

Prepared By: The Ontario Clean Water Agency

Prepared for: The Township of McGarry

SYSTEM OVERVIEW

January 1 to March 31, 2021

HIGHLIGHTS

Virginiatown-Kearns Drinking Water System

- Erratic flow readings from Well No. 1 are being investigated to confirm if the aquifer level is acceptable. OCWA's Instrumentation Technician conducted a well level measurement by calculating the sound traveled in the well after hitting the well cap with a metal pipe and using a cell phone to record the echo. The results of the test were inconclusive. OCWA contacted IWS for information on the well and for assistance. OCWA will continue to monitor and work on the issue.
- Silent check valve on the raw water inlet pipe is making noise and needs to be replaced. Approve by Town.
- Two (2) water mains break occurred in the first quarter. Refer to "*Incidents*" below for details.
- Regulatory year-end reporting for 2020 complete.

McGarry Wastewater Treatment Lagoon

- Replaced check valves on blowers. All blowers are operational.
- One (1) effluent exceedance occurred in March. Refer to "*Incidents*" below for details.
- Regulatory year-end reporting for 2020 complete.

ASSET MANAGEMENT

Preventative maintenance and equipment calibrations are performed as recommended by the manufacturer. Work is scheduled, assigned and tracked using OCWA's Workplace Management System (Maximo). Corrective and emergency maintenance is also managed using Maximo. Refer to Appendix A for a Work Order Summary Reports.

CAPITAL PLAN PROGRESS

The Capital Letter which provides a list of recommended capital and major maintenance for 2021 was provided to the Owner and requires approval.

The table below provides the status of capital works completed to date in 2021.

CAPITAL ITEM – WATER TREATMENT SYSTEM	STATUS
N/A	



CAPITAL ITEM - WASTEWATER LAGOON SYSTEM	STATUS
Replace check valves on blowers	Completed

CALL-OUT SUMMARY

Number of Call-outs this Quarter:	0 (water system)	0 (sewage lagoon)
Total Call-outs to Date (2021):	0	
Annual Call-out Allowance:	8	
Details of the Call-outs:	No call-outs in the first quarter	

Note: Not all call backs are billed to the Owner; depends on the nature of the call.

FLOW SUMMARIES

Virginiatown-Kearns Water Treatment Plant (Tower Flows) – Historical Flow Comparison

Year	Total Treated Flows (m ³)	Maximum Treated Flow (m ³ /d)	Average Daily Treated Flow (m ³ /d)	Average Day % of Rated Capacity (2045 m ³ /d)
Jan. to Mar. 2021	39,724	789	441	21.6%
2020	188,494	889	515	25.2%
2019	230,717	991	632	30.9%
2018	337,340	1870	924	45.2%
2017*	383,370	2724	1050	51.3%

McGarry Lagoon – Historical Flow Comparison

Year	Total Influent Flow (m ³)	Maximum Influent Flow (m ³ /d)	Average Daily Influent Flow (m ³ /d)	Average Day % of Design Capacity (1135 m ³ /d)
Jan. to Mar. 2021	72,751	4822	808	71.2%
2020	476,828	6191	1303	115%
2019	475,681	7585	1303	115%
2018	575,627	7896	1580	139%
2017*	662,826	8257	1816	160%

* Infrastructure work began in 2017 and continued in 2018 to significantly reduce water loss in the distribution system and excess flow into the sewage collection system.

Refer to Appendix B for historical flow trends which compare flows from 2017 to March 2021

REGULATORY

Sampling, Testing and Monitoring

- ✓ All water samples required under O. Regulation 170/03 were collected and tested in the first quarter and fell within regulatory limits.



- ✓ The system complied with its water taking permit and municipal license having no raw or treated water flow exceedances during this quarter.
- ✓ All sewage samples required under the system's Environmental Compliance Approval (ECA) were collected and tested in the first quarter and results fell within regulatory limits.
- ✓ The sewage treatment system did not comply with its rated capacity in the March due to heavy snow melt and rainfall.
- ✓ The effluent failed to meet the total ammonia nitrogen (TAN) loading requirements of 5.7 kg/d, having an average loading of 6.7 kg/d in March. High flows contributed to the exceedance.
- ✓ Refer to Appendix C for Performance Assessment Reports which provide summaries of water usage, wastewater treatment volumes and regulatory results for the quarter.

Reporting

- ✓ The 2020 Annual/Summary Report for the Virginiatown-Kearns Drinking Water System as required under O. Regulation 170/03 was submitted on February 22, 2021 (due February 28, 2021).
- ✓ The 2020 Annual Water Taking Report as per O. Regulation 387/04 was submitted on February 1, 2021 (due March 31, 2021).
- ✓ The 2020 Annual Performance Report for the McGarry Sewage Treatment Lagoon was submitted to the MECP and the Owner as required under its approval on March 29, 2021 (due March 31, 2021).
- ✓ All other regulatory reporting required this quarter was completed as required.

Inspections/Audits

- ✓ The MECP conducted an unannounced virtual inspection of the Virginiatown-Kearns drinking water system on March 4th. The report date April 19, 2021 identified one (1) recommendation with 4 parts.
 1. It is recommended that the operating authority make improvements to the standard operating procedures and CT calculations to ensure an accurate assessment of primary disinfection during incidents where it is suspected that unchlorinated water has entered the contact pipe.

The hypo pumps now have a feature that will shut down the well pumps if they fail. With this fail-safe feature, unchlorinated water will not enter the contact pipe; therefore the CT calculation and SOP do not need changing. OCWA will monitor the effectiveness of this feature.

2. It is recommended that real-time CT calculations used by operators are improved to include the actual volume of the water in the water tower.

The CT calculation will be updated. The first step is to develop a calculation and get the water volume into OCWA's Wonderware so that operators have easy access to the information for the calculation.

3. It is recommended that a continuous free chlorine residual analyzer is installed downstream of the sodium hypochlorite injection point.



This will be deferred 2024 and will be identified on the capital forecast: With the well pump shutdown on a hypo pump failure, there should be no situations where low chlorine water would leave the well house.

4. The Town and OCWA should collaborate a plan to ensure the operating authority and ORO are kept up-to-date when there is a change in status of Township operator certification.

The Senior Operations Manager/ORO will meet with the Town to discuss this issue and ensure a plan is in place for the Town to notify OCWA of any changes in operator certification.

INCIDENTS

Virginiatown Drinking Water System:

Two (2) watermain breaks occurred in the first quarter and were reported to the Ministry's Spills Action Centers and local Health Unit as adverse water quality incidents (AWQIs).

Date	AWQI No.	Details
February 28	153640	<p>February 28th at 1830 hours - Loss of pressure due to a watermain break/repair (Category 2) at 15 Dorfman Street. A hole occurred due to deterioration in a 6" watermain. The repair occurred on Monday March 1st. The local Health Unit was notified and a precautionary boil water advisory (BWA) was issued for the affected area on March 1st. Approximately 8 houses were affected. The main was isolated in order to conduct repair using a repair band.</p> <p>Pedersen was called to excavate and Town operators conducted the repair. OCWA's OIC oversaw the repair and sampled. All materials were disinfected and the area flushed as per the Ministry's Watermain Disinfection procedure (FCR = 1.11 mg/L). Repair was completed and the pressure was restored on March 1st at 1400 hours. SAC and the local MECP inspector were notified of the incident as required.</p> <p>After the repair was complete and the area was flushed, 2 sets of 3 bacteriological samples were collected (upstream, downstream and at the site of the break) on March 1st and 2nd. Sample results indicated no total coliforms or <i>E.coli</i>. BWA was lifted on March 3, 2021 at approx. 1400 hours.</p>
March 2	153640	<p>March 2 at 1200 hours - Watermain break at the end of Kearns Avenue was initially classified as a Category 2 when 6 homes were to be isolated in order to conduct the repairs. The Health Unit was notified and was preparing a precautionary Boil Water Advisory (BWA) for the affected area. The OIC reclassified the break to a Category 1 after finding out that they could not isolate the 6 homes due to a broken valve and the repair would be done live. The Health Unit was notified of the change and did not issue the BWA. They also did not request bacteriological samples be collected and tested. The repair was conducted under positive pressure with no suspected or evident contamination to users.</p> <p>After the repair, the residents flushed inside taps (FCR = 1.45 mg/L) as there was no hydrant in the area and advised to continue flushing overnight.</p>

McGarry Lagoon Sewage Treatment System:

One (1) effluent exceedance occurred in March and was reported to the Ministry's Spills Action Centers (SAC) as a non-compliance.

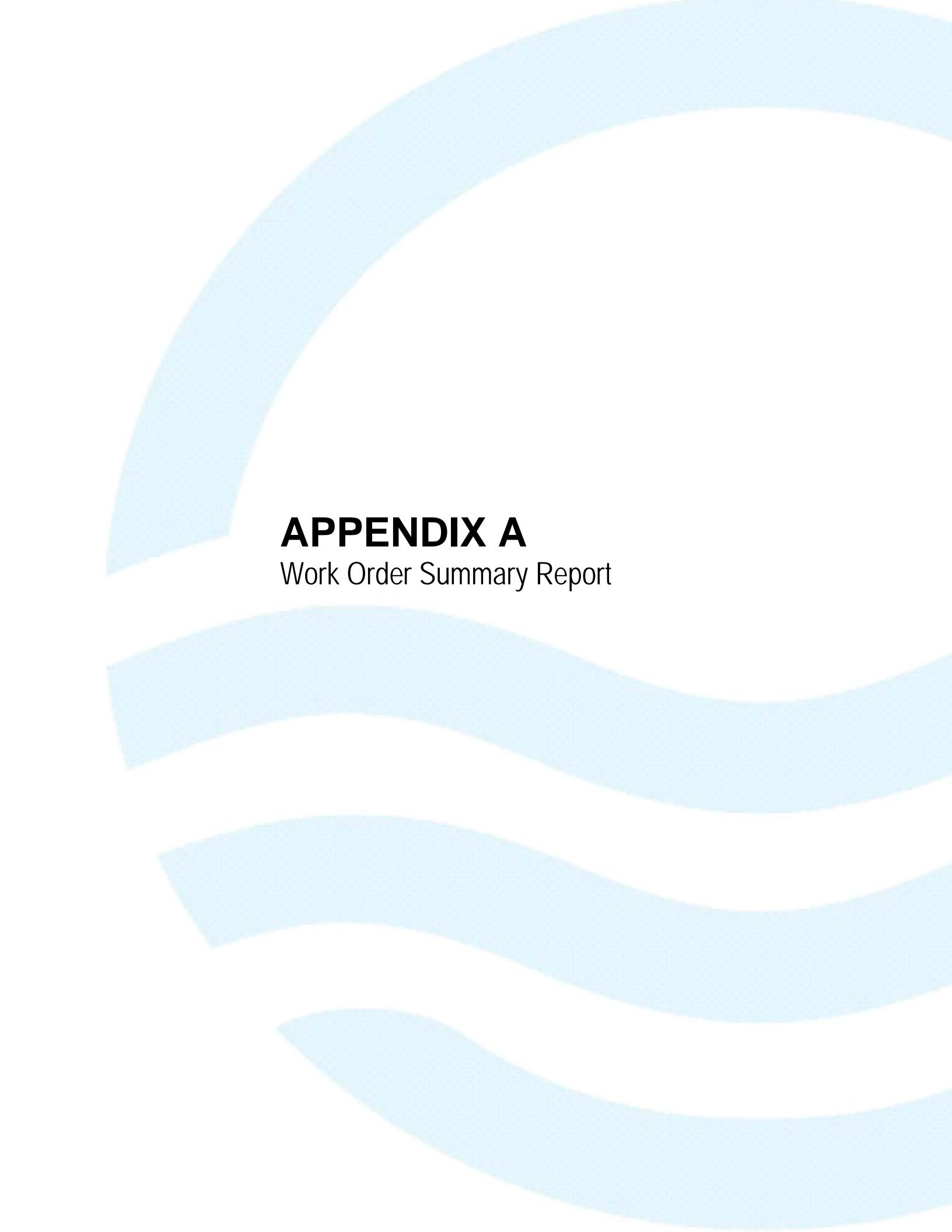
Date	Exceedance	Details
March	Total Ammonia Nitrogen (TAN)	March 2021 - the effluent exceeded the average monthly loading limit of 5.0 kg/d for total ammonia nitrogen (TAN) having a monthly average loading of 6.70 kg/d (Mar. 1 = 1.06, Mar. 9 = 2.15, Mar. 15 = 8.43, Mar. 18 = 7.79, Mar. 22 = 6.30, Mar. 29 = 3.61). <u>Corrective Actions:</u> Adjusted gates to prepare for spring melt. Diffusers on aeration lines require maintenance which will be done in warmer weather.

COMPLAINTS

No complaints were documented this quarter.

HEALTH AND SAFETY

- All safety equipment at each plant was checked monthly to ensure that they are in good working order.
- Health and Safety Training/Sessions completed this quarter include:
 - ✓ WHMIS Training
 - ✓ Workplace Inspections and Guarding Safety
 - ✓ Fire Safety when Working with Gas Powered Equipment



APPENDIX A

Work Order Summary Report

Virginiatown-Kearns DWS

Workorder Summary Report

Report Start Date: Jan 1, 2021 12:00 AM

Report End Date: Mar 31, 2021 11:59 PM

Location: 5085*

Work Order Type: CORR,EMER,OPER,PM

Work Order Class:

				WorkOrder		PM Schedule		Workorder Details					
WO #	Asset ID	Asset Description	Location Description	Type	Class	FEQ	Units	Work Order Description	Status	Schedule Start	Actual Start	Actual Finsh	WorkLog Detail
2174368	0000090412	ANALYZER CHLORINE 01 TOWER	5085, McGarry WTP Tower, Process	PM	Calibration	0		Chlorine Analyzer Calibration, (6m) 5085	COMP	2/18/21 02:30 PM	2/18/21 02:45 PM		
2042162			5085, McGarry WTP Pump House	PM	Compliance	1	YEARS	Facility Emergency Plan Review (1y) 5085	CLOSE	1/1/21 12:00 AM	1/11/21 07:49 AM	1/11/21 07:49 AM	
2042163			5085, McGarry WTP Pump House	PM	Compliance	3	MONTHS	Sampling and Testing (3m) 5085	COMP	1/1/21 12:00 AM	2/2/21 08:39 AM	2/2/21 08:39 AM	
2042884			5085, McGarry WTP Pump House	PM	Inspection	1	MONTHS	TPM Inspection/Maintenance (1m) 5085	COMP	1/1/21 12:00 AM	1/26/21 11:11 AM	1/26/21 11:11 AM	
2096065			5085, McGarry WTP Pump House	PM	Inspection	1	MONTHS	TPM Inspection/Maintenance (1m) 5085	COMP	2/1/21 12:00 AM	2/22/21 09:54 AM	2/22/21 09:54 AM	
2136057			5085, McGarry WTP Pump House	PM	Inspection	1	MONTHS	TPM Inspection/Maintenance (1m) 5085	COMP	3/1/21 12:00 AM	3/30/21 08:08 AM	3/30/21 08:08 AM	

Workorder Summary Report

Report Start Date: Jan 1, 2021 12:00 AM

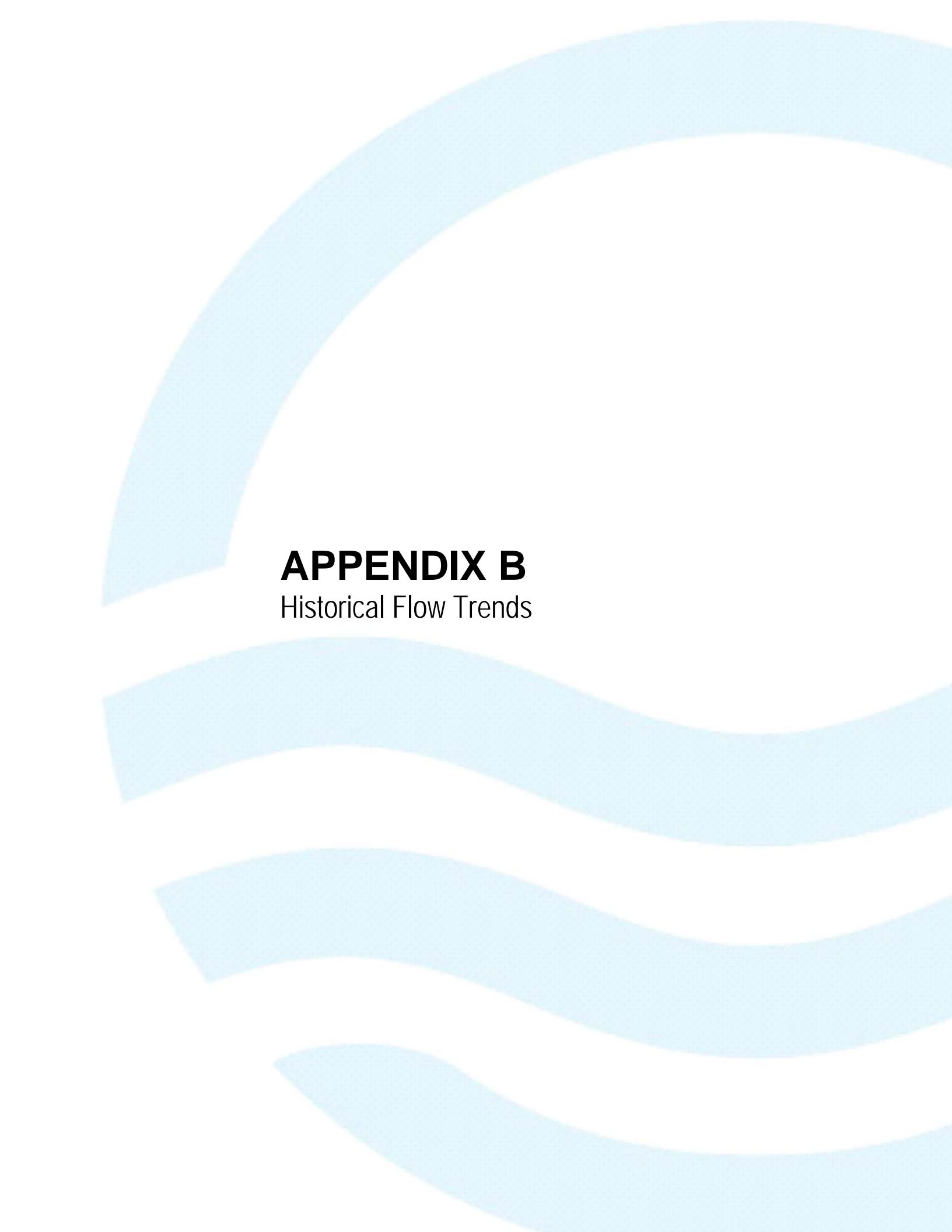
Report End Date: Mar 31, 2021 11:59 PM

Location: 1022*

Work Order Type: CORR,EMER,OPER,PM

Work Order Class:

				WorkOrder		PM Schedule		Workorder Details						
WO #	Asset ID	Asset Description	Location Description	Type	Class	FEQ	Units	Work Order Description	Status	Schedule Start	Actual Start	Actual Finsh	WorkLog Detail	
2042834	0000060624	ENGINE DIESEL	1022, Kearns Lift Station, Facility	PM	Refurbish/Replace/Repair	1	MONTHS	Diesel Generator Kearns Lift Station Inspection/Functional Test (1m) 1022	COMP	1/1/21 12:00 AM	2/8/21 11:53 AM	2/8/21 11:53 AM		
2042850	0000247225	ENGINE DIESEL	1022, V Town Pumping Station, Facility	PM	Refurbish/Replace/Repair	1	MONTHS	Diesel Generator V Town Pumping Station Inspection/Functional Test (1m) 1022	COMP	1/1/21 12:00 AM	2/8/21 11:54 AM	2/8/21 11:54 AM		
2088505	0000060616	ENGINE DIESEL	1022, McGarrys Sewage Treatment Lagoon, Facility, Power Generation	PM	Refurbish/Replace/Repair	1	MONTHS	Diesel Generator Lagoon Inspection/Functional Test (1m) 1022	COMP	1/1/21 12:00 AM	2/8/21 11:54 AM	2/8/21 11:54 AM		
2088527			1022, McGarrys Sewage Treatment Lagoon	PM	Inspection	1	MONTHS	TPM Inspection/Maintenance (1m) 1022	COMP	1/1/21 12:00 AM	1/26/21 11:09 AM	1/26/21 11:09 AM		
2128689			1022, McGarrys Sewage Treatment Lagoon	PM	Inspection	1	MONTHS	TPM Inspection/Maintenance (1m) 1022	COMP	2/1/21 12:00 AM	2/22/21 09:56 AM	2/22/21 09:56 AM		
2171360			1022, McGarrys Sewage Treatment Lagoon	PM	Inspection	1	MONTHS	TPM Inspection/Maintenance (1m) 1022	COMP	3/1/21 12:00 AM	3/30/21 08:05 AM	3/30/21 08:05 AM		

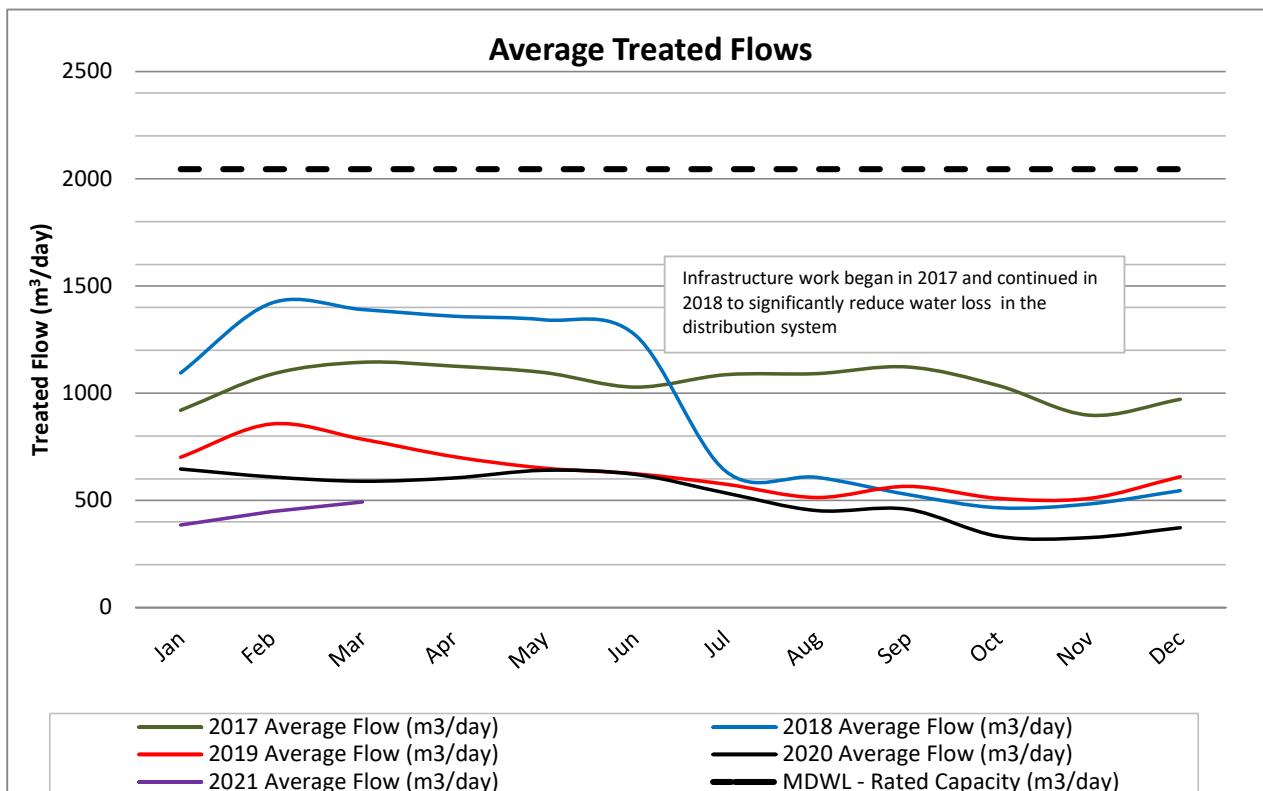


APPENDIX B

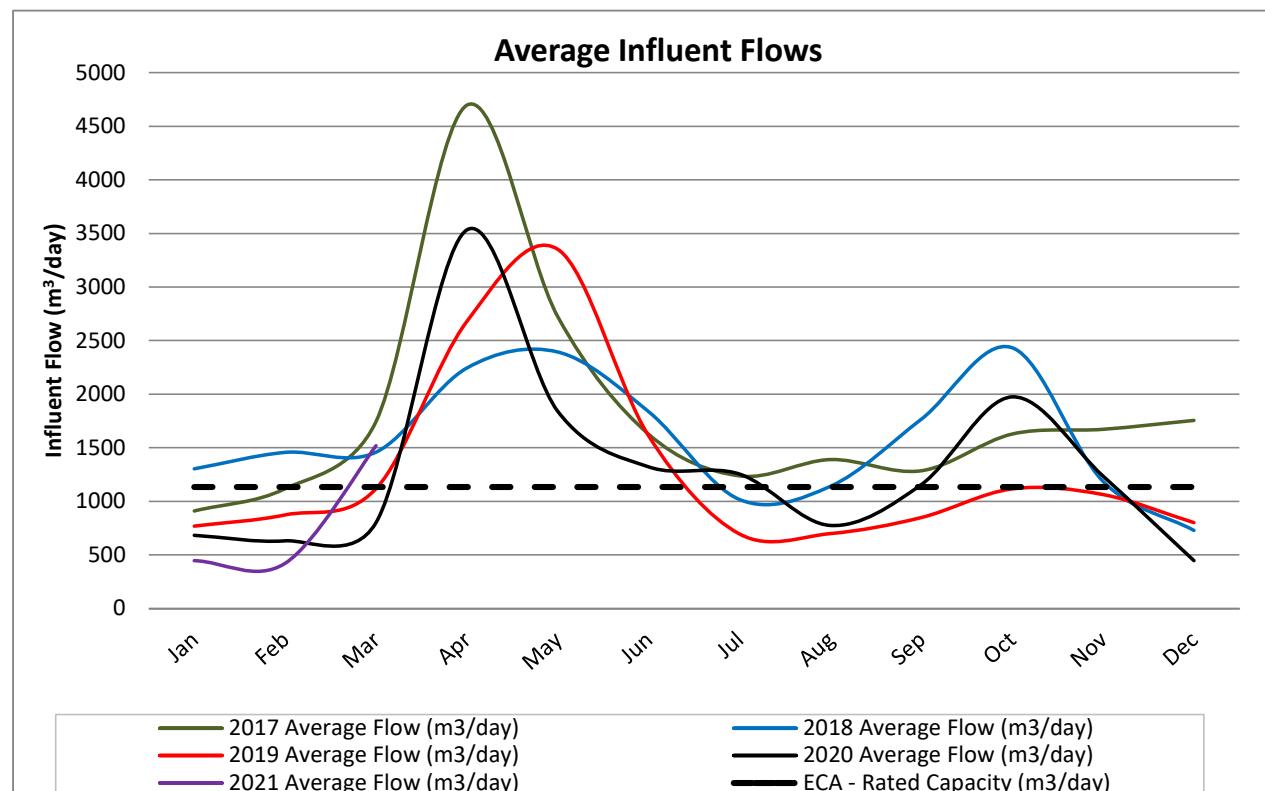
Historical Flow Trends

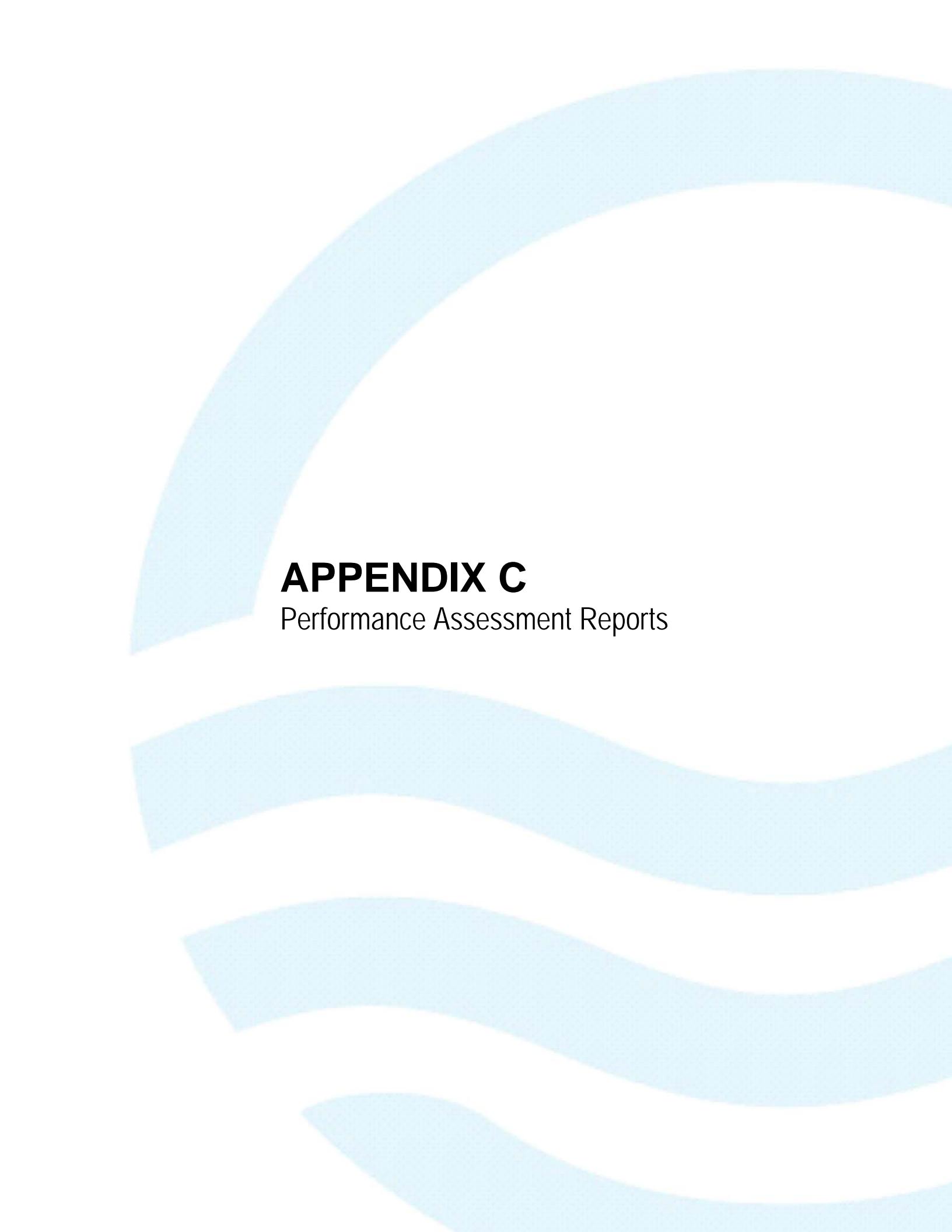
Virginiatown-Kearns Water Treatment System - Average Treated Water Tower Flows from 2017 to March 2021

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2017 Average Flow (m ³ /day)	920	1088	1144	1126	1096	1028	1086	1091	1122	1035	897	971
2018 Average Flow (m ³ /day)	1094	1420	1390	1359	1342	1272	635	607	527	465	483	545
2019 Average Flow (m ³ /day)	701	856	785	704	650	624	575	513	565	509	509	610
2020 Average Flow (m ³ /day)	646	609	589	604	640	621	534	452	458	332	326	372
2021 Average Flow (m ³ /day)	385	448	492									
MDWL - Rated Capacity (m ³ /day)	2045	2045	2045	2045	2045	2045	2045	2045	2045	2045	2045	2045



McGarry Lagoon - Average Influent Flows from 2017 to March 2021





APPENDIX C

Performance Assessment Reports

WATER USAGE	01/2021	02/2021	03/2021	<--Total-->	<--Avg.-->	<--Max.-->	<--Min.-->	Max. Capacity
Flows:								
Raw Flow: Monthly Total - Well 1 (Cheminis) (m³)	11893	12684	15196	39773				
Raw Flow: Monthly Avg - Well 1 (Cheminis) (m³/d)	383.65	453	490.19		442.28			
Raw Flow: Monthly Max - Well 1 (Cheminis) (m³/d)	462	707	792			792		2044.8
Raw Flow: Monthly Total - Well 2 (Standby) (m³)	187	195	296	678				
Raw Flow: Monthly Avg - Well 2 (Standby) (m³/d)	6.03	6.96	9.55		7.51			
Raw Flow: Monthly Max - Well 2 (Standby) (m³/d)	66	61	76			76		1500
Treated Tower Flow: Monthly Total - Treated Water (POE) (m³)	11933.4	12532.7	15257.9	39724				
Treated Tower Flow: Monthly Avg - Treated Water (POE) (m³/d)	384.95	447.6	492.19		441.38			
Treated Tower Flow: Monthly Max - Treated Water (POE) (m³/d)	427.2	587.2	789			789		2045
RAW WATER								
Turbidity:								
Raw: Max Turbidity - Well 1 (Cheminis) (NTU)	0.302	0.18	0.6			0.6		N/A
Raw: Max Turbidity - Well 2 (Standby) (NTU)	3.86	0.72	0.55			3.86		N/A
TREATED WATER								
Chlorine Residuals:								
Treated: Min Free Cl2 Resid - Treated Water (POE) (mg/L)	1.207	1.222	1.105				1.105	CT*
Treated: Max Free Cl2 Resid - Treated Water (POE) (mg/L)	1.914	1.919	1.65			1.919		
Bacti Samples:								
Treated Bacti: # of samples - Treated Water (POE)	4	4	5	13				13
Treated Bacti: # of TC exceedances - Treated Water (POE)	0	0	0	0				0
Treated Bacti: # of EC exceedances - Treated Water (POE)	0	0	0	0				0
Chemical Parameters:								
Treated: Max Nitrite - Treated Water (POE) (mg/L)	<	0.05			<	0.05		1
Treated: Max Nitrate - Treated Water (POE) (mg/L)		0.05				0.05		10
DISTRIBUTION WATER								
Chlorine Residuals:								
Dist: Min Free Cl2 Resid - Residual No. 1 (mg/L)	0.84	0.80	0.92				0.80	0.05
Dist: Min Free Cl2 Resid - Residual No. 2 (mg/L)	0.98	1.01	0.81				0.81	0.05
Dist: Min Free Cl2 Resid - Residual No. 3 (mg/L)	0.94	1.00	0.91				0.91	0.05
Dist: Min Free Cl2 Resid - Residual No. 4 (mg/L)	1.03	0.91	0.89				0.89	0.05
Dist: Max Free Cl2 Resid - Residual No. 1 (mg/L)	1.25	1.39	1.41			1.41		
Dist: Max Free Cl2 Resid - Residual No. 2 (mg/L)	1.19	1.39	1.55			1.55		
Dist: Max Free Cl2 Resid - Residual No. 3 (mg/L)	1.16	1.26	1.31			1.31		
Dist: Max Free Cl2 Resid - Residual No. 4 (mg/L)	1.29	1.21	1.56			1.56		
Bacti Samples:								
Dist Bacti: # of samples - VT-3 (Bacti)	4	4	5	13				13
Dist Bacti: # of TC exceedances - VT-3 (Bacti)	0	0	0	0				0
Dist Bacti: # of EC exceedances - VT-3 (Bacti)	0	0	0	0				0
Dist Bacti: # of samples - VT-4 (Bacti)	4	4	5	13				13
Dist Bacti: # of TC exceedances - VT-4 (Bacti)	0	0	0	0				0
Dist Bacti: # of EC exceedances - VT-4 (Bacti)	0	0	0	0				0
Distribution: Max THM - Distribution Water (µg/l)								
Distribution: Max HAA - Distribution Water (µg/l)	1.3					1.3		100**
Distribution: Max HAA - Distribution Water (µg/l)	<	8			<	8		80***
Dist Alkalinity/pH/Temperature: # of samples			2	2				2
Dist. Min Alkalinity (as CaCO3) - mg/L			73				73	N/A
Dist. Max Alkalinity (as CaCO3) - mg/L			75			75		N/A
Dist. Min pH Field: Lab Upload - --			7.29				7.29	N/A
Dist. Max pH Field: Lab Upload - --			7.42			7.42		N/A
Dist. Min Temperature Field: Lab Upload - °C			6.3				6.3	N/A
Dist. Max Temperature Field: Lab Upload - °C			12.9			12.9		N/A

NOTES:

* CT is the concentration of chlorine in the water times the time of contact that the chlorine has with the water. It is used to demonstrate the level of disinfection treatment in the water. CT calculations are performed for the Virginiatown-Kearns water plant if the free chlorine residual level drops below 0.05 mg/L to ensure primary disinfection is achieved.

** Maximum Allowable Concentration (MAC) for Trihalomethanes (THMS) = 100 ug/L (Four Quarter Running Average). The running average to end of the quarter = **1.10 ug/L**

*** Maximum Allowable Concentration (MAC) for Haleoacetic Acids (HAAs) = 100 ug/L (Four Quarter Running Average). The running average to end of the quarter = **<8 ug/L**

Facility: [1022] McGARRY WASTEWATER TREATMENT LAGOON

Works: [120000024]

FLows	01/2021	02/2021	03/2021	<--Total-->	<--Avg.-->	<--Max.-->	Avg. Capacity
Flows:							
Raw Flow: Total - Influent (m ³)	13848	11809	47094	72751			
Raw Flow: Avg - Influent (m ³ /d)	446.71	421.75	1519.16*		808		1135
Raw Flow: Max - Influent (m ³ /d)	512	542	4822			4822	
Eff. Flow: Total - Effluent (m ³)	14360	12991	42468	69819			
Eff. Flow: Avg - Effluent (m ³ /d)	463.23	463.96	1369.94*		776		1135
Eff. Flow: Max - Effluent (m ³ /d)	527	550	3571			3571	
INFLUENT & EFFLUENT							
Biochemical Oxygen Demand: CBOD:							
Raw: # of samples of BOD ₅ - Influent (mg/L)	1	1	1	3			3
Raw: Avg BOD ₅ - Influent (mg/L)	62	42	76.6		60.2	76.6	
Carbonaceous Biochemical Oxygen Demand: CBOD:							
Eff: # of samples of cBOD ₅ - Effluent (mg/L)	4	4	6**	14			13
Eff: Avg cBOD ₅ - Effluent (mg/L)	0.825	1.075	< 2.067		< 1.322	2.067	25
Loading: cBOD ₅ - Effluent (kg/d)	0.382	0.499	< 2.831		< 1.237	2.831	28.4
Biochemical Oxygen Demand: BOD ₅ :							
Total Suspended Solids: TSS:							
Raw: # of samples of TSS - Influent (mg/L)	1	1	1	3			3
Raw: Avg TSS - Influent (mg/L)	388	33	232		217.667	388	
Eff: # of samples of TSS - Effluent (mg/L)	4	4	6**	14			13
Eff: Avg TSS - Effluent (mg/L)	< 2	< 1.25	< 19.667		< 7.639	< 19.667	25
Loading: TSS - Effluent (kg/d)	< 0.926	< 0.58	< 26.942		< 9.483	< 26.942	28.4
Percent Removal: TSS - Influent (mg/L)	99.485	96.212	91.523			99.485	
Total Phosphorus: TP:							
Raw: # of samples of TP - Influent (mg/L)	1	1	1	3			
Raw: Avg TP - Influent (mg/L)	3.46	1.67	2.58		2.57	3.46	
Eff: # of samples of TP - Effluent (mg/L)	4	4	6**	14			13
Eff: Avg TP - Effluent (mg/L)	0.262	0.375	0.347		0.328	0.375	0.5
Loading: TP - Effluent (kg/d)	0.121	0.174	0.475		0.257	0.475	0.6
Percent Removal: TP - Influent (mg/L)	92.428	77.53	86.563			92.428	
Nitrogen Series:							
Raw: # of samples of TKN - Influent (mg/L)	1	1	1	3			3
Raw: Avg TKN - Influent (mg/L)	18.3	17.1	19.7		18.367	19.7	
Eff: # of samples of TAN - Effluent (mg/L)	4	4	6**	14			13
Eff: Avg TAN - Effluent (mg/L)	0.36	0.865	4.92		2.048	4.92	5
Loading: TAN - Effluent (kg/d)	0.167	0.401	6.7***		2.436	6.7	5.7
Disinfection:							
Eff: # of samples of E. Coli - Effluent (cfu/100mL)	4	4	6**	14			13
Eff: GMD E. Coli - Effluent (cfu/100mL)	1006.217	1218.989	8786.084		3670.43	8786.084	N/A

NOTES:

* The system did not comply with its rated capacity in March due to high flows from heavy snow melt and rains.

** An extra effluent sample was collected in March to monitor the increasing TSS, TP and TAN results.

*** The effluent failed to meet the TAN loading requirements of 5.7 kg/d, having an average loading of 6.7 kg/d in March. High flows contributed to the exceedance.