was issued to AEPA on July 13, 2023.	Release	
06-Jul-23	14402-114 Avenue NW	Sample results of the stormwater discharge from the City of Edmonton (COE) NW district yard facility were received and reviewed by COE Engineering Services. The results of the sample exceeded Bylaw 19627 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for E.coli at > 6000 CFU/100mL and Phenols at 0.009 mg/L. The original sample from the NW district yard facility was collected on June 15, 2023 by COE Environmental Technologists. This event was reported to AEPA by the City of Edmonton. A written report was issued to AEPA on July 13, 2023.	Reportable-3rd Party Release	415985
06-Jul-23	13003-56 Street NW	Sample results of the stormwater discharge from the City of Edmonton (COE) NE district yard facility were received and reviewed by COE Engineering Services. The results of the sample exceeded Bylaw 19627 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for Chemical Oxygen Demand at 190 mg/L, Cadmium at 0.0006 mg/L, Phenols at 0.006 mg/L and E.coli at > 6000 CFU/100ml. The original sample from the NE district yard facility was collected on June 15, 2023 by COE Environmental Technologists. This release was reported to AEPA by the City of Edmonton. A written report was issued to AEPA on July 13, 2023.	Reportable-3rd Party Release	415957
06-Jul-23	7824-51 Avenue NW	Beta Glucan byproduct waste (approx. 30L) was released into a private storm catch basin at the Ceapro Inc. facility. EPCOR Drainage investigators confirmed that the waste material was contained within the private storm collection system. A 3rd party vactor unit (Canadian Hydrovac) was called in to clean the impacted private storm system and surrounding area. This release was reported to AEPA by the company. A written report was issued to AEPA on July 10, 2023.	Reportable-3rd Party Release	415991
11-Jul-23	9330-80 Avenue NW	EPCOR Network Operations responded to a report of low water levels downstream of the Mill Creek – Shamrock storm inlet (Outfall #249). Investigations at this location confirmed that the twin pipes (PIP341766 & PIP387155) at the Shamrock inlet were completely plugged with silt / debris. The creek bed downstream of the Shamrock inlet was completely dry. A 3rd party contractor (Precision Gradall Ltd) was mobilized to the site. Sediment and debris was removed from the inlet structure. A slight increase in turbidity was observed downstream of the inlet structure when flow was fully restored to Mill Creek. The water turned clear approximately 15 meters downstream of the inlet and no environmental impact was identified as the sediment was observed to settle out naturally over a short distance and remained primarily within the area around the outfall. This event was reported to AEPA by the Drainage Environmental Manager. A written report was issued to AEPA on July 17, 2023.	Reportable-Internal	416233
13-Jul-23	12304-184 Street NW	Diesel fuel (approx. 5L) was released into a private storm catch basin from a fuel theft incident. EPCOR Monitoring & Compliance investigators observed that the fuel was contained within the sump of a private storm catch basin. A 3rd party (GFL Environmental) vacuum truck was contacted to remove contaminants from the impacted catch basin and surrounding area. There was no release of diesel fuel to the storm / sanitary collection system. This release was reported to AEPA by City of Edmonton – Fire Services. A written report was not requested by AEPA.	Reportable-3rd Party Release	416314
17-Jul-23	14205-82 Street NW	Motor oil (approx. 1L) was released at a condominium complex. EPCOR Monitoring & Compliance investigators observed that the motor oil was leaking from oil pails that had been placed inside a garbage bin. Absorbent material was used to contain and clean-up the oil that had been released onto the ground. There was no release of motor oil to the storm / sanitary collection system. This release was reported to AEPA. A written report was not requested by AEPA.	Reportable-3rd Party Release	416527
19-Jul-23	1-Sir Winston Churchill Square NW	Diesel fuel (approx. 1L) was released into a private storm catch basin located at Edmonton City Hall. EPCOR Monitoring & Compliance investigators were informed that during the re-fueling of a building generator, the contractor (Hughes Petroleum) overflowed the fuel tank releasing fuel into a nearby catch basin. A 3rd party (Noralta) vacuum truck was contacted to remove contaminants from the impacted catch basin and surrounding area. The release was contained within the catch basin and there was no release of diesel fuel into the storm collection system. This release was reported to AEPA by the City of Edmonton. A written report was not requested by AEPA.	Reportable-3rd Party Release	416653

24-Jul-23	4318-Kennedy Bay SW	Untreated wastewater was released into the storm collection system from sanitary Pump Station #222 (PS480669). During thunderstorm activity in the area, a blown fuse caused the pumps at the station to stop working and a nearby sanitary manhole to surcharge. Untreated wastewater (approx. 12.3m^3) entered an adjacent storm catch basin that released into the Keswick SWMF #3 (SWM495593). The blown fuse was replaced at the pump station, which stopped the release of untreated wastewater. EPCOR Industrial Wastewater investigators collected samples from the Keswick SWMF #3. The results of the sample exceeded Bylaw 19627 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for E.coli at 610 CFU/100ml. However, these results were within background levels observed in the stormwater management facilities. This release was reported to AEPA by EPCOR – Monitoring & Compliance. A written report was issued to AEPA on July 31, 2023.	Reportable-Internal	416900
24-Jul-23	8543-Coronet Road NW	Sample results of the shop interceptor wastewater from a private machine shop (Bhurjee Industries Ltd) were reviewed and reported by EPCOR - Monitoring & Compliance. The results of the sample exceeded Bylaw 19627 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for Chemical Oxygen Demand at 448,000 mg/L, Copper at 15 mg/L and Zinc at 26 mg/L. The sample also exceeded Alberta Environment hazardous waste limits for Lead at 7.5 mg/L. The original sample from the company's interceptor was collected on July 11, 2023 by Drainage investigators. EPCOR Monitoring & Compliance investigators confirmed that the interceptor had been cleaned out by a 3rd party contractor (GFL Environmental) on July 19, 2023. A Notice to Comply was issued to the machine shop to discontinue the release of restricted / hazardous waste into the sewerage system. This release was reported to AEPA by the machine shop. A written report was issued to AEPA on July 25, 2023.	Reportable-3rd Party Release	416994
24-Jul-23	758-43A Avenue NW	Hydraulic fluid (approx. 1L) was released into a private catch basin from a City of Edmonton (COE) garbage truck. EPCOR Drainage investigators check a nearby storm manhole (MH535972), but water flowing thru the manhole would have released any contaminants further into the storm collection system. Absorbent material was used to remove hydraulic fluid from the spill site. This release was reported to AEPA by the City of Edmonton. A written report was issued to AEPA on July 25, 2023.	Reportable-3rd Party Release	416896
31-Jul-23	17308-108 Street NW	Untreated wastewater (approx. 250L) was released into the storm collection system from a residential condominium complex. EPCOR Drainage investigators responded to this incident and confirmed that residents were using a shop vac to remove untreated wastewater from a flooded basement and releasing it into a nearby storm catch basin (CB302660). EPCOR equipment was mobilize to clean the impacted storm catch basin and surrounding area. A 3rd party company was called in to remove the blockage (tree roots) from the sanitary line of the condominium complex. A Notice to Comply was issued to the Castleridge Condominium Corporation to discontinue the release of restricted waste into the sewerage system. This release was reported to AEPA by the condo manager. A written report was issued to AEPA on August 11, 2023.	Reportable-3rd Party Release	417257
02-Aug-23	10136-143 Street NW	EPCOR industrial wastewater investigators confirmed a sanitary / storm sewer cross-connection at a condominium unit. The storm collection system at this location releases into the North Saskatchewan River thru storm Outfall #30 (OF241827). A Notice to Comply was issued to the property owner to have their sanitary wastewater redirected from the storm sewer into the sanitary sewer system. Once the repairs are completed, EPCOR will collect a sample to ensure compliance. This release was reported to AEPA by EPCOR – Monitoring & Compliance. A written report was issued to AEPA on August 9, 2023.	Reportable-3rd Party Release	417369
03-Aug-23	127-Avenue & 101-Street NW	Untreated wastewater (unknown volume) was released from a combined sewer line into a nearby storm sewer line thru an interconnection (MH277375). During dry weather conditions the untreated wastewater in the storm line would travel down 127-Avenue and re-enter the combined sewer system at MH277582. During rain events, untreated wastewater may overflowed into the storm collection system at a downstream combined sewer chamber (CS355353). If any untreated wastewater entered this chamber, it would be released thru storm Outfall #74 (OF374179). This release was reported to AEPA by the EPCOR Wastewater Collection environmental manager. A written report was not requested by AEPA.	Reportable-Internal	417421
14-Aug-23	167-Avenue & 112-Street NW	Untreated wastewater (unknown volume) was released from a sanitary force main (PIP355802). EPCOR industrial wastewater investigators responded to this incident and observed that untreated wastewater was surcharging to the surface from a 3rd party hydrovac borehole. EPCOR equipment was mobilized to the site and removed contaminants from the borehole and surrounding area. The untreated	Reportable-3rd Party Release	417806

		wastewater was contained in a nearby ditch and did not enter the storm collection system. This release was reported to AEPA by EPCOR Monitoring & Compliance. A written report was issued to AEPA on August 21, 2023.		
16-Aug-23	4461-50 Street NW	Diesel fuel (approx. 5L) was released into the storm collection system (MH217537) from a damaged truck located at Hi-Way 9 Express. EPCOR industrial wastewater investigators investigated the downstream Burnewood SWMF (SWM322988) and did not detect any contaminants. A 3rd party vacuum truck (Clean Harbours) was called-in to remove contaminants from the impacted storm collection system and surrounding area. A Notice to Comply was issued to the trucking company to discontinue the release of restricted wastes into the sewerage system. This release was reported to AEPA by the trucking company. A written report was issued to AEPA on August 17, 2023.	Reportable-3rd Party Release	417876
16-Aug-23	13003-56 Street NW	Sample results of the stormwater discharge from the City of Edmonton NE district yard facility were received and reviewed by City of Edmonton Environment and Climate Resilience (COEECR). The results of the sample exceeded Bylaw 19627 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for Chemical Oxygen Demand at 803 mg/L, Cadmium at 0.0016 mg/L, Lead at 0.044 mg/L, Total Phosphorus at 2.19 mg/L, Zinc at 0.4 mg/L and E.coli at > 6000 CFU/100ml. The original sample from the NE district yard facility was collected on July 27, 2023 by COEECR. This release was reported to AEPA by the City of Edmonton. A written report was issued to AEPA on August 23, 2023.	Reportable-3rd Party Release	417898
16-Aug-23	5404-59 Avenue NW	Sample results of the stormwater discharge from the City of Edmonton SE district yard facility were received and reviewed by City of Edmonton Environment and Climate Resilience (COEECR). The results of the sample exceeded Bylaw 19627 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for Chemical Oxygen Demand at 620 mg/L, Cadmium at 0.0036 mg/L and E.coli at 460 CFU/100ml. The original sample from the SE district yard facility was collected on July 27, 2023 by COEECR. This release was reported to AEPA by the City of Edmonton. A written report was issued to AEPA on August 23, 2023.	Reportable-3rd Party Release	417897
17-Aug-23	10020-56 Avenue NW	Diesel fuel (approx. 100L) was released into the storm collection system (MH217537) from a damaged truck located at the Fastfrate Group facility. EPCOR industrial wastewater investigators confirmed that diesel fuel had entered the storm collection system. A 3rd party vacuum truck (Supreme Hydrovac) was called-in to remove contaminants from the impacted storm collection system and surrounding area. This release was reported to AEPA by the company. A written report was issued to AEPA on August 23, 2023.	Reportable-3rd Party Release	417926
18-Aug-23	3002-Parsons Road NW	An EPCOR field investigation identified that untreated wastewater (unknown volume) was being released thru a damaged bulkhead (MH211864) into a nearby storm sewer line. On August 19th EPCOR mobilized resources to this site and repaired the bulkhead and stopped the release of untreated wastewater into the storm collection system. EPCOR has identified additional work required to permanently repair the bulkhead. Engineering and repair design to eliminate future releases for this location have been completed. This release was reported to AEPA by EPCOR – Monitoring & Compliance. A written report was issued to AEPA on August 25, 2023.	Reportable-Internal	418009
29-Aug-23	157-Street & Stony Plain Road NW	Coolant (approx. 1L) was released into a private storm catch basin from a City of Edmonton bus located at the Jasper Place Transit Center. EPCOR industrial wastewater investigators observed that the coolant was contained within the sump of a private storm catch basin. A 3rd party (GFL Environmental) vacuum truck was contacted to remove contaminants from the impacted catch basin and surrounding area. There was no release of coolant to the storm collection system. This release was reported to AEPA by the City of Edmonton. A written report was not requested by AEPA.	Reportable-3rd Party Release	418530
30-Aug-23	14402-114 Avenue NW	Sample results of the stormwater discharge from the City of Edmonton NW district yard facility were received and reviewed by City of Edmonton Environment and Climate Resilience (COEECR). The results of the sample exceeded Bylaw 19627 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for E.coli at > 6000 CFU/100ml. The original sample from the NW district yard facility was collected on July 27, 2023 by COEECR. This release was reported to AEPA by the City of Edmonton. A written report was requested by AEPA.	Reportable-3rd Party Release	418590
05-Sep-23	10960-83 Street NW	Coolant (approx. 0.5L) was released from a City of Edmonton contractor (Collective Waste Solutions) vehicle. EPCOR Industrial Wastewater Investigators confirmed that no coolant was visible in nearby catch basins (CB265314 & CB265313). Absorbent material was used to remove contaminants from the spill site. There was no release of coolant to the storm / sanitary collection system. This release was reported to AEPA by the contractor. A written report was not requested by AEPA.	Reportable-3rd Party Release	418856

05-Sep-23	13404-137 Street NW	Hydraulic fluid (approx. 1L) was released into a storm catch basin (CB240687) from a private garbage truck (Waste Connections Canada). A heavy rainfall subsequent to the release, flushed the hydraulic fluid into the storm collection system. Absorbent material was used to remove hydraulic fluid from the spill site. This release was reported to AEPA by the company. A written report was not requested by AEPA.	Reportable-3rd Party Release	418886
07-Sep-23	6609-Gateway Boulevard NW	Diesel fuel (approx. 1L) was released into a catch basin from a street sweeper at the City of Edmonton – Southwest District Yard. A 3rd party vacuum truck (GFL Environmental) was called-in to remove contaminants from the impacted catch basin and surrounding area. EPCOR Industrial Wastewater Investigators confirmed that stormwater from the catch basins in this area release into the combined collection system and onto the Gold Bar WWTP for treatment. This release was reported to AEPA by the City of Edmonton. A written report was not requested by AEPA.	Reportable-3rd Party Release	418991
09-Sep-23	11510-153 Avenue NW	Thin-Set Mortar Admix (approx. 4L) was released into the storm collection system (MH358161) at the Castle Downs YMCA parking lot. EPCOR Industrial Wastewater Investigators confirmed that an unknown person had released the substance directly into a private storm catch basin. A 3rd party vacuum truck (GFL Environmental) was called-in to remove contaminants from the impacted storm collection system and surrounding area. This release was reported to AEPA by the City of Edmonton. A written report was not requested by AEPA.	Reportable-3rd Party Release	419100
12-Sep-23	16733-84 Street NW	Diesel fuel (approx. 100L) was released into the storm collection system (MH374597) from a vehicle fuel theft at the Klarvatten Daycare. The storm lines in this area release downstream into the Klarvatten #1 SWMF (SWM322289). As a precaution, EPCOR Industrial Wastewater Investigators had the gates to the Klarvatten SWMF closed and absorbent booms were placed along the inlet pipe to the pond. A 3rd party vacuum truck (GFL Environmental) was called-in to remove contaminants from the impacted storm collection system and surrounding area. This release was reported to AEPA by City of Edmonton-Fire Services. A written report was not requested by AEPA.	Reportable-3rd Party Release	419249
14-Sep-23	14402-114 Avenue NW	Sample results of the stormwater discharge from the City of Edmonton (COE) NW district yard facility were received and reviewed by City of Edmonton Environment and Climate Resilience (COEECR). The results of the sample exceeded Bylaw 19627 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for Chemical Oxygen Demand at 166 mg/L, E. coli at >6000 CFU/100mL, Lead at 0.025 mg/L and Phenols at 0.028 mg/L. The original sample from the NW district yard facility was collected on August 31, 2023 by COEECR. This release was reported to AEPA by the City of Edmonton. A written report was issued to AEPA on September 18, 2023.	Reportable-3rd Party Release	419394
18-Sep-23	191-Homestead Crescent NW	Gasoline (approx. 20L) was released into a storm catch basin (MH283341) at a townhouse complex. A 3rd party vacuum truck (GFL Environmental) was called-in to remove contaminants from the impacted catch basin and surrounding area. There was no release of gasoline to the storm / sanitary collection system. This release was reported to AEPA by City of Edmonton-Fire Services. A written report was not requested by AEPA.	Reportable-3rd Party Release	419581
18-Sep-23	13310-50A Street NW	A 10% caustic solution (approx. 10L) was released into a wash bay sump at the City of Edmonton D.L. MacDonald Transit garage. EPCOR Industrial Wastewater Investigators confirmed that any caustic solution released from the sump would have entered the sanitary collection system and onto the Gold Bar WWTP for treatment. A 3rd party vacuum truck (Nor-Alta Inc.) was called-in to remove contaminants from the sump. This release was reported to AEPA by the City of Edmonton. A written report was issued to AEPA on September 25, 2023.	Reportable-Internal	419606
18-Sep-23	89-Street & Conners Road NW	Ethylene glycol (approx. 1L) was released into a catch basin (CB516257) from a City of Edmonton Transit bus. EPCOR Industrial Wastewater Investigators confirmed that stormwater from the catch basin would have released into the combined collection system and onto the Gold Bar WWTP for treatment. This release was reported to AEPA by the City of Edmonton. A written report was issued to AEPA on September 25, 2023.	Reportable-3rd Party Release	419596
22-Sep-23	8919-95 Avenue NW	Coolant (approx. 1L) was released into a storm catch basin (CB581105) from a City of Edmonton Transit bus. Absorbent material was used to contain / remove contaminants from the spill site. City of Edmonton - Roadways called a sweeper truck to the spill site to remove any remaining contaminants. EPCOR Industrial Wastewater Investigators confirmed that stormwater from the catch basin would have released into the combined collection system and onto the Gold Bar WWTP for treatment. This release was reported to AEPA by City of Edmonton-Fire Services. A written report was issued to AEPA on September 25, 2023.	Reportable-3rd Party Release	419845

27-Sep-23	5404-59 Avenue NW	Sample results of the stormwater discharge from the City of Edmonton (COE) SE district yard facility were received and reviewed by City of Edmonton Environment and Climate Resilience (COEECR). The results of the sample exceeded Bylaw 19627 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for Biochemical Oxygen Demand at 68 mg/L, Chemical Oxygen Demand at 307 mg/L, Cadmium at 0.0013 mg/L and Phenol at 0.007 mg/L. The original sample from the SE district yard facility was collected on September 12, 2023 by COEECR. This release was reported to AEPA by the City of Edmonton. A written report was issued to AEPA on September 29, 2023.	Reportable-3rd Party Release	420063
27-Sep-23	13003-56 Street NW	Sample results of the stormwater discharge from the City of Edmonton (COE) NE district yard facility were received and reviewed by City of Edmonton Environment and Climate Resilience (COEECR). The results of the sample exceeded Bylaw 19627 Appendix C and Bylaw 18093 Schedule B Restricted Wastes Applicable to Storm Sewers and Watercourses for Chemical Oxygen Demand at 246 mg/L, E.coli at 550 CFU/100ml and Phenols at 0.008 mg/L. The original sample from the NE district yard facility was collected on September 12, 2023 by COEECR. This release was reported to AEPA by the City of Edmonton. A written report was issued to AEPA on September 29, 2023.	Reportable-3rd Party Release	420064
29-Sep-23	14410-114 Avenue NW	Diesel fuel (approx. 2L) was released into a private storm catch basin from a truck at the City of Edmonton – Northwest District Yard. A 3rd party vacuum truck (GFL Environmental) was called-in to remove contaminants from the impacted catch basin and surrounding area. The stormwater from the Northwest District Yard would release downstream into a pre-treatment system at Outfall #31 (OF379692). EPCOR Industrial Wastewater Investigators checked the pre-treatment system and confirmed that the stormwater was not above the weir, so the contaminants from the Northwest District Yard had not bypassed the system. This release was reported to AEPA by the City of Edmonton. A written report was issued to AEPA on October 6, 2023.	Reportable-3rd Party Release	420154
03-Oct-23	5607-Gateway Boulevard NW	Diesel fuel (approx. 200L) was released into a private storm catch basin from a 3rd party garbage truck (310 Dump). A 3rd party vacuum truck (GFL Environmental) was called-in to remove contaminants from the impacted storm catch basin and surrounding area. The diesel fuel was contained within the catch basin sump and there was no release to the storm / sanitary collection system. This release was reported to AEPA by City of Edmonton – Fire Services. A written report was issued to AEPA on October 10, 2023.	Reportable-Internal	420274
04-Oct-23	10187-34 Avenue NW	Untreated wastewater (unknown volume) was released into the storm collection system from a surcharging private sanitary manhole (MH314595) located at the Memory Express building. A 3rd party vacuum truck (Canessco) was called-in to release the blockage in the sanitary line and remove contaminants from the impacted storm collection system and surrounding area. A Notice to Comply was issued to the building owner to discontinue the release of prohibited waste into the sewerage system. This release was reported to AEPA. A written report was issued to AEPA on October 11, 2023.	Reportable-3rd Party Release	420346
07-Oct-23	25612-49A Street NW	Concrete residue (approx. 5-50L) was released into the storm collection system (CB204238) from a residence located at 2512-49A Street NW. A 3rd party vacuum truck (GFL Environmental) was called-in to remove contaminants from the impacted storm collection system and surrounding area. This release was reported to AEPA. A written report was not requested by AEPA.	Reportable-3rd Party Release	420510
10-Oct-23	9720-137 Avenue NW	Unknown wastewater (approx. 100L) was released into the storm collection system (MH492022) by a private contractor (Waiward Construction). EPCOR Wastewater Collection personnel observed that the contractor was pumping the wastewater from an abandoned line they had damaged into a nearby storm manhole (MH492022). The contractor was instructed to relocate the discharge from their pumping operations into a nearby sanitary manhole (MH492003). Laboratory results from a sample that was taken from the pump discharge line indicated that the release was not potable water or untreated wastewater. This abandoned line does not show on any EPCOR plans or the utility locate that was completed prior to the contractors ground disturbance work and is thought to be a previously abandoned private line crossing the property. This release was reported to AEPA. A written report was issued to AEPA on October 17, 2023.	Reportable-3rd Party Release	420583
10-Oct-23	9346-83 Avenue NW	Untreated wastewater (unknown volume) was released into the storm collection system from a surcharging combined sewer manhole (MH243902) located within the Mill Creek Ravine. EPCOR equipment was mobilized to the site to release the blockage (grease / solids) in the combined line and remove contaminants from the downstream storm catch basin (CB243899) and surrounding area. EPCOR crews noted that the majority of untreated wastewater was contained on the surface prior to entering the catch basin. Stormwater from the catch	Reportable-Internal	420584

		basin enters the downstream storm collection system and travels approximately 20 meters downstream into Mill Creek at Outfall #116 (OF387153). This release was reported to AEPA. A written report was issued to AEPA on October 17, 2023.		
12-Oct-23	16-Avenue & 111-Street NW	Sediment (unknown volume) was released into Blackmud Creek by an EPCOR Contractor (PME Inc.) during rehabilitation work at Outfall #275 (OF327182). The sediment release occurred following isolated instream work that required de-watering via a pumping discharge. As the pumping operation proceeded, the volume of water entering the creek increased significantly and a sediment plume was observed by the contractor. The sediment exceedance lasted for approximately 1 hour. To prevent further releases, the contractor will ensure that the pump does not run while the water is very turbid. The pumping discharge will be relocated to a location where the water will not affect the creek. This release was reported to AEPA by the contractor. A written report was issued to AEPA on October 17, 2023.	Reportable-Internal	420691
14-Oct-23	167-Street & Stony Plain Road NW	Coolant (approx. 5L) was released from a City of Edmonton bus. EPCOR Industrial Wastewater Investigators confirmed that the coolant had dried on the roadway and had not entered any nearby storm catch basins. A street sweeper from the City of Edmonton was called to the spill site to remove contaminants from the roadway. There was no release of coolant to the storm / sanitary collection system. This release was reported to AEPA by the City of Edmonton. A written report was not requested by AEPA.	Reportable-3rd Party Release	420736
16-Oct-23	3859-99 Street NW	Gasoline (approx. 60L) was released from a vehicle fuel theft at Enterprise Rent-A-Car. EPCOR industrial wastewater investigators confirmed that the gasoline had been absorbed into cracks on a low quality roadway and there was no residue to clean-up. There was no release of gasoline to the storm / sanitary collection system. This release was reported to AEPA by the company. A written report was not requested by AEPA.	Reportable-3rd Party Release	420817
16-Oct-23	109-Street & Princess Elizabeth Avenue NW	Coolant (approx. 1L) was released into a catch basin (CB281295) from a City of Edmonton bus. EPCOR Industrial Wastewater Investigators confirmed that the catch basin releases into the combined sewer system and onto the Gold Bar WWTP for treatment. A street sweeper from the City of Edmonton was called to the spill site to remove contaminants from along the roadway. This release was reported to AEPA by the City of Edmonton. A written report was not requested by AEPA.	Reportable-3rd Party Release	420808
18-Oct-23	52-Marlboro Road NW	Sample results of the wastewater from two storm manholes (MH303873 & MH209545) and storm Outfall #1 (OF209526) located near the Whitemud Creek ravine were received and reviewed by EPCOR Monitoring & Compliance. The results exceeded Bylaw 18100 Appendix C and Bylaw 18093 Schedule B "Restricted Wastes Applicable to Storm Sewers and Watercourses" for E.coli from OF209526, MH303873 and MH209545 were 1,800,000, 4,200,000 & 770,000 CFU/100 mL respectively. The original samples were collected on October 12, 2023 by EPCOR Industrial Wastewater Investigators. EPCOR will initiate further investigations into this event to determine the source of the cross-connection at this location. Notice to Comply's will be issued to any residence that has been confirmed to have a cross-connection. The Notice will required that the resident redirect their sanitary wastewater discharge from the storm sewer to the sanitary sewer system. This release was reported to AEPA by EPCOR Monitoring & Compliance. A written report was issued to AEPA on October 25, 2023.	Reportable-3rd Party Release	420942
18-Oct-23	11750-180 Street NW	Contaminated stormwater (approx. 100L) was released into the storm collection system (CB204238) from a private companies (Chemtrade Logistics) retention pond. The company currently has a Permit to Release (PR-22-436127399) to discharge this stormwater to the sanitary or storm sewer dependent upon sample results. Once the company became aware of the release they obtained a sample of the discharge. The results were received by EPCOR on October 24th with Bylaw 18100 Appendix C and Bylaw 18093 Schedule B "Restricted Wastes Applicable to Storm Sewers and Watercourses" violations for COD at 879 mg/L and pH at 11.5. A Notice to Comply was issued to the company to discontinue the release of restricted waste into the storm sewerage system and for contravention of their permit. This release was reported to AEPA by the company. A written report was issued to AEPA on October 24, 2023.	Reportable-3rd Party Release	420910
19-Oct-23	5539-Yellowhead Trail NW	Gasoline (approx. 20L) was released into a catch basin (CB447142) from a private vehicle collision. Due to heavy traffic on Yellowhead Trail, EPCOR industrial wastewater investigators were unable to check inside the catch basin. The Investigators confirmed that this catch basin releases into the combined sewer system and onto the Gold Bar WWTP for treatment. There was no release of gasoline to the storm collection system. This release was reported to AEPA by City of Edmonton – Fire Services. A written report was not requested by AEPA.	Reportable-3rd Party Release	420963
20-Oct-23	13022-82 Avenue NW	Untreated wastewater (unknown volume) was released into the storm collection system (CB277657) from a restaurant. EPCOR Industrial Wastewater Investigators observed that wastewater from a sewage backup in the restaurant (Smilies Restaurant) was being pumped into a	Reportable-3rd Party	421084

		nearby storm catch basin. EPCOR equipment was mobilized to the site to remove contaminants from the impacted storm collection system and surrounding area. A Notice to Comply was issued to the business to discontinue the release of restricted waste into the storm sewerage system. This release was reported to AEPA. A written report was issued to AEPA on October 27, 2023.	Release	
20-Oct-23	12-Avenue & 111-Street NW	Untreated wastewater (approx. 10-50L) was released from a sanitary force main located near Blackmud Creek. During the relocation of this line to make way for the extension of the Capital LRT line south, a failure occurred in two reconnection pits. EPCOR Industrial Wastewater Investigators observed that the release point was contained within a bermed area and was approximately 65 meters from Blackmud Creek. The investigators confirmed that there were no impacts to soil or vegetation in the vicinity of the release. The EPCOR contractor (PME Inc) called-in a 3rd party vactor truck to clean up the spill site. A bypass of the sanitary line in now in operation at this location to maintain service to EPCOR customers. This release was reported to AEPA by the contractor. A written report was issued to AEPA on October 27, 2023.	Reportable-Internal	421068
21-Oct-23	250-Aurum Road NE	Benzene contaminated wastewater (25 cubic meters) was released into the sanitary collection system from a 3rd party company (Enerkem). Sanitary wastewater from the company drains into an EPCOR's lift station near the Clover Bar lagoons and onto the Gold Bar WWTP via the supernatant line. It is estimated that a Benzene level over 500ppm was released into the sanitary collection system for approximately three hours. This company operates under an EPCOR Permit to Release PR23-458501011. A Notice to Comply will be issued to the company to discontinue the release of restricted waste into the sewerage system. This release was reported to AEPA by the company. A written report was issued to AEPA on October 27, 2023.	Reportable-3rd Party Release	421100
23-Oct-23	5083-Windermere Boulevard NW	Gasoline (approx. 1L) was released into the storm collection system from a vehicle fuel theft at Jayman Built Homes. EPCOR industrial wastewater investigators instructed the company to have a 3rd party vacuum truck called in to clean up the impacted private catch basin and surrounding area. The investigators checked the downstream Ambleside #2 SWMF (SWM438970) and did not observe any contaminants on the surface. This release was reported to AEPA by City of Edmonton – Fire Services. A written report was not requested by AEPA.	Reportable-3rd Party Release	421131
28-Oct-23	4540-44 Avenue NW	Untreated wastewater (unknown volume) was released from a surcharging sanitary manhole (MH314595). EPCOR Industrial Wastewater Investigators confirmed that the untreated wastewater had entered a nearby private storm pond at the Millwoods Golf Course. The water level in the pond was well below the outlet and the pond is frozen so there is no potential for a release into the storm collection system from this facility. This release was reported to AEPA. A written report was issued to AEPA on November 2, 2023.	Reportable-Internal	421352
30-Oct-23	8648-81 Street NW	A hydrochloric acid solution (approx. 0.5L) was released into a floor drain at the City of Edmonton - Bonnie Doon Leisure Center. EPCOR Industrial Wastewater Investigators confirmed that the release entered the combined sewer system and onto the Gold Bar WWTP for treatment. This release was reported to AEPA by City of Edmonton. A written report was requested by AEPA.	Reportable-3rd Party Release	421407
30-Oct-23	12160-68 Street NW	In response to a report of sanitary sewer backups at a number of businesses, a sample was collected from a nearby storm manhole (MH285398). The results of the wastewater sample from this manhole was received and reviewed by EPCOR Monitoring & Compliance on October 30, 2023. The results exceeded Bylaw 18100 Appendix C and Bylaw 18093 Schedule B "Restricted Wastes Applicable to Storm Sewers and Watercourses" for E.coli at 360,000 CFU/100 mL. The original sample was collected on October 25, 2023 by EPCOR Industrial Wastewater Investigators. EPCOR is in the process of investigating the private properties with service connections upstream of this location. Preliminary investigation findings indicate that one commercial property upstream of this location may have a sanitary service incorrectly connected to the storm collection system. The owners of suspected cross connections will be contacted and dye tests of the private services will be performed to confirm the cross connection of customer sanitary services to the storm collection system. A Notice to Comply will be issued to the owner of each impacted property directing them to repair the cross connection. This release was reported to AEPA. A written report was issued to AEPA on November 6, 2023.	Reportable-3rd Party Release	421413
31-Oct-23	14212-92A Avenue NW	Untreated wastewater (approx. 100L) was released from a sanitary line leak at Trestle #5 (PIP501894). An EPCOR Contractor (Whitson Contracting) reported that while installing plugs for a bypass on Trestle #5, the sewage in the pipe backed up and leaked onto the ground. The contractor pumped the untreated wastewater from the spill site into a nearby sanitary manhole (MH241389) and then through the	Reportable-3rd Party Release	421477

		bypass system to the north side of the trestle. This release was reported to AEPA by the contractor. A written report was issued to AEPA on November 7, 2023.		
01-Nov-23	1524-111 Street NW	Sediment (unknown volume) was released into Blackmud Creek by an EPCOR Contractor (PME Inc.) during rehabilitation work at Outfall #275 (OF327182). The sediment release occurred on November 1st following the removal of a stream isolation structure (gravel bags). The isolation structure was removed via lifting bags with excavator and workers. As the structure was frozen to the creek bottom due to colder weather, substrates were disturbed during removal. The sediment exceedance lasted for approximately 45 minutes. To prevent further releases, PME stopped work to let the turbidity drop and ascertain the nature of the release. A turbidity curtain and filter fabric were left in the creek to capture sediment released from the isolation area. No further instream construction works were conducted on November 1st. This release was reported to AEPA by the contractor. A written report was issued to AEPA on November 3, 2023.	Reportable-Internal	421530
06-Nov-23	20104-128 Avenue NW	An unknown chemical (approx. 20L) was released into the storm collection system (CB483627) by a private contractor. A 3rd party vacuum truck (GFL Environmental) was called-in to remove contaminants from the impacted storm collection system and surrounding area. EPCOR Industrial Wastewater Investigators checked the downstream Trumpeter #1 SWMF (SWM483843) and confirmed that no contaminants had reached this facility. A Notice to Comply was issued to the owner of the premises to provide information on the release to EPCOR investigators including the name, address and contact information of the contractor. This release was reported to AEPA. A written report was issued to AEPA on November 10, 2023.	Reportable-3rd Party Release	421689
07-Nov-23	141-Street & Ellerslie Road SW	Antifreeze (approx. 80L) was released into a storm catch basin (MH457736) by an unknown truck. EPCOR Industrial Wastewater Investigators confirmed that the antifreeze was contained within the catch basin and was not released into the storm collection system. A 3rd party vacuum truck (GFL Environmental) was called-in to remove contaminants from the impacted storm catch basin and surrounding area. An investigation will be ongoing to determine if the generator responsible for the release can be identified. If the generator can be identified a Notice to Comply and the cost of the cleanup will be issued. This release was reported to AEPA. A written report was not requested by AEPA.	Reportable-3rd Party Release	421714
07-Nov-23	12720-Inland Way NW	A 15% hydrochloric acid solution (approx. 10L) was released into a private storm collection system by a company (Cleartech Industries Inc.). The company attempted to neutralize the acid by adding calcium carbonate solids. The addition of the calcium carbonate resulted in a high pH in the downstream EPCOR storm collection system between MH451677 and MH451677. EPCOR Industrial Wastewater Investigators checked the downstream Mistatim Industrial #6 SWMF (SWM451761) and confirmed that no contaminants had reached this facility. A 3rd party vacuum truck (GFL Environmental) was called-in to remove contaminants from the impacted storm collection system and surrounding area. A Notice to Comply was issued to the company to discontinue the release of restricted waste (pH=10.89) and prohibited waste (solidified sodium carbonate) into the sewerage system. This release was reported to AEPA by the company. A written report was issued to AEPA on November 9, 2023.	Reportable-3rd Party Release	421707
17-Nov-23	28-Avenue & 16-Street NW	In response to a report of sewer odours samples were collected from two nearby storm manhole (MH499052 & MH499053). The results of the wastewater samples from these manholes was received and reviewed by EPCOR Monitoring & Compliance on November 17, 2023. The results from MH499052 & MH499053 exceeded Bylaw 18100 Appendix C and Bylaw 18093 Schedule B "Restricted Wastes Applicable to Storm Sewers and Watercourses" for E.coli at 1,200,000 CFU/100 mL and 410,000 CFU/100 mL respectively. The original samples were collected on November 14, 2023 by EPCOR Industrial Wastewater Investigators. EPCOR is in the process of investigating the private properties with service connections upstream of this location. Preliminary investigation findings indicate that one or more of the residential customers upstream of this location may have a sanitary service incorrectly connected to the storm collection system. The owners of suspected cross connections will be contacted and dye tests of the private services will be performed to confirm the cross connection of customer sanitary services to the storm collection system. A Notice to Comply will be issued to the owner of each impacted property directing them to repair the cross connection. This release was reported to AEPA. A written report was issued to AEPA on November 24, 2023.	Reportable-3rd Party Release	422064

18-Nov-23	9510-79 Street NW	Coolant (approx. 4L) was released from a damaged vehicle into a private storm catch basin located near an apartment complex. EPCOR Industrial Wastewater Investigators confirmed that the coolant was contained within the catch basin sump and there was no release to the storm / sanitary collection system. The property manager for this site contacted a 3rd party vacuum truck to remove contaminants from the impacted catch basin and surrounding area. This release was reported to AEPA by City of Edmonton – Fire Services. A written report was not requested by AEPA.	Reportable-3rd Party Release	422116
22-Nov-23	10233-96 Avenue NW	Coolant (approx. 10L) was released from a boiler system failure into the sanitary collection system located at the Re/Maxx Field. EPCOR Industrial Wastewater Investigators confirmed that the coolant leak has been stopped and the boiler system has been tagged as out of service until it is repaired. There was no release of coolant to the storm collection system. This release was reported to AEPA by the City of Edmonton. A written report was not requested by AEPA.	Reportable-3rd Party Release	422286
29-Nov-23	9411-39 Avenue NW	Untreated wastewater (unknown volume) was released into the storm collection system (CB213014) from a surcharging private sanitary manhole located at Jomax Drilling. A 3rd party vacuum truck was called-in to release the blockage (sediment / rags) in the sanitary line. EPCOR assets were mobilized to remove contaminants from the impacted storm collection system and surrounding area. A Notice to Comply was issued to the company to discontinue the release of restricted waste into the sewerage system. This release was reported to AEPA by the company. A written report was issued to AEPA on December 5, 2023.	Reportable-3rd Party Release	422559
30-Nov-23	15202-77 Avenue NW	Sample results of the wastewater from a storm manhole (MH222591) were received and reviewed by EPCOR Monitoring & Compliance. The results exceeded Bylaw 18100 Appendix C and Bylaw 18093 Schedule B "Restricted Wastes Applicable to Storm Sewers and Watercourses" for E.coli at 16,000,000 CFU/100 mL. The original sample were collected on November 28, 2023 by EPCOR Industrial Wastewater Investigators. EPCOR will initiate further investigations into this event to determine the source of the cross-connection at this location. Notice to Comply's will be issued to any residence that has been confirmed to have a cross-connection. The Notice will required that the resident redirect their sanitary wastewater discharge from the storm sewer to the sanitary sewer system. This release was reported to AEPA by EPCOR Monitoring & Compliance. A written report was requested by AEPA.	Reportable-3rd Party Release	422588
05-Dec-23	4404-Gateway Boulevard NW	Potable water (unknown volume) was released into the storm collection system from the Delta Edmonton South Hotel. EPCOR Industrial Wastewater Investigators observed that for approximately 12 hours, potable water from a damaged water line was coming up thru the asphalt parking lot and was flowing into a nearby private storm catch basin. Dechlorination pucks were placed around the catch basin and the water line for the property was shut-off for repairs. A Notice to Comply was issued to the hotel to discontinue the release of restricted/prohibited waste into the storm sewerage system. This release was reported to AEPA by the hotel. A written report was issued to AEPA on December 11, 2023.	Reportable-3rd Party Release	422762
11-Dec-23	16126-110A Avenue NW	Sample results of the wastewater from a storm manhole (MH253144) were received and reviewed by EPCOR Monitoring & Compliance. The results exceeded Bylaw 18100 Appendix C and Bylaw 18093 Schedule B "Restricted Wastes Applicable to Storm Sewers and Watercourses" for E. coli at 200,000 CFU/100 mL. The original sample were collected on December 6, 2023 by EPCOR Industrial Wastewater Investigators. EPCOR will initiate further investigations into this event to determine the source of the cross-connection at this location. Notice to Comply's will be issued to the owners of any properties that have been confirmed to have a cross-connection. The Notices will require that the owners redirect their sanitary wastewater discharge from the storm sewer to the sanitary sewer system. This release was reported to AEPA. A written report was issued to AEPA on December 19, 2023.	Reportable-3rd Party Release	422939
18-Dec-23	13315-156 Street NW	A mixture of potable water & Gardoclean Parts Washer Fluid (approx. 2800L) was released into the sanitary collection system located at OEM Remanufacturing. A potable water hose that was used to fill a tool washing unit had overflowed into a nearby floor drain. The release was predominantly potable water and would therefore have no impact on the Gold Bar WWTP. There was no release of potable water/ washer fluid to the storm collection system. This release was reported to AEPA. A written report was issued to AEPA on December 21, 2023.	Reportable-3rd Party Release	423138
19-Dec-23	6715-97 Street NW	Sample results of the wastewater from a storm manhole (MH229481) were received and reviewed by EPCOR Monitoring & Compliance. The results exceeded Bylaw 18100 Appendix C and Bylaw 18093 Schedule B "Restricted Wastes Applicable to Storm Sewers and Watercourses"	Reportable-3rd Party	423192

		for E. coli at 160,000 CFU/100 mL. The original sample were collected on December 14, 2023 by EPCOR Industrial Wastewater Investigators. EPCOR will initiate further investigations into this event to determine the source of the cross-connection at this location. Notice to Comply's will be issued to the owners of any properties that have been confirmed to have a cross-connection. The Notices will require that the owners redirect their sanitary wastewater discharge from the storm sewer to the sanitary sewer system. This release was reported to AEPA. A written report was issued to AEPA on December 22, 2023.	Release	
19-Dec-23	6619-8 Street NW	Untreated wastewater (unknown volume) was released from an onsite septic tank at a private residence. EPCOR Industrial Wastewater Investigators observed that untreated wastewater from a pipe at this location was being discharged into an adjacent roadside ditch. A Notice to Comply was issued to the property owner to discontinue the release of restricted waste (E. coli = 160,000 CFU/100mL and Ammonia = 50.6 mg/L) into the sewerage system. This release was reported to AEPA. A written report was issued to AEPA on December 28, 2023.	Reportable-3rd Party Release	423258
19-Dec-23	1109A-Avenue & 139-Street NW	Sample results of the wastewater from a storm manhole (MH257494) were received and reviewed by EPCOR Monitoring & Compliance. The results exceeded Bylaw 18100 Appendix C and Bylaw 18093 Schedule B "Restricted Wastes Applicable to Storm Sewers and Watercourses" for E. coli at 1,600,000 CFU/100 mL. The original sample was collected on December 15, 2023 by EPCOR Industrial Wastewater Investigators. EPCOR will initiate further investigations into this event to determine the source of the cross-connection at this location. Notice to Comply's will be issued to the owners of any properties that have been confirmed to have a cross-connection. The Notices will require that the owners redirect their sanitary wastewater discharge from the storm sewer to the sanitary sewer system. This release was reported to AEPA. A written report was issued to AEPA on December 23, 2023.	Reportable-3rd Party Release	423191
21-Dec-23	3908-67 Street NW	Sample results of the wastewater from a storm manhole (MH217323) were received and reviewed by EPCOR Monitoring & Compliance. The results exceeded Bylaw 18100 Appendix C and Bylaw 18093 Schedule B "Restricted Wastes Applicable to Storm Sewers and Watercourses" for E. coli at 1,000,000 CFU/100 mL. The original sample was collected on December 19, 2023 by EPCOR Industrial Wastewater Investigators. EPCOR will initiate further investigations into this event to determine the source of the cross-connection at this location. Notice to Comply's will be issued to the owners of any properties that have been confirmed to have a cross-connection. The Notices will require that the owners redirect their sanitary wastewater discharge from the storm sewer to the sanitary sewer system. This release was reported to AEPA. A written report was issued to AEPA on December 27, 2023.	Reportable-3rd Party Release	423259
22-Dec-23	12020-142 Street NW	Sediment (unknown volume) was released into the storm collection system from a stone masonry company (Atlas Granite Inc.). EPCOR Industrial Wastewater Investigators observed that a discharge hose from stone cutting operations was leading from the facility into a private catch basin near the building. A Notice to Comply has been issued to the company to report this release to AEPA. This release was reported to AEPA by the company. A written report was not requested by AEPA.	Reportable-3rd Party Release	423394
23-Dec-23	14644-50 Street NW	Untreated wastewater (unknown volume) was released into the storm collection system (MH296873) from a private sanitary line blockage located at a residential townhouse complex. Untreated wastewater from the blocked sanitary line surcharged into the basement of the townhouse which started a sump pump and the wastewater was discharged onto a nearby alleyway. EPCOR equipment was mobilized to the site to release the blockage and removed contaminants from the impacted storm collection system and surrounding area. This release was reported to AEPA by the homeowner. A written report was not requested by AEPA.	Reportable-3rd Party Release	423315
25-Dec-23	13307-47 Street NW	Gasoline (approx. 5L) was released into a private storm catch basin from a vehicle fuel theft at a residential housing complex. EPCOR industrial wastewater investigators confirmed that the gasoline was contained with the catch basin sump. A 3rd party vacuum truck was called to the spill site to remove contaminants from the impacted catch basin and surrounding area. There was no release of gasoline to the storm / sanitary collection system. This release was reported to AEPA by City of Edmonton – Fire Services. A written report was not requested by AEPA.	Reportable-3rd Party Release	423349
26-Dec-23	9315-74 Street NW	Gasoline (approx. 1L) was released from a vehicle fuel theft at a residential house. The spill site was cleaned-up by City of Edmonton – Fire Services using absorbent material from a spill kit. EPCOR Industrial Wastewater Investigators confirmed that there was no release of	Reportable-3rd Party Release	423363

		gasoline to the storm / sanitary collection system. This release was reported to AEPA by City of Edmonton – Fire Services. A written report was not requested by AEPA.		
27-Dec-23	4708-Malmo Road NW	Sample results of the wastewater from a storm manhole (MH210764) were received and reviewed by EPCOR Monitoring & Compliance. The results exceeded Bylaw 18100 Appendix C and Bylaw 18093 Schedule B "Restricted Wastes Applicable to Storm Sewers and Watercourses" for E. coli at 1,100,000 CFU/100 mL. The original sample was collected on December 19, 2023 by EPCOR Industrial Wastewater Investigators. EPCOR will initiate further investigations into this event to determine the source of the cross-connection at this location. Notice to Comply's will be issued to the owners of any properties that have been confirmed to have a cross-connection. The Notices will require that the owners redirect their sanitary wastewater discharge from the storm sewer to the sanitary sewer system. This release was reported to AEPA. A written report was issued to AEPA on December 29, 2023.	Reportable-3rd Party Release	423378
27-Dec-23	25-Avenue & 119-Street NW	Hydraulic fluid (approx. 1L) was released into a storm catch basin (CB457011) by a City of Edmonton contractor (Collective Waste Solutions) truck. EPCOR Industrial Wastewater Investigators confirmed that the hydraulic fluid was contained within the catch basin and was not released into the storm collection system. The City of Edmonton mobilized equipment to the spill site to remove contaminants from the impacted storm catch basin and surrounding area. This release was reported to AEPA by the City of Edmonton. A written report was not requested by AEPA.	Reportable-3rd Party Release	423384

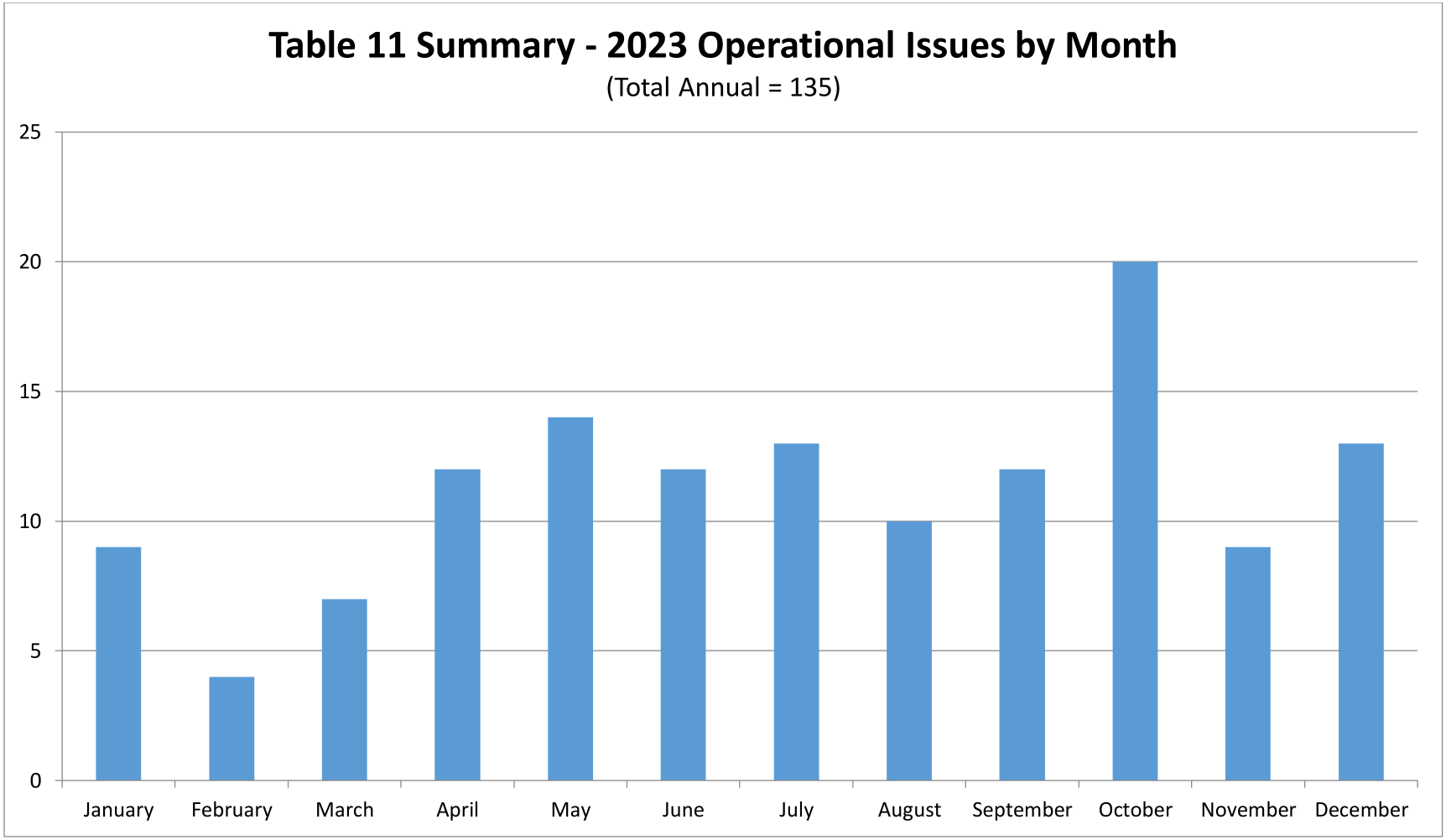


Table 11 Summary - 2023 Operational Issues by Month
(Total Annual = 135)
25
20
15
10
5
0
January
February
March
April
May
June
July
August
September
October
November
December

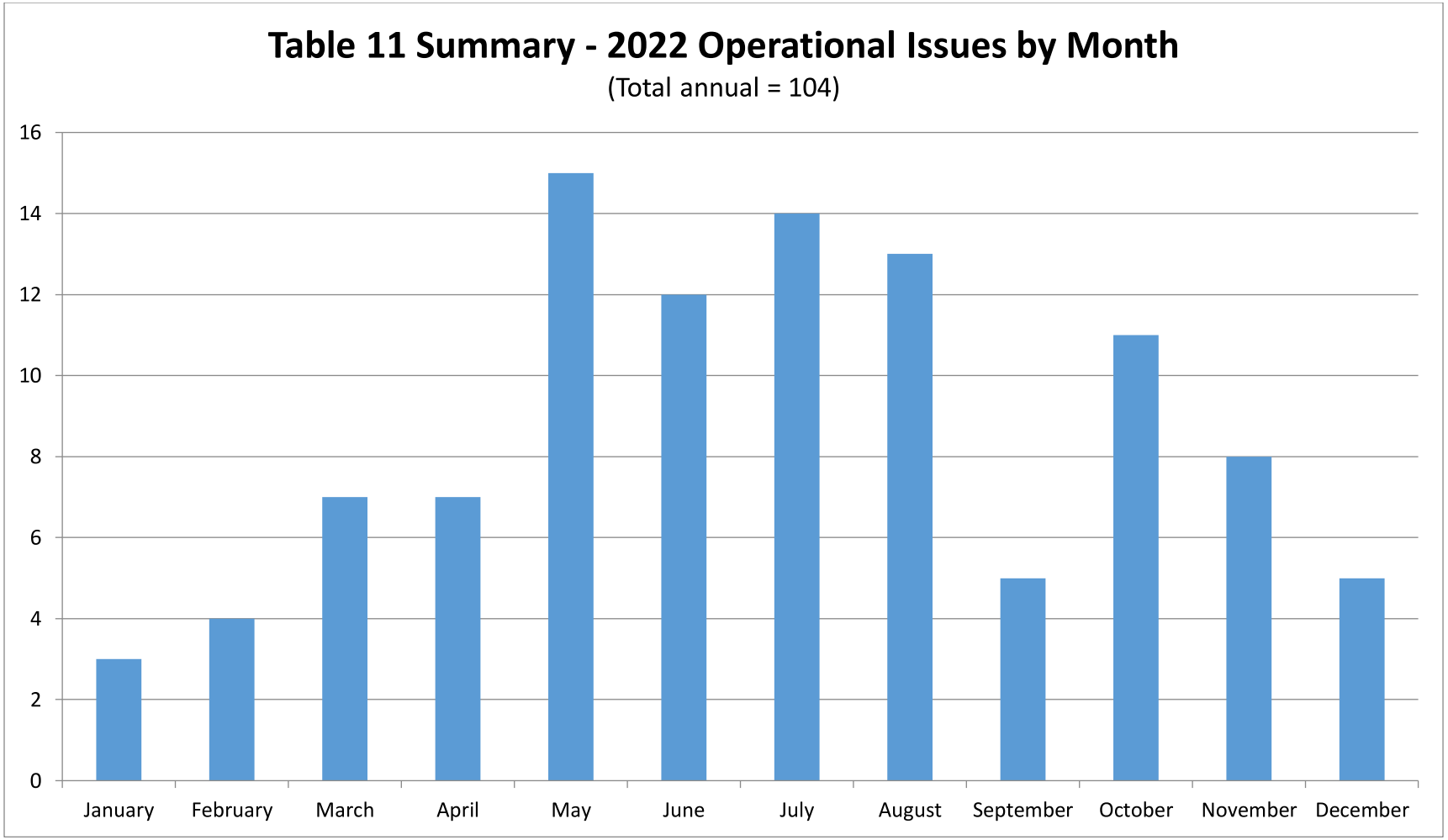


Table 11 Summary - 2022 Operational Issues by Month
(Total annual = 104)
16
14
12
10
8
6
4
2
0
January
February
March
April
May
June
July
August
September
October
November
December