EDMONTON WATERWORKS

ANNUAL REPORT TO ALBERTA ENVIRONMENT AND PROTECTED AREAS

Approval Number 638-04-00

2023

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1.1 Overview

Through 2023, EPCOR Water Services Inc. (EWSI) continued to satisfy all water demand requirements while meeting our strict water quality criteria. Total demand in 2023 was higher than in 2022, 386 ML/d average versus 373 ML/d in 2022, and higher than the previous 10-year average.

Construction, commissioning and start-up of phosphoric acid chemical feed systems at both WTPs was completed in Q1 2023. EWSI began feeding phosphoric acid at a dose of 0.9 mg/L (as phosphorus) on March 20 for lead mitigation.

Rossdale and EL Smith WTPs converted from direct filtration (DF) on April 4 in advance of runoff. The runoff was extremely mild, however, and there was little impact on raw water quality. Raw water color remained below 10 TCU and there was no significant increase in organic nitrogen. Both plants fed carbon at a low dose April 4 through 12 as a precautionary measure. The 2023 Spring Home Analysis Runoff Program (SHARP), formerly known as the Home Sniffing Program, concluded on May 13. The average score was 95.3% satisfied over the 90-day period, slightly above the 94.4% PBR target.

Heavy rains mid-June led to a High Streamflow Advisory being issued for the North Saskatchewan River (NSR) and tributaries upstream of Edmonton. Raw water color peaked at approximately 110 TCU and turbidity at 1500 NTU. Both plants fed carbon June 21 through June 23 to manage the high color but production was not impacted. Outside of this event, raw water conditions were favorable through the summer and fall.

E.L. Smith converted to DF on October 16 and Rossdale followed on November 6. In 2023, the WTPs achieved an average of 149 days in DF, exceeding the internal target of 120 days for DF operations. DF operation resulted in a reduction of total solids discharged to the NSR by 53.5% during the months of January, February, November, and December compared to baseline conventional operation. In 2023, the plants operated several days in DF in March, April and October. During this Extended DF period, the total solids reduction was 44.1% compared to baseline conventional operation.

In 2023, EWSI began collecting water quality samples as part of the Wastestream Monitoring Program, which was approved by AEPA in December 2022. The goal of the program is to improve wastestream load quantification to better determine if acute and/or chronic guidelines and regional water quality triggers and limits are being met. A report summarizing the 2023 results is included as an appendix.

There was one notification to AEPA from the WTPs in 2023, involving a chlorinated release to the stormwater system at the Roslyn 1 Pump Station. The release occurred October 17 when a coupling on the discharge pipe from the station failed as employees were working on the pipe upstream. Approximately 1 ML of potable water was released from the pump station onto the street and into the stormwater management system. Samples collected from the Kennedale Outfall, the final discharge point to the NSR, showed no detectable chlorine residual.

The WTPs continue to improve the integrated safety and environmental management system in accordance with the ISO 14001:2015 and 45001:2018 standard. In 2023, an external auditor completed a recertification audit of the WTPs and reservoirs to both of these standards. There were no non-conformances identified.

EWSI continued to upgrade the water treatment plants and the reservoir assets. Total expenditures in 2023 were approximately $31.3M. Some of the major projects are as follows:

- E.L. Smith Filter Upgrades is on-going. To date, Filters 1-4 are complete and Filter 5 is construction is underway. Filter 6 is scheduled for 2025. This upgrade program will be completed on all of the Stage 1 and Stage 2 filters (12 in total) for future deep bed filtration implementation.
- E.L. Smith Low Impact Development (LID) bio-retention pond construction was completed in 2023. Three separate ponds will now provide protection from localized flooding during rain events.
- Construction started on the Rossdale WTP Aqua Ammonia (AA) conversion to Liquid Ammonium Sulphate (LAS). This conversion will provide a safer chemical for injection into potable water for converting free chlorine to chloramine. AA off-gasses easily and is a hazard to plant staff. The conversion has already been completed at the E.L. Smith WTP.

- Phosphoric acid injection for lead control was placed into service in March 2023 at both WTPs.
- Plants Flood Protection work progressed in 2023 on this multi-year project. Work completed in 2023 included submission of the EIA under the NSRV ARP to City Council in September and was approved, completion of barrier design to 75%, construction of 3 outfall manholes and associated control gates, and further consultation work with indigenous nations.

In 2023, Water Distribution and Transmission repaired 265 water main breaks on the distribution system in Edmonton, with the majority of main breaks occurring on cast iron pipes. EPCOR generally experiences a higher volume of breaks in the first quarter of the year attributed to deeper frost penetration as we incurred 87 in this time frame. The overall reliability of the water distribution system can be attributed to the water main replacement and cathodic protection programs as well as the use of more reliable pipe materials in both replacement and new water main construction.

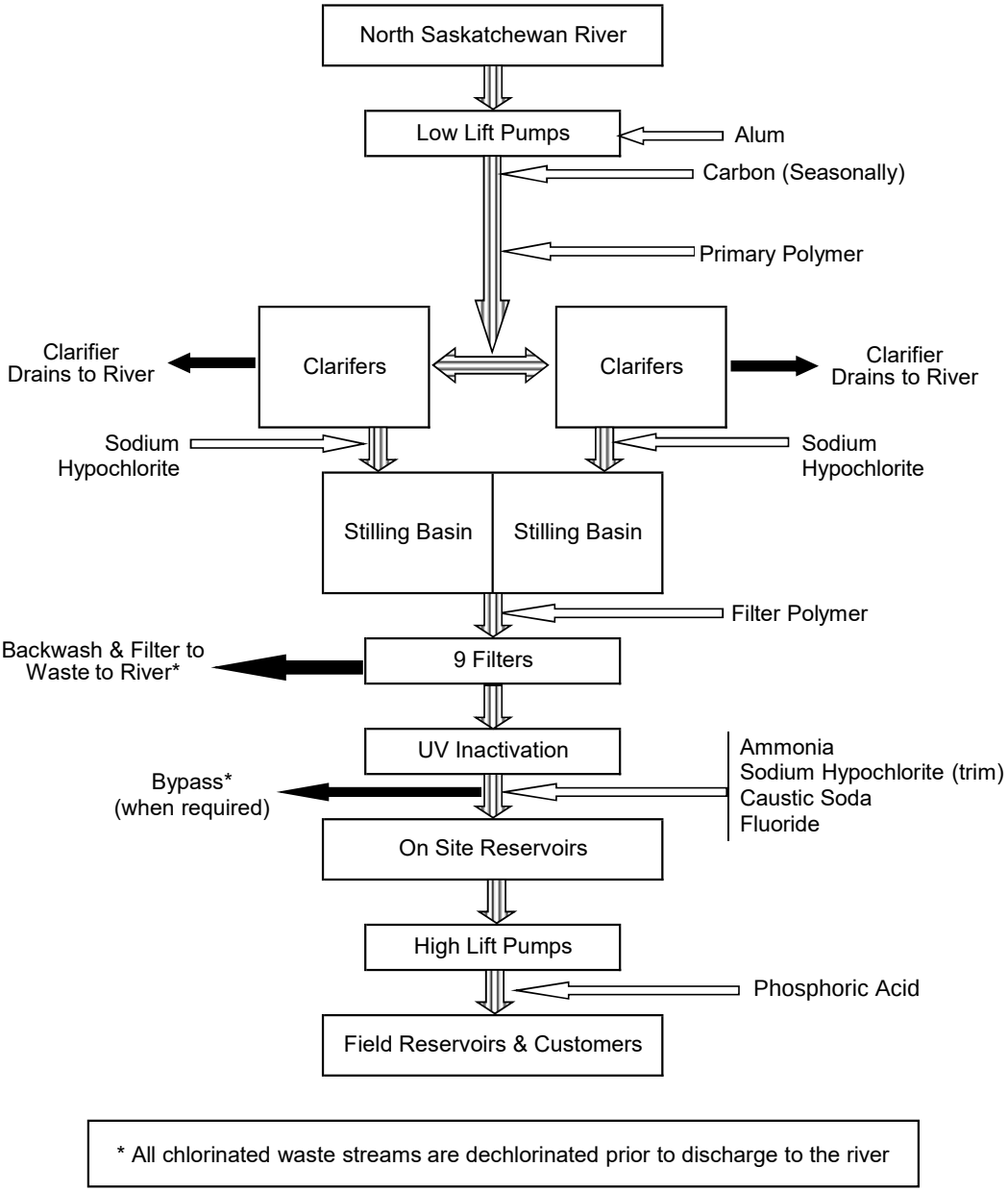
In 2023, the Uni-Directional Flushing program completed flushing and valve exercising in about 30% of Edmonton (2234 runs).This program is now a eight-year cycle with area prioritization emphasis placed on water quality parameters, percentage of Cast Iron Mains, and the relative success of the previous flush.

In 2023, there were 15 single Total Coliform Positive (TC+) results for the Edmonton system. Of those results, there were four Approval contraventions related to TC+, meaning the resample results were also TC+. All samples were determined to be from either contaminated hydrants or home taps. Issues were addressed by super-chlorinating the hydrant barrel and/or resampling. There were 64 main breaks reported to AEPA due to the proximity of release to the storm system and the North Saskatchewan River

As we move into 2024, we will continue to focus our efforts on the production of and distribution of high quality water, customer satisfaction, protection of the environment, workplace safety and cost effectiveness. We will continue to ensure our customers receive best value for the services we provide them.

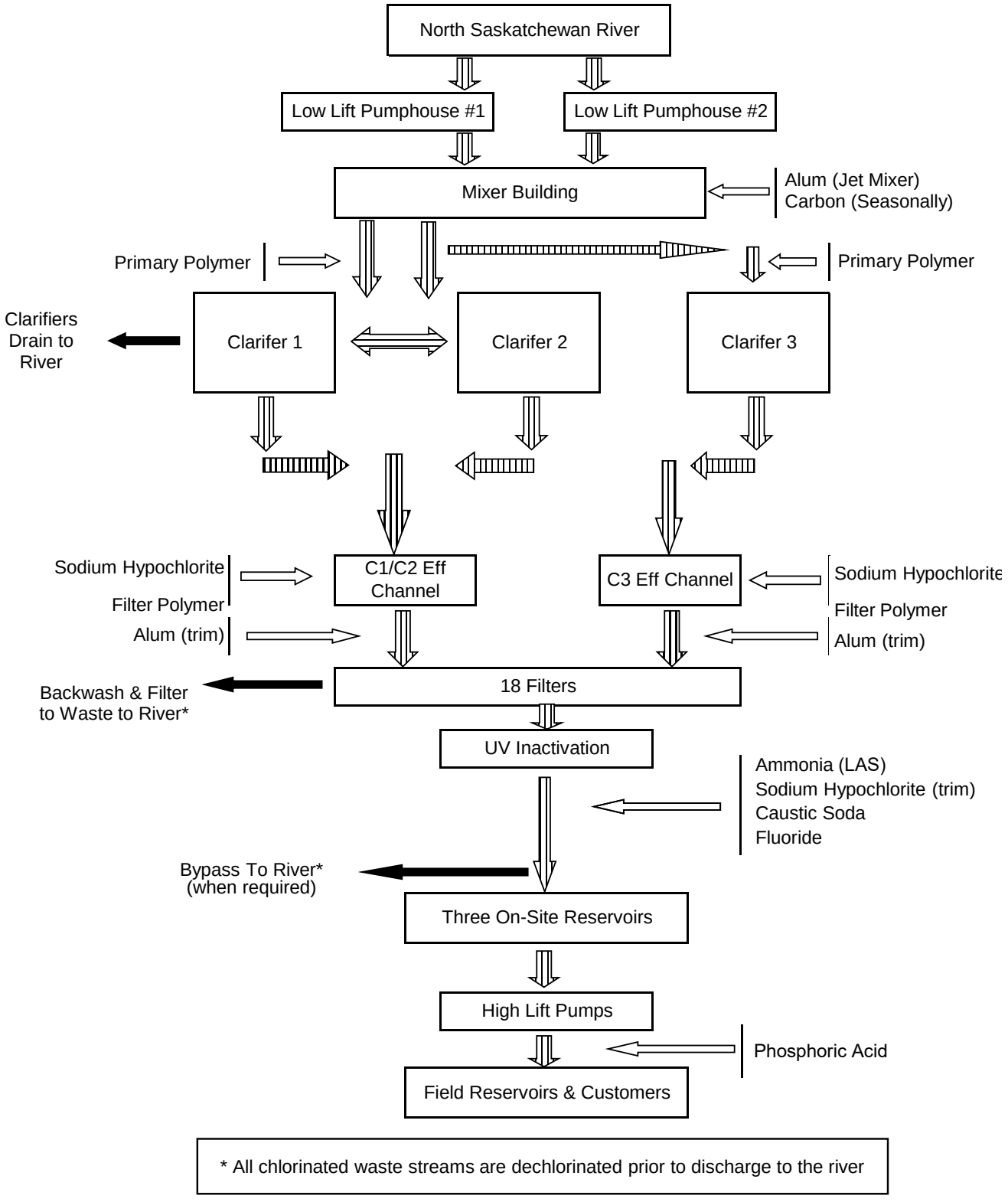
(End of Section)

1.2 Process Schematic - Rossdale (Plants 1 & 2)



* All chlorinated waste streams are dechlorinated prior to discharge to the river

1.3 Process Schematic - E. L. Smith (Plant 4)



1.4 Summary of Violations and Notifications for 2023

EPCOR Incident Number	Description	Date of Incident	AESRD Report File Number
ENV-20230102-616429	About 78 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into a storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	January 2, 2023	408223
ENV-20230103-284988	About 36 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the drainage catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	January 3, 2023	408232
ENV-20230111-930949	About 73 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the drainage storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	January 11, 2023	408503
ENV-20230115-973423	About 36 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the drainage storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	January 15, 2023	408665
ENV-20230129-891966	About 43 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	January 29, 2023	409099
ENV-20230130-104971	About 134m3 of potable chlorinated water was released to the surface due to a suspected leak within the water distribution system buried underground. Dechlorination pucks were placed in the path of the water. Another about 278m3 of dechlorinated water was released until water was shutoff. The dechlorinated water travelled overland and in the storm system to an outfall on the north of 97 Avenue and overland south of 97 Avenue. The leak was isolated until the repair was completed.	January 30, 2023	409136
ENV-20230206-732709	About 50 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into a storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	February 6, 2023	409341
ENV-20230213-997892	About 53 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the drainage catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	February 13, 2023	409575

1.4 Summary of Violations and Notifications for 2023

EPCOR Incident Number	Description	Date of Incident	AESRD Report File Number
ENV-20230214-685613	About 84 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the drainage storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	February 14, 2023	409588
ENV-20230223-640577	About 34 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the drainage storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	February 23, 2023	409875
ENV-20230228-432044	About 37 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	February 27, 2023	410011
ENV-20230304-479488	About 40 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into a storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	March 4, 2023	410222
ENV-20230310-339296	About 40 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the drainage catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	March 9, 2023	410412
ENV-20230311-377983	About 138 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the drainage storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	March 11, 2023	410454
ENV-20230314-678556	About 102 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the drainage storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	March 13, 2023	410515
ENV-20230319-077470	About 44 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	March 19, 2023	410707
ENV-20230323-628125	The Rossdale WTP noted a significant daily demand increase for Tuesday, March 21, 2023. Through investigative efforts a water main break was identified and the leak was isolated until the repair is completed or the water line is abandoned. About 193 ML of water was lost from March 20-24, 2023.	March 22, 2023	410863

1.4 Summary of Violations and Notifications for 2023

EPCOR Incident Number	Description	Date of Incident	AESRD Report File Number
ENV-20230325-383874	About 48 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	March 25, 2023	410980
ENV-20230327-844305	About 107 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	March 26, 2023	410999
ENV-20230331-632945	About 58 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	March 31, 2023	411192
ENV-20230403-411481	About 46 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into a storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	April 3, 2023	411284
ENV-20230405-849999	About 119 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the drainage catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	April 5, 2023	411344
ENV-20230311-377983	About 138 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the drainage storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	April 11, 2023	411568
ENV-20230411-378737	About 40 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the drainage storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	April 11, 2023	411564
ENV-20230411-127108	About 39 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	April 11, 2023	411543
ENV-20230412-228705	About 0.5 cubic metres per hour of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	April 12, 2023	411629

1.4 Summary of Violations and Notifications for 2023

EPCOR Incident Number	Description	Date of Incident	AESRD Report File Number
ENV-20230416-301359	About 69 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	April 16, 2023	411725
ENV-20230418-117816	About 42 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	April 18, 2023	411822
ENV-20230419-198226	About 44 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	April 19, 2023	411886
ENV-20230421-343817	About 44 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	April 20,2023	411924
ENV-20230420-134256	About 78 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	April 20, 2023	411920
ENV-20230420-005001	About 1 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	April 20, 2023	411913
ENV-20230430-429135	About 98 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	April 30, 2023	412238
ENV-20230501-183298	About 39 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into a storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	May 1, 2023	412260
ENV-20230503-262440	About 51 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the drainage storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	May 3, 2023	412428

1.4 Summary of Violations and Notifications for 2023

EPCOR Incident Number	Description	Date of Incident	AESRD Report File Number
ENV-20230506-339246	About 46 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the drainage storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	May 6, 2023	412600
ENV-20230508-366022	About 48 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the drainage storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	May 8, 2023	412656
ENV-20230511-190574	During an inspection on May 5, 2023 a Water Operations crew noticed standing water inside a chamber but couldn't investigate further at the time due to not having safe access into the chamber. Dechlorination pucks were placed in the chamber at this time, will be replenished regularly, and any visible water at the outfall will be tested for residual chlorine until the leak can be repaired. Water Operations suspected a water leak with an estimated* 5L/min of potable chlorinated water at +/-1.5ppm being released within the chamber (based on level of water inside chamber).The leak is likely just upstream of the chamber and would follow the pipe to this lower point.	May 5, 2023	412884
ENV-20230517-072278	About 52 cubic metres per hour of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the drainage infrastructure to dechlorinate the water.The leak was isolated until the repair was completed.	May 17, 2023	413215
ENV-20230518-282489	About 141 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	May 18, 2023	413346
ENV-20230518-192222	About 105 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the drainage infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	May 18, 2023	413333
ENV-20230523-6286	About 107 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	May 23, 2023	413539
ENV-20230602-636431	About 58 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into a storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	June 1, 2023	414126

1.4 Summary of Violations and Notifications for 2023

EPCOR Incident Number	Description	Date of Incident	AESRD Report File Number
ENV-20230610-077079	About 86 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the drainage storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	June 10, 2023	414597
ENV-20230613-544435	About 41 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the drainage storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	June 13, 2023	414765
ENV-20230614-674610	About 44 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the drainage storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	June 14, 2023	414873
ENV-20230617-110762	About 160 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the drainage storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	June 17, 2023	414995
ENV-20230619-643518	About 90 cubic metres per hour of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the drainage infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	June 19, 2023	415058
ENV-20230704-512176	About 155 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into a storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	July 4, 2023	415810
ENV-20230724-906081	About 51 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the drainage storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	July 24,2023	416870
ENV-20230724-832434	About 46 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the drainage storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	July 24, 2023	416859
ENV-20230808-022339	About 84 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into a storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	August 8, 2023	417564

1.4 Summary of Violations and Notifications for 2023

EPCOR Incident Number	Description	Date of Incident	AESRD Report File Number
ENV-20230814-517459	About 95 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the drainage storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	August 14, 2023	417819
ENV-20230822-772493	About 36 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the drainage storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	August 22, 2023	418132
ENV-20230828-168957	About 88 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the drainage storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	August 28, 2023	418401
ENV-20230903-313998	About 60 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into a combined sanitary catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	Sept 3, 2023	418787
ENV-20230911-128145	About 42 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into a nearby storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	Sept 11, 2023	419136
ENV-20230903-313998	We received a call about a potential water main break at 8:11 AM on September 3rd. Arrival time was 8:21 AM when it was confirmed to be a main break. De-chlorination was completed upon arrival. Water was turned off at 8:36 AM. Water went into a combined sanitary line. Two (2) apartments were impacted by the closed water line causing more than 100 customers to be out of water. Spoke with Alberta Environment and Protected Areas at 9:40 AM: reference number is 418787.	September 3, 2023	418787
ENV-20230903-520358	A sample was taken at Hydrant 11107 (near 12320 160 St) on Sept. 2 at 9:15 AM by Labour Foreman from the maintenance crew. Dispatch received a Resample First Total Coliform Positive request e-mail at 3:04 PM on September 3rd. Alberta Environment and Protected Areas was notified at 3:22 PM on September 3rd: the reference number is 418797. Third Re-Sample Failed, incident changed to Reportable, Significant.	September 3, 2023	418797
ENV-20230905-283286	The sample was taken at hydrant 12039 across the street from 4104 36 St on September 4 at 11:00 AM. The sample result was total coliform positive. E-coli was negative. Contacted AEPA at 16:00. The AEP reference number is 418896. Follow up samples taken were total colofirm (TC) negative.	September 4, 2023	418896

1.4 Summary of Violations and Notifications for 2023

EPCOR Incident Number	Description	Date of Incident	AESRD Report File Number
ENV-20230905-284895	The sample was taken at hydrant 21068 at the south east corner of 1803 34 St NW on September 4 at 12:15 PM. The sample result was total coliform (TC) positive. E-coli was negative. Contacted AEPAat 16:00. The AEP reference number is 418897. Follow up samples were TC negative.	September 4, 2023	418897
ENV-20230906-279382	At about 6:15 pm this evening Discovery Park utility power failed. The emergency generator failed to start. The pressure decreased to zero kPa by about 6:50 pm. An electrician reset the generator just after 7 pm. AEPA Notification Details: minimal customer impact – assumed only closed businesses only, no residential. Total number of businesses impacted will be provided in 7 day letter. Flushing will be completed. UDF mobilized to Discovery Business Park to begin flushing the zone.	September 6, 2023	418983
ENV-20230908-669155	Bacteriological Sample was collected at hydrant H26540 as result of an unplanned distribution water main depressurization that occurred. The sample result failed for total coliform (TC positive). Report made to AEPA at 09:39 AM and Ref# 419049 was issued. Call request (CR) 339880 was created for resampling at the same hydrant and also upstream and downstream hydrants.	September 7, 2023	419049
ENV-20230911-128145	We received a call at 5:35 AM about water surfacing in front of 4846 117 Ave. Crew arrived on site at 5:54 AM where it was confirmed to be a water main break. De-chlorination was completed upon arrival. Water went into storm CB's 285501 and 285502. 48 houses and 1 church were impacted, water was turned off at 6:19 AM. AEPA was contacted at 6:55 AM. AEPA reference number is 419136.	September 11, 2023	419136
ENV-20230912-289829-v1	Resident took sample as part of Quality Assurance home sampling program and it failed total coliform positive. Lab sent water trouble to resample. AEPA reference number is 419265. A sample collected on September 11, 2023 from a residence's kitchen tap (2011 - 104A Street, Edmonton) tested Total Coliform positive (TC+) on September 12th. A notification was called into AEPA's EDGE line (AEPA Reference # 419265) (ERS ENV-20230912-289829; CR#: 340096). On Sept 13th, as part of the TC+ follow-up, 4 samples were collected. On Sept 14th, 1 of 4 follow-up samples—taken from a separate residence (2007 - 104A Street, kitchen tap) also tested TC+. A follow-up notification was called into AEPA's EDGE line (AEPA Reference # 419402) (CR#340238). The location of the original TC+ was clear upon resampling. Final update: Sample results received today from Rossdale Laboratory indicated all follow-up samples passed for all parameters tested.	September 12, 2023	419402

1.4 Summary of Violations and Notifications for 2023

EPCOR Incident Number	Description	Date of Incident	AESRD Report File Number
ENV-20230913-122365	Quarterly toxicity testing (rainbow trout 96-hour acute lethality test) of the clarifier blowdown waste stream at the EL Smith WTP, sampled August 30, showed an LC50 of 70.7%. Results are typically non-toxic (i.e. LC50 >100%). Sampling and testing of the waste streams released to the North Saskatchewan River is not a requirement under the Approval to Operate but is done voluntarily as part of the residuals management program. Alberta Environment was notified of the result on September 13 (AEP Reference No. 419328).	September 13, 2023	419328
ENV-20230922-953941-v1	Sample taken from EL Smith treatment plant Operator Lab September 21 at 8:45 am failed for first total coliform positive. Call request 340690 created for Water System Serviceman (WSS) to collect resamples. Alberta Environment and Protected Areas notified. Reference number # 419840.	September 21, 2023	419840
ENV-20230927-257847	FAILED WATER SAMPLE. Flushing was performed and a sample collected at a downstream hydrant (H3786) located at 9447 Ottewell as a result of a low chlorine test result from a residential home at 9603 Ottewell. The result was TC positive. This incident is linked to ENV-20230926-370482 in which a sample was taken from 9603 Ottewell and result was low chlorine.	September 26, 2023	420072
ENV-20230930-845346	SAMPLE FAILED - FIRST TOTAL COLIFORM POSITIVE. 51 ST NW North of 35 AVE NW (3604 51 ST NW). Contacted AEPA and was issued Ref # 420195. Called Sep 30 @ 15:14 hrs. Call request CR 341145 created to take resamples.	September 30, 2023	420195
ENV-20231007-917236-v1	A sample was collected from a hydrant (H6411) and lab results indicated it failed for total coliforms (TC). In following Alberta's Communication and Action Protocol for failed bacteriological results in drinking water, four (4) additional samples were then collected and all resamples passed.	October 7, 2023	420482
ENV-20231018-242239	A coupling on the discharge pipe failed at the Rosslyn 1 pump station at a time when the pumping station was down for maintenance. Repair was completed about one hour after the leak had started and about 1 ML of potable water was released onto the street and into the storm water management system. Chlorine residual field testing was carried out at several locations and showed 0.00 mg/L chlorine residual at the Kennedale Outfall (OF #74) which is the final discharge point to the North Saskatchewan river.	October 17, 2023	420855
ENV-20231022-001254	A valve (V76361) was identified has having a very slow leak. The grass was heavily saturated in the surrounding area all the way to nearby storm pond. Dechlorination pucks was placed inside the valve casing and chlorine readings were 0.0 mg/L exiting the valve leak location.	October 22, 2023	421112

1.4 Summary of Violations and Notifications for 2023

EPCOR Incident Number	Description	Date of Incident	AESRD Report File Number
ENV-20231024-324664	About 0.5 cubic metres per hour of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into a storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	October 23, 2023	421156
ENV-20231026-242659	About 21 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the drainage storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	October 26, 2023	421279
ENV-20231029-137025	About 79 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the drainage storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	October 29, 2023	421378
ENV-20231104-888716	About 78 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into a storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	November 4, 2023	421630
ENV-20231105-912640-v1	About 55 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the drainage storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	November 5, 2023	421644
ENV-20231123-178666-v1	About 73 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into the drainage storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	November 23, 2023	422318
ENV-20231220-043446	About 148 cubic metres of potable chlorinated water was released due to a suspected leak within the water distribution system. Dechlorination pucks were placed in the path of water and the water entry point into a storm catch basin infrastructure to dechlorinate the water. The leak was isolated until the repair was completed.	December 20, 2023	423242

(End of Section)

1.5 Alberta Environment Operator Certifications (Effective to year end 2023)

Operator Contact Number: EPCOR Water Services Dispatch (24 hr) (780) 412-4500

ROSSDALE WATER TREATMENT PLANT (LEVEL IV)	
Director, Edmonton Water Treatment Plants	
Senior Manager, Operations	**WT II**
Manager, Operations	**WT III, WWT III**
Title	Alberta Environment Certification Level
Operations Engineer	WT I
Manager, Transmission Operations	WT III
Operations Foreman	WT IV
HEI Foreman	WT IV
Operations Foreman	WT IV
Operations Foreman	WT IV
Operations Foreman	WT IV
Operations Foreman	WT IV
Transmission Foreman	WT III
Training Operator Foreman	WT III
Lead Hand, Operator	WT II
Operator I	WT III
Operator I	WT II
Lead Hand, Operator	WT II
Operator I	WT III
Operator I	WT II
Operations Trainer	WT III
Day Foreman	WT IV
Lead Hand, Operator	WT II
Lead Hand, Operator	WT III
Operator I	WT II
Operator I	WT II
Operator I	WT III
Lead Hand, Operator	WT II
Operator I	WT III, WD II
Operator I	WT III, WWT III
Operator I	WT I
Operator I	WT II, WD II, WWT II, WWC II
Operator I (temp)	WT I, WC I

1.5 Alberta Environment Operator Certifications (Effective to year end 2023)

Operator Contact Number: EPCOR Water Services Dispatch (24 hr) (780) 412-4500

E.L. SMITH TREATMENT PLANT (LEVEL IV)	
Director, Edmonton Water Treatment Plants	
Senior Manager, Operations	**WT II**
Manager, Operations	**WT III, WWT III**
Title	Alberta Environment Certification Level
Operations Engineer	
Operations Engineer	WWC I
Day Foreman	WT IV
HEI Foreman	WT IV
Training Operator Foreman	WT III
Operations Foreman	WT IV
Operations Foreman	WT IV
Operations Foreman	WT III
Operations Foreman	WT IV
Operations Foreman	WT IV
Lead Hand, Operator	WT III
Lead Hand, Operator	WT II
Lead Hand, Operator	WT III
Lead Hand, Operator	WT III
Lead Hand, Operator	WT II, WD II, WWT I, WWC I
Operator I	WT III, WWT II,
Operator I	WT II
Operator I	WT III, WWT III
Operator I	WT II
Operator I	WT I
Operator I	WT II, WD I, WWT II, WWC I
Operator I	WT III, WD I, WWT II, WWC I

1.5 Alberta Environment Operator Certifications (Effective to year end 2023)

Operator Contact Number: EPCOR Water Services Dispatch (24 hr) (780) 412-4500

DISTRIBUTION SYSTEM (LEVEL IV FACILITY)

WATER DISTRIBUTION (WD) - NETWORK MAINTENANCE

Senior Manager, Maintenance and Construction

Manager, Distribution Maintenance

Manager, Dist. Maint Schedule

Title	Alberta Environment Certification Level
Water Network Operator	WD IV WWC I
Water Network Operator	WD IV
Foreman III	WD III
Foreman III	WD III
Foreman III	WD III
Foreman III	WD III
Foreman I	WD III WWC I
Foreman I	WD II
Foreman I	WD III
Foreman I	WD II
Foreman I	WD II
Foreman I	WD II
Foreman I	WD II
Foreman I	WD II
Foreman I	WD II
Foreman I	WD III
Foreman I	WD II
Foreman I	WD II
Foreman I	WD II
Equipment Operator III	WD II
Equipment Operator III	WD I
Equipment Operator III	WD II
Equipment Operator III	WD I
Equipment Operator III	WD II
Equipment Operator III	WD I
Equipment Operator III	WD I
Equipment Operator III	WD II
Equipment Operator III	WD II
Equipment Operator III	WD II
Equipment Operator III	WD II
Equipment Operator III	WD II
Equipment Operator III	WD I
Equipment Operator III	WD II
Equipment Operator III	WD II

1.5 Alberta Environment Operator Certifications (Effective to year end 2023)

Operator Contact Number: EPCOR Water Services Dispatch (24 hr) (780) 412-4500

DISTRIBUTION SYSTEM (LEVEL IV FACILITY)

WATER DISTRIBUTION (WD) - NETWORK MAINTENANCE

Senior Manager, Maintenance and Construction

Manager, Maintenance and Construction

Manager, Dist. Maint Scheduling

Title	Alberta Environment Certification Level
Labourer II	WD I
Labourer II	WD I
Labourer II	WD I
Labourer II	WD I
Labourer III	WD II
Labourer III	WD III
Labourer II	WD I
Labourer III	WD I
Labourer II	WD I
Labourer II	WD I

DISTRIBUTION SYSTEM (LEVEL IV FACILITY)

WATER DISTRIBUTION (WD) - NETWORK MAINTENANCE

Senior Manager, Maintenance and Construction

Manager, Maintenance and Construction

Manager, Dist. Maint Scheduling

Title	Alberta Environment Certification Level
Truck Driver III	WD I
Labourer II	WD I
Labourer II	WD I
Labourer II	WD I
Labourer II	WD II
Labourer II	WD II
Labourer II	WD II
Truck Driver III	WD II
Truck Driver III	WD I
Truck Driver III	WD I
Foreman III	WD III
Welder	WD II
Maintenance Repairman I	WD II
Maintenance Repairman I	WD I
Maintenance Repairman I	WD I
Labourer III	WD I
Labourer II	WD I
Foreman I	WD I
Water Sys Tech Support Specialist	WD II
Water Sys Tech Support Specialist	WD IV

1.5 Alberta Environment Operator Certifications (Effective to year end 2023)

Operator Contact Number: EPCOR Water Services Dispatch (24 hr) (780) 412-4500

DISTRIBUTION SYSTEM (LEVEL IV FACILITY)

WATER DISTRIBUTION (WD) - FIELD OPERATIONS

Senior Manager, Distribution Operations	
Manager, Field Operations	
Manager, Metering and Preventative Maintenance	**WD I**
Manager, Water Trouble	**WD III**
Title	Alberta Environment Certification Level
Foreman III	WD IV
Foreman III	WD IV
Foreman I	WD II
Foreman I	WD II
Labourer III	WD II
Labourer III	WD II
Labourer III	WD I
Foreman I	WD I
Labourer III	WD III
Labourer II	WD I
Labourer II	WD II
Labourer II	WD I
Labourer III	WD I
Labourer III	WD I
Labourer II	WD II
Labourer II	WD I
Labourer III	WD I
Labourer II	WD II
Water Systems Serviceman	WD II
Water Systems Serviceman	WD II
Water Systems Serviceman	WD II
Water Systems Serviceman	WD II
Water Systems Serviceman	WD II
Water Systems Serviceman	WD III
Water Systems Serviceman	WD II
Water Systems Serviceman	WD III
Water Systems Serviceman	WD II
Water Systems Serviceman	WD II
Water Systems Serviceman	WD II
Water Systems Serviceman	WD II
Water Systems Serviceman	WD II

1.5 Alberta Environment Operator Certifications (Effective to year end 2023)

Operator Contact Number: EPCOR Water Services Dispatch (24 hr) (780) 412-4500

DISTRIBUTION SYSTEM (LEVEL IV FACILITY)

WATER DISTRIBUTION (WD) - CUSTOMER SERVICE

Senior Manager, Customer Service

Manager, Dispatch

Manager, Inspections and Customer Service

Title	Alberta Environment Certification Level
Team Lead, Dispatch	
Dispatcher Coordinator	WD I
Inspector – Water Metering	WD II
Inspector – Water Metering	WD I
Foreman III	WD III
Manager, Cross Connections	WD II
Inspector – Cross Connections	WD I

1.5 Alberta Environment Operator Certifications (Effective to year end 2023)

Operator Contact Number: EPCOR Water Services Dispatch (24 hr) (780) 412-4500

DISTRIBUTION SYSTEM (LEVEL IV FACILITY) WATER METERING (WD)	
Manager, Metering Operations	**WD I**
Title	Alberta Environment Certification Level
Foreman III	WD II
Meter Mechanic II	WD II
Meter Installer II	WD III
Meter Installer I	WD I
Meter Installer I	WD II
Meter Installer I	WD II
Meter Installer I	WD I
Meter Installer I	WD III
Meter Installer II	WD I

1.6 Demand/Production Statistics

December 2023

Month	ROSSDALE ZONE			E.L.SMITH ZONE			SYSTEM TOTAL			RESERVOIR PUMPAGE		
	Monthly Prod'n (ML)	Max Daily Prod'n (ML)	Peak Daily Demand (ML)	Monthly Prod'n (ML)	Max Daily Prod'n (ML)	Peak Daily Demand (ML)	Monthly Prod'n (ML)	Max Daily Prod'n (ML)	Peak Daily Demand (ML)	Rossdale Zone (ML)	E.L.Smith Zone (ML)	Total (ML)
JANUARY	3,454	136	138	7,577	262	262	11,032	366	365	1,047	2,738	3,785
FEBRUARY	3,226	122	129	6,790	250	264	10,016	370	367	913	2,380	3,293
MARCH	3,943	168	177	7,470	273	282	11,414	431	419	1,188	2,597	3,784
APRIL	4,107	161	168	6,708	237	247	10,814	395	402	1,024	2,583	3,607
MAY	5,487	215	209	8,171	295	302	13,658	494	487	1,516	3,232	4,748
JUNE	5,429	263	253	7,967	317	305	13,395	576	545	1,394	3,217	4,610
JULY	5,030	197	218	7,861	290	295	12,891	485	471	1,363	3,056	4,419
AUGUST	4,678	190	188	7,669	286	341	12,347	466	448	1,367	3,015	4,382
SEPTEMBER	4,499	189	200	7,321	275	266	11,820	461	425	1,280	2,730	4,011
OCTOBER	4,576	189	205	6,818	277	300	11,394	423	386	1,089	2,954	4,043
NOVEMBER	4,080	164	193	6,805	253	292	10,885	412	375	998	2,790	3,788
DECEMBER	3,790	138	139	7,299	258	267	11,088	388	382	1,186	2,594	3,779

2023 - HIGH 5-DAY DEMAND

	PLANTS PROD (ML/d)	RES. GAIN / LOSS (%)	RES. GAIN / LOSS (ML)	TOTAL DEMAND (ML)
08-Jun-2023	576	6.5	40.7	535
09-Jun-2023	554	1.5	9.2	545
10-Jun-2023	544	3.3	20.9	523
11-Jun-2023	531	3.3	20.7	510
12-Jun-2023	533	-0.7	-4.1	537
			AVERAGE:	530

Year to Date Data	2023	2022	% CHANGE
TOTAL PRODUCTION TO DATE (ML)	140,753	136,309	3.2
AVG. DAILY DEMAND TO DATE (ML)	386	373	3.4
PEAK DAILY DEMAND TO DATE (ML)	545	513	5.9
PEAK HOURLY DEMAND TO DATE (ML)	751	716	4.9
HIGH 5-DAY AVERAGE TO DATE (ML)	530	486	8.4

Peak daily demand of 545 ML/d occurred on June 09, 2023

Peak hourly demand of 751 ML/d occurred on June 12, 2023 at 20:00-21:00

1.7 Energy Consumption and Usage

Energy Consumption

Power Consumption (kWh):

	2023	2022	Change %
Rossdale WTP	31,610,814	32,298,100	-2.13%
E.L Smith WTP.	46,214,133	43,911,766	5.24%
Field Pump Stations	16,187,133	15,910,792	1.74%
TOTAL	94,012,081	92,120,658	2.05%

Gas Consumption (GJ):

	2023	2022	Change %
Plants	87,094	93,903	-7.25%
Pumping Stations	4,578	4,362	4.95%
TOTAL	91,672	98,265	-6.71%

Water Production/Pumpage(ML):

	2023	2022	Change %
Rossdale WTP	52,299	54,689	-4.37%
E.L Smith WTP.	88,456	81,621	8.37%
Field Pump Stations	47,608	43,743	8.84%
TOTAL	140,755	136,310	3.26%

Note: The reservoirs and booster stations are not included into these totals.

Energy Usage

	2023	2022
Energy Consumption for Treatment and	94,012,081	92,120,658
Pumpage (kWh)		
Energy in kW.h per ML pumped	668	676
Gas Consumption – All Facilities (GJ)	91,672	98,265
Gas Consumption – All Field Pump Stations (GJ)	4,578	4,362

(End of Section)

1.8 Summary of Changes to the Operations Program

A summary of the significant changes to the 2023 Operations Program document from the previous year is as follows:

1. The Watershed Protection Program (WPP) as outlined in Section 1, is now called the Integrated Watershed Management Strategy (IWMS).
2. Reference added to the Urban Creek Collaborative and the development of the Total Loadings Plan is Section 1.1.
3. Update that EWSI staff are included on the Mutual Drought Support Committee and that EWSI was designated as large urban alternate on the Alberta Water Council board of directors.
4. EWSI is supporting the WaterSMART hydrological modelling project.
5. As part of NSR WaterSHED Monitoring Program, CreekWatch will be completing Edmonton urban creek monitoring as part of an expanded program with three year funding from EWSI.
6. The Capital City Cleanup was removed from the key education and awareness initiatives.
7. Administrative change to the team name that implements and maintains policies and procedures relating to SCADA to Controls and Automation Engineering.
8. In section 2.1, the addition: Phosphoric acid is fed at both plants in the discharge of the high lift pumps, as water enters the distribution system, for lead mitigation.
9. In section 2.1, an outcome of the memo was that the original validated range of UVT at E.L. Smith was extended from 88% down to 86% and the minimum dose required to achieve 3.0 log removal of Cryptosporidium and Giardia at ≥86% UVT was determined. The dose set points in Table 2.4 reflect this change.
10. In section 2.1, the addition of a section for phosphoric acid injection information.
11. In Table 2.1 updates to UV reactor targets.
12. In section 2.2.1.1, Criteria may also be relaxed when operating in direct filtration, when river quality is good and risk is low, to reduce plant losses.
13. In Table 2.4, updates to UV dose system set points.
14. In Table 2.5, updates to polymer dosage ranges.
15. In section 2.5, a name change to the Spring Home Analysis Program, formerly known as the Home Sniffing Program.
16. In Table 2.6, updates to trigger levels for raw water colour.
17. In Table 2.7, update to polymer manufacturer.
18. In section 3.1, and increase to 23 field pumping stations, 15 pumping stations with reservoirs and 14 treated water storage sites. Average daily demand increased to 371 ML, and average available storage level of 72%, which theoretically would last 1.2 days.

19. Each WTP is supplied by two power feeders and power use is monitored closely to avoid creating a momentary peak demand. For E.L. Smith, there is a combined plant feeder virtual demand which is the sum of actual power consumptions at each 15-minute internal. At Rossdale the peak is the max 15-minute average from the previous 24 months.
20. Each customer participating in the hydrant permit program is instructed on proper use, including the requirements to use a meter and backflow prevention device when accessing water and that the water is for non-potable use only.
21. In section 3.3, The CCC office has the responsibility for approving the backflow method for all customers who apply for a hydrant permit which is administered by the Water Metering and Customer Service Group.
22. Removal of reference to Process Innovation and Residuals Management Committee (PIRC) in section 5.1
23. In section 5.4, update reference to WTP residuals reports
24. Removed 2,4,6-trichlorophenol from the primary organics list for raw water quality parameters, as it is a pesticide already included in the secondary organics list.

2.1 Storage Capacities of Reservoirs

Reservoir Name	Available ML	Fire Storage (ML)	Operating Storage (ML)	Dead/ Emergency ML	Gross ML
Water Treatment Plant Reservoir Cells					
Rossdale Total	80.42	0.00	80.42	16.98	97.40
E.L. Smith Total	95.20	0.00	95.20	42.30	137.50
WTPs Sub Total	**175.62**	**0.00**	**175.62**	**59.28**	**234.90**
Field Reservoir Cells					
Rosslyn	97.54	12.56	110.10	12.93	123.04
Clareview	50.51	2.95	53.46	11.14	64.60
Papaschase	66.80	9.71	76.51	5.63	81.59
Londonderry	39.10	2.58	41.68	3.56	45.24
North Jasper Place	29.74	4.66	34.40	11.66	46.06
Ormsby	37.41	2.99	40.40	4.87	45.27
Thorncliff	37.10	2.93	40.03	3.40	43.43
Kaskitayo	21.78	3.96	25.74	3.20	28.94
Mill Woods	46.98	5.92	52.90	3.33	56.23
Castle Downs	22.70	2.41	25.11	8.93	34.04
Discovery Park	5.00	1.44	6.44	0.71	6.93
Field Sub Total	**454.65**	**52.11**	**506.77**	**69.36**	**575.37**
Grand Total	**630.27**	**52.11**	**682.39**	**128.64**	**810.27**

(End of Section)

2.2 Pumping Station Operating Pressure Ranges

		Current Alarms					
Treatment Plants Highlift Pump Stations	**Elevation, m**	**LOLO**	**LO**	**HI**	**HIHI**	**Low Pressure (SAVs)**	**High Pressure Setpoints (PRVs)**
ELS North	620.85	910	940	1080	1100	-	1100
ELS South	620.85	910	940	1080	1100	-	1093
Rossdale West	622.25	800	830	950	980	500	980
Rossdale South	622.25	800	830	950	980	640	100
Reservoir Pumping Stations	**Elevation, m**	**LOLO**	**LO**	**HI**	**HIHI**	**Low Pressure SD**	**High Pressure Setpoints**
Clareview Intake	649.73	365	410	640	670	-	-
Clareview Discharge	648.95	430	480	620	640	-	610
Papaschase 1 Intake/Discharge	693.3	45	95	270	385	-	-
Rosslyn 1 Intake/Discharge	669.87	295	345	475	595	-	-
Rosslyn 2 Intake/Discharge	671.42	280	330	465	580	60/140	-
Rosslyn 3 Discharge	669.14	510	540	630	700	-	610
Londonderry Intake	677.91	170	220	380	480	-	-
Londonderry Discharge	670.21	400	450	500	525	-	535
NJP Intake/Discharge	675.12	320	345	440	580	-	-
Thorncliff Intake	672.02	310	340	480	500	-	-
Thorncliff Discharge	672.02	350	380	495	515	-	-
Ormsby Intake	679.41	295	325	1000	1000	-	-
Ormsby Primary Discharge	679.41	325	355	460	490	-	600
Ormsby LE Discharge	679.38	525	575	680	710	-	700
Castledowns Intake	678.96	230	260	400	430	-	-
Castledowns Discharge	677.99	400	450	530	710	-	520
Kaskitayo Intake	673.84	280	315	480	550	-	-
Kaskitayo Discharge	673.84	490	550	690	720	-	690
Millwoods Intake	678.82	220	250	400	430	-	-
Mill Woods P6 Suction	678.82					60/140	
Millwoods Discharge	678.83	490	520	620	650	-	610
Papachase 2 Intake	689.06	40	70	700	700	-	-
Papachase 2 Discharge	690.42	350	380	500	530	-	520
Discovery Park Intake	716	350	400	460	510	-	-
Discovery Park Discharge	716	280	330	470	520	-	-
Booster Pumping Stations	**Elevation, m**	**LOLO**	**LO**	**HI**	**HIHI**	**Low Pressure SD**	**High Pressure Setpoints**
Parkland Intake	682.353	270	290	380	400	60/140	-
Parkland Discharge 300mm	682.4	555	605	700		-	-
Parkland Discharge 600mm	682.4	555	605	700		-	-
Big Lake Intake	677.6					60/140	-
Big Lake Discharge	677.6	315	365	475	625	-	-
Terwillegar Intake	682.16	240	257	750	750	60/140	-
Terwillegar Discharge	683.00	440	480	650	690	-	-
Burnewood Intake	695.05	210	240	700	700	60/140	-
Burnewood Discharge	695.05	520	550	610	640	-	-
Laurel Intake	723.57	230	280	300	350	60/140	-
Laurel Discharge	723.57	280	300	400	450	-	-
Ellerslie Intake	695.2	250	280	500	540	60/140	-
Ellerslie Discharge	695.23	490	540	580	600	-	-
Walker Intake	723.6					60/140	-
Walker Discharge	723.6	360	410	500	650	-	-
Blackmud Creek Intake	690.104					60/140	-
Blackmud Creek Discharge	689.3	630	680	830	880	-	-

(End of Section)

2.3 Fire Stations & Other City Pressure Monitors

		Current Alarms			
Firehall Stations	**Elevation, m**	**LOLO**	**LO**	**HI**	**HIHI**
Fire Hall #1 (Headquarters)	661.759	310	360	550	700
Fire Hall #2 (Downtown)	667.018	270	320	495	645
Fire Hall #3 (University)	667.792	370	420	520	670
Fire Hall #5 (Norwood)	663.986	235	285	515	665
Fire Hall #6 (Mill Creek)	663.863	360	410	520	670
Fire Hall #7 (Highlands)	655.873	280	330	550	700
Fire Hall #8 (Hagman)	674.153	295	345	450	600
Fire Hall #9 (Roper Station)	693.967	240	290	460	610
Fire Hall #11 (Capilano)	665	260	310	475	625
Fire Hall #15 (Coronet)	675.232	285	335	470	625
Fire Hall 12 (Meadowlark)	673.546	250	300	445	595
Fire Hall 13 (Rainbow Valley)	669.812	285	335	515	665
Fire Hall #16 (Mill Woods)	693.516	260	310	430	580
Fire Hall #17 (Castledowns)	680.669	230	280	470	620
Fire Hall #20 (Kaskitayo)	679.57	230	280	430	580
Fire Hall #22 (Oliver)	668.561	230	280	520	670
Fire Hall #24 (Terwillegar)	686	265	315	450	600
Fire Hall #26 (Meadows)	712.5	295	345	475	525
Firehall #27 (Ellerslie)	688.48	375	425	470	615
Fire Hall #28 (Heritage Valley)	697.73	290	300	400	550
Other City Pressure Monitoring Stations	**Elevation, m**	**LOLO**	**LO**	**HI**	**HIHI**
U of A #1 (Sask Dr)	669.63				
U of A #2 (83 Ave)	670.762				
U of A #3 (116st)		330	360	460	490
Sobeys	682	305	355	490	640
Northwest Line		420	450	580	610
Westview	696.7	320	340	500	
HD Windermere	682.7	410	460	550	770
HD 17st	707.6	340	390	490	640

(End of Section)

2.4 Regional Customers

Customer	Elevation (m)	Pressure (kPa)			HGL (m)		
		Min	Low Normal	High Normal	Min	Low Normal	High Normal
Regional Water Customer Group*							
CRPWSC (Parkland)	711.95	89	89	138	722.3	722.3	727.2
Sturgeon County	692	240	304	354	570	723	723
Strathcona County	664.384	349	379	438	700	703	709
Morinville	662.65	383	422	471	698	702	707
St. Albert Sturgeon	685.173	175	214	263	703	707	712
St. Albert Oakmont	655.45	402	441	491	696	700	706
CRNWSC (Northeast)	643.05	470	519	578	691	696	702
CRSWSC (Southwest)	716	390	430	495	755.7	759.8	766.4
Bulk Customers*							
Enoch Cree Nation	703.7	128	160	240	717	720	728
Namao	681.495	280	309	437	710	713	726

*Based on Water Supply Agreements

(End of Section)

2.5 Pumping Facilities

Zones	Facilities	Year Built	Number of Pumps			Best Efficiency Flow by Pump (ML/d)**							
			Fixed Speed	Variable Speed	Total	P-1	P-2	P-3	P-4	P-5	P-6	P-7	P-8
Primary	**Water Treatment Plants Highlift Pump Stations**												
	E.L. Smith Plant	1976	2	2	4	*95*	*95*	205	205				
	Rossdale Plant	1947	4	2	6	105	*105*	105	105	*95*	105		
	Field Reservoir & Booster Pump Stations												
	Ormsby*	1969	2	1*	3	16	16	*30*					
	Thorncliff	1970	3	0	3	12	12	12					
	North Jasper Place	1974	3	1	4	15	15	*26*	*26*				
	Rosslyn 1	1955	3	0	3	17	17	17					
	Rosslyn 2	1969	1	0	1				17				
	Clareview	1979	1	2	3	12	*30*	*30*					
	Papaschase 1	1976/82	2	0	2	20	20						
Secondary	Castledowns	1979	1	2	3			*20*	*19*	*18*			
	Rosslyn 3	1963	3**	0	3	*2*	*4*				*12*	*19*	*25*
	Londonderry	1974/79	1	2	3	*2*	*2*	*6*	*6*	*15*			
	Ormsby, Lewis Estates	1969	0	3	3	*16*	*16*	16					
	Parkland Booster	1973	3	2	5					17	19	17	
	Big Lake Booster	2016	0	5	5	15	*15*	*21*					
	Terwillegar Booster	1998	2	1	3	17	17	*17*					
	Kaskitayo	1980	3	2	5	*7*	*7*	*21*	*7*	19			
	Mill Woods	1977	3	2	6	16	16	30	25	16	15		
	Papaschase 2	1968/71	2	1	3			*14*	21	21			
Teriary	Burnewood Booster	1985	2	2	4	11	14	*14*	*14*				
	Ellerslie Booster	2007	0	2	2	*6*	*6*						
	Laurel Booster	2018	0	2	2	*1*	*1*						
	Blackmud Creek Booste	1982	0	3	3		*17*	*35*	*22*				
	Discovery Park	2020	0	5	5	*1*	*3*	*3*	*11*	*11*			
Quat	Walker Booster	2015	0	5	5	*2*	*2*	*7*	*7*	*16*			
	TOTAL		**15**	**32**	**47**								

*Ormsby Pump #3 can be used to support Primary Pressure Zone or West Secondary Pressure Zone depending on the discharge header valve configuation. The totals include this pump once.

**Updated capacities to best efficiency flows as per pump curves when available.

(End of Section)

2.6 Production Summary

Water Production	2023	2022	2021
Treated and Pumped into the System	140,752	136,309	137,214
Water Treated at Rossdale Plants	52,297	54,690	51,848
Water Treated at E. L. Smith Plant	88,455	81,619	85,366
Supplied to Residential Customers	66,655	66,096	69,534
Supplied to Commercial/Industrial Customers	27,203	24,581	22,342
Supplied to Suburban Customers	37,252	36,254	37,659
Percentage Accounted for from:			
Metered & Bulk Sources	94%	94%	94%
Assumed System Leakage	6%	6%	6%
Average Day Pumpage (ML)	386	373	376
Peak Day Demand (ML)	545	513	608

Population Served	2023	2022	2021
Approximate Population Served (City)	1,140,300	1,087,172	1,010,899
Approximate Population Served (Region)	365,000	360,000	356,000
Approximate Population Served (Total)	1,505,300	1,447,172	1,366,899

Per Capita Consumption (L/cap)	2023	2022	2021
Average Day Demand	256	258	275
Peak Day Demand	362	354	445

(End of Section)

2.7 Raw Water Intake (ML)

2023

Month	Rossdale									E.L. Smith				Plants Combined Total
	Plant 1				Plant 2				Plant Total	Min	Max	Avg	Plant Total	
	Min	Max	Avg	Total	Min	Max	Avg	Total						
January	0.0	58	2.7	83	92	130	122	3,776	3,858	261	294	278	8,618	12,477
February	0.0	5.5	0.9	26	119	130	127	3,544	3,570	261	281	275	7,699	11,269
March	0.0	120	66	2,055	0.0	130	80	2,321	4,376	177	311	279	8,638	13,014
April	50	82	60	1,814	80	95	89	2,682	4,496	241	281	259	7,780	12,276
May	17	90	79	2,455	24	140	112	3,477	5,932	272	333	301	9,317	15,249
June	50	116	80	2,388	90	158	116	3,490	5,878	241	360	298	8,943	14,820
July	49	97	68	2,104	80	132	109	3,383	5,487	251	321	285	8,844	14,331
August	6.7	87	66	2,034	10.0	122	99	3,055	5,088	241	331	277	8,598	13,686
September	52	84	63	1,890	85	120	99	2,979	4,869	134	312	276	8,281	13,150
October	19	100	65	2,020	24	120	95	2,958	4,979	103	320	268	8,311	13,290
November	0.0	60	47	1,422	18	140	108	3,234	4,656	121	301	275	8,239	12,895
December	0.0	0.0	0.0	0.0	99	150	135	4,200	4,200	251	310	281	8,719	12,919
Annual Total				18,290				39,099	57,389				101,987	159,376
Annual Min/Max/Avg	0.0	120	50		0.0	158	108			103	360	279		

2.8 Treated Water Production (ML)

2023

Month	Rossdale (Plant 1 & Plant 2)				E.L. Smith				Plants Combined	
	Flow Meters				Flow Meters				Avg	Total
	Min	Max	Avg	Total	Min	Max	Avg	Total		
January	33	212	111	3,454	67	305	244	7,578	351	11,032
February	23	205	115	3,226	0.0	300	242	6,790	358	10,016
March	32	208	127	3,943	0.0	331	241	7,470	368	11,413
April	13	207	137	4,106	118	303	224	6,707	360	10,813
May	0.0	296	177	5,487	204	357	264	8,171	441	13,658
June	29	304	181	5,429	203	369	266	7,967	447	13,996
July	16	298	162	5,031	0.0	367	254	7,861	416	12,892
August	0.0	288	151	4,678	202	313	247	7,669	398	12,347
September	16	220	150	4,499	0.0	355	244	7,321	394	11,820
October	0.0	269	148	4,576	0.0	305	220	6,818	367	11,393
November	0.0	209	136	4,080	0.0	315	227	6,805	363	10,885
December	0.0	208	122	3,790	0.0	303	235	7,299	358	11,089
Annual Total				52,297				88,455		140,753
Annual Min/Max/Avg	0.0	304	143		0.0	369	242		385	

NOTES: ' -- ' indicates plant offline

3.1 Raw Water Quality - North Saskatchewan River

2023

Month	Rossdale									E.L. Smith								
	Turbidity (NTU)			pH			Colour (TCU)			Turbidity (NTU)			pH			Colour (TCU)		
	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
January	1.5	8.2	2.4	7.8	8.1	8.0	2.1	4.8	3.4	1.9	4.8	2.7	7.8	8.1	8.0	2.7	4.9	3.5
February	1.6	5.7	2.9	7.9	8.1	8.0	2.7	5.2	4.0	1.9	8.7	3.2	7.9	8.1	8.0	2.7	5.5	4.1
March	1.3	4.6	2.7	8.0	8.1	8.0	2.2	5.3	3.7	1.6	5.7	3.0	7.9	8.1	8.0	2.0	5.5	3.8
April	2.6	250	34	8.0	8.3	8.1	2.4	14.4	4.3	2.5	260	32	7.8	8.2	8.1	2.5	8.9	4.3
May	8.1	95	20	8.3	8.5	8.4	4.7	15.6	8.4	7.8	55	20	8.2	8.4	8.3	4.2	13.7	8.6
June	3.9	1,500	130	7.9	8.5	8.3	3.3	112.6	21.7	7.2	1,500	130	7.9	8.5	8.3	4.0	110.0	21.9
July	4.3	120	30	8.2	8.5	8.3	8.0	31.3	17.3	4.7	90	29	8.1	8.5	8.3	6.4	32.8	17.1
August	2.2	180	16	8.0	8.6	8.4	4.6	72.5	14.2	3.0	180	15	8.1	8.6	8.4	5.4	74.0	14.1
September	1.7	12	4.5	8.3	8.5	8.4	5.6	20.7	9.5	1.9	12	4.4	8.2	8.5	8.4	5.5	21.3	9.7
October	1.8	7.0	2.7	8.1	8.4	8.3	4.3	10.3	6.5	1.7	8.7	2.8	8.1	8.4	8.3	4.7	11.3	6.7
November	1.9	4.8	2.9	8.1	8.5	8.2	3.8	10.4	6.8	2.2	5.4	3.2	8.0	8.4	8.2	3.1	10.9	6.9
December	1.7	7.6	3.1	8.1	8.2	8.2	4.5	9.7	6.2	1.9	7.4	3.1	8.1	8.2	8.2	3.4	10.5	6.4
Annual Min/Max/Avg	1.3	1,500	21	7.8	8.6	8.2	2.1	112.6	8.8	1.6	1,500	20	7.8	8.6	8.2	2.0	110.0	8.9

NOTES: ' -- ' indicates plant offline

3.2 Treated Water Quality Entering the Distribution System

2023

Month	Rossdale														E.L. Smith											
	Turbidity (NTU)			Chloramine Residual (mg/L)			pH			Fluoride Residual (mg/L)			Total Hardness (mg/L as $CaCO_3$)	Colour (TCU)	Turbidity (NTU)			Chloramine Residual (mg/L)			pH			Fluoride Residual (mg/L)			Total Hardness (mg/L as $CaCO_3$)	Colour (TCU)
	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Avg	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Avg	Avg
January	0.03	0.07	0.05	1.90	2.21	2.03	7.9	8.1	8.0	0.65	0.75	0.71	166	0.6	0.05	0.08	0.05	1.81	2.15	1.95	7.8	8.1	7.9	0.65	0.82	0.73	165	0.7
February	0.02	0.08	0.05	1.80	2.16	2.03	8.0	8.2	8.1	0.66	0.77	0.71	178	0.8	0.05	0.07	0.05	1.83	2.15	1.93	7.9	8.1	8.0	0.69	0.75	0.71	177	0.8
March	0.02	0.08	0.04	1.90	2.21	2.04	7.8	8.2	8.0	0.68	0.72	0.70	189	0.7	0.04	0.07	0.05	1.83	2.06	1.92	7.7	8.2	7.9	0.72	0.79	0.75	187	0.9
April	0.01	0.07	0.03	1.90	2.21	2.04	7.7	8.0	7.9	0.65	0.78	0.70	158	0.4	0.04	0.09	0.04	1.81	2.08	1.93	7.7	7.9	7.8	0.65	0.76	0.71	158	0.6
May	0.02	0.09	0.05	1.90	2.16	2.00	7.6	8.0	7.8	0.65	0.75	0.68	172	0.7	0.05	0.06	0.05	1.81	2.26	1.99	7.5	7.8	7.7	0.62	0.70	0.67	172	1.0
June	0.03	0.08	0.05	1.90	2.16	2.01	7.7	7.9	7.8	0.61	0.77	0.68	167	0.7	0.04	0.07	0.05	1.97	2.28	2.10	7.5	8.0	7.8	0.60	0.75	0.65	167	0.9
July	0.02	0.08	0.04	1.80	2.26	2.02	7.5	7.9	7.7	0.66	0.79	0.71	164	0.7	0.04	0.05	0.05	1.98	2.22	2.07	7.8	8.0	7.9	0.60	0.77	0.63	164	1.0
August	0.02	0.08	0.05	1.90	2.33	2.13	7.5	8.1	7.8	0.60	0.77	0.70	171	0.6	0.05	0.07	0.05	2.00	2.26	2.09	7.6	7.9	7.8	0.60	0.78	0.65	169	0.9
September	0.02	0.06	0.04	1.90	2.52	2.33	7.6	7.9	7.7	0.69	0.77	0.72	168	0.5	0.05	0.09	0.05	2.02	2.42	2.21	7.5	7.9	7.7	0.61	0.68	0.65	167	0.8
October	0.02	0.13	0.05	2.20	2.53	2.38	7.6	7.9	7.8	0.67	0.75	0.70	169	0.5	0.05	0.11	0.07	1.96	2.31	2.16	7.7	8.1	7.9	0.61	0.73	0.68	168	0.9
November	0.02	0.09	0.06	1.90	2.47	2.28	7.6	8.1	8.0	0.68	0.78	0.72	168	1.0	0.07	0.12	0.08	2.02	2.28	2.13	8.0	8.3	8.0	0.69	0.79	0.75	167	1.3
December	0.05	0.09	0.06	2.00	2.38	2.26	7.9	8.1	8.0	0.66	0.74	0.70	176	1.1	0.06	0.09	0.07	1.90	2.27	2.03	8.0	8.2	8.1	0.64	0.81	0.76	173	1.3
Annual Min/Max/ Avg	0.01	0.13	0.05	1.80	2.53	2.13	7.5	8.2	7.9	0.60	0.79	0.70	171	0.7	0.04	0.12	0.06	1.81	2.42	2.04	7.5	8.3	7.9	0.60	0.82	0.70	170	0.9

NOTES: ' -- ' indicates plant offline

3.2-1 Treated Water Quality Entering the Distribution System

2023

	Rossdale									E.L. Smith								
	Temperature (°C)			pH			Hourly Flow (ML per day)			Temperature (°C)			pH			Hourly Flow (ML per day)		
	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
January	0.5	0.6	0.5	7.9	8.1	8	47	206	112	0.5	0.7	0.6	7.8	8.1	7.9	162	287	228
February	0.5	0.7	0.5	8	8.2	8.1	51	203	116	0.6	0.7	0.6	7.9	8.1	8	32	297	242
March	0.5	0.6	0.5	7.8	8.2	8	55	206	128	0.5	5.9	0.6	7.7	8.2	7.9	0	318	241
April	0.5	8.8	1.5	7.7	8	7.9	64	203	137	0.5	9.7	1.4	7.7	7.9	7.8	139	298	224
May	10.6	19.4	16.2	7.6	8	7.8	33	233	138	10.6	18.9	15.7	7.5	7.8	7.7	233	311	263
June	18.2	18.2	18.2	7.7	7.9	7.8	169	190	181	17.6	17.7	17.6	7.5	8	7.8	258	190	265
July	19.8	19.8	19.8	7.5	7.9	7.7	151	172	162	19.2	19.2	19.2	7.8	8	7.9	245	262	253
August	19.9	20	19.9	7.5	8.1	7.8	141	161	152	19.5	19.5	19.5	7.6	7.9	7.8	242	255	248
September	12.6	19.8	15.7	7.6	7.9	7.7	114	194	150	11.7	19.4	15.2	7.5	7.9	7.7	85	290	243
October	1.1	11.8	8.2	7.6	7.9	7.7	5	193	148	1.2	12.7	7.9	7.5	7.9	7.7	74	268	220
November	0.5	3.7	1.6	7.6	8.1	8	79	194	136	0.6	4.8	1.7	8	8.3	8	64	274	227
December	0.5	0.6	0.5	7.9	8.1	8	0	206	123	0.5	0.7	0.7	8	8.2	8.1	0	297	236
Annual Min/Max/Avg	**0.5**	**20.0**	**8.6**	**7.5**	**8.2**	**7.9**	**0**	**233**	**140**	**0.5**	**19.5**	**8.4**	**7.5**	**8.3**	**7.9**	**0**	**318**	**241**

3.3 Rossdale Filters 1 - 9 Particle Counts (no./mL >2um)

2023

Filter	1			2			3			4			5			6			7			8			9		
Month	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**
January	1	25	1	1	20	2	1	31	2	1	39	2	1	24	2	1	36	2	1	24	2	1	26	2	1	44	2
February	1	30	2	1	14	2	1	34	1	1	17	2	1	35	4	1	31	3	1	29	2	1	45	2	1	32	2
March	1	38	2	1	33	1	1	40	1	1	40	1	1	29	2	1	23	2	1	36	1	1	25	2	1	43	2
April	1	33	2	1	36	2	1	14	2	1	21	2	1	45	3	1	41	2	1	35	3	1	29	2	1	20	3
May	1	30	5	1	25	6	2	9	5	1	26	5	1	27	7	1	35	6	1	30	6	1	28	5	1	48	6
June	1	19	2	1	22	3	1	18	3	1	20	2	1	23	3	1	41	3	1	25	3	1	24	3	1	20	3
July	1	11	2	1	19	3	1	15	2	1	15	2	1	30	3	1	16	2	1	15	2	1	14	2	1	15	2
August	1	12	3	1	24	5	1	18	3	1	27	4	1	28	7	1	24	5	1	28	5	1	16	4	1	21	5
September	1	38	2	1	44	4	1	45	2	1	23	2	1	23	3	1	15	2	1	25	2	1	27	3	1	46	3
October	1	45	3	1	33	7	1	39	3	1	34	4	1	30	5	1	28	4	1	45	5	1	43	4	1	26	4
November	1	44	6	2	46	9	1	43	5	1	40	5	1	42	7	1	40	6	1	45	6	1	41	6	1	31	5
December	1	43	4	1	40	7	1	36	3	1	43	5	1	43	5	1	43	4	1	44	6	1	45	6	1	45	5
Annual Min/Max/Avg	1	45	3	1	46	4	1	45	3	1	43	3	1	45	4	1	43	3	1	45	4	1	45	3	1	48	3

NOTE: ' -- ' indicates filter offline

3.4 E.L. Smith Filters 1 - 9 Particle Counts (no./mL >2um)

2023

Filter	1			2			3			4			5			6			7			8			9		
Month	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**
January	1	38	2	1	22	2	1	44	2	--	--	--	1	42	3	1	45	9	1	30	3	1	34	2	1	30	3
February	1	45	2	1	24	2	1	40	2	--	--	--	1	42	2	1	45	7	1	29	3	1	33	3	1	32	3
March	1	44	1	1	22	1	1	37	1	--	--	--	1	45	2	1	45	5	1	33	3	1	37	2	1	43	3
April	1	25	2	1	23	2	1	29	2	--	--	--	1	29	2	1	29	2	1	38	3	1	34	3	1	31	3
May	1	45	7	1	45	6	1	31	6	--	--	--	1	32	6	1	36	7	1	40	8	1	43	8	1	36	8
June	1	42	4	1	22	3	1	40	4	--	--	--	1	45	4	1	45	5	1	33	4	1	42	4	1	44	4
July	1	45	3	1	25	3	1	43	3	--	--	--	1	43	4	1	45	6	1	35	5	1	34	4	1	40	4
August	1	38	7	1	44	6	1	28	7	--	--	--	1	33	8	1	37	7	1	43	10	1	37	8	1	40	8
September	1	42	6	1	45	6	1	28	7	--	--	--	1	32	6	1	30	7	1	38	9	1	43	8	1	42	8
October	1	38	9	1	41	8	1	37	9	--	--	--	1	31	8	1	41	9	1	45	10	1	39	10	1	43	10
November	1	31	10	1	41	8	1	43	8	1	45	9	--	--	--	1	43	9	2	43	9	1	44	8	1	45	11
December	1	35	6	1	28	5	1	23	5	1	38	5	--	--	--	1	45	8	2	44	8	1	36	6	1	45	8
Annual Min/Max/Avg	1	45	5	1	45	4	1	44	5	1	45	5	1	45	4	1	45	7	1	45	6	1	44	6	1	45	6

NOTE: ' -- ' indicates filter offline

3.5 E.L. Smith Filters 10 - 18 Particle Counts (no./mL >2um)

2023

Filter	10			11			12			13			14			15			16			17			18		
Month	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**
January	1	45	6	1	28	2	2	42	13	1	44	3	1	39	3	1	45	3	1	45	4	1	44	4	1	44	3
February	1	45	6	1	28	3	3	38	15	1	41	3	1	30	5	1	45	5	1	45	5	1	45	3	1	44	4
March	1	45	5	1	30	2	1	44	13	1	43	3	1	29	4	1	45	4	1	45	4	1	44	3	1	41	3
April	1	29	3	1	29	3	1	31	3	1	27	3	1	38	5	1	30	4	1	31	3	1	25	2	1	28	2
May	1	37	7	1	37	7	1	38	8	1	37	7	1	38	10	1	38	9	1	37	6	1	28	6	1	33	6
June	1	45	4	1	35	4	1	45	5	1	38	4	1	44	5	1	37	5	1	38	3	1	34	4	1	29	4
July	1	36	4	1	32	4	1	34	5	1	35	4	1	35	6	1	41	6	1	29	3	1	37	4	1	42	3
August	1	32	7	1	40	8	1	38	9	1	41	8	1	41	11	1	42	9	1	42	7	1	35	6	1	40	7
September	1	32	7	1	35	7	1	33	8	1	35	7	1	44	12	1	43	8	1	29	7	1	32	6	1	34	6
October	1	44	10	1	40	10	1	43	11	1	38	9	2	44	14	1	43	10	1	38	10	1	37	8	1	42	9
November	1	45	10	1	42	10	1	45	11	1	44	9	2	45	10	1	40	18	1	42	9	1	44	8	1	44	8
December	2	45	9	1	33	6	2	45	10	1	45	6	2	34	14	4	39	12	1	45	7	1	44	6	1	40	6
Annual Min/Max/Avg	1	45	7	1	42	5	1	45	9	1	45	6	1	45	8	1	45	8	1	45	6	1	45	5	1	44	5

NOTES: ' -- ' indicates filter offline

3.6 Rossdale Filters 1 - 9 Turbidity (NTU)

2023

Filter	1			2			3			4			5			6			7			8			9		
Month	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**
January	0.02	0.08	0.02	0.02	0.07	0.03	0.01	0.06	0.02	0.01	0.07	0.02	0.02	0.08	0.03	0.00	0.07	0.01	0.02	0.08	0.03	0.01	0.06	0.02	0.01	0.07	0.02
February	0.02	0.06	0.03	0.02	0.06	0.03	0.01	0.04	0.01	0.01	0.04	0.02	0.02	0.08	0.03	0.00	0.08	0.01	0.02	0.06	0.03	0.01	0.05	0.02	0.02	0.06	0.02
March	0.02	0.10	0.03	0.02	0.10	0.03	0.01	0.07	0.01	0.01	0.07	0.02	0.02	0.07	0.03	0.01	0.08	0.01	0.02	0.06	0.03	0.01	0.07	0.02	0.01	0.07	0.02
April	0.02	0.05	0.02	0.02	0.05	0.02	0.00	0.04	0.01	0.01	0.06	0.01	0.01	0.07	0.02	0.01	0.07	0.01	0.02	0.05	0.02	0.01	0.05	0.02	0.01	0.07	0.02
May	0.02	0.08	0.03	0.02	0.08	0.03	0.01	0.03	0.01	0.01	0.08	0.02	0.02	0.08	0.03	0.00	0.07	0.01	0.02	0.08	0.03	0.01	0.08	0.02	0.02	0.08	0.03
June	0.02	0.07	0.03	0.02	0.07	0.03	0.01	0.04	0.01	0.01	0.06	0.01	0.01	0.07	0.03	0.00	0.06	0.01	0.02	0.08	0.03	0.01	0.06	0.02	0.02	0.06	0.02
July	0.02	0.06	0.02	0.02	0.06	0.03	0.01	0.04	0.01	0.01	0.08	0.01	0.01	0.06	0.02	0.00	0.07	0.01	0.02	0.05	0.02	0.01	0.07	0.02	0.01	0.05	0.02
August	0.02	0.07	0.03	0.03	0.07	0.03	0.01	0.05	0.01	0.01	0.06	0.01	0.02	0.07	0.03	0.00	0.06	0.02	0.02	0.08	0.03	0.01	0.07	0.02	0.02	0.07	0.03
September	0.02	0.06	0.02	0.02	0.07	0.03	0.01	0.04	0.01	0.00	0.06	0.01	0.01	0.06	0.02	0.00	0.07	0.01	0.02	0.06	0.02	0.01	0.07	0.02	0.01	0.06	0.02
October	0.02	0.08	0.03	0.02	0.07	0.03	0.01	0.05	0.01	0.00	0.06	0.02	0.02	0.08	0.03	0.00	0.07	0.01	0.02	0.08	0.03	0.01	0.08	0.02	0.02	0.08	0.02
November	0.02	0.10	0.04	0.02	0.09	0.04	0.01	0.09	0.03	0.01	0.10	0.03	0.02	0.09	0.04	0.00	0.09	0.03	0.02	0.10	0.04	0.01	0.09	0.04	0.01	0.09	0.04
December	0.02	0.09	0.04	0.02	0.09	0.04	0.01	0.08	0.03	0.01	0.09	0.03	0.02	0.09	0.04	0.01	0.08	0.03	0.02	0.09	0.04	0.02	0.09	0.04	0.02	0.09	0.03
Annual Min/Max/Avg	0.02	0.10	0.03	0.02	0.10	0.03	0.00	0.09	0.02	0.01	0.10	0.02	0.01	0.09	0.03	0.01	0.09	0.02	0.02	0.10	0.03	0.01	0.09	0.02	0.01	0.09	0.02

NOTES: ' -- ' indicates filter offline

3.7 E.L. Smith Filters 1 - 9 Turbidity (NTU)

2023

Filter	1			2			3			4			5			6			7			8			9		
Month	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**
January	0.01	0.08	0.02	0.01	0.05	0.01	0.01	0.09	0.01	--	--	--	0.00	0.06	0.01	0.00	0.09	0.01	0.00	0.06	0.01	0.02	0.09	0.03	0.01	0.07	0.01
February	0.01	0.05	0.02	0.01	0.08	0.01	0.01	0.04	0.01	--	--	--	0.00	0.05	0.01	0.01	0.06	0.01	0.00	0.06	0.01	0.02	0.07	0.03	0.00	0.05	0.01
March	0.01	0.06	0.02	0.00	0.08	0.01	0.01	0.05	0.01	--	--	--	0.00	0.06	0.01	0.00	0.06	0.01	0.01	0.07	0.01	0.02	0.07	0.03	0.01	0.06	0.01
April	0.01	0.07	0.01	0.01	0.07	0.01	0.01	0.06	0.01	--	--	--	0.01	0.07	0.01	0.00	0.07	0.01	0.01	0.07	0.01	0.02	0.08	0.03	0.01	0.08	0.00
May	0.01	0.08	0.02	0.00	0.08	0.01	0.01	0.08	0.02	--	--	--	0.00	0.08	0.01	0.00	0.07	0.02	0.00	0.07	0.01	0.02	0.08	0.03	0.01	0.07	0.01
June	0.01	0.07	0.02	0.00	0.07	0.01	0.01	0.08	0.01	--	--	--	0.01	0.07	0.01	0.00	0.08	0.01	0.00	0.08	0.01	0.02	0.08	0.03	0.01	0.07	0.01
July	0.01	0.08	0.02	0.00	0.05	0.01	0.01	0.06	0.01	--	--	--	0.00	0.05	0.01	0.00	0.08	0.01	0.00	0.06	0.01	0.02	0.07	0.03	0.01	0.06	0.01
August	0.01	0.08	0.02	0.00	0.07	0.01	0.01	0.07	0.01	--	--	--	0.00	0.07	0.01	0.00	0.08	0.01	0.00	0.07	0.01	0.02	0.08	0.03	0.01	0.08	0.01
September	0.01	0.08	0.02	0.00	0.07	0.01	0.01	0.07	0.01	--	--	--	0.00	0.07	0.01	0.00	0.07	0.01	0.00	0.08	0.01	0.02	0.08	0.03	0.00	0.08	0.01
October	0.01	0.09	0.03	0.00	0.09	0.02	0.01	0.09	0.02	--	--	--	0.01	0.09	0.02	0.00	0.09	0.02	0.00	0.09	0.02	0.02	0.10	0.04	0.01	0.09	0.02
November	0.01	0.09	0.03	0.00	0.09	0.02	0.01	0.09	0.02	0.03	0.09	0.04	--	--	--	0.02	0.09	0.05	0.01	0.09	0.02	0.02	0.09	0.04	0.00	0.09	0.02
December	0.01	0.09	0.02	0.01	0.09	0.01	0.01	0.09	0.02	0.02	0.09	0.04	--	--	--	0.03	0.09	0.04	0.01	0.09	0.02	0.02	0.09	0.04	0.00	0.09	0.02
Annual Min/Max/Avg	0.01	0.09	0.02	0.01	0.09	0.01	0.01	0.09	0.02	0.02	0.09	0.04	0.01	0.09	0.01	0.00	0.09	0.02	0.01	0.09	0.01	0.02	0.10	0.03	0.01	0.09	0.01

NOTES: ' -- ' indicates filter offline

3.8 E.L. Smith Filters 10 - 18 Turbidity (NTU)

2023

Filter	10			11			12			13			14			15			16			17			18		
Month	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**
January	0.02	0.09	0.03	0.00	0.06	0.01	0.01	0.09	0.02	0.02	0.09	0.03	0.02	0.08	0.03	0.03	0.08	0.04	0.03	0.08	0.04	0.03	0.08	0.04	0.03	0.08	0.04
February	0.03	0.09	0.04	0.00	0.07	0.01	0.01	0.07	0.02	0.03	0.08	0.03	0.03	0.06	0.03	0.02	0.07	0.04	0.03	0.06	0.03	0.03	0.08	0.04	0.03	0.06	0.03
March	0.02	0.08	0.03	0.01	0.08	0.01	0.00	0.05	0.02	0.02	0.07	0.03	0.03	0.07	0.03	0.03	0.07	0.04	0.03	0.06	0.03	0.03	0.07	0.03	0.03	0.06	0.03
April	0.02	0.08	0.03	0.01	0.07	0.01	0.00	0.07	0.01	0.01	0.08	0.03	0.03	0.07	0.03	0.03	0.08	0.04	0.03	0.07	0.03	0.03	0.08	0.03	0.02	0.07	0.03
May	0.02	0.08	0.04	0.00	0.08	0.01	0.01	0.08	0.02	0.03	0.08	0.04	0.02	0.08	0.04	0.03	0.08	0.04	0.02	0.08	0.04	0.03	0.08	0.04	0.03	0.08	0.03
June	0.02	0.08	0.03	0.01	0.08	0.01	0.00	0.07	0.01	0.03	0.08	0.03	0.03	0.08	0.03	0.03	0.08	0.04	0.03	0.08	0.03	0.03	0.08	0.04	0.02	0.07	0.03
July	0.02	0.07	0.03	0.00	0.08	0.01	0.01	0.07	0.01	0.03	0.07	0.03	0.03	0.07	0.03	0.02	0.08	0.04	0.03	0.07	0.03	0.02	0.07	0.03	0.02	0.06	0.03
August	0.02	0.08	0.03	0.01	0.07	0.01	0.00	0.07	0.01	0.03	0.08	0.03	0.03	0.07	0.03	0.03	0.08	0.04	0.02	0.08	0.03	0.01	0.08	0.04	0.02	0.07	0.03
September	0.02	0.08	0.03	0.00	0.08	0.01	0.01	0.07	0.02	0.03	0.08	0.04	0.03	0.07	0.04	0.03	0.08	0.04	0.03	0.08	0.03	0.03	0.08	0.04	0.02	0.07	0.03
October	0.02	0.10	0.04	0.00	0.10	0.02	0.01	0.10	0.02	0.02	0.09	0.04	0.03	0.09	0.04	0.03	0.09	0.04	0.03	0.09	0.04	0.01	0.09	0.04	0.02	0.09	0.03
November	0.03	0.09	0.05	0.00	0.09	0.02	0.01	0.09	0.03	0.03	0.09	0.04	0.03	0.09	0.04	0.03	0.09	0.05	0.03	0.09	0.04	0.04	0.09	0.05	0.02	0.08	0.03
December	0.03	0.09	0.05	0.00	0.09	0.02	0.01	0.09	0.03	0.03	0.09	0.04	0.03	0.09	0.04	0.02	0.09	0.05	0.03	0.09	0.04	0.03	0.09	0.04	0.02	0.08	0.03
Annual Min/Max/Avg	0.02	0.10	0.04	0.01	0.10	0.01	0.00	0.10	0.02	0.01	0.09	0.04	0.02	0.09	0.03	0.02	0.09	0.04	0.02	0.09	0.03	0.01	0.09	0.04	0.02	0.09	0.03

NOTES: ' -- ' indicates filter offline

3.9 Combined Filter Effluent Water Quality

2023

Month	Rossdale						E.L. Smith					
	Particle Counts (no./mL,>2um)			Turbidity (NTU)			Particle Counts (no./mL,>2um)			Turbidity (NTU)		
	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
January	1	13	2	0.00	0.09	0.03	1	12	4	0.02	0.03	0.02
February	1	13	2	0.03	0.10	0.03	1	11	4	0.02	0.03	0.02
March	1	9	1	0.02	0.08	0.03	1	14	3	0.01	0.03	0.02
April	1	18	2	0.02	0.09	0.03	1	12	3	0.01	0.03	0.02
May	1	14	5	0.02	0.10	0.04	3	17	7	0.02	0.04	0.02
June	1	12	3	0.01	0.10	0.04	1	11	4	0.01	0.03	0.02
July	1	12	2	0.03	0.10	0.04	1	25	4	0.01	0.03	0.02
August	1	17	5	0.01	0.09	0.04	2	19	8	0.01	0.03	0.02
September	1	20	2	0.03	0.08	0.04	1	19	7	0.02	0.05	0.02
October	1	21	4	0.03	0.07	0.04	3	34	10	0.01	0.05	0.03
November	1	25	6	0.01	0.08	0.04	1	24	10	0.03	0.05	0.03
December	1	20	5	0.04	0.10	0.05	1	20	7	0.02	0.04	0.03
Annual Min/Max/Avg	1	25	3	0.01	0.10	0.04	1	34	6	0.01	0.05	0.02

NOTES: ' -- ' indicates plant offline

3.10 Rossdale UV Disinfection - Filters 1 - 3

2023

Filter	1						2						3						Transmittance (%)		
Month	Dosage (mJ/cm²)			Flow (MLD)			Dosage (mJ/cm²)			Flow (MLD)			Dosage (mJ/cm²)			Flow (MLD)					
	Min	Max	Avg	Min	Max	Total	Min	Max	Avg	Min	Max	Total	Min	Max	Avg	Min	Max	Total	Min	Max	Avg
January	35.5	80.9	53.2	12.0	29.9	316.8	35.5	80.5	48.9	10.3	30.0	273.5	35.2	66.8	46.0	11.6	28.8	290.6	94.1	96.3	95.7
February	34.4	99.0	43.3	12.3	29.1	383.2	34.2	68.0	42.2	12.1	30.9	365.0	34.0	58.8	40.2	11.1	28.7	362.3	93.2	95.9	94.7
March	34.4	71.0	45.8	12.7	31.9	381.0	35.1	66.9	44.0	11.0	31.4	483.8	34.3	65.9	39.4	11.2	28.7	446.7	93.5	97.6	95.5
April	35.1	92.4	55.3	16.4	30.9	482.3	35.1	87.0	52.6	15.1	31.4	463.2	35.1	73.8	44.7	16.2	31.9	444.0	95.2	98.6	96.8
May	33.3	51.6	35.9	13.4	35.4	636.0	34.6	45.5	35.6	17.2	38.2	696.5	34.5	36.1	35.6	19.6	30.0	77.5	90.6	96.3	93.9
June	33.0	58.5	35.6	15.4	36.7	666.5	34.4	54.7	35.6	17.4	37.2	645.9	34.2	48.3	35.5	15.1	35.5	378.2	87.5	96.2	93.2
July	34.6	58.8	35.5	19.7	36.7	569.2	34.4	53.9	35.5	19.5	35.5	592.7	34.4	58.7	35.5	14.2	34.0	481.7	90.6	94.1	92.3
August	34.2	56.2	35.6	9.4	36.0	493.9	34.1	37.8	35.5	11.7	35.2	555.0	34.4	57.2	35.6	9.5	33.1	563.3	89.7	94.6	93.1
September	34.6	74.1	35.7	16.0	33.1	451.4	33.4	105.0	35.9	15.2	34.4	517.6	34.6	59.9	35.7	10.2	32.8	439.3	91.3	95.5	94.0
October	33.9	60.3	39.2	11.2	43.0	552.5	33.6	60.7	38.9	13.3	36.1	537.3	33.4	58.6	39.8	12.0	33.6	487.0	93.6	96.0	94.8
November	33.9	80.1	37.9	10.7	33.7	439.6	33.4	53.5	38.0	11.3	36.4	492.6	32.4	66.6	37.6	10.6	34.0	453.9	89.5	96.2	93.1
December	34.4	59.5	38.0	10.7	30.7	477.7	33.7	59.8	37.6	10.0	30.4	454.8	34.3	79.1	38.4	10.2	30.2	421.9	89.8	96.7	93.5
Annual Total						5850						6078						4847			
Annual Min/Max/ Avg	33.0	99.0	40.6	9.4	43.0		33.4	105.0	39.7	10.0	38.2		32.4	79.1	38.9	9.5	35.5		87.5	98.6	94.2

NOTES: - Each filter has a UV reactor

- Transmittance (%) is a grab sample of the filter effluent prior to the UV reactor of a random online filter

' -- ' indicates filter and UV reactor offline

3.11 Rossdale UV Disinfection - Filters 4 - 6

2023

Filter	4						5						6						Transmittance (%)		
Month	Dosage (mJ/cm²)			Flow (MLD)			Dosage (mJ/cm²)			Flow (MLD)			Dosage (mJ/cm²)			Flow (MLD)					
	Min	Max	Avg	Min	Max	Total	Min	Max	Avg	Min	Max	Total	Min	Max	Avg	Min	Max	Total	Min	Max	Avg
January	33.3	74.8	48.5	11.0	28.9	243.8	34.8	79.5	43.8	11.3	40.4	445.4	33.7	64.7	38.7	12.0	33.2	502.4	94.1	96.3	95.7
February	34.4	61.9	43.6	11.5	29.2	375.8	33.8	55.0	40.0	12.5	27.4	343.1	34.0	46.3	36.8	11.8	29.7	358.1	93.2	95.9	94.7
March	34.8	69.6	47.6	12.4	30.9	428.7	34.7	63.5	40.4	11.1	28.5	416.8	34.1	72.8	40.1	11.4	32.9	470.9	93.5	97.6	95.5
April	35.1	124.3	57.2	16.8	30.1	463.4	35.3	113.5	53.0	14.9	29.2	408.8	34.8	80.8	47.3	15.2	32.8	482.3	95.2	98.6	96.8
May	33.1	58.2	35.6	17.7	36.9	697.9	33.4	51.7	35.7	14.6	33.4	653.0	32.7	55.0	35.5	17.2	36.9	712.9	90.6	96.3	93.9
June	32.3	56.2	35.6	17.5	37.4	643.5	31.8	50.1	35.6	16.9	31.9	589.9	32.6	52.8	35.5	15.0	39.8	674.9	87.5	96.2	93.2
July	34.0	39.5	35.5	17.6	32.2	585.7	34.0	48.7	35.6	14.1	35.7	526.0	34.8	46.1	35.5	15.1	38.0	551.3	90.6	94.1	92.3
August	30.1	48.1	35.5	11.5	32.8	505.8	34.7	44.7	35.7	12.6	32.2	518.6	33.9	40.4	35.5	16.6	37.6	577.9	89.7	94.6	93.1
September	33.1	67.8	36.2	13.7	32.9	500.5	34.1	64.5	36.3	18.3	31.6	492.9	34.3	63.1	35.6	12.7	36.4	580.1	91.3	95.5	94.0
October	31.4	72.5	40.3	14.4	43.5	490.6	35.0	91.4	41.3	10.5	33.2	517.0	34.4	65.9	38.0	10.1	36.1	504.3	93.6	96.0	94.8
November	33.9	68.7	40.8	10.2	33.1	433.4	33.5	62.6	39.8	11.0	31.0	458.3	31.4	65.8	37.3	10.2	32.2	474.5	89.5	96.2	93.1
December	33.7	64.6	39.6	10.7	32.0	428.3	33.1	58.7	39.7	10.2	29.2	395.0	34.1	48.7	36.6	10.3	32.5	444.8	89.8	96.7	93.5
Annual Total						5797						5765						6334			
Annual Min/Max/ Avg	30.1	124.3	41.0	10.2	43.5		31.8	113.5	39.7	10.2	40.4		31.4	80.8	37.6	10.1	39.8		87.5	98.6	94.2

NOTES: - Each filter has a UV reactor

- Transmittance (%) is a grab sample of the filter effluent prior to the UV reactor of a random online filter

' -- ' indicates filter and UV reactor offline

3.12 Rossdale UV Disinfection - Filters 7 - 9

2023

Filter	7						8						9						Transmittance (%)		
Month	Dosage (mJ/cm²)			Flow (MLD)			Dosage (mJ/cm²)			Flow (MLD)			Dosage (mJ/cm²)			Flow (MLD)					
	Min	Max	Avg	Min	Max	Total	Min	Max	Avg	Min	Max	Total	Min	Max	Avg	Min	Max	Total	Min	Max	Avg
January	34.0	88.6	41.9	13.8	35.9	513.8	34.2	64.0	40.6	12.6	35.6	508.5	35.0	67.2	42.1	14.2	37.2	556.5	94.1	96.3	95.7
February	33.8	56.4	37.8	12.6	32.0	414.7	34.5	75.4	37.2	13.5	28.8	411.0	32.1	49.6	37.7	14.8	29.9	402.4	93.2	95.9	94.7
March	33.8	73.2	40.1	11.5	32.0	488.5	34.6	58.8	38.7	12.0	37.1	545.8	34.5	59.3	38.8	14.3	33.7	471.5	93.5	97.6	95.5
April	34.8	91.1	49.2	15.7	32.7	477.8	35.1	83.7	42.2	15.6	33.9	520.7	34.3	78.9	46.0	16.3	33.6	529.6	95.2	98.6	96.8
May	33.6	58.9	35.6	18.8	42.1	762.8	32.3	53.3	35.6	15.2	42.7	724.3	34.7	57.8	35.6	14.7	42.1	742.4	90.6	96.3	93.9
June	34.7	53.2	35.6	13.1	37.1	671.6	34.1	52.9	35.6	14.7	40.4	641.4	32.4	50.8	35.7	18.1	40.2	687.6	87.5	96.2	93.2
July	34.2	38.2	35.6	15.7	39.7	633.6	33.7	47.6	35.6	14.6	39.0	613.3	34.7	48.4	35.6	18.2	36.3	668.8	90.6	94.1	92.3
August	32.3	59.1	35.7	10.9	37.2	604.3	34.4	47.8	35.6	12.2	40.1	457.4	33.8	62.7	35.6	11.7	37.8	593.3	89.7	94.6	93.1
September	32.4	87.5	35.8	15.0	35.5	573.2	33.9	53.8	35.6	11.3	36.5	554.8	34.0	71.0	35.6	13.3	37.1	550.0	91.3	95.5	94.0
October	32.6	58.5	38.0	13.1	36.2	569.2	33.0	91.1	36.0	10.7	39.2	561.4	34.2	50.7	36.4	14.8	45.0	532.5	93.6	96.0	94.8
November	33.5	67.0	37.1	10.6	35.5	510.6	33.3	56.5	35.9	11.3	34.5	528.9	33.4	77.7	36.6	10.0	35.1	527.3	89.5	96.2	93.1
December	33.6	71.2	36.8	11.0	35.5	468.9	32.6	64.7	35.7	10.1	35.8	476.1	33.5	63.7	36.8	10.3	35.0	454.5	89.8	96.7	93.5
Annual Total						6689						6543						6717			
Annual Min/Max/ Avg	32.3	91.1	38.3	10.6	42.1		32.3	91.1	37.1	10.1	42.7		32.1	78.9	37.8	10.0	45.0		87.5	98.6	94.2

NOTES: - Each filter has a UV reactor

- Transmittance (%) is a grab sample of the filter effluent prior to the UV reactor of a random online filter

' -- ' indicates filter and UV reactor offline

3.13 E.L. Smith UV Disinfection - UV Reactors 1 - 4

2023

Filter	1						2						3						4						Transmittance (%)		
Month	Dosage (mJ/cm²)			Flow (MLD)			Dosage (mJ/cm²)			Flow (MLD)			Dosage (mJ/cm²)			Flow (MLD)			Dosage (mJ/cm²)			Flow (MLD)					
	Min	Max	Avg	Min	Max	Total	Min	Max	Avg	Min	Max	Total	Min	Max	Avg	Min	Max	Total	Min	Max	Avg	Min	Max	Total	Min	Max	Avg
January	--	--	--	--	--	0.0	45.2	136.8	63.7	57.3	95.3	2,556.9	45.2	131.2	55.7	57.5	98.4	2,657.3	46.2	108.3	47.2	67.6	90.0	2,450.2	93.6	97.6	95.5
February	45.6	98.4	67.5	45.0	94.7	466.3	42.3	153.2	60.6	52.5	91.7	2,254.1	45.0	104.0	62.9	60.8	102.5	2,364.0	41.4	99.2	47.1	42.2	85.4	1,782.2	93.3	95.9	94.6
March	45.0	95.9	69.3	60.6	103.0	1,908.7	45.7	99.5	61.2	20.8	94.0	842.9	44.4	85.7	66.9	65.0	103.0	2,708.4	43.0	108.6	53.2	30.6	87.1	2,265.4	93.6	97.5	95.4
April	48.6	176.1	70.9	27.5	94.3	883.2	61.2	222.4	74.5	55.8	87.6	1,491.1	53.4	155.4	79.7	61.9	98.7	2,465.0	44.0	99.1	47.2	30.0	79.0	2,056.4	94.8	99.0	97.2
May	45.8	93.2	70.2	69.8	116.2	2,279.0	39.0	102.4	61.7	45.0	102.8	684.4	44.7	91.9	65.3	68.1	113.0	2,876.4	46.5	122.3	47.3	62.9	96.3	2,460.2	91.5	95.9	94.0
June	44.5	160.2	64.0	31.4	130.6	1,322.4	45.5	152.5	63.7	29.3	110.3	2,187.2	45.4	96.7	63.7	59.9	133.1	2,744.1	45.9	94.0	48.7	45.8	100.4	1,861.9	89.2	96.6	93.6
July	43.9	97.6	63.2	33.6	101.6	1,706.5	45.0	80.6	62.2	55.2	105.6	1,002.3	41.9	84.4	60.6	37.0	116.6	2,826.0	46.4	68.3	47.2	45.6	86.3	2,135.0	91.0	94.1	92.3
August	45.7	281.0	69.4	53.1	106.2	1,297.6	45.0	204.2	66.2	58.7	105.1	2,351.1	45.1	110.6	66.5	63.6	113.4	2,770.8	46.7	106.5	54.4	52.2	77.2	1,203.5	90.4	94.5	93.1
September	44.3	127.2	70.1	42.7	105.1	2,488.8	45.0	126.4	65.1	40.7	103.6	2,420.8	43.8	129.9	68.8	44.8	110.7	2,659.2	--	--	--	--	--	0.0	90.5	95.4	93.7
October	45.0	121.7	65.2	37.5	104.0	2,454.4	43.5	122.9	63.2	35.7	101.6	2,373.4	45.2	101.6	63.5	39.9	110.3	2,622.3	--	--	--	--	--	0.0	89.9	96.0	93.6
November	45.4	91.3	63.0	58.1	138.5	2,392.8	45.3	159.7	61.8	54.4	128.7	2,267.1	45.6	120.0	61.8	58.2	150.0	2,560.7	--	--	--	--	--	0.0	90.2	94.7	92.5
December	45.7	91.8	64.9	53.4	97.7	2,535.9	45.7	91.5	65.3	51.0	95.6	2,440.6	44.9	93.7	67.9	56.0	102.3	2,694.2	--	--	--	--	--	0.0	90.0	94.5	93.3
Annual Total						19,736						22,872						31,948						16,215			
Annual Min/Max/ Avg	43.9	281.0	66.8	27.5	138.5		39.0	222.4	64.3	20.8	128.7		41.9	155.4	65.3	37.0	150.0		41.4	122.3	48.8	30.0	100.4		89.2	99.0	94.1

NOTES: ' -- ' indicates UV reactor offline

- Transmittance (%) is a grab sample of the combined filter effluent prior to the UV reactor

3.14 Log Removal

2023

Month	Rossdale									E.L. Smith								
	Log Removal									Log Removal								
	Giardia			Virus			*Cryptosporidium*			*Giardia*			Virus			*Cryptosporidium*		
	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
January	7.2	8.3	7.5	11	16	13	6.5	6.5	6.5	6.6	6.7	6.7	5.3	8.3	6.8	6.5	6.5	6.5
February	7.0	8.6	7.6	5.1	16	14	6.5	6.5	6.5	6.6	6.7	6.7	5.7	8.8	7.2	6.5	6.5	6.5
March	7.1	8.9	8.0	11	16	13	6.5	7.0	6.6	6.6	7.2	6.8	5.5	9.1	7.2	6.5	7.0	6.6
April	7.9	9.0	8.2	12	20	14	6.6	7.0	7.0	7.1	7.3	7.2	6.3	12	7.9	7.0	7.0	7.0
May	7.0	10.6	9.7	6.0	34	26	6.8	7.0	7.0	7.2	7.6	7.4	9.3	26	18	6.9	7.0	7.0
June	9.4	12.0	10.4	20	42	29	7.0	7.0	7.0	6.5	7.7	7.5	13	29	20	6.1	7.0	7.0
July	9.8	12.9	11.0	23	50	32	7.0	7.0	7.0	7.3	7.9	7.5	15	34	22	7.0	7.0	7.0
August	7.8	12.7	11.1	11	46	35	7.0	7.0	7.0	7.3	7.8	7.6	16	31	23	7.0	7.0	7.0
September	9.6	11.6	10.3	23	37	30	6.9	7.0	7.0	7.3	7.7	7.5	14	26	19	7.0	7.0	7.0
October	7.5	10.0	9.0	14	26	20	6.2	7.0	7.0	6.4	7.4	7.0	6.3	18	12	6.1	7.0	6.7
November	6.5	8.5	7.7	12	20	15	6.2	7.0	6.6	6.3	6.7	6.7	5.6	11	7.9	6.1	6.5	6.5
December	7.0	8.4	7.7	12	16	14	6.5	6.5	6.5	6.5	6.8	6.7	5.8	9.3	7.3	6.5	6.5	6.5
Annual Min/Max/Avg	6.5	12.9	9.0	5.1	50	21	6.2	7.0	6.8	6.3	7.9	7.1	5.3	34	13	6.1	7.0	6.8

NOTES: ' -- ' indicates plant offline

4.1 Liquid Alum Chemical Consumption

2023

Month	Dosage (mg/L)			Consumption (kg)			
	Rossdale		E.L. Smith	Rossdale			E.L. Smith
	Plant 1	Plant 2		Plant 1	Plant 2	Plant Total	
January	5.01	4.95	5.14	853	38,634	39,487	91,358
February	--	4.87	5.14	--	35,595	35,595	81,649
March	9.50	10.0	8.27	37,891	48,144	86,035	146,902
April	25.2	25.2	29.7	95,430	139,465	234,895	474,775
May	31.6	31.6	41.8	160,181	229,211	389,391	806,784
June	72.6	72.8	92.2	338,443	484,016	822,459	1,686,439
July	54.8	54.8	66.7	238,698	380,292	618,990	1,223,701
August	47.2	47.3	53.5	202,713	302,121	504,834	967,337
September	34.4	34.4	38.4	133,317	213,942	347,259	659,504
October	27.3	27.5	17.8	113,433	167,835	281,269	302,570
November	12.1	11.8	7.07	36,634	75,382	112,016	120,293
December	--	7.38	6.94	--	63,894	63,894	124,891
Annual Total				1,357,593	2,178,532	3,536,125	6,686,203
Annual Avg	35.2	28.1	31.2				

NOTES : ' -- ' indicates plant offline
- Liquid alum consumption (kg) at 100% by weight (solution delivered to sites at a concentration of 48.5%)

4.2 Primary Polymer (Magnafloc LT 27AG) Chemical Consumption 2023

Month	Dosage (mg/L)			Consumption (kg)			
	Rossdale		E.L. Smith	Rossdale			E.L. Smith
	Plant 1	Plant 2		Plant 1	Plant 2	Plant Total	
January	0.10	0.10	--	8	375	383	--
February	--	0.10	--	--	354	354	--
March	0.14	0.15	0.15	279	344	622	322.83
April	0.26	0.26	0.18	471	692	1,162	1,377.69
May	0.23	0.23	0.17	573	808	1,381	1,608.31
June	0.24	0.24	0.17	572	828	1,400	1,559.29
July	0.25	0.25	0.16	536	858	1,394	1,400.94
August	0.24	0.24	0.12	483	732	1,215	1,069.27
September	0.20	0.20	0.11	379	597	976	934.21
October	0.21	0.21	0.11	421	619	1,039	503.05
November	0.12	0.13	--	188	401	589	--
December	--	0.10	--	--	420	420	--
Annual Total				3,910	7,027	10,937	8,776
Annual Avg	0.21	0.19	0.15				

NOTES: ' -- ' indicates plant offline

- Primary polymer consumption (kg) at 100% by weight mixed at the sites to required solution

4.3 Carbon Chemical Consumption

2023

Month	Dosage (mg/L)			Consumption (kg)			
	Rossdale		E.L. Smith	Rossdale			E.L. Smith
	Plant 1	Plant 2		Plant 1	Plant 2	Plant Total	
January	--	--	--	--	--	--	--
February	--	--	--	--	--	--	--
March	0.24	0.12	--	56	54	110	--
April	9.15	9.02	9.25	4,392	7,268	11,659	21,990
May	--	--	--	--	--	--	--
June	16.5	16.5	15.8	3,103	4,991	8,094	13,251
July	--	--	--	--	--	--	--
August	--	--	--	--	--	--	--
September	--	--	--	--	--	--	--
October	--	--	--	--	--	--	--
November	--	--	--	--	--	--	--
December	--	--	--	--	--	--	--
Annual Total				7,551	12,313	19,864	35,242
Annual Avg	8.31	8.20	10.9				

NOTES: ' -- ' indicates carbon not being used

4.4 Sodium Hypochlorite Chemical Consumption

2023

Month	Rossdale					E.L. Smith	
	Dosage (mg/L)		Consumption (kg)			Dosage (mg/L)	Consumption (kg)
	Plant 1	Plant 2	Plant 1	Plant 2	Plant Total		
January	2.80	2.81	28,753	1,326,026	1,354,779	3.03	3,438,286
February	--	2.78	--	1,233,977	1,233,977	3.22	3,257,549
March	2.67	2.64	694,461	771,059	1,465,520	3.00	3,405,481
April	2.56	2.48	579,119	830,715	1,409,834	3.04	3,111,320
May	2.77	2.72	852,684	1,187,658	2,040,341	3.33	4,091,007
June	2.95	2.87	876,981	1,245,925	2,122,906	3.47	4,086,187
July	2.93	2.87	768,872	1,212,976	1,981,849	3.77	4,393,110
August	3.17	3.10	810,644	1,192,614	2,003,259	3.59	4,066,000
September	3.17	3.14	747,596	1,171,486	1,919,081	3.63	3,955,710
October	2.87	2.84	734,772	1,063,594	1,798,366	3.56	3,890,280
November	2.68	2.69	473,722	1,077,095	1,550,816	3.43	3,718,480
December	--	2.71	--	1,422,817	1,422,817	3.15	3,618,282
Annual Total			6,567,605	13,735,941	20,303,546		45,031,691
Annual Avg	2.87	2.81				3.35	

NOTES: ' -- ' indicates plant offline

- Sodium hypochlorite consumption (kg) at 0.8% by weight (sodium hypochlorite generated onsite at a concentration of 0.8%)
- Plant 1 was converted to sodium hypochlorite from chlorine on Feb 2, 2015.
- Plant 2 was converted to sodium hypochlorite from chlorine on Feb 10, 2015.
- Plant Total Consumption is the combined addition of Plant 1, Plant 2 and Post Filter Trim.

4.5 Filter Polymer (Magnafloc LT 7995) Chemical Consumption

2023

Month	Dosage (mg/L)		Consumption (kg)	
	Rossdale	E.L. Smith	Rossdale	E.L. Smith
January	0.30	0.37	1,109	3,175
February	0.29	0.43	987	3,273
March	0.25	0.35	1,024	2,996
April	0.10	0.10	416	766
May	0.19	0.14	1,049	1,344
June	0.19	0.12	1,084	1,089
July	0.19	0.09	1,006	756
August	0.19	0.15	950	1,264
September	0.19	0.15	899	1,228
October	0.20	0.47	968	3,908
November	0.37	0.63	1,591	5,256
December	0.39	0.55	1,553	4,806
Annual Total			12,636	29,861
Annual Avg	0.24	0.29		

NOTES: ' -- ' indicates plant offline

- Filter polymer consumption (kg) at 100% by weight mixed at the sites to required solution

4.6 Aqua Ammonia Chemical Consumption

2023

Month	Dosage (mg/L)		Consumption (kg)	
	Rossdale	E.L. Smith	Rossdale	E.L. Smith
January	0.61	--	11,710	--
February	0.61	--	10,933	--
March	0.60	--	13,034	--
April	0.60	--	13,446	--
May	0.60	--	17,927	--
June	0.60	--	17,688	--
July	0.60	--	16,424	--
August	0.60	--	15,368	--
September	0.69	--	16,858	--
October	0.71	--	17,568	--
November	0.66	--	14,951	--
December	0.65	--	13,709	--
Annual Total			179,613	--
Annual Avg	0.63	--		

NOTES: ' -- ' indicates plant offline
- Aqua ammonia consumption (kg) at 100% by weight (solution delivered to sites at a concentration of 19.0%)

4.6-1 LAS Ammonia Chemical Consumption

2023

Month	Dosage (mg/L)	Consumption (kg)
	E.L. Smith	E.L. Smith
January	0.64	47,109
February	0.64	42,202
March	0.64	47,010
April	0.64	42,252
May	0.65	51,701
June	0.67	54,141
July	0.65	51,115
August	0.65	50,900
September	0.68	52,594
October	0.69	51,545
November	0.67	49,491
December	0.65	51,116
Annual Total		591,175
Annual Avg	0.66	

NOTES: ' -- ' indicates plant offline
- LAS ammonia consumption (kg) at 100% by weight (solution delivered to sites at a concentration of 41.0%)
- NSF limit for LAS Ammonia is 16.4 mg/L

4.7 Caustic Soda Chemical Consumption

2023

Month	Dosage (mg/L)		Consumption (kg)	
	Rossdale	E.L. Smith	Rossdale	E.L. Smith
January	--	--	--	--
February	--	--	--	--
March	1.91	3.12	3,384	12,242
April	2.86	5.97	22,436	81,632
May	2.17	7.04	22,802	116,698
June	17.3	19.4	78,984	303,681
July	5.93	15.7	55,308	242,690
August	7.79	10.0	37,789	160,095
September	2.65	6.52	14,858	99,130
October	4.21	3.63	2,609	27,853
November	2.33	--	3,949	--
December	--	--	--	--
Annual Total			242,120	1,044,023
Annual Avg	5.15	9.93		

NOTES: ' -- ' indicates plant offline
- Caustic soda consumption (kg) at 100% by weight (solution delivered to sites at a concentration of 50.0%)

4.8 Fluoride Chemical Consumption

2023

Month	Dosage (mg/L)		Consumption (kg)	
	Rossdale	EL Smith	Rossdale	EL Smith
January	0.65	0.64	10,944	22,457
February	0.63	0.64	9,842	20,192
March	0.60	0.64	11,391	22,457
April	0.64	0.63	12,595	19,807
May	0.60	0.67	15,515	25,268
June	0.64	0.68	16,191	24,742
July	0.68	0.69	16,190	24,234
August	0.69	0.68	15,598	23,638
September	0.66	0.67	14,128	23,325
October	0.66	0.71	14,469	23,749
November	0.66	0.74	13,183	24,477
December	0.61	0.71	11,197	25,154
Annual Total			161,245	279,500
Annual Avg	0.64	0.67		

NOTES: ' -- ' indicates plant offline

- Fluoride consumption (kg) at 100% by weight (solution delivered to sites at a concentration of 21.8%)

4.9 Sodium Bisulfite Chemical Consumption
2023

Month	Rossdale			E.L. Smith		
	Dosage (mg/L)	Consumption (kg)	De-chlorinated Waste Stream to Outfall (ML)	Dosage (mg/L)	Consumption (kg)	De-chlorinated Waste Stream to Outfall (ML)
January	19.0	19,651	395	11.8	40,371	1,305
February	18.1	16,073	337	13.3	39,839	1,139
March	16.7	17,085	416	11.6	42,316	1,402
April	13.7	13,390	378	14.5	47,995	1,278
May	18.2	20,918	433	15.6	57,035	1,425
June	18.2	18,274	422	17.0	56,249	1,264
July	17.0	19,021	444	14.3	55,219	1,461
August	19.8	21,178	400	18.4	56,202	1,224
September	16.7	14,909	359	20.4	51,162	991
October	19.0	18,912	392	16.6	63,448	1,492
November	20.4	31,179	576	15.7	61,735	1,506
December	26.3	27,668	403	13.4	53,131	1,512
Annual Total		238,258	4,956		624,704	15,998
Annual Avg	18.6			15.2		

NOTES: ' -- ' indicates Plant Offline
- Sodium bisulfite consumption (kg) at 38% by weight (solution delivered to sites at a concentration of 38.0%)

4.10 Phosphoric Acid Chemical Consumption
2023

Month	Dosage (mg/L)		Consumption (kg)	
	Rossdale	EL Smith	Rossdale	EL Smith
February	--	0.00	--	2
March	0.86	0.80	6,064	9,585
April	0.90	0.90	15,592	25,365
May	0.89	0.90	20,738	30,623
June	0.90	0.90	20,669	30,124
July	0.90	0.90	19,118	29,773
August	0.91	0.90	17,850	29,142
September	0.90	0.90	17,061	27,598
October	0.90	0.89	17,341	25,477
November	0.89	0.90	15,645	25,836
December	0.89	0.90	14,212	27,709
Annual Total			164,289	261,236
Annual Avg	0.90	0.89		

NOTES: ' -- ' indicates plant offline
- Phosphoric acid consumption (kg) at 100% by weight (solution delivered to sites at a concentration of 75%)
- NSF limit for phosphoric acid (75%) is 13 mg/L

5.1 Waste Stream Volumes (ML)

2023

Month	Rossdale						E.L. Smith								
	Clarifier Blowdown	Clarifier Washdown	Backwash Water	Filter to Waste	Bypass	Plant Total	Clarifier Blowdown	Clarifier Washdown	Backwash Water	Filter to Waste	Bypass	LLP Flush	HLP Cooling	Plant Total	De-chlorinated Waste Flow to Outfall
January	230	7.8	140	25	0.2	403	518	--	328	151	2.5	0.6	29	1,029	1,305
February	174	12	98	20	25	330	453	--	288	133	0.0	0.6	25	899	1,139
March	252	--	113	27	7.6	399	--	--	388	177	22	0.7	27	615	1,402
April	271	--	91	20	0.0	382	505	--	352	160	31	0.7	17	1,066	1,278
May	271	--	123	40	9.8	443	595	13	352	167	0.0	0.7	24	1,152	1,425
June	315	--	103	26	3.6	447	519	--	292	106	0.0	0.9	24	942	1,264
July	325	--	104	25	0.8	455	571	10	266	89	25	0.7	22	984	1,461
August	248	--	98	29	33	408	573	--	238	93	0.0	0.7	20	925	1,224
September	255	--	91	23	0.0	370	539	--	232	96	66	0.7	22	955	991
October	258	--	99	29	16	402	642	13	442	342	28	0.6	27	1,494	1,492
November	289	24	164	93	23	594	620	--	422	320	33	0.8	24	1,420	1,506
December	159	--	158	39	9.5	366	657	--	431	272	26	5.9	25	1,416	1,512
Annual Total	3,048	44	1,381	399	128	5,000	6,193	35	4,031	2,105	233	13	287	12,897	15,998

NOTES: - Clarifier washdown volume(s) estimated for clarifier cleaning
- LLP flush, HLP cooling and chlorinated waste flow to outfall are not applicable to the Rossdale WTP
- De-chlorinated waste flow to outfall is the estimated chlorinated waste flow to outfall for dechlorination

5.2 Rossdale Clarifier Blowdown Clarifier Washdown and Backwash Water Waste Stream Data

2023

Month	Clarifier Blowdown		Clarifier Washdown		Backwash Water	
	TSS (kg)	Aluminum (kg)	TSS (kg)	Aluminum (kg)	TSS (kg)	Aluminum (kg)
January	20,018	1,714	32	3	13,974	4,837
February	22,592	1,547	99	4	16,603	5,747
March	29,089	3,666	0	0	11,567	4,004
April	474,841	10,332	0	0	3,360	1,163
May	220,551	16,958	0	0	3,995	1,383
June	1,940,246	35,954	0	0	5,440	1,883
July	391,708	27,239	0	0	4,449	1,540
August	216,801	21,770	0	0	3,557	1,231
September	41,414	15,271	0	0	3,022	1,046
October	25,116	12,282	0	0	4,060	1,405
November	22,705	5,023	122	6	23,203	8,032
December	17,207	2,798	0	0	23,722	8,212
Annual Total	3,422,287	154,556	253	13	116,952	40,483

NOTES: '--' indicates that clarifier washdown did not occur
- Clarifier washdown waste stream solids, TSS and aluminum are calculated values

5.3 Rossdale Waste Stream Data

2023

Month	De-Chlorinated Waste Flow to Waste Stream 3						De-Chlorinated Waste Flow to Waste Stream 7					
	Total Chlorine (mg/L)			Sulfite (mg/L)			Total Chlorine (mg/L)			Sulfite (mg/L)		
	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
January	0.00	0.00	0.00	2.32	20.0	10.6	0.00	0.00	0.00	1.15	17.6	7.85
February	0.00	0.00	0.00	1.09	20.0	9.12	0.00	0.00	0.00	2.50	20.0	9.53
March	0.00	0.00	0.00	1.03	20.0	8.42	0.00	0.00	0.00	0.87	20.0	6.97
April	0.00	0.00	0.00	2.19	20.0	7.91	0.00	0.00	0.00	2.36	18.9	6.82
May	0.00	0.00	0.00	1.06	20.0	8.54	0.00	0.00	0.00	1.30	20.0	8.45
June	0.00	0.00	0.00	1.40	20.0	5.76	0.00	0.00	0.00	1.41	20.0	8.97
July	0.00	0.00	0.00	0.99	20.0	6.85	0.00	0.00	0.00	1.87	20.0	7.27
August	0.00	0.00	0.00	0.10	20.0	6.17	0.00	0.00	0.00	0.10	20.0	7.68
September	0.00	0.00	0.00	0.23	20.0	5.34	0.00	0.00	0.00	0.23	14.4	7.59
October	0.00	0.00	0.00	0.10	20.0	9.40	0.00	0.00	0.00	0.10	20.0	7.02
November	0.00	0.00	0.00	0.67	20.0	10.5	0.00	0.00	0.00	0.68	20.0	7.89
December	0.00	0.00	0.00	1.08	20.0	12.6	0.00	0.00	0.00	2.49	20.0	9.84
Annual Min/Max/Avg	0.00	0.00	0.00	0.10	20.0	8.44	0.00	0.00	0.00	0.10	20.0	7.98

5.4 E.L. Smith Clarifier Blowdown Clarifier Washdown and Backwash Water Waste Stream Data

2023

Month	Clarifier Blowdown		Clarifier Washdown		Backwash Water	
	TSS (kg)	Aluminum (kg)	TSS (kg)	Aluminum (kg)	TSS (kg)	Aluminum (kg)
January	61,233	3,987	0	0	38,311	13,262
February	65,831	3,563	0	0	42,040	14,552
March	77,719	6,411	0	0	41,076	14,219
April	600,808	20,723	0	0	23,676	8,196
May	488,748	34,562	282	32	18,945	6,558
June	658,685	73,030	0	0	23,049	7,979
July	708,020	52,826	403	47	29,238	10,121
August	401,023	41,554	0	0	13,919	4,818
September	163,846	28,205	0	0	12,470	4,316
October	88,613	12,504	72	7	33,049	11,440
November	74,424	4,762	0	0	56,318	19,495
December	72,403	5,050	0	0	58,023	20,085
Annual Total	3,461,353	287,176	756	86	390,113	135,039

NOTES: '--' indicates that clarifier wash did not occur

- Clarifier washdown waste stream solids, TSS and aluminum are calculated values

5.5 E.L. Smith Waste Stream Data

2023

Month	De-chlorinated Waste Flow to Outfall								
	Sulphite (mg/L)			Total Chlorine (mg/L)			pH		
	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
January	0.16	20.0	7.22	0.00	0.00	0.00	7.66	8.00	7.92
February	0.64	20.0	7.74	0.00	0.00	0.00	7.83	8.07	7.96
March	0.17	20.0	6.20	0.00	0.00	0.00	6.98	8.11	7.85
April	0.13	20.0	6.45	0.00	0.00	0.00	6.63	7.54	7.33
May	0.15	20.0	8.32	0.00	0.00	0.00	6.62	7.50	7.32
June	0.23	20.0	6.60	0.00	0.00	0.00	6.80	7.60	7.26
July	0.10	20.0	6.55	0.00	0.00	0.00	6.81	7.79	7.28
August	0.05	20.0	5.26	0.00	0.00	0.00	6.62	7.76	7.42
September	0.05	20.0	6.72	0.00	0.00	0.00	6.54	7.69	7.20
October	0.34	20.0	6.03	0.00	0.00	0.00	6.33	7.69	7.36
November	0.85	20.0	8.45	0.00	0.00	0.00	6.65	7.67	7.53
December	0.10	20.0	5.56	0.00	0.00	0.00	7.44	7.72	7.64
Annual Min/Max/Avg	0.05	20.0	6.75	0.00	0.00	0.00	6.3	8.1	7.5

6.0 Reservoir Chlorine Residual (mg/L) - Part 1

2023

Reservoir	Papaschase 1			Ormsby			Clareview Discharge			Millwoods Discharge			Kaskitayo			Discovery Park		
Day	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
Jan	1.52	1.95	1.67	1.73	2.38	1.89	1.36	1.94	1.79	--	--	--	1.77	2.14	2.00	1.34	1.51	1.43
Feb	1.43	1.95	1.65	1.78	2.14	1.93	1.24	1.92	1.61	1.63	2.08	2.03	1.76	2.14	2.02	1.27	1.46	1.37
Mar	1.34	1.97	1.70	1.77	2.11	1.92	1.18	2.03	1.68	1.45	2.14	1.99	1.55	2.10	1.86	1.32	1.69	1.44
Apr	1.01	1.97	1.67	1.59	2.09	1.95	1.25	1.79	1.58	1.59	1.99	1.82	1.73	1.97	1.86	1.49	1.73	1.66
May	1.29	1.86	1.45	1.28	1.94	1.58	--	--	--	1.52	1.88	1.67	1.21	1.88	1.62	1.08	1.64	1.36
Jun	1.15	1.83	1.29	1.17	1.93	1.57	1.01	2.11	1.59	1.40	2.05	1.73	1.25	2.07	1.82	0.94	1.72	1.38
Jul	1.03	1.95	1.24	1.46	1.82	1.65	1.05	1.91	1.44	1.57	2.10	1.77	1.61	1.98	1.84	0.99	1.38	1.19
Aug	1.09	2.00	1.36	1.50	1.87	1.69	1.20	1.73	1.42	1.61	2.07	1.81	1.65	2.04	1.88	0.97	1.26	1.11
Sep	1.11	2.31	1.47	1.53	2.04	1.82	1.16	2.06	1.61	1.65	2.24	1.92	1.73	2.24	2.00	0.86	1.47	1.16
Oct	1.60	2.33	1.81	1.76	2.22	2.01	1.25	2.30	1.94	1.92	2.25	2.09	1.85	2.25	2.10	0.89	1.56	1.16
Nov	1.72	2.37	1.92	1.89	2.31	2.10	1.17	2.26	1.98	1.96	2.30	2.13	1.91	2.28	2.12	0.65	1.45	1.14
Dec	1.58	2.29	1.87	1.85	2.10	1.97	1.62	2.42	1.90	1.91	2.12	2.01	1.79	2.12	1.90	1.04	1.65	1.44
Monthly Min/Max/ Avg	1.01	2.37	1.59	1.17	2.38	1.84	1.01	2.42	1.70	1.40	2.30	1.90	1.21	2.28	1.92	0.65	2.42	1.70

NOTES: '--' Indication Analyzer Offline

6.1 Reservoir Chlorine Residual (mg/L) - Part 2

2023

Reservoir	Rosslyn 1			Londonderry			N. Jasper Place			Rosslyn 2			Thorncliffe			Blackmud Creek		
Day	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**
Jan	1.58	1.80	1.74	1.62	2.03	1.86	1.54	2.12	1.67	1.52	2.02	1.67	1.60	2.20	1.74	1.76	1.96	1.84
Feb	1.70	1.84	1.76	1.60	1.93	1.78	1.33	2.03	1.67	1.49	1.94	1.63	1.49	2.15	1.78	1.35	1.85	1.60
Mar	1.56	1.83	1.74	1.56	1.99	1.83	1.46	1.93	1.53	1.53	1.91	1.66	1.65	2.12	1.73	1.62	1.82	1.72
Apr	1.68	1.85	1.76	1.40	1.97	1.86	1.64	1.92	1.68	1.48	2.09	1.68	1.62	2.08	1.75	1.46	1.88	1.59
May	1.28	1.81	1.47	1.32	1.91	1.59	1.24	1.96	1.52	1.23	2.02	1.47	1.18	1.99	1.46	1.21	1.60	1.38
Jun	1.24	1.50	1.39	1.23	1.68	1.43	1.15	2.00	1.27	1.10	2.04	1.34	1.18	2.18	1.37	1.24	1.79	1.54
Jul	1.14	1.47	1.34	1.08	1.55	1.32	1.07	1.88	1.21	1.06	2.04	1.26	1.13	2.08	1.37	1.33	1.77	1.55
Aug	1.26	1.52	1.40	1.04	1.71	1.35	1.12	1.91	1.35	1.01	2.06	1.31	1.30	2.12	1.46	1.47	1.91	1.69
Sep	1.21	1.87	1.54	1.03	1.98	1.57	1.12	2.00	1.33	1.12	2.55	1.50	1.22	2.28	1.50	1.56	1.90	1.72
Oct	1.05	1.96	1.74	1.03	2.10	1.49	1.41	2.05	1.52	1.71	2.46	1.99	1.47	2.24	1.68	1.48	2.21	1.74
Nov	--	--	--	0.87	2.12	1.67	1.57	1.99	1.63	1.82	2.51	2.11	1.67	2.26	1.85	1.31	1.93	1.66
Dec	2.10	2.18	2.15	1.65	2.09	1.88	1.49	2.00	1.60	1.80	2.42	1.97	1.59	2.14	1.75	1.57	1.78	1.70
Monthly Min/Max/ Avg	1.05	2.18	1.60	0.87	2.12	1.63	1.07	2.12	1.48	1.01	2.55	1.63	1.13	2.28	1.62	1.21	2.21	1.64

NOTES: '--' Indication Analyzer Offline

Water Quality 2023

7.1 Water Quality Objectives for EPCOR

Parameter	Approval Requirement	EPCOR Internal Limit	EPCOR Target
Turbidity (NTU)			
Individual Filters	<0.3	<0.1 (2)	<0.08
Distribution System	N/A	< 1 (1)	< 1
Distribution System (Maintenance)	N/A	< 3 (1)	< 1
Colour (TCU)	<15 (3)	<10 (1)	<3
pH (25°C)	6.5 - 8.5	7.3 - 8.3 (1)	7.4 - 8.0
Taste and Odour	Inoffensive (3)	Inoffensive (1)	Inoffensive
E.coli (PA/100 mL)	absent	absent (1)	absent
Total Coliforms (PA/100 mL)	absent	absent (1)	absent
Total Chlorine Residual (mg/L)			
Water Treatment Plant Effluent	>1.0	1.3 - 2.4 (2)	1.9 - 2.2
Reservoirs	>0.5	1.0 - 2.4 (1)	1.2 - 2.2
Distribution	>0.5 (4)	1.0 - 2.4 (1)	1.0 - 2.2
Fluoride: (mg/L)			
Reservoir Effluent	0.5 - 0.9	0.6 - 0.8 (1)	0.6 - 0.8
Trihalomethanes (mg/L)			
Reservoir Effluent	<0.100	<0.050 (1)	<0.040
Distribution System	<0.100	<0.050 (1)	<0.040
UV254 % Transmittance			
E.L. Smith		>89% (2)	>90%
Rossdale		>87% (2)	>88%
HAA (mg/L)			
Reservoir Effluent	< 0.080	< 0.040 (1)	<0.035
Distribution System	< 0.080	< 0.040 (1)	<0.035
NDMA (mg/L):			
Reservoir Effluent	< 0.000040	< 0.000010 (1)	<0.000005
Distribution System	< 0.000040	< 0.000010 (1)	
Microoganism Log Removal at Water Treatment Plants			
Giardia	≥5.5	≥6.0 (2)	>6.5
Cryptosporidium	≥5.5	≥5.3 (2)	>6.0
Virus	≥4.0	≥4.5 (2)	>5.0

(1) Limit based on City of Edmonton Performance Based Rate (PBR) agreement

(2) Limit based on EPCOR Action Level

(3) Aesthetic Objective

(4) in 75% of samples collected in a day

All values are expressed in units of mg/L unless otherwise stated.

Based on March 2022 Summary of Epcor Edmonton Water Quality Standards.

7.2 SUMMARY OF MAJOR CHEMICALS, MICROBIOLOGICAL, AND PHYSICAL PARAMETERS OF EDMONTON DRINKING WATER PRODUCED AT WATER TREATMENT PLANTS

2023

Parameter	Unit	MAC*	Average	Median	Min	Max	Count
Alkalinity Total	mg CaCO3/L		118	117	89	162	730
Aluminum	mg/L	2.9	0.083	0.075	0.026	0.204	24
Arsenic	mg/L	0.01	0.0002	<0.0002	<0.0002	0.0003	24
Bromate Dissolved	mg/L	0.01	<0.005	<0.005	<0.005	<0.005	105
Bromodichloromethane	µg/L		<0.5	<0.5	<0.5	<0.5	730
Cadmium	mg/L	0.007	<0.0002	<0.0002	<0.0002	<0.0002	24
Calcium Hardness	mg/L CaCO3		112	112	87	150	730
Chlorate Dissolved	mg/L	1	0.142	0.131	0.060	0.288	105
Chloride Dissolved	mg/L	(250)	6.10	5.89	4.44	11.80	105
Chlorite Dissolved	mg/L	1	<0.01	<0.01	<0.01	<0.01	105
Chromium	mg/L	0.05	<0.0002	<0.0002	<0.0002	<0.0002	24
Colour	TCU	(15)	0.9	0.9	<0.5	2.4	730
Conductivity	µS/cm		375	371	335	458	105
Copper	mg/L	2 (1)	<0.0050	<0.0050	<0.0050	<0.0050	24
Fluoride	mg/L	1.5	0.69	0.69	0.58	0.79	730
Iron	mg/L	(0.3)	<0.0050	<0.0050	<0.0050	<0.0050	24
Lead	mg/L	0.005	<0.0002	<0.0002	<0.0002	<0.0002	24
Manganese	mg/L	0.12 (0.02)	<0.0020	<0.0020	<0.0020	<0.0020	24
Mercury	mg/L	0.001	<0.0002	<0.0002	<0.0002	<0.0002	24
Nitrate (as N) Dissolved	mg/L	10	0.046	0.050	<0.010	0.149	105
Nitrite (as N) Dissolved	mg/L	1	<0.01	<0.01	<0.01	<0.01	105
pH	N/A	(7.0 - 10.5)	7.8	7.9	7.1	8.4	730
Potassium	mg/L		0.77	0.75	0.70	0.90	24
Sodium	mg/L	(200)	9.62	8.50	5.90	19.20	24
Sulphate Dissolved	mg/L	(500)	64.9	63.3	52.8	115.0	105
Total Chlorine	N/A	>1.0	2.14	2.10	1.79	2.60	732
Total Dissolved Solids	mg/L	(500)	215	216	190	252	24
Total Organic Carbon	mg/L C		1.4	1.4	<0.6	3.2	105
Trihalomethanes	µg/L	100	16.6	15.7	2.0	37.9	730
Turbidity	NTU		0.05	0.05	<0.04	0.11	732
Uranium	mg/L	0.02	0.0005	<0.0005	<0.0005	0.0006	24
Zinc	mg/L	(5.0)	<0.0050	<0.0050	<0.0050	<0.0050	24
Bacteriological Data							
Coliforms, total	PA/100mL		Absent	Absent	Absent	Absent	732
E. coli	PA/100mL		Absent	Absent	Absent	Absent	732

* Numbers with no brackets are Health Canada Guidelines for Canadian Drinking Water Quality (GCDWQ) Maximum Acceptable Concentrations (MAC) and/or a limit set out in the Alberta Environment and Parks (AEP) Operating Approval 638-04-00. Limits in brackets indicate Aesthetic Objectives or Operational Guidelines (OG) and are not Approval limits.

7.3 SUMMARY OF LABORATORY ANALYSIS - 2023

DISTRIBUTION OF TESTING

Drinking Water Testing

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	**Total**
Water Treatment Plant	# Tests	7,504	6,798	8,483	9,292	9,255	9,055	9,196	9,303	8,959	9,256	8,869	9,158	105,128
	# Samples	268	248	272	316	264	265	268	272	266	269	263	260	3,231
Field Reservoirs	# Tests	834	726	1,293	1,272	1,646	1,271	1,436	1,549	1,421	1,519	1,309	1,244	15,520
	# Samples	65	50	52	52	66	52	52	65	51	63	49	50	667
Routine Distribution System	# Tests	732	864	1,571	2,380	2,486	2,248	2,409	2,368	2,443	2,423	2,503	2,623	25,050
	# Samples	131	150	140	142	149	136	143	144	149	145	153	161	1,743
System Depressurization/Repair	# Tests	216	196	603	735	1,020	1,125	1,083	915	1,115	1,188	868	598	9,662
	# Samples	54	49	60	49	68	75	72	61	75	79	58	40	740
Customer Complaints	# Tests	676	592	1,025	1,530	935	1,020	510	850	955	965	1,275	680	11,013
	# Samples	12	8	16	18	11	12	6	10	17	13	15	8	146
Total	# Tests	9,962	9,176	12,975	15,209	15,342	14,719	14,634	14,985	14,893	15,351	14,824	14,303	166,373
	# Samples	530	505	540	577	558	540	541	552	558	569	538	519	6,527

Additional Testing

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	**Total**
New Watermain Testing	# Tests	85	65	25	0	5	100	70	90	165	485	525	345	1,960
	# Samples	17	13	5	0	1	20	14	18	33	97	105	69	392
Water Treatment Plant Waste Discharge	# Tests	49	146	205	43	134	173	96	124	52	141	75	35	1,273
	# Samples	32	45	45	35	38	52	34	41	36	33	38	31	460
Quality Control	# Tests	3,923	3,036	3,445	3,924	4,669	3,444	2,990	4,118	2,694	3,802	4,153	3,172	43,370
	# Samples	911	759	931	1,023	1,084	922	964	933	812	1,092	1,049	1,007	11,487
Externally Contracted Analyses	# Tests	138	100	102	104	130	109	107	160	210	234	240	208	1,842
	# Samples	69	50	51	52	65	57	56	68	105	117	108	104	902
PAR	# Tests	0	0	60	30	30	30	30	30	30	168	0	30	438
	# Samples	0	0	8	4	4	4	4	4	4	24	0	4	60
Total	# Tests	4,195	3,347	3,837	4,101	4,968	3,856	3,293	4,522	3,151	4,830	4,993	3,790	48,883
	# Samples	1,029	867	1,040	1,114	1,192	1,055	1,072	1,064	990	1,363	1,300	1,215	13,301

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	**Total**
Total	# Tests	14,157	12,523	16,812	19,310	20,310	18,575	17,927	19,507	18,044	20,181	19,817	18,093	215,256
	# Samples	1,555	1,372	1,580	1,691	1,750	1,595	1,612	1,616	1,443	1,815	1,734	1,630	19,393

7.4 Bacteriological Data: Water Treatment Plants

2023

	Coliforms, total						E. coli					cATP (pg/mL)			
	Count	# +ve	% +ve	Mean	Min	Max	# +ve	% +ve	Mean	Min	Max	Count	Mean	Min	Max
January															
Rossdale Raw (MPN/100mL)	31			84	24	308			4	1	26	1	27.2	27.2	27.2
E.L. Smith Raw (MPN/100mL)	4			72	40	120			1	1	1	0			
Raw River Water Entering the Treatment Plants	35			83	24	308			4	1	26	1	27.2	27.2	27.2
Rossdale Treated (PA/100mL)	31	0	0.0				0	0.0				31	0.69	0.10	1.99
E.L. Smith Treated (PA/100mL)	31	0	0.0				0	0.0				31	0.65	0.11	1.00
Water Entering the Plant Reservoir	62	0	0.0				0	0.0				62	0.67	0.10	1.99
Rossdale Reservoir (PA/100mL)	31	0	0.0				0	0.0				31	0.71	0.12	1.07
E.L. Smith Reservoir (PA/100mL)	31	0	0.0				0	0.0				31	0.60	0.13	1.81
Treated Water Entering the Distribution System	62	0	0.0				0	0.0				62	0.66	0.12	1.81
February															
Rossdale Raw (MPN/100mL)	28			65	21	166			9	1	24	1	32.2	32.2	32.2
E.L. Smith Raw (MPN/100mL)	4			36	25	51			1	1	1	1	27.0	27.0	27.0
Raw River Water Entering the Treatment Plants	32			61	21	166			8	1	24	2	29.6	27.0	32.2
Rossdale Treated (PA/100mL)	28	0	0.0				0	0.0				28	0.85	0.11	2.10
E.L. Smith Treated (PA/100mL)	28	0	0.0				0	0.0				28	0.82	0.10	2.51
Water Entering the Plant Reservoir	56	0	0.0				0	0.0				56	0.84	0.10	2.51
Rossdale Reservoir (PA/100mL)	28	0	0.0				0	0.0				28	0.76	0.10	1.71
E.L. Smith Reservoir (PA/100mL)	28	0	0.0				0	0.0				28	0.77	0.11	2.25
Treated Water Entering the Distribution System	56	0	0.0				0	0.0				56	0.77	0.10	2.25

7.4 Bacteriological Data: Water Treatment Plants

2023

	Coliforms, total						E. coli					cATP (pg/mL)			
	Count	# +ve	% +ve	Mean	Min	Max	# +ve	% +ve	Mean	Min	Max	Count	Mean	Min	Max
March															
Rossdale Raw (MPN/100mL)	31			264	16	980			31	1	115	1	68.3	68.3	68.3
E.L. Smith Raw (MPN/100mL)	5			19	13	29			1	1	2	1	21.7	21.7	21.7
Raw River Water Entering the Treatment Plants	36			230	13	980			27	1	115	2	45.0	21.7	68.3
Rossdale Treated (PA/100mL)	31	0	0.0				0	0.0				31	0.71	0.11	1.47
E.L. Smith Treated (PA/100mL)	31	0	0.0				0	0.0				31	0.69	0.10	1.59
Water Entering the Plant Reservoir	62	0	0.0				0	0.0				62	0.70	0.10	1.59
Rossdale Reservoir (PA/100mL)	31	0	0.0				0	0.0				31	0.85	0.12	1.00
E.L. Smith Reservoir (PA/100mL)	31	0	0.0				0	0.0				31	0.70	0.11	1.00
Treated Water Entering the Distribution System	62	0	0.0				0	0.0				62	0.78	0.11	1.00
April															
Rossdale Raw (MPN/100mL)	30			224	42	1,200			15	2	50	1	207	207	207
E.L. Smith Raw (MPN/100mL)	4			52	15	88			1	1	2	1	186	186	186
Raw River Water Entering the Treatment Plants	34			203	15	1,200			13	1	50	2	197	186	207
Rossdale Treated (PA/100mL)	30	0	0.0				0	0.0				30	0.69	0.12	2.46
E.L. Smith Treated (PA/100mL)	30	0	0.0				0	0.0				30	0.64	0.10	2.28
Water Entering the Plant Reservoir	60	0	0.0				0	0.0				60	0.67	0.10	2.46
Rossdale Reservoir (PA/100mL)	30	0	0.0				0	0.0				30	0.73	0.10	2.42
E.L. Smith Reservoir (PA/100mL)	30	0	0.0				0	0.0				30	0.62	0.10	3.35
Treated Water Entering the Distribution System	60	0	0.0				0	0.0				60	0.68	0.10	3.35

7.4 Bacteriological Data: Water Treatment Plants

2023

	Coliforms, total						E. coli					cATP (pg/mL)			
	Count	# +ve	% +ve	Mean	Min	Max	# +ve	% +ve	Mean	Min	Max	Count	Mean	Min	Max
May															
Rossdale Raw (MPN/100mL)	32			408	1	5,820			26	1	320	3	52.1	32.8	75.4
E.L. Smith Raw (MPN/100mL)	5			159	140	179			12	2	31	1	62.9	62.9	62.9
Raw River Water Entering the Treatment Plants	37			374	1	5,820			24	1	320	4	54.8	32.8	75.4
Rossdale Treated (PA/100mL)	31	0	0.0				0	0.0				31	0.67	0.11	1.46
E.L. Smith Treated (PA/100mL)	31	0	0.0				0	0.0				31	0.75	0.11	1.62
Water Entering the Plant Reservoir	62	0	0.0				0	0.0				62	0.71	0.11	1.62
Rossdale Reservoir (PA/100mL)	31	0	0.0				0	0.0				31	0.66	0.11	1.18
E.L. Smith Reservoir (PA/100mL)	31	0	0.0				0	0.0				31	0.70	0.11	1.01
Treated Water Entering the Distribution System	62	0	0.0				0	0.0				62	0.68	0.11	1.18
June															
Rossdale Raw (MPN/100mL)	30			3,552	66	31,100			171	1	1,720	1	54.5	54.5	54.5
E.L. Smith Raw (MPN/100mL)	4			6,767	219	24,100			247	22	828	1	125	125	125
Raw River Water Entering the Treatment Plants	34			3,931	66	31,100			180	1	1,720	2	89.5	54.5	125
Rossdale Treated (PA/100mL)	30	0	0.0				0	0.0				30	0.89	0.11	1.00
E.L. Smith Treated (PA/100mL)	30	0	0.0				0	0.0				30	0.78	0.11	1.15
Water Entering the Plant Reservoir	60	0	0.0				0	0.0				60	0.84	0.11	1.15
Rossdale Reservoir (PA/100mL)	30	0	0.0				0	0.0				30	0.81	0.12	1.00
E.L. Smith Reservoir (PA/100mL)	30	0	0.0				0	0.0				30	0.87	0.14	1.00
Treated Water Entering the Distribution System	60	0	0.0				0	0.0				60	0.84	0.12	1.00

7.4 Bacteriological Data: Water Treatment Plants

2023

	Coliforms, total						E. coli					cATP (pg/mL)			
	Count	# +ve	% +ve	Mean	Min	Max	# +ve	% +ve	Mean	Min	Max	Count	Mean	Min	Max
July															
Rossdale Raw (MPN/100mL)	32			3,797	1	48,400			237	1	1,980	1	148	148	148
E.L. Smith Raw (MPN/100mL)	4			926	613	1,550			31	11	45	1	47.7	47.7	47.7
Raw River Water Entering the Treatment Plants	36			3,478	1	48,400			214	1	1,980	2	97.7	47.7	148
Rossdale Treated (PA/100mL)	31	0	0.0				0	0.0				31	0.84	0.13	1.00
E.L. Smith Treated (PA/100mL)	31	0	0.0				0	0.0				31	0.82	0.12	1.00
Water Entering the Plant Reservoir	62	0	0.0				0	0.0				62	0.83	0.12	1.00
Rossdale Reservoir (PA/100mL)	31	0	0.0				0	0.0				31	0.79	0.10	1.00
E.L. Smith Reservoir (PA/100mL)	31	0	0.0				0	0.0				31	0.85	0.11	1.00
Treated Water Entering the Distribution System	62	0	0.0				0	0.0				62	0.82	0.10	1.00
August															
Rossdale Raw (MPN/100mL)	32			5,558	1	34,700			647	1	2,900	1	283	283	283
E.L. Smith Raw (MPN/100mL)	5			550	365	980			14	5	20	1	128	128	128
Raw River Water Entering the Treatment Plants	37			4,881	1	34,700			561	1	2,900	2	205	128	283
Rossdale Treated (PA/100mL)	31	0	0.0				0	0.0				31	0.70	0.14	1.00
E.L. Smith Treated (PA/100mL)	31	0	0.0				0	0.0				31	0.58	0.14	1.00
Water Entering the Plant Reservoir	62	0	0.0				0	0.0				62	0.64	0.14	1.00
Rossdale Reservoir (PA/100mL)	31	0	0.0				0	0.0				31	0.63	0.11	1.00
E.L. Smith Reservoir (PA/100mL)	31	0	0.0				0	0.0				31	0.66	0.12	1.00
Treated Water Entering the Distribution System	62	0	0.0				0	0.0				62	0.64	0.11	1.00

7.4 Bacteriological Data: Water Treatment Plants

2023

	Coliforms, total						E. coli					cATP (pg/mL)			
	Count	# +ve	% +ve	Mean	Min	Max	# +ve	% +ve	Mean	Min	Max	Count	Mean	Min	Max
September															
Rossdale Raw (MPN/100mL)	31			230	1	1,300			21	1	124	1	78.8	78.8	78.8
E.L. Smith Raw (MPN/100mL)	4			232	86	488			35	6	77	1	72.1	72.1	72.1
Raw River Water Entering the Treatment Plants	35			231	1	1,300			23	1	124	2	75.5	72.1	78.8
Rossdale Treated (PA/100mL)	30	0	0.0				0	0.0				30	0.60	0.12	1.00
E.L. Smith Treated (PA/100mL)	30	0	0.0				0	0.0				30	0.66	0.12	1.06
Water Entering the Plant Reservoir	60	0	0.0				0	0.0				60	0.63	0.12	1.06
Rossdale Reservoir (PA/100mL)	30	0	0.0				0	0.0				30	0.48	0.12	1.00
E.L. Smith Reservoir (PA/100mL)	32	1	3.1				0	0.0				30	0.58	0.10	1.00
Treated Water Entering the Distribution System	62	1	1.6				0	0.0				60	0.53	0.10	1.00
October															
Rossdale Raw (MPN/100mL)	31			125	23	1,200			7	1	35	1	94.3	94.3	94.3
E.L. Smith Raw (MPN/100mL)	4			134	72	192			9	3	12	1	49.4	49.4	49.4
Raw River Water Entering the Treatment Plants	35			126	23	1,200			7	1	35	2	71.9	49.4	94.3
Rossdale Treated (PA/100mL)	31	0	0.0				0	0.0				31	0.63	0.11	1.00
E.L. Smith Treated (PA/100mL)	31	0	0.0				0	0.0				31	0.46	0.15	1.00
Water Entering the Plant Reservoir	62	0	0.0				0	0.0				62	0.54	0.11	1.00
Rossdale Reservoir (PA/100mL)	31	0	0.0				0	0.0				31	0.51	0.11	1.00
E.L. Smith Reservoir (PA/100mL)	31	0	0.0				0	0.0				31	0.49	0.13	1.00
Treated Water Entering the Distribution System	62	0	0.0				0	0.0				62	0.50	0.11	1.00

7.4 Bacteriological Data: Water Treatment Plants

2023

	Coliforms, total						E. coli					cATP (pg/mL)			
	Count	# +ve	% +ve	Mean	Min	Max	# +ve	% +ve	Mean	Min	Max	Count	Mean	Min	Max
November															
Rossdale Raw (MPN/100mL)	29			79	40	155			6	1	36	1	42.2	42.2	42.2
E.L. Smith Raw (MPN/100mL)	5			115	83	142			6	1	11	0			
Raw River Water Entering the Treatment Plants	34			85	40	155			6	1	36	1	42.2	42.2	42.2
Rossdale Treated (PA/100mL)	29	0	0.0				0	0.0				29	0.52	0.11	1.72
E.L. Smith Treated (PA/100mL)	30	0	0.0				0	0.0				30	0.46	0.14	1.44
Water Entering the Plant Reservoir	59	0	0.0				0	0.0				59	0.49	0.11	1.72
Rossdale Reservoir (PA/100mL)	29	0	0.0				0	0.0				29	0.57	0.12	1.54
E.L. Smith Reservoir (PA/100mL)	31	0	0.0				0	0.0				31	0.35	0.10	1.23
Treated Water Entering the Distribution System	60	0	0.0				0	0.0				60	0.46	0.10	1.54
December															
Rossdale Raw (MPN/100mL)	32			98	1	517			9	1	72	1	30.4	30.4	30.4
E.L. Smith Raw (MPN/100mL)	4			56	35	81			3	1	6	1	31.7	31.7	31.7
Raw River Water Entering the Treatment Plants	36			93	1	517			8	1	72	2	31.0	30.4	31.7
Rossdale Treated (PA/100mL)	31	0	0.0				0	0.0				31	0.49	0.11	3.39
E.L. Smith Treated (PA/100mL)	31	0	0.0				0	0.0				31	0.35	0.12	1.15
Water Entering the Plant Reservoir	62	0	0.0				0	0.0				62	0.42	0.11	3.39
Rossdale Reservoir (PA/100mL)	31	0	0.0				0	0.0				31	0.33	0.13	1.00
E.L. Smith Reservoir (PA/100mL)	31	0	0.0				0	0.0				31	0.41	0.12	1.33
Treated Water Entering the Distribution System	62	0	0.0				0	0.0				62	0.37	0.12	1.33

PA = present or absent, MPN = most probable number, cATP = cellular adenosine triphosphate

7.5 Bacteriological Data: Distribution System

2023

	Coliforms, total (PA/100 mL)			E. coli (PA/100 mL)		cATP (pg/mL)			
	Count	# +ve	% +ve	# +ve	% +ve	Count	Mean	Min	Max
January									
FIELD DISTRIBUTION	88	1	1.1	0	0.0	8	0.58	0.14	1.30
FIELD DISTRIBUTION - PLPH	56	0	0.0	0	0.0				
FIELD RESERVOIR	65	0	0.0	0	0.0	65	0.49	0.12	1.08
FIELD RESERVOIR - PLPH (duplicate-not counted)	65	0	0.0	0	0.0				
Monthly	209	1	0.5	0	0.0	73	0.50	0.12	1.30
February									
FIELD DISTRIBUTION	102	1	1.0	0	0.0	8	0.81	0.10	1.93
FIELD DISTRIBUTION - PLPH	56	0	0.0	0	0.0				
FIELD RESERVOIR	50	0	0.0	0	0.0	50	0.73	0.10	4.28
FIELD RESERVOIR - PLPH (duplicate-not counted)	50	0	0.0	0	0.0				
Monthly	208	1	0.5	0	0.0	58	0.74	0.10	4.28
March									
FIELD DISTRIBUTION	100	1	1.0	0	0.0	12	0.52	0.15	1.29
FIELD DISTRIBUTION - PLPH	56	0	0.0	0	0.0				
FIELD RESERVOIR	52	0	0.0	0	0.0	52	0.31	0.11	1.45
FIELD RESERVOIR - PLPH (duplicate-not counted)	51	0	0.0	0	0.0				
Monthly	208	1	0.5	0	0.0	64	0.36	0.11	1.45
April									
FIELD DISTRIBUTION	105	0	0.0	0	0.0	18	0.39	0.11	0.91
FIELD DISTRIBUTION - PLPH	55	0	0.0	0	0.0				
FIELD RESERVOIR	52	0	0.0	0	0.0	52	0.50	0.11	2.29
FIELD RESERVOIR - PLPH (duplicate-not counted)	52	0	0.0	0	0.0				
Monthly	212	0	0.0	0	0.0	70	0.46	0.11	2.29

7.5 Bacteriological Data: Distribution System

2023

	Coliforms, total (PA/100 mL)			E. coli (PA/100 mL)		cATP (pg/mL)			
	Count	# +ve	% +ve	# +ve	% +ve	Count	Mean	Min	Max
May									
FIELD DISTRIBUTION	114	0	0.0	0	0.0	11	0.65	0.16	1.45
FIELD DISTRIBUTION - PLPH	56	0	0.0	0	0.0				
FIELD RESERVOIR	66	0	0.0	0	0.0	66	0.43	0.10	1.34
FIELD RESERVOIR - PLPH (duplicate-not counted)	64	0	0.0	0	0.0				
Monthly	236	0	0.0	0	0.0	77	0.45	0.10	1.45
June									
FIELD DISTRIBUTION	104	1	1.0	0	0.0	12	0.17	0.10	0.29
FIELD DISTRIBUTION - PLPH	56	0	0.0	0	0.0				
FIELD RESERVOIR	52	0	0.0	0	0.0	52	0.25	0.11	0.71
FIELD RESERVOIR - PLPH (duplicate-not counted)	52	0	0.0	0	0.0				
Monthly	212	1	0.5	0	0.0	64	0.24	0.10	0.71
July									
FIELD DISTRIBUTION	95	0	0.0	0	0.0	6	0.21	0.12	0.29
FIELD DISTRIBUTION - PLPH	56	0	0.0	0	0.0				
FIELD RESERVOIR	52	0	0.0	0	0.0	52	0.80	0.12	2.40
FIELD RESERVOIR - PLPH (duplicate-not counted)	51	0	0.0	0	0.0				
Monthly	203	0	0.0	0	0.0	58	0.77	0.12	2.40
August									
FIELD DISTRIBUTION	96	0	0.0	0	0.0	10	0.48	0.28	0.73
FIELD DISTRIBUTION - PLPH	56	0	0.0	0	0.0				
FIELD RESERVOIR	65	0	0.0	0	0.0	65	0.72	0.11	7.28
FIELD RESERVOIR - PLPH (duplicate-not counted)	64	0	0.0	0	0.0				
Monthly	217	0	0.0	0	0.0	75	0.69	0.11	7.28

7.5 Bacteriological Data: Distribution System

2023

	Coliforms, total (PA/100 mL)			E. coli (PA/100 mL)		cATP (pg/mL)			
	Count	# +ve	% +ve	# +ve	% +ve	Count	Mean	Min	Max
September									
FIELD DISTRIBUTION	116	4	3.4	0	0.0	10	0.42	0.14	1.49
FIELD DISTRIBUTION - PLPH	55	0	0.0	0	0.0				
FIELD RESERVOIR	51	0	0.0	0	0.0	51	1.21	0.13	8.20
FIELD RESERVOIR - PLPH (duplicate-not counted)	50	0	0.0	0	0.0				
Monthly	222	4	1.8	0	0.0	61	1.08	0.13	8.20
October									
FIELD DISTRIBUTION	105	1	1.0	0	0.0	11	0.73	0.18	3.30
FIELD DISTRIBUTION - PLPH	55	0	0.0	0	0.0				
FIELD RESERVOIR	62	0	0.0	0	0.0	62	0.36	0.10	1.32
FIELD RESERVOIR - PLPH (duplicate-not counted)	61	0	0.0	0	0.0				
Monthly	222	1	0.5	0	0.0	73	0.42	0.10	3.30
November									
FIELD DISTRIBUTION	112	0	0.0	0	0.0	15	0.27	0.11	0.65
FIELD DISTRIBUTION - PLPH	56	0	0.0	0	0.0				
FIELD RESERVOIR	49	0	0.0	0	0.0	49	0.37	0.13	1.07
FIELD RESERVOIR - PLPH (duplicate-not counted)	48	0	0.0	0	0.0				
Monthly	217	0	0.0	0	0.0	64	0.35	0.11	1.07
December									
FIELD DISTRIBUTION	114	0	0.0	0	0.0	8	0.47	0.18	1.01
FIELD DISTRIBUTION - PLPH	54	0	0.0	0	0.0				
FIELD RESERVOIR	50	0	0.0	0	0.0	50	0.34	0.14	0.80
FIELD RESERVOIR - PLPH (duplicate-not counted)	50	0	0.0	0	0.0				
Monthly	218	0	0.0	0	0.0	58	0.36	0.14	1.01
Year to Date	2,584	9	0.3	0	0.0	795	0.55	0.10	8.20

7.5 Bacteriological Data: Distribution System

2023

Guidelines for Canadian Drinking Water Quality recommend 195 bacteriological samples for a city the size of Edmonton. Total Coliform and E.coli testing is required in the AEP Approval. At least 95 of the 195 samples must be tested at ProvLab each month according to our Operations Program.

Testing conducted by Laboratory for Provincial Laboratory for Public Health (ProvLAB) are labelled with PLPH.

7.5 Bacteriological Data: Distribution System

2023

	Coliforms, total (PA/100 mL)			E. coli (PA/100 mL)		cATP (pg/mL)			
	Count	# +ve	% +ve	# +ve	% +ve	Count	Mean	Min	Max
Samples from Complaints									
January	12	1	8.3	0	0.0	8	0.58	0.14	1.30
February	8	0	0.0	0	0.0	8	0.81	0.10	1.93
March	16	1	6.3	0	0.0	12	0.52	0.15	1.29
April	18	0	0.0	0	0.0	18	0.39	0.11	0.91
May	11	0	0.0	0	0.0	11	0.65	0.16	1.45
June	12	0	0.0	0	0.0	12	0.17	0.10	0.29
July	6	0	0.0	0	0.0	6	0.21	0.12	0.29
August	10	0	0.0	0	0.0	10	0.48	0.28	0.73
September	17	1	5.9	0	0.0	10	0.42	0.14	1.49
October	13	0	0.0	0	0.0	11	0.73	0.18	3.30
November	15	0	0.0	0	0.0	15	0.27	0.11	0.65
December	8	0	0.0	0	0.0	8	0.47	0.18	1.01
Year to Date	146	3	2.1	0	0.0	129	0.48	0.10	3.30
Samples from Depressurizations									
January	54	0	0.0	0	0.0				
February	49	1	2.0	0	0.0				
March	60	0	0.0	0	0.0				
April	49	0	0.0	0	0.0				
May	68	0	0.0	0	0.0				
June	75	0	0.0	0	0.0				
July	72	1	1.4	0	0.0				
August	61	0	0.0	0	0.0				
September	74	7	9.5	0	0.0				
October	79	0	0.0	0	0.0				
November	58	0	0.0	0	0.0				
December	40	0	0.0	0	0.0				
Year to Date	739	9	1.2	0	0.0				

7.6 Giardia and Cryptosporidium

2023

Treated Water entering the distribution system

	Cryptosporidium oocysts/100L		Giardia cysts/100L	
	E.L. Smith	Rossdale	E.L. Smith	Rossdale
9 - Jan		<0.1		<0.1
10 - Jan	<0.1		<0.1	
21 - Feb	<0.1		<0.1	
22 - Feb		<0.1		<0.1
27 - Mar	<0.1		<0.1	
29 - Mar		<0.1		<0.1
11 - Apr	<0.1		<0.1	
12 - Apr		<0.1		<0.1
8 - May		<0.1		<0.1
19 - May	<0.1		<0.1	
7 - Jun	<0.0		<0.0	
12 - Jun		<0.1		<0.1
17 - Jul	<0.1		<0.1	
18 - Jul		<0.1		<0.1
1 - Aug	<0.1		<0.1	
2 - Aug		<0.1		<0.1
18 - Sep	<0.1		<0.1	
20 - Sep		<0.1		<0.1
25 - Sep	<0.1		<0.1	
26 - Sep		<0.1		<0.1
6 - Oct		<0.1		<0.1
	<0.1		<0.1	
23 - Oct	0.1		<0.1	
1 - Nov	0.1		<0.1	
14 - Nov	<0.1		<0.1	
15 - Nov		<0.1		<0.1
18 - Dec		<0.1		<0.1
	<0.09		<0.09	

7.6 Giardia and Cryptosporidium

2023

Raw Water

	Cryptosporidium oocysts/100L		Giardia cysts/100L	
	E.L. Smith	**Rossdale**	**E.L. Smith**	**Rossdale**
9 - Jan		<24.0		73.0
10 - Jan	<1.6		11.0	
21 - Feb	<1.5		4.5	
22 - Feb		<1.5		1.5
29 - Mar		<1.1		2.3
30 - Mar	<2.1		4.1	
11 - Apr	<5.5		<5.5	
12 - Apr		<4.9		15.0
8 - May		<10.0		30.0
19 - May	<12.0		<12.0	
7 - Jun	<17.0		<17.0	
12 - Jun		<1.5		<1.5
17 - Jul	<7.5		<7.5	
18 - Jul		<4.5		<4.5
1 - Aug	3.0		42.0	
2 - Aug		<4.9		<4.9
18 - Sep	<1.5		11.0	
21 - Sep		<6.9		14.0
25 - Sep	<1.9		1.9	
26 - Sep		<1.4		12.0
6 - Oct		<3.8		15.0
	<1.6		11.0	
23 - Oct	<2.3		130.0	
1 - Nov	<1.7		100.0	
14 - Nov	<1.7		130.0	
15 - Nov		2.5		120.0
18 - Dec		<2.09		52.1
	<1.66		49.9	

7.7 ROSSDALE AND E.L. SMITH TREATED WATER ENTERING PLANT RESERVOIR

2023

	ROSSDALE				E.L. SMITH				Limits	
	Mean	Min	Max	Count	Mean	Min	Max	Count	*Approval or GCDWQ MAC, (AO or OG)	EPCOR
Microbiologicals										
Microcystin	<0.2	<0.2	<0.2	5	<0.2	<0.2	<0.2	5	1.5	
Physical										
Colour (TCU)	0.9	<0.5	2.3	364	1.0	<0.5	2.4	366	(15)	10
Conductivity (uS/cm)	370	335	420	52	379	344	458	53	(<1)	<1
FPA-Intensity (N/A)	0.89	0.31	1.38	59	0.77	0.38	1.25	59		
pH (N/A)	7.8	7.1	8.2	364	7.8	7.1	8.4	366	(7.0 - 10.5)	7.3-8.3
Total Dissolved Solids (mg/L)	212	190	240	12	218	197	252	12	(500)	
Turbidity (NTU)	0.05	<0.04	0.10	364	0.06	<0.04	0.11	368		0.3
UV 254 %T ****				0	<93.5	<93.5	<93.5	1		
Primary Inorganics (mg/L)										
Antimony	<0.0002	<0.0002	0.0004	12	<0.0002	<0.0002	0.0004	12	0.006	
Arsenic	<0.0002	<0.0002	0.0003	12	<0.0002	<0.0002	0.0003	12	0.01	
Barium	0.058	0.048	0.064	12	0.059	0.051	0.065	12	2	
Boron	0.010	0.007	0.013	12	0.011	0.007	0.027	12	2	
Bromate Dissolved	<0.005	<0.005	<0.005	52	<0.005	<0.005	<0.005	53	0.01	
Cadmium	<0.0002	<0.0002	<0.0002	12	<0.0002	<0.0002	<0.0002	12	0.007	
Chlorate Dissolved	0.19	0.12	0.29	52	0.11	0.06	0.15	53	1	
Chlorite Dissolved	<0.005	<0.005	<0.005	52	<0.005	<0.005	<0.005	53	1	
Chromium	<0.0002	<0.0002	<0.0002	12	<0.0002	<0.0002	<0.0002	12	0.05	
Copper	<0.005	<0.005	<0.005	12	<0.005	<0.005	<0.005	12	2 (1)	
Cyanide Dissolved	<0.002	<0.002	<0.002	1	<0.002	<0.002	<0.002	1	0.2	
Fluoride	0.70	0.59	0.79	364	0.68	0.58	0.79	366	1.5	0.6–0.8
Lead	<0.0002	<0.0002	<0.0002	12	<0.0002	<0.0002	<0.0002	12	0.005	
Manganese	<0.002	<0.002	<0.002	12	<0.002	<0.002	<0.002	12	0.12 (0.02)	
Mercury	<0.0002	<0.00001	<0.0002	16	<0.0002	<0.00001	<0.0002	16	0.001	
Nitrate (as N) Dissolved	0.05	<0.01	0.15	52	0.05	<0.01	0.08	53	10	
Nitrite (as N) Dissolved	<0.01	<0.01	0.01	52	<0.01	<0.01	0.01	53	1	
Selenium	0.0002	<0.0002	0.0003	12	0.0002	<0.0002	0.0003	12	0.05	
Total Chlorine	2.16	1.79	2.60	364	2.12	1.88	2.41	368	>1.0	>1.0 and <2.4
Uranium	<0.0005	<0.0005	0.0006	12	<0.0005	<0.0005	0.0006	12	0.02	

7.7 ROSSDALE AND E.L. SMITH TREATED WATER ENTERING PLANT RESERVOIR

2023

	ROSSDALE				E.L. SMITH				Limits	
	Mean	Min	Max	Count	Mean	Min	Max	Count	*Approval or GCDWQ MAC, (AO or OG)	EPCOR
Primary Organics (ug/L)										
2,4-D	<0.10	<0.05	<0.25	4	<0.10	<0.05	<0.25	4	100	
Atrazine	<0.1	<0.1	<0.1	4	<0.1	<0.1	<0.1	4	5	
Benzene	<0.5	<0.5	<0.5	368	<0.5	<0.5	<0.5	370	5	
Benzo(a)pyrene	<0.005	<0.005	<0.005	4	<0.005	<0.005	<0.005	4	0.04	
Bromoxynil	<0.10	<0.05	<0.25	4	<0.10	<0.05	<0.25	4	5	
Carbon Tetrachloride	<1	<1	<1	364	<1	<1	<1	366	2	
Chlorobenzene	<0.5	<0.5	<0.5	368	<0.5	<0.5	<0.5	370	80 (30)	
Chlorpyrifos	<0.1	<0.1	<0.1	4	<0.1	<0.1	<0.1	4	90	
Cyanazine	<0.1	<0.1	<0.1	4	<0.1	<0.1	<0.1	4		
Diazinon	<0.1	<0.1	<0.1	4	<0.1	<0.1	<0.1	4		
Dicamba	<0.2	<0.1	<0.5	4	<0.2	<0.1	<0.5	4	110	
Dichlorobenzene (1,2)	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	366		
Dichlorobenzene (1,4)	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	366	5 (1)	
Dichloroethylene (1,1)	<3	<3	<3	364	<3	<3	<3	366	14	
Dichlorophenol (2,4)	<0.3	<0.3	<0.3	4	<0.3	<0.3	<0.3	4		
Diclofop-methyl	<0.1	<0.1	<0.1	4	<0.1	<0.1	<0.1	4		
Dimethoate	<0.1	<0.1	<0.1	4	<0.1	<0.1	<0.1	4	20	
Diuron	<1	<1	<1	4	<1	<1	<1	4		
Ethylbenzene	<0.5	<0.5	<0.5	368	<0.5	<0.5	<0.5	370	140 (1.6)	
Glyphosate	<0.2	<0.2	<0.2	4	<0.2	<0.2	<0.2	4	280	
Haloacetic Acids, (HAA5)	18.579	<0.013	31.500	11	17.829	<0.012	32.900	11	80	40
Malathion	<0.1	<0.1	<0.1	4	<0.1	<0.1	<0.1	4	190	
MCPA	<0.10	<0.05	<0.25	4	<0.10	<0.05	<0.25	4	100	
Methylene Chloride	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	366	50	
Metolachlor	<0.1	<0.1	<0.1	4	<0.1	<0.1	<0.1	4		
Metribuzin	<0.1	<0.1	<0.1	4	<0.1	<0.1	<0.1	4	80	
NDMA	<0.00190	<0.00090	0.00790	11	<0.00130	<0.00090	0.00270	11	0.040	10
NTA (mg/L)	<200.2	<0.2	<400.0	4	<200.2	<0.2	<400.0	4	0.4	
Pentachlorophenol	<0.5	<0.5	<0.5	4	<0.5	<0.5	<0.5	4	60 (30)	
Perfluorooctane sulfonic acid (PFOS)	<0.01	<0.01	<0.01	8	<0.01	<0.01	<0.01	8	0.6	
Perfluorooctanoic acid (PFOA)	<0.01	<0.01	<0.01	8	<0.01	<0.01	<0.01	8	0.0002	
Phorate	<0.1	<0.1	<0.1	4	<0.1	<0.1	<0.1	4		
Picloram	<0.2	<0.1	<0.5	4	<0.2	<0.1	<0.5	4		
Simazine	<0.1	<0.1	<0.1	4	<0.1	<0.1	<0.1	4		
Terbufos	<0.1	<0.1	<0.1	4	<0.1	<0.1	<0.1	4		
Tetrachloroethylene	<0.5	<0.5	<0.5	368	<0.5	<0.5	<0.5	370	10	
Toluene	<0.5	<0.5	<0.5	368	<0.5	<0.5	<0.5	370	60 (24)	
Total Xylenes	<2.5	<2.5	<2.5	364	<2.5	<2.5	<2.5	366	90	
Trichloroethylene	<0.5	<0.5	<0.5	368	<0.5	<0.5	<0.5	370	5	
Trifluralin	<0.1	<0.1	<0.1	4	<0.1	<0.1	<0.1	4		
Trihalomethanes	17.3	3.0	34.1	364	16.1	2.0	37.9	366	100	50
Vinyl chloride	<0.5	<0.5	<0.5	4	<0.5	<0.5	<0.5	4	2	
Radionuclides (Bq/L)										
Cesium-137	<0.1	<0.1	<0.1	2	<0.2	<0.2	<0.2	2	10	
Gross Alpha	<0.12	<0.11	<0.12	2	<0.13	<0.12	<0.14	2	(0.5)	
Gross Beta	<0.06	<0.06	<0.06	2	<0.07	<0.06	<0.07	2	(1.0)	
Iodine-131	<0.6	<0.5	<0.6	2	<0.7	<0.4	<1.0	2	6	
Lead-210	<0.03	<0.02	0.03	2	<0.02	<0.02	<0.02	2	0.2	
Radium-226	<0.005	<0.005	<0.005	2	<0.005	<0.005	<0.005	2	0.5	
Strontium-90	<0.05	<0.05	<0.05	2	<0.05	<0.05	<0.05	2	5	
Tritium	<40	<40	<40	2	<40	<40	<40	2	7000	

7.7 ROSSDALE AND E.L. SMITH TREATED WATER ENTERING PLANT RESERVOIR

2023

	ROSSDALE				E.L. SMITH				Limits	
	Mean	Min	Max	Count	Mean	Min	Max	Count	*Approval or GCDWQ MAC, (AO or OG)	EPCOR
Secondary Inorganics (mg/L)										
Alkalinity Total (mg CaCO3/L)	117	89	142	364	118	100	162	366		
Aluminum	0.084	0.031	0.204	12	0.082	0.026	0.150	12	2.9	0.1/0.2
Ammonia as NH3	0.11	0.07	0.17	59	0.10	<0.05	0.16	60		
Beryllium	<0.0002	<0.0002	<0.0002	12	<0.0002	<0.0002	<0.0002	12		
Bromide Dissolved	<0.01	<0.01	<0.01	52	<0.01	<0.01	<0.01	53		
Calcium	46.0	43.1	52.2	12	46.4	42.3	53.7	12		
Chloride Dissolved	5.8	4.6	11.8	52	6.3	4.4	8.3	53	(250)	
Cobalt	<0.0002	<0.0002	<0.0002	12	<0.0002	<0.0002	0.0003	12		
Free Chlorine	<0.07	<0.03	<0.07	12	<0.07	<0.03	<0.07	12		
Hardness, Ca (mg CaCO3/L)	113	94	149	364	112	87	150	366		
Iron	<0.005	<0.005	<0.005	12	<0.005	<0.005	<0.005	12	(0.3)	0.3
Lanthanum	<0.001	<0.001	<0.001	12	<0.001	<0.001	<0.001	12		
Lithium	0.0033	0.0029	0.0041	12	0.0031	0.0027	0.0036	12		
Magnesium	13.8	12.9	15.8	12	13.8	12.5	16.2	12		
Molybdenum	0.0008	0.0006	0.0011	12	0.0007	0.0005	0.0011	12		
Nickel	<0.0005	<0.0005	<0.0005	12	<0.0005	<0.0005	0.0005	12		
Phosphate,Ortho (as P)	0.07	<0.02	0.86	17	<0.02	<0.02	<0.02	17		
Phosphorus	<0.02	<0.02	<0.02	12	<0.02	<0.02	<0.02	12		
Potassium	0.8	0.7	0.9	12	0.8	0.7	0.9	12		
Silicon	1.92	1.53	2.54	12	1.87	1.52	2.48	12		
Silver	<0.0002	<0.0002	<0.0002	12	<0.0002	<0.0002	<0.0002	12		
Sodium	8.2	6.4	11.2	12	10.6	5.9	19.2	12	(200)	
Strontium	0.414	0.361	0.457	12	0.419	0.358	0.470	12	7.0	
Sulphate Dissolved	63.5	52.8	94.0	52	65.8	53.5	115.0	53	(500)	
Sulphide	<0.002	<0.002	<0.002	1	<0.002	<0.002	<0.002	1	(0.05)	
Thallium	<0.0005	<0.0005	<0.0005	12	<0.0005	<0.0005	<0.0005	12		
Tin	<0.0005	<0.0005	<0.0005	12	<0.0005	<0.0005	<0.0005	12		
Titanium	<0.0005	<0.0005	<0.0005	12	<0.0005	<0.0005	<0.0005	12		
Total Hardness (mg/L CaCO3)	171	148	198	364	170	101	198	366		
Vanadium	<0.0005	<0.0005	<0.0005	12	<0.0005	<0.0005	<0.0005	12		
Zinc	<0.005	<0.005	<0.005	12	<0.005	<0.005	<0.005	12	(5.0)	
Zirconium	<0.001	<0.001	<0.001	12	<0.001	<0.001	<0.001	12		

7.7 ROSSDALE AND E.L. SMITH TREATED WATER ENTERING PLANT RESERVOIR

2023

	ROSSDALE				E.L. SMITH				Limits	
	Mean	Min	Max	Count	Mean	Min	Max	Count	*Approval or GCDWQ MAC, (AO or OG)	EPCOR
Secondary Organics (ug/L)										
Aldicarb	<1	<1	<1	4	<1	<1	<1	4		
Aldrin	<0.008	<0.008	<0.008	4	<0.008	<0.008	<0.008	4		
Azinphos-methyl	<0.1	<0.1	<0.1	4	<0.1	<0.1	<0.1	4		
Bromochloroacetic acid	<0.909	<0.001	<1.000	11	<0.909	<0.001	<1.000	11		
Bromodichloromethane	<0.51	<0.50	1.56	368	<0.51	<0.50	1.57	370		16
Bromoform	<1.0	<0.5	<1.0	368	<1.0	<0.5	<1.0	370		
Bromomethane	<0.5	<0.5	<0.5	4	<0.5	<0.5	<0.5	4		
Carbaryl	<0.2	<0.2	<0.2	4	<0.2	<0.2	<0.2	4		
Carbofuran	<0.2	<0.2	<0.2	4	<0.2	<0.2	<0.2	4		
Chloroethane	<0.5	<0.5	<0.5	4	<0.5	<0.5	<0.5	4		
Chloroform	17.3	3.00	35.3	368	16.2	2.00	41.4	370		
Chloromethane	<5	<5	<5	4	<5	<5	<5	4		
Dibromoacetic acid	<0.909	<0.001	<1.000	11	<0.909	<0.001	<1.000	11		
Dibromochloromethane	<0.5	<0.5	<0.5	368	<0.5	<0.5	<0.5	370		
Dichloroacetic acid	9.10150	<0.00604	15.30000	11	9.07960	<0.00583	16.70000	11		
Dichlorobenzene (1,3)	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	366		
Dichloroethylene, cis (1,2)	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	366		
Dichloroethylene, trans (1,2)	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	366		
Dichloropropane (1,2)	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	366		
Dieldrin	<0.008	<0.008	<0.008	4	<0.008	<0.008	<0.008	4		
Methyl t-Butyl Ether (MTBE)	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	366	(15)	
MIBK	<1	<1	<1	364	<1	<1	<1	366		
Monobromoacetic acid	<0.909	<0.001	<1.000	11	<0.909	<0.001	<1.000	11		
Monochloroacetic acid	<0.932	<0.001	1.130	11	<0.931	<0.001	1.240	11		
Parathion	<0.1	<0.1	<0.1	4	<0.1	<0.1	<0.1	4		
Perfluorobutanoic acid (PFBA)	<0.8	<0.8	<0.8	8	<0.8	<0.8	<0.8	8		
Perfluoroheptanoic acid (PFHpA)	<0.02	<0.02	<0.02	8	<0.02	<0.02	<0.02	8		
Perfluorohexane sulfonic acid (PFHxS)	<0.02	<0.02	<0.02	8	<0.02	<0.02	<0.02	8		
Perfluorohexanoic acid (PFHxA)	<0.02	<0.02	<0.02	8	<0.02	<0.02	<0.02	8		
Perfluorononanoic acid (PFNA)	<0.02	<0.02	<0.02	8	<0.02	<0.02	<0.02	8		
Perfluoropentanoic acid (PFPeA)	<0.02	<0.02	<0.02	8	<0.02	<0.02	<0.02	8		
Styrene	<0.5	<0.5	<0.5	368	<0.5	<0.5	<0.5	370		
Tetrachloroethane (1,1,2,2)	<1	<1	<1	364	<1	<1	<1	366		
Total Organic Carbon	1.5	0.6	3.2	52	1.4	<0.6	2.3	53		
Total Volatile Organics (NonTHM)	<1	<1	<1	364	<1	<1	<1	366		
Total Volatile Organics (Unknown)	<1	<1	<1	364	<1	<1	<1	366		
Triallate	<0.1	<0.1	<0.1	4	<0.1	<0.1	<0.1	4		
Trichloroacetic acid	9.27880	<0.00703	15.10000	11	8.64330	<0.00652	15.00000	11		
Trichlorobenzene (1,2,4)	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	366		
Trichloroethane (1,1,1)	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	366		
Xylene (1,2)	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	366		
Xylene (1,4)	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	366		

TABLE EXPLANATIONS:

* Numbers with no brackets are Health Canada Guidelines for Canadian Drinking Water Quality (GCDWQ) Maximum Acceptable Concentrations (MAC) and/or a limit set out in the Alberta Environment and Parks (AEP) Operating Approval 638-04-00. Limits in brackets indicate Aesthetic Objectives or Operational Guidelines (OG) and are not Approval limits. The EPCOR limits are internal limits set by EPCOR in the Operations Program.

** Primary parameters are those that have health-based limits (MACs) according the AEP Operating Approval 638-04-(

*** Secondary parameters do not have health-based limits but may have aesthetic or operational objectives

7.8 Treated Water Entering the Distribution System: Physical, Inorganic, and Organic

2023

	ROSSDALE				E.L. SMITH				Limits	
	Mean	Min	Max	Count	Mean	Min	Max	Count	*Approval or GCDWQ MAC, (AO or OG)	EPCOR
Physical										
Turbidity (NTU)	0.05	<0.04	0.12	364	0.05	<0.04	0.10	365		0.3
UV 254 %T ****	<94.3	<89.2	<98.2	363	<94.4	<90.1	<98.7	365		
Primary Inorganics (mg/L)										
Bromate Dissolved	<0.005	<0.005	0.005	52	<0.005	<0.005	<0.005	52	0.01	
Chlorate Dissolved	0.19	0.11	0.28	52	0.11	0.06	0.16	52	1	
Chlorite Dissolved	<0.005	<0.005	<0.005	52	<0.005	<0.005	<0.005	52	1	
Nitrate (as N) Dissolved	0.05	<0.01	0.13	52	0.05	<0.01	0.08	52	10	
Nitrite (as N) Dissolved	<0.01	<0.01	0.01	52	<0.01	<0.01	0.01	52	1	
Primary Organics (ug/L)										
Benzene	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	365	5	
Carbon Tetrachloride	<1	<1	<1	364	<1	<1	<1	365	2	
Chlorobenzene	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	365	80 (30)	
Dichlorobenzene (1,2)	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	365		
Dichlorobenzene (1,4)	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	365	5 (1)	
Dichloroethylene (1,1)	<3	<3	<3	364	<3	<3	<3	365	14	
Ethylbenzene	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	365	140 (1.6)	
Methylene Chloride	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	365	50	
Tetrachloroethylene	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	365	10	
Toluene	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	365	60 (24)	
Total Xylenes	<2.5	<2.5	<2.5	364	<2.5	<2.5	<2.5	365	90	
Trichloroethylene	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	365	5	
Trihalomethanes	15.1	3.0	34.8	364	14.1	1.9	95.7	365	100	50
Secondary Inorganics (mg/L)										
Ammonia as NH3	0.10	<0.05	0.16	59	0.10	<0.05	0.24	59		
Bromide Dissolved	<0.01	<0.01	<0.01	52	<0.01	<0.01	<0.01	52		
Chloride Dissolved	5.8	4.7	10.2	52	6.3	4.5	8.6	52	(250)	
Phosphate,Ortho (as P)	<0.02	<0.02	<0.02	1	<0.02	<0.02	<0.02	1		
Sulphate Dissolved	63.2	52.4	91.6	52	65.7	52.7	114.0	52	(500)	
Secondary Organics (ug/L)										
Bromodichloromethane	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	365		16
Bromoform	<1	<1	<1	364	<1	<1	<1	365		
Chloroform	15.1	3.00	34.8	364	14.1	1.90	95.7	365		
Dibromochloromethane	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	365		
Dichlorobenzene (1,3)	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	365		
Dichloroethylene, cis (1,2)	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	365		
Dichloroethylene, trans (1,2)	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	365		
Dichloropropane (1,2)	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	365		
Methyl t-Butyl Ether (MTBE)	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	365	(15)	
MIBK	<1	<1	<1	364	<1	<1	<1	365		
Styrene	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	365		
Tetrachloroethane (1,1,2,2)	<1	<1	<1	364	<1	<1	<1	365		
Total Volatile Organics (NonTHM)	<1	<1	<1	364	<1	<1	<1	365		
Total Volatile Organics (Unknown)	<1	<1	<1	364	<1	<1	<1	365		
Trichlorobenzene (1,2,4)	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	365		
Trichloroethane (1,1,1)	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	365		
Xylene (1,2)	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	365		
Xylene (1,4)	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	365		

TABLE EXPLANATIONS:

* Numbers with no brackets are Health Canada Guidelines for Canadian Drinking Water Quality (GCDWQ) Maximum Acceptable Concentrations (MAC) and/or a limit set out in the Alberta Environment and Parks (AEP) Operating Approval 638-04-00. Limits in brackets indicate Aesthetic Objectives or Operational Guidelines (OG) and are not Approval Limits The EPCOR limits are internal limits set by EPCOR in the Operations Program.

** Primary parameters are those that have health-based limits (MACs) according the AEP Operating Approval 638-04-0

*** Secondary parameters do not have health-based limits but may have aesthetic or operational objectives

**** UV 254 %T for Rossdale based on a sample collected daily from one of the nine filters selected randomly. For E.L. Smith it is based on a daily sample of Combined Filter Effluent

7.9.a Routine Distribution System (does not include Field Reservoirs)

2023

					Limits	
	Mean	Min	Max	Count	*Approval or GCDWQ MAC, (AO or OG)	EPCOR
Microbiological						
Microcystin	<0.2	<0.2	<0.2	6	1.5	
Physical						
Colour (TCU)	1.2	<0.5	2.2	4	(15)	10
pH (N/A)	7.8	7.6	8.1	29	(7.0 - 10.5)	7.3 - 8.3
Total Dissolved Solids (mg/L)	223	203	241	4	(500)	
Turbidity (NTU)	0.17	<0.04	3.84	1743		1.0
UV 254 %T	<92.3	<90.7	<93.3	4		
Primary Inorganics (mg/L) **						
Antimony	<0.0002	<0.0002	<0.0002	4	0.006	
Arsenic	0.0002	<0.0002	0.0003	4	0.01	
Barium	0.060	0.052	0.070	4	2	
Boron	0.010	0.008	0.010	4	2	
Bromate Dissolved	<0.005	<0.005	<0.005	27	0.01	
Cadmium	<0.0002	<0.0002	<0.0002	4	0.007	
Chlorate Dissolved	0.14	0.10	0.24	27	1	
Chlorite Dissolved	<0.005	<0.005	<0.005	27	1	
Chromium	<0.0002	<0.0002	<0.0002	4	0.05	
Copper	<0.005	<0.005	<0.005	4	2 (1)	
Fluoride	0.69	0.66	0.71	4	1.5	0.6 - 0.8
Lead	<0.0002	<0.0002	<0.0002	4	0.005	
Manganese	<0.002	<0.002	<0.002	4	0.12 (0.02)	
Mercury	<0.00010	<0.00001	<0.00020	8	0.001	
Nitrate (as N) Dissolved	0.05	0.02	0.09	27	10	
Nitrite (as N) Dissolved	0.01	<0.01	0.02	27	1	
Selenium	<0.0002	<0.0002	<0.0002	4	0.05	
Strontium	0.402	0.349	0.422	4	7.0	
Total Chlorine	1.83	0.11	2.48	1743	>0.5 and <3.0	>1.0 and <2.4
Uranium	<0.0005	<0.0005	<0.0005	4	0.02	

7.9.a Routine Distribution System (does not include Field Reservoirs)

2023

					Limits	
	Mean	Min	Max	Count	*Approval or GCDWQ MAC, (AO or OG)	EPCOR
Primary Organics (ug/L) **						
2,4-D	<0.10	<0.05	<0.25	4	100	
Atrazine	<0.1	<0.1	<0.1	4	5	
Atrazine+N-Dealkylated Metabolites	<0.2	<0.2	<0.2	4	0.005	
Azinphos-methyl	<0.1	<0.1	<0.1	4	0.02	
Benzene	<0.5	<0.5	<0.5	77	5	
Benzo(a)pyrene	<0.005	<0.005	<0.005	4	0.04	
Bromoxynil	<0.10	<0.05	<0.25	4	5	
Carbon Tetrachloride	<1.0	<0.5	<1.0	77	2	
Chlorobenzene	<0.5	<0.5	<0.5	77	80 (30)	
Chlorpyrifos	<0.1	<0.1	<0.1	4	90	
Cyanazine	<0.24	<0.10	<0.65	4		
Diazinon	<0.1	<0.1	<0.1	4		
Dicamba	<0.2	<0.1	<0.5	4	110	
Dichlorobenzene (1,2)	<0.5	<0.5	<0.5	77		
Dichlorobenzene (1,4)	<0.5	<0.5	<0.5	77	5 (1)	
Dichloroethane (1,2)	<0.5	<0.5	<0.5	4	5	
Dichloroethylene (1,1)	<3	<3	<3	73	14	
Dichlorophenol (2,4)	<0.3	<0.3	<0.3	4		
Diclofop-methyl	<0.1	<0.1	<0.1	4		
Dimethoate	<0.1	<0.1	<0.1	4	20	
Diquat	<1	<1	<1	4	0.05	
Diuron	<1	<1	<1	4		
Ethylbenzene	<0.5	<0.5	<0.5	77	140 (1.6)	
Glyphosate	<0.2	<0.2	<0.2	4	280	
Malathion	<0.1	<0.1	<0.1	4	190	
MCPA	<0.10	<0.05	<0.25	4	100	
Methylene Chloride	<0.5	<0.5	<0.5	73	50	
Metolachlor	<0.1	<0.1	<0.1	4		
Metribuzin	<0.1	<0.1	<0.1	4	80	
Nitrilotriacetic acid	<200.2	<0.2	<400.0	4	0.4	
Paraquat	<1	<1	<1	4	0.07	
Pentachlorophenol	<0.5	<0.5	<0.5	4	60 (30)	
Perfluorooctane sulfonic acid (PFOS)	<0.01	<0.01	<0.01	4	0.0006	
Perfluorooctanoic acid (PFOA)	<0.01	<0.01	<0.01	4	0.0002	
Phorate	<0.1	<0.1	<0.1	4		
Picloram	<0.2	<0.1	<0.5	4		
Simazine	<0.1	<0.1	<0.1	4		
Terbufos	<0.1	<0.1	<0.1	4		
Tetrachloroethylene	<0.5	<0.5	<0.5	77	10	

7.9.a Routine Distribution System (does not include Field Reservoirs)

2023

					Limits	
	Mean	Min	Max	Count	*Approval or GCDWQ MAC, (AO or OG)	EPCOR
Primary Organics (ug/L) **						
Tetrachlorophenol (2,3,4,6)	<0.5	<0.5	<0.5	4	100 (1)	
Toluene	<0.5	<0.5	<0.5	77	60 (24)	
Total Xylenes	<2.5	<2.5	<2.5	73	90	
Trichloroethylene	<0.5	<0.5	<0.5	77	5	
Trichlorophenol (2,4,6)	<0.5	<0.5	<0.5	4	5 (2)	
Trifluralin	<0.1	<0.1	<0.1	4		
Secondary Inorganics (mg/L) ***						
Alkalinity Total	114	103	124	4		
Alkalinity, PHP (mg CaCO3/L)	<3	<3	<3	4		
Aluminum	0.043	0.020	0.072	4	2.9	0.1/0.2
Ammonia as N	0.13	0.06	0.22	29		
Beryllium	<0.0002	<0.0002	<0.0002	4		
Bromide Dissolved	<0.01	<0.01	<0.01	27		
Calcium	47.0	45.1	48.7	4		
Chloride Dissolved	6.1	4.8	7.7	27	(250)	
Cobalt	<0.0002	<0.0002	<0.0002	4		
Free Chlorine	<0.07	<0.07	<0.07	4		
Iron	0.008	<0.005	0.013	4	(0.3)	0.3
Lanthanum	<0.001	<0.001	<0.001	4		
Lithium	0.0032	0.0028	0.0034	4		
Magnesium	13.9	12.8	14.9	4		
Molybdenum	0.0008	0.0007	0.0010	4		
Nickel	0.0006	<0.0005	0.0007	4		
Phosphorus	0.69	<0.02	0.94	4		
Potassium	0.9	0.8	0.9	4		
Silicon	2.05	1.67	2.66	4		
Silver	<0.0002	<0.0002	<0.0002	4		
Sodium	12.1	7.7	17.0	4	(200)	
Sulphate Dissolved	64.9	54.2	80.5	27	(500)	
Thallium	<0.0005	<0.0005	<0.0005	4		
Tin	<0.0005	<0.0005	<0.0005	4		
Titanium	<0.0005	<0.0005	<0.0005	4		
Total Hardness (mg/L CaCO3)	168	162	173	4		
Total Kjeldahl Nitrogen	0.4	0.3	0.5	4		
Vanadium	<0.0005	<0.0005	<0.0005	4		
Zinc	<0.005	<0.005	<0.005	4	(5.0)	
Zirconium	<0.001	<0.001	<0.001	4		

7.9.a Routine Distribution System (does not include Field Reservoirs)

2023

					Limits	
	Mean	Min	Max	Count	*Approval or GCDWQ MAC, (AO or OG)	EPCOR
Secondary Organics (ug/L) ***						
2,4,5-T	<0.10	<0.05	<0.25	4		
6:2 Fluorotelomer sulfonic acid(6:2 FTS)	<0.01	<0.01	<0.01	4		
8:2 Fluorotelomer sulfonic acid(8:2 FTS)	<0.01	<0.01	<0.01	4		
a-chlordane	<0.008	<0.008	<0.008	4		
Alachlor	<0.1	<0.1	<0.1	4		
Aldicarb	<1	<1	<1	4		
Aldrin	<0.008	<0.008	<0.008	4		
Ametryn	<0.1	<0.1	<0.1	4		
Atrazine Desethyl	<0.1	<0.1	<0.1	4		
Bendiocarb	<0.5	<0.5	<0.5	4		
Bromochloroacetic acid	<0.918	<0.001	<1.000	73		
Bromodichloromethane	0.54	<0.50	1.44	77		16
Bromoform	<1.0	<0.5	<1.0	77		
Carbaryl	<0.2	<0.2	<0.2	4		
Carbofuran	<0.2	<0.2	<0.2	4		
Chloroform	19.1	5.3	36.3	77		
Dibromoacetic acid	<0.918	<0.001	<1.000	73		
Dibromochloromethane	<0.5	<0.5	<0.5	77		
Dibromoethane (1,2)	<0.5	<0.5	<0.5	4		
Dichloroacetic acid	9.82990	<0.00671	18.40000	73		
Dichlorobenzene (1,3)	<0.5	<0.5	<0.5	73		
Dichloroethylene, cis (1,2)	<0.5	<0.5	<0.5	73		
Dichloroethylene, trans (1,2)	<0.5	<0.5	<0.5	73		
Dichloropropane (1,2)	<0.5	<0.5	<0.5	73		
Dieldrin	<0.008	<0.008	<0.008	4		
Dinoseb	<0.10	<0.05	<0.25	4		
gamma-hexachlorocyclohexane	<0.008	<0.008	<0.008	4		
g-chlordane	<0.008	<0.008	<0.008	4		
Heptachlor	<0.008	<0.008	<0.008	4		
Heptachlor Epoxide	<0.008	<0.008	<0.008	4		
Methoxychlor	<0.008	<0.008	<0.008	4		
Methyl Parathion	<0.1	<0.1	<0.1	4		
Methyl t-Butyl Ether (MTBE)	<0.5	<0.5	<0.5	73	(15)	
MIBK	<1	<1	<1	73		
Monobromoacetic acid	<0.918	<0.001	<1.000	73		
Monochloroacetic acid	<0.949	<0.001	1.420	73		
op-DDT	<0.004	<0.004	<0.004	4		
Oxychlordane	<0.008	<0.008	<0.008	4		
Parathion	<0.1	<0.1	<0.1	4		

7.9.a Routine Distribution System (does not include Field Reservoirs)

2023

					Limits	
	Mean	Min	Max	Count	*Approval or GCDWQ MAC, (AO or OG)	EPCOR
Secondary Organics (ug/L) * **						
Perfluorobutane sulfonic acid (PFBS)	<0.02	<0.02	<0.02	4		
Perfluorobutanoic acid (PFBA)	<0.8	<0.8	<0.8	4		
Perfluoroheptanoic acid (PFHpA)	<0.02	<0.02	<0.02	4		
Perfluorohexane sulfonic acid (PFHxS)	<0.02	<0.02	<0.02	4		
Perfluorohexanoic acid (PFHxA)	<0.02	<0.02	<0.02	4		
Perfluorononanoic acid (PFNA)	<0.02	<0.02	<0.02	4		
Perfluoropentanoic acid (PFPeA)	<0.02	<0.02	<0.02	4		
pp-DDD	<0.004	<0.004	<0.004	4		
pp-DDE	<0.004	<0.004	<0.004	4		
pp-DDT	<0.005	<0.004	<0.006	4		
Prometon	<0.1	<0.1	<0.1	4		
Prometryne	<0.1	<0.1	<0.1	4		
Propazine	<0.1	<0.1	<0.1	4		
Styrene	<0.5	<0.5	<0.5	77		
Temephos	<1	<1	<1	4		
Terbutryn	<0.1	<0.1	<0.1	4		
Tetrachloroethane (1,1,2,2)	<1	<1	<1	73		
Total Organic Carbon	1.6	1.3	2.2	4		
Total Volatile Organics (NonTHM)	<1	<1	<1	73		
Total Volatile Organics (Unknown)	<1	<1	<1	73		
Triallate	<0.1	<0.1	<0.1	4		
Trichloroacetic acid	9.13180	<0.00741	15.40000	73		
Trichlorobenzene (1,2,4)	<0.5	<0.5	<0.5	81		
Trichloroethane (1,1,1)	<0.5	<0.5	<0.5	73		
Trichloroethane (1,1,2)	<0.5	<0.5	<0.5	4		
Trichloropropane (1,2,3)	<0.5	<0.5	<0.5	4		
Xylene (1,2)	<0.5	<0.5	<0.5	73		
Xylene (1,4)	<0.5	<0.5	<0.5	73		

TABLE EXPLANATIONS:

* Numbers with no brackets are Health Canada Guidelines for Canadian Drinking Water Quality (GCDWQ) Maximu Acceptable Concentrations (MAC) and/or a limit set out in the Alberta Environment and Parks (AEP) Operating Approval 638-04-00. Limits in brackets indicate Aesthetic Objectives or Operational Guidelines (OG) and are not Approval limits. The EPCOR limits are internal limits set by EPCOR in the Operations Program.

** Primary parameters are those that have health-based limits (MACs) according the AEP Operating Approval 638-0 00

*** Secondary parameters do not have health-based limits but may have aesthetic or operational objectives

Schedule 4 Testing:

- As per AEP Approval 638-04-00 requirements 2 grab samples per annum and these were collected from two location in the distribution system during December and February (sampled February 6, 2023) and June to August (sampled July 10, 2023) and tested for all Schedule 4 parameters. Two additional samples were collected from two locations in the distribution system (on May 8, 2023 and October ___, 2023) and tested for all Schedule 4 parameters.

Microcystin Testing:

- As per AEP Approval 638-04-00, one sample was collected from the distribution system between August 1 an 16 (sampled August 14, 2023) and between September 1 and September 16 (sampled Sept 11, 2023) and tested for total microcystin.

7.9.b Additional Distribution System Samples Collected from Water Quality Complaint Investigations

2023

					Limits	
	Mean	Min	Max	Count	*Approval or GCDWQ MAC, (AO or OG)	EPCOR
Physical						
Colour (TCU)	0.9	<0.5	2.8	129	(15)	10
pH (N/A)	7.8	7.3	8.1	129	(7.0 - 10.5)	7.3 - 8.3
Turbidity (NTU)	0.47	<0.04	5.87	146		1.0
Primary Inorganics (mg/L) **						
Antimony	<0.0002	<0.0002	<0.0002	131	0.006	
Arsenic	0.0002	<0.0002	0.0003	131	0.01	
Barium	0.055	<0.002	0.090	131	2	
Boron	0.009	0.007	0.024	131	2	
Cadmium	<0.0002	<0.0002	<0.0002	131	0.007	
Chromium	<0.0002	<0.0002	<0.0002	131	0.05	
Copper	0.006	<0.005	0.012	131	2 (1)	
Lead	0.0003	<0.0002	0.0050	131	0.005	
Manganese	0.003	<0.002	0.035	131	0.12 (0.02)	
Mercury	<0.00020	<0.00020	<0.00020	131	0.001	
Selenium	0.0002	<0.0002	0.0003	131	0.05	
Strontium	0.419	<0.002	0.489	131	7.0	
Total Chlorine	1.78	0.32	2.42	146	>0.5 and <3.0	>1.0 and <2.4
Uranium	0.0005	<0.0005	0.0006	131	0.02	
Primary Organics (ug/L) **						
Benzene	<0.5	<0.5	<0.5	129	5	
Carbon Tetrachloride	<1	<1	<1	129	2	
Chlorobenzene	<0.5	<0.5	<0.5	129	80 (30)	
Dichlorobenzene (1,2)	<0.5	<0.5	<0.5	129		
Dichlorobenzene (1,4)	<0.5	<0.5	<0.5	129	5 (1)	
Dichloroethylene (1,1)	<3	<3	<3	129	14	
Ethylbenzene	<0.5	<0.5	<0.5	129	140 (1.6)	
Methylene Chloride	<0.5	<0.5	<0.5	129	50	
Tetrachloroethylene	<0.5	<0.5	<0.5	129	10	
Toluene	<0.5	<0.5	<0.5	129	60 (24)	
Total Xylenes	<2.5	<2.5	<2.5	129	90	
Trichloroethylene	<0.5	<0.5	<0.5	129	5	

7.9.b Additional Distribution System Samples Collected from Water Quality Complaint Investigations

2023

					Limits	
	Mean	Min	Max	Count	*Approval or GCDWQ MAC, (AO or OG)	EPCOR
Secondary Inorganics (mg/L) * **						
Aluminum	0.062	<0.005	0.292	131	2.9	0.1/0.2
Beryllium	<0.0002	<0.0002	<0.0002	131		
Calcium	45.8	<0.1	53.8	131		
Cobalt	0.0002	<0.0002	0.0005	131		
Iron	0.058	<0.005	0.781	131	(0.3)	0.3
Lanthanum	<0.001	<0.001	<0.001	131		
Lithium	0.0032	0.0005	0.0045	131		
Magnesium	13.8	<0.1	16.2	131		
Molybdenum	0.0007	0.0005	0.0013	131		
Nickel	0.0005	<0.0005	0.0012	131		
Phosphorus	0.71	<0.02	1.07	131		
Potassium	0.8	0.2	1.2	131		
Silicon	2.0	1.5	2.7	131		
Silver	<0.0002	<0.0002	<0.0002	131		
Sodium	10.6	6.7	93.8	131	(200)	
Thallium	<0.0005	<0.0005	<0.0005	131		
Tin	<0.0005	<0.0005	<0.0005	131		
Titanium	0.0005	<0.0005	0.0015	131		
Total Hardness	168	<2	198	129		
Vanadium	<0.0005	<0.0005	<0.0005	131		
Zinc	0.005	<0.005	0.024	131	(5.0)	
Zirconium	<0.001	<0.001	<0.001	131		

7.9.b Additional Distribution System Samples Collected from Water Quality Complaint Investigations

2023

Secondary Organics (ug/L) ***						
Bromodichloromethane	<0.5	<0.5	<0.5	129		16
Bromoform	<1	<1	<1	129		
Chloroform	17.4	2.8	36.2	129		
Dibromochloromethane	<0.5	<0.5	<0.5	129		
Dichlorobenzene (1,3)	<0.5	<0.5	<0.5	129		
Dichloroethylene, cis (1,2)	<0.5	<0.5	<0.5	129		
Dichloroethylene, trans (1,2)	<0.5	<0.5	<0.5	129		
Dichloropropane (1,2)	<0.5	<0.5	<0.5	129		
Methyl t-Butyl Ether (MTBE)	<0.5	<0.5	<0.5	129	(15)	
MIBK	<1	<1	<1	129		
Styrene	<0.5	<0.5	<0.5	129		
Tetrachloroethane (1,1,2,2)	<1	<1	<1	129		
Total Volatile Organics (NonTHM)	<1	<1	<1	129		
Total Volatile Organics (Unknown)	1.4	<1.0	50.3	129		
Trichlorobenzene (1,2,4)	<0.5	<0.5	<0.5	129		
Trichloroethane (1,1,1)	<0.5	<0.5	<0.5	129		
Xylene (1,2)	0.5	<0.5	0.6	129		
Xylene (1,4)	0.5	<0.5	1.7	129		

TABLE EXPLANATIONS:

* Numbers with no brackets are Health Canada Guidelines for Canadian Drinking Water Quality (GCDWQ) Maximum Acceptable Concentrations (MAC) and/or a limit set out in the Alberta Environment and Parks (AEP) Operating Approval 638-04-00. Limits in brackets indicate Aesthet Objectives or Operational Guidelines (OG) and are not Approval Limits The EPCOR limits are internal limits set by EPCOR in the Operations Program.

** Primary parameters are those that have health-based limits (MACs) according the AEP Operating Approval 638-04-00

*** Secondary parameters do not have health-based limits but may have aesthetic or operational objectives

7.10 Castledowns, Clareview and Discovery Park Reservoirs
2023

Parameter	Castledowns				Clareview				Discovery Park				Limits	
	Mean	Min	Max	Count	Mean	Min	Max	Count	Mean	Min	Max	Count	*Approval or GCDWQ MAC, (AO or OG)	EPCOR
Physical														
Colour (TCU)	1.1	0.6	1.9	5	0.9	<0.5	1.5	7	0.9	<0.5	1.4	7	(15)	10
Conductivity (uS/cm)	373	364	381	5	380	355	396	7	387	354	440	7		
Odour	Inoff	Inoff	Inoff	6	Inoff	Inoff	Inoff	7	Inoff	Inoff	Inoff	7		
pH (N/A)	7.8	7.6	7.9	5	7.8	7.6	8.1	7	7.8	7.6	7.9	7	(7.0 - 10.5)	7.3 - 8.3
Turbidity (NTU)	0.09	0.04	0.20	52	0.14	0.08	0.25	53	0.11	0.05	0.21	53		1
Primary Inorganics (mg/L) **														
Antimony	<0.0002	<0.0002	0.0003	5	<0.0002	<0.0002	0.0004	8	<0.0002	<0.0002	0.0004	7	0.006	
Arsenic	0.0003	<0.0002	0.0003	5	<0.0002	<0.0002	0.0002	8	<0.0002	<0.0002	0.0003	7	0.01	
Barium	0.057	0.053	0.062	5	0.060	0.049	0.066	8	0.059	0.051	0.067	7	2	
Boron	0.009	0.009	0.010	5	0.009	0.007	0.012	8	0.009	0.007	0.012	7	2	
Bromate Dissolved	<0.005	<0.005	<0.005	10	<0.005	<0.005	<0.005	14	<0.005	<0.005	<0.005	14	0.01	
Cadmium	<0.0002	<0.0002	<0.0002	5	<0.0002	<0.0002	<0.0002	8	<0.0002	<0.0002	<0.0002	7	0.007	
Chlorate Dissolved	0.113	0.090	0.132	10	0.167	0.128	0.232	14	0.100	0.070	0.128	14	1	
Chlorine, total	1.96	1.93	2.02	3	1.84	1.83	1.84	3	1.57	1.52	1.61	2	>0.5 and <3.0	>1.0 and <2.4
Chlorite Dissolved	<0.005	<0.005	<0.005	10	<0.005	<0.005	<0.005	14	<0.005	<0.005	<0.005	14	1	
Chromium	<0.0002	<0.0002	<0.0002	5	<0.0002	<0.0002	<0.0002	8	<0.0002	<0.0002	<0.0002	7	0.05	
Copper	<0.005	<0.005	<0.005	5	<0.005	<0.005	<0.005	8	<0.005	<0.005	<0.005	7	2 (1)	
Fluoride	0.67	0.63	0.72	5	0.70	0.68	0.75	7	0.67	0.64	0.74	7	1.5	0.6 - 0.8
Lead	<0.0002	<0.0002	<0.0002	5	<0.0002	<0.0002	<0.0002	8	<0.0002	<0.0002	<0.0002	7	0.005	
Manganese	<0.002	<0.002	<0.002	5	<0.002	<0.002	<0.002	8	0.003	<0.002	0.006	7	0.12 (0.02)	
Mercury	<0.0002	<0.0002	<0.0002	5	<0.0002	<0.0002	<0.0002	8	<0.0002	<0.0002	<0.0002	7	0.001	
Nitrate (as N) Dissolved	0.042	0.010	0.070	10	0.054	0.020	0.080	14	0.059	0.030	0.080	14	10	
Nitrite (as N) Dissolved	<0.010	<0.010	<0.010	10	<0.010	<0.010	<0.010	14	<0.010	<0.010	0.010	14	1	
Selenium	0.0002	0.0002	0.0003	5	0.0002	<0.0002	0.0003	8	0.0002	<0.0002	0.0003	7	0.05	
Strontium	0.426	0.408	0.455	5	0.414	0.321	0.459	8	0.399	0.324	0.449	7	7.0	
Total Chlorine	1.91	1.63	2.25	49	1.79	1.34	2.11	50	1.43	1.11	1.76	51	>0.5 and <3.0	>1.0 and <2.4
Uranium	<0.0005	<0.0005	<0.0005	5	<0.0005	<0.0005	0.0006	8	<0.0005	<0.0005	0.0005	7	0.02	
Primary Organics (ug/L) **														
Benzene	<0.5	<0.5	<0.5	5	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	7	5	
Carbon Tetrachloride	<1.0	<1.0	<1.0	5	<1.0	<1.0	<1.0	8	<1.0	<1.0	<1.0	7	2	
Chlorobenzene	<0.50	<0.50	<0.50	5	<0.50	<0.50	<0.50	8	<0.50	<0.50	<0.50	7	80 (30)	
Dichlorobenzene (1,2)	<0.50	<0.50	<0.50	5	<0.50	<0.50	<0.50	8	<0.50	<0.50	<0.50	7		
Dichlorobenzene (1,4)	<0.5	<0.5	<0.5	5	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	7	5 (1)	
Dichloroethylene (1,1)	<3.0	<3.0	<3.0	5	<3.0	<3.0	<3.0	8	<3.0	<3.0	<3.0	7	14	
Ethylbenzene	<0.50	<0.50	<0.50	5	<0.50	<0.50	<0.50	8	<0.50	<0.50	<0.50	7	140 (1.6)	
Methylene Chloride	<0.5	<0.5	<0.5	5	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	7	50	
Tetrachloroethylene	<0.5	<0.5	<0.5	5	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	7	10	

7.10 Castledowns, Clareview and Discovery Park Reservoirs
2023

Parameter	Castledowns				Clareview				Discovery Park				Limits	
	Mean	Min	Max	Count	Mean	Min	Max	Count	Mean	Min	Max	Count	*Approval or GCDWQ MAC, (AO or OG)	EPCOR
Toluene	<0.50	<0.50	<0.50	5	<0.50	<0.50	<0.50	8	<0.50	<0.50	<0.50	7	60 (24)	
Total Xylenes	<3	<3	<3	5	<3	<3	<3	8	<3	<3	<3	7	90	
Trichloroethylene	<0.50	<0.50	<0.50	5	<0.50	<0.50	<0.50	8	<0.50	<0.50	<0.50	7	5	
Secondary Inorganics (mg/L) ***														
Alkalinity Total	118	109	123	5	121	99	139	7	116	104	131	7		
Aluminum	0.075	0.054	0.098	5	0.063	0.034	0.096	8	0.057	0.012	0.145	7	2.9	0.1/0.2
Beryllium	<0.0002	<0.0002	<0.0002	5	<0.0002	<0.0002	<0.0002	8	<0.0002	<0.0002	<0.0002	7		
Bromide Dissolved	<0.010	<0.010	<0.010	10	<0.010	<0.010	<0.010	14	<0.013	<0.010	0.030	14		
Calcium	46.2	44.5	47.3	5	47.1	40.7	51.5	8	47.5	42.7	55.2	7		
Calcium Hardness	113	111	118	5	117	110	126	7	110	104	119	7		
Chloride Dissolved	6.6	6.0	7.0	10	5.7	5.1	6.2	14	6.4	5.4	8.5	14	(250)	
Cobalt	<0.0002	<0.0002	<0.0002	5	<0.0002	<0.0002	<0.0002	8	<0.0002	<0.0002	0.0002	7		
Iron	<0.005	<0.005	<0.005	5	0.013	0.009	0.019	8	<0.005	<0.005	0.005	7	(0.3)	0.3
Lanthanum	<Inoff	<Inoff	<Inoff	5	<Inoff	<Inoff	<Inoff	8	<0	<0	<0	7		
Lithium	0.0031	0.0031	0.0032	5	0.0031	0.0024	0.0036	8	0.0029	0.0019	0.0037	7		
Magnesium	13.9	13.4	14.3	5	13.8	11.8	15.7	8	13.8	11.8	16.4	7		
Molybdenum	0.0008	0.0006	0.0011	5	0.0009	0.0006	0.0010	8	0.0008	0.0006	0.0014	7		
Nickel	<0.0005	<0.0005	0.0007	5	<0.0005	<0.0005	0.0006	8	<0.0005	<0.0005	0.0007	7		
Ortho_P	0.78	<0.02	0.94	23	0.76	<0.02	0.92	23	0.74	<0.02	0.94	27		
Phosphorus	0.75	<0.02	0.96	5	0.45	<0.02	0.91	8	0.66	<0.02	0.94	7		
Potassium	0.80	0.70	0.90	5	0.80	0.70	1.00	8	0.89	0.70	1.10	7		
Silicon	1.82	1.59	2.02	5	2.06	1.49	2.64	8	2.05	1.60	2.57	7		
Silver	<0.0002	<0.0002	<0.0002	5	<0.0002	<0.0002	<0.0002	8	<0.0002	<0.0002	<0.0002	7		
Sodium	9.7	7.7	12.4	5	9.9	7.3	17.3	8	13.5	7.2	25.6	7	(200)	
Sulphate Dissolved	63	57	68	10	66	56	87	14	71	55	104	14	(500)	
Thallium	<0.0005	<0.0005	<0.0005	5	<0.0005	<0.0005	<0.0005	8	<0.0005	<0.0005	<0.0005	7		
Tin	<0.0005	<0.0005	<0.0005	5	<0.0005	<0.0005	<0.0005	8	<0.0005	<0.0005	<0.0005	7		
Titanium	<0.0005	<0.0005	<0.0005	5	<0.0005	<0.0005	<0.0005	8	<0.0005	<0.0005	<0.0005	7		
Total Hardness	171	168	178	5	175	162	189	7	167	157	181	7		
Vanadium	<0.0005	<0.0005	<0.0005	5	<0.0005	<0.0005	<0.0005	8	<0.0005	<0.0005	<0.0005	7		
Zinc	<0.005	<0.005	<0.005	5	<0.005	<0.005	<0.005	8	<0.005	<0.005	<0.005	7	(5.0)	
Zirconium	<0.0010	<0.0010	<0.0010	5	<0.0010	<0.0010	<0.0010	8	<0.0010	<0.0010	<0.0010	7		
Secondary Organics (ug/L) ***														
Bromodichloromethane	<0.5	<0.5	<0.5	5	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	7		16
Bromoform	<1.0	<1.0	<1.0	5	<1.0	<1.0	<1.0	8	<1.0	<1.0	<1.0	7		
Chloroform	19.8	11.6	28.8	5	18.6	<0.5	33.5	8	16.9	6.8	29.8	7		
Dibromochloromethane	<0.50	<0.50	<0.50	5	<0.50	<0.50	<0.50	8	<0.50	<0.50	<0.50	7		
Dichlorobenzene (1,3)	<0.50	<0.50	<0.50	5	<0.50	<0.50	<0.50	8	<0.50	<0.50	<0.50	7		

7.10 Castledowns, Clareview and Discovery Park Reservoirs
2023

Parameter	Castledowns				Clareview				Discovery Park				Limits	
	Mean	Min	Max	Count	Mean	Min	Max	Count	Mean	Min	Max	Count	*Approval or GCDWQ MAC, (AO or OG)	EPCOR
Dichloroethylene, cis (1,2)	<0.50	<0.50	<0.50	5	<0.50	<0.50	<0.50	8	<0.50	<0.50	<0.50	7		
Dichloroethylene, trans (1,2)	<0.50	<0.50	<0.50	5	<0.50	<0.50	<0.50	8	<0.50	<0.50	<0.50	7		
Dichloropropane (1,2)	<0.5	<0.5	<0.5	5	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	7		
Methyl t-Butyl Ether (MTBE)	<0.5	<0.5	<0.5	5	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	7	(15)	
MIBK	<1.0	<1.0	<1.0	5	<1.0	<1.0	<1.0	8	<1.0	<1.0	<1.0	7		
Styrene	<0.50	<0.50	<0.50	5	<0.50	<0.50	<0.50	8	<0.50	<0.50	<0.50	7		
Tetrachloroethane (1,1,2,2)	<1.0	<1.0	<1.0	5	<1.0	<1.0	<1.0	8	<1.0	<1.0	<1.0	7		
Total Organic Carbon	1.4	1.2	1.6	5	1.6	1.2	2.5	7	1.4	0.8	2.2	7		
Total Volatile Organics (NonTHM)	<1.0	<1.0	<1.0	5	<1.0	<1.0	<1.0	8	<1.0	<1.0	<1.0	7		
Total Volatile Organics (Unknown)	<1.0	<1.0	<1.0	5	<1.0	<1.0	<1.0	8	<1.0	<1.0	<1.0	7		
Trichlorobenzene (1,2,4)	<0.5	<0.5	<0.5	5	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	7		
Trichloroethane (1,1,1)	<0.5	<0.5	<0.5	5	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	7		
Xylene (1,2)	<0.5	<0.5	<0.5	5	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	7		
Xylene (1,4)	<0.5	<0.5	<0.5	5	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	7		

TABLE EXPLANATIONS:

* Numbers with no brackets are Health Canada Guidelines for Canadian Drinking Water Quality (GCDWQ) Maximum Acceptable Concentrations (MAC) and/or a limit set out in the Alberta Environment and Parks (AEP) Operating Approval 638-04-00. Limits in brackets indicate Aesthetic Objectives or Operational Guidelines (OG) and are not Approval limits. The EPCOR limits are internal limits set by EPCOR in the Operations Program.

** Primary parameters are those that have health-based limits (MACs) according the AEP Operating Approval 638-04-00

*** Secondary parameters do not have health-based limits but may have aesthetic or operational objectives

7.11 Kaskitayo, Londonderry, Millwoods Reservoirs
2023

Parameter	Kaskitayo				Londonderry				Millwoods				Limits	
	Mean	Min	Max	Count	Mean	Min	Max	Count	Mean	Min	Max	Count	*Approval or GCDWQ MAC, (AO or OG)	EPCOR
Physical														
Colour (TCU)	0.9	0.6	1.2	7	1.3	0.8	2.6	6	0.9	<0.5	1.7	6	(15)	10
Conductivity (uS/cm)	390	352	414	7	367	361	371	6	374	365	384	6		
Odour	Inoff	Inoff	Inoff	7	Inoff	Inoff	Inoff	7	Inoff	Inoff	Inoff	6		
pH (N/A)	7.7	7.5	7.8	7	7.7	7.4	7.9	6	7.8	7.4	8.0	6	(7.0 - 10.5)	7.3 - 8.3
Turbidity (NTU)	0.12	<0.04	1.32	53	0.12	0.04	0.51	52	0.09	<0.04	0.31	52		1
Primary Inorganics (mg/L) **														
Antimony	<0.0002	<0.0002	0.0004	7	<0.0002	<0.0002	0.0004	6	<0.0002	<0.0002	0.0004	6	0.006	
Arsenic	<0.0002	<0.0002	0.0003	7	<0.0002	<0.0002	0.0003	6	0.0002	<0.0002	0.0003	6	0.01	
Barium	0.060	0.051	0.065	7	0.057	0.052	0.062	6	0.058	0.049	0.062	6	2	
Boron	0.009	0.007	0.012	7	0.009	0.008	0.011	6	0.010	0.008	0.010	6	2	
Bromate Dissolved	<0.005	<0.005	<0.005	14	<0.005	<0.005	<0.005	12	<0.005	<0.005	<0.005	12	0.01	
Cadmium	<0.0002	<0.0002	<0.0002	7	<0.0002	<0.0002	<0.0002	6	<0.0002	<0.0002	<0.0002	6	0.007	
Chlorate Dissolved	0.108	0.080	0.127	14	0.178	0.129	0.215	12	0.119	0.102	0.160	12	1	
Chlorine, total	1.99	1.96	2.01	2	1.95	1.91	1.97	3	1.98	1.95	2.01	2	>0.5 and <3.0	>1.0 and <2.4
Chlorite Dissolved	<0.005	<0.005	<0.005	14	<0.005	<0.005	<0.005	12	<0.005	<0.005	<0.005	12	1	
Chromium	<0.0002	<0.0002	<0.0002	7	<0.0002	<0.0002	<0.0002	6	<0.0002	<0.0002	<0.0002	6	0.05	
Copper	<0.005	<0.005	<0.005	7	<0.005	<0.005	<0.005	6	<0.005	<0.005	<0.005	6	2 (1)	
Fluoride	0.68	0.66	0.75	7	0.70	0.67	0.72	6	0.68	0.66	0.70	6	1.5	0.6 - 0.8
Lead	<0.0002	<0.0002	<0.0002	7	<0.0002	<0.0002	<0.0002	6	<0.0002	<0.0002	<0.0002	6	0.005	
Manganese	<0.002	<0.002	<0.002	7	<0.002	<0.002	<0.002	6	<0.002	<0.002	<0.002	6	0.12 (0.02)	
Mercury	<0.0002	<0.0002	<0.0002	7	<0.0002	<0.0002	<0.0002	6	<0.0002	<0.0002	<0.0002	6	0.001	
Nitrate (as N) Dissolved	0.051	0.020	0.080	14	0.047	0.010	0.070	12	0.052	<0.010	0.114	12	10	
Nitrite (as N) Dissolved	<0.010	<0.010	0.010	14	<0.010	<0.010	<0.010	12	<0.010	<0.010	<0.010	12	1	
Selenium	0.0002	<0.0002	0.0003	7	0.0003	<0.0002	0.0003	6	0.0002	<0.0002	0.0003	6	0.05	
Strontium	0.394	0.322	0.452	7	0.425	0.398	0.450	6	0.433	0.411	0.451	6	7.0	
Total Chlorine	1.98	1.75	2.23	51	1.79	1.01	2.19	49	1.97	1.72	2.25	50	>0.5 and <3.0	>1.0 and <2.4
Uranium	<0.0005	<0.0005	0.0005	7	<0.0005	<0.0005	<0.0005	6	<0.0005	<0.0005	0.0005	6	0.02	
Primary Organics (ug/L) **														
Benzene	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	7	5	
Carbon Tetrachloride	<1.0	<1.0	<1.0	8	<1.0	<1.0	<1.0	6	<1.0	<1.0	<1.0	7	2	
Chlorobenzene	<0.50	<0.50	<0.50	8	<0.50	<0.50	<0.50	6	<0.50	<0.50	<0.50	7	80 (30)	
Dichlorobenzene (1,2)	<0.50	<0.50	<0.50	8	<0.50	<0.50	<0.50	6	<0.50	<0.50	<0.50	7		
Dichlorobenzene (1,4)	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	7	5 (1)	
Dichloroethylene (1,1)	<3.0	<3.0	<3.0	8	<3.0	<3.0	<3.0	6	<3.0	<3.0	<3.0	7	14	
Ethylbenzene	<0.50	<0.50	<0.50	8	<0.50	<0.50	<0.50	6	<0.50	<0.50	<0.50	7	140 (1.6)	
Methylene Chloride	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	7	50	
Tetrachloroethylene	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	7	10	

7.11 Kaskitayo, Londonderry, Millwoods Reservoirs
2023

Parameter	Kaskitayo				Londonderry				Millwoods				Limits	
	Mean	Min	Max	Count	Mean	Min	Max	Count	Mean	Min	Max	Count	*Approval or GCDWQ MAC, (AO or OG)	EPCOR
Toluene	<0.50	<0.50	<0.50	8	<0.50	<0.50	<0.50	6	<0.50	<0.50	<0.50	7	60 (24)	
Total Xylenes	<3	<3	<3	8	<3	<3	<3	6	<3	<3	<3	7	90	
Trichloroethylene	<0.50	<0.50	<0.50	8	<0.50	<0.50	<0.50	6	<0.50	<0.50	<0.50	7	5	
Secondary Inorganics (mg/L) ***														
Alkalinity Total	115	103	134	7	118	112	126	6	119	112	127	6		
Aluminum	0.055	0.020	0.126	7	0.074	0.032	0.122	6	0.087	0.033	0.159	6	2.9	0.1/0.2
Beryllium	<0.0002	<0.0002	<0.0002	7	<0.0002	<0.0002	<0.0002	6	<0.0002	<0.0002	<0.0002	6		
Bromide Dissolved	<0.010	<0.010	<0.010	14	<0.010	<0.010	<0.010	12	<0.010	<0.010	<0.010	12		
Calcium	46.7	44.3	49.9	7	45.8	44.1	47.2	6	46.3	44.5	47.1	6		
Calcium Hardness	114	110	126	7	114	110	120	6	120	112	142	6		
Chloride Dissolved	6.3	4.9	7.7	14	6.1	5.2	7.2	12	6.4	4.9	7.0	12	(250)	
Cobalt	<0.0002	<0.0002	<0.0002	7	<0.0002	<0.0002	<0.0002	6	<0.0002	<0.0002	<0.0002	6		
Iron	<0.005	<0.005	<0.005	7	<0.005	<0.005	0.007	6	<0.005	<0.005	<0.005	6	(0.3)	0.3
Lanthanum	<Inoff	<Inoff	<Inoff	7	<Inoff	<Inoff	<Inoff	6	<0	<0	<0	6		
Lithium	0.0028	0.0021	0.0034	7	0.0033	0.0031	0.0037	6	0.0031	0.0029	0.0032	6		
Magnesium	13.5	12.0	15.3	7	13.7	13.3	14.1	6	13.9	13.5	14.1	6		
Molybdenum	0.0007	0.0006	0.0009	7	0.0007	0.0006	0.0010	6	0.0007	0.0006	0.0011	6		
Nickel	<0.0006	<0.0005	0.0008	7	<0.0005	<0.0005	<0.0005	6	<0.0005	<0.0005	<0.0005	6		
Ortho_P	0.78	<0.02	0.92	26	0.79	<0.02	0.94	24	0.77	<0.02	0.94	26		
Phosphorus	0.68	<0.02	0.99	7	0.74	<0.02	0.93	6	0.76	<0.02	0.95	6		
Potassium	0.81	0.70	0.90	7	0.77	0.70	0.90	6	0.75	0.60	0.80	6		
Silicon	2.11	1.75	2.59	7	1.83	1.61	1.99	6	1.84	1.57	1.99	6		
Silver	<0.0002	<0.0002	<0.0002	7	<0.0002	<0.0002	<0.0002	6	<0.0002	<0.0002	<0.0002	6		
Sodium	13.5	6.3	21.9	7	8.4	7.7	10.1	6	9.4	7.9	11.2	6	(200)	
Sulphate Dissolved	71	54	91	14	62	56	66	12	64	58	67	12	(500)	
Thallium	<0.0005	<0.0005	<0.0005	7	<0.0005	<0.0005	<0.0005	6	<0.0005	<0.0005	<0.0005	6		
Tin	<0.0005	<0.0005	<0.0005	7	<0.0005	<0.0005	<0.0005	6	<0.0005	<0.0005	<0.0005	6		
Titanium	<0.0005	<0.0005	<0.0005	7	<0.0005	<0.0005	<0.0005	6	<0.0005	<0.0005	<0.0005	6		
Total Hardness	168	154	191	7	173	167	181	6	173	167	186	6		
Vanadium	<0.0005	<0.0005	<0.0005	7	<0.0005	<0.0005	<0.0005	6	<0.0005	<0.0005	<0.0005	6		
Zinc	<0.005	<0.005	<0.005	7	<0.005	<0.005	<0.005	6	<0.005	<0.005	<0.005	6	(5.0)	
Zirconium	<0.0010	<0.0010	<0.0010	7	<0.0010	<0.0010	<0.0010	6	<0.0010	<0.0010	<0.0010	6		
Secondary Organics (ug/L) ***														
Bromodichloromethane	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	7		16
Bromoform	<1.0	<1.0	<1.0	8	<1.0	<1.0	<1.0	6	<1.0	<1.0	<1.0	7		
Chloroform	17.2	<0.5	29.9	8	19.1	6.1	29.2	6	15.4	<0.5	28.8	7		
Dibromochloromethane	<0.50	<0.50	<0.50	8	<0.50	<0.50	<0.50	6	<0.50	<0.50	<0.50	7		
Dichlorobenzene (1,3)	<0.50	<0.50	<0.50	8	<0.50	<0.50	<0.50	6	<0.50	<0.50	<0.50	7		

7.11 Kaskitayo, Londonderry, Millwoods Reservoirs
2023

Parameter	Kaskitayo				Londonderry				Millwoods				Limits	
	Mean	Min	Max	Count	Mean	Min	Max	Count	Mean	Min	Max	Count	*Approval or GCDWQ MAC, (AO or OG)	EPCOR
Dichloroethylene, cis (1,2)	<0.50	<0.50	<0.50	8	<0.50	<0.50	<0.50	6	<0.50	<0.50	<0.50	7		
Dichloroethylene, trans (1,2)	<0.50	<0.50	<0.50	8	<0.50	<0.50	<0.50	6	<0.50	<0.50	<0.50	7		
Dichloropropane (1,2)	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	7		
Methyl t-Butyl Ether (MTBE)	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	7	(15)	
MIBK	<1.0	<1.0	<1.0	8	<1.0	<1.0	<1.0	6	<1.0	<1.0	<1.0	7		
Styrene	<0.50	<0.50	<0.50	8	<0.50	<0.50	<0.50	6	<0.50	<0.50	<0.50	7		
Tetrachloroethane (1,1,2,2)	<1.0	<1.0	<1.0	8	<1.0	<1.0	<1.0	6	<1.0	<1.0	<1.0	7		
Total Organic Carbon	1.6	1.1	2.1	7	1.3	0.9	1.6	6	1.3	0.8	1.7	6		
Total Volatile Organics (NonTHM)	<1.0	<1.0	<1.0	8	<1.0	<1.0	<1.0	6	<1.0	<1.0	<1.0	7		
Total Volatile Organics (Unknown)	<1.0	<1.0	<1.0	8	<1.0	<1.0	<1.0	6	<1.0	<1.0	<1.0	7		
Trichlorobenzene (1,2,4)	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	7		
Trichloroethane (1,1,1)	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	7		
Xylene (1,2)	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	7		
Xylene (1,4)	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	7		

TABLE EXPLANATIONS:

* Numbers with no brackets are Health Canada Guidelines for Canadian Drinking Water Quality (GCDWQ) Maximum Acceptable Concentrations (MAC) and/or a limit set out in the Alberta Environment and Parks (AEP) Operating Approval 638-04-00. Limits in brackets indicate Aesthetic Objectives or Operational Guidelines (OG) and are not Approval limits. The EPCOR limits are internal limits set by EPCOR in the Operations Program.

** Primary parameters are those that have health-based limits (MACs) according the AEP Operating Approval 638-04-00

*** Secondary parameters do not have health-based limits but may have aesthetic or operational objectives

7.12 North Jasper Place, Ormsby, Papaschase 1 Reservoirs
2023

Parameter	North Jasper Place				Ormsby				Papaschase 1				Limits	
	Mean	Min	Max	Count	Mean	Min	Max	Count	Mean	Min	Max	Count	*Approval or GCDWQ MAC, (AO or OG)	EPCOR
Physical														
Colour (TCU)	<0.6	<0.5	1.0	7	0.9	<0.5	1.5	6	0.9	<0.5	1.7	7	(15)	10
Conductivity (uS/cm)	387	359	440	7	372	353	380	6	370	360	384	7		
Odour	Inoff	Inoff	Inoff	7	Inoff	Inoff	Inoff	6	Inoff	Inoff	Inoff	6		
pH (N/A)	7.7	7.4	7.9	7	7.7	7.4	7.8	6	7.8	7.5	8.0	7	(7.0 - 10.5)	7.3 - 8.3
Turbidity (NTU)	0.11	0.06	0.19	49	0.18	<0.04	2.41	52	0.13	0.04	0.24	52		1
Primary Inorganics (mg/L) **														
Antimony	<0.0002	<0.0002	0.0005	7	<0.0002	<0.0002	0.0003	6	<0.0002	<0.0002	0.0003	7	0.006	
Arsenic	<0.0002	<0.0002	0.0003	7	0.0003	<0.0002	0.0003	6	0.0003	<0.0002	0.0003	7	0.01	
Barium	0.059	0.045	0.071	7	0.058	0.051	0.063	6	0.057	0.054	0.064	7	2	
Boron	0.009	0.008	0.012	7	0.009	0.008	0.010	6	0.009	0.008	0.010	7	2	
Bromate Dissolved	<0.005	<0.005	<0.005	14	<0.005	<0.005	<0.005	12	<0.005	<0.005	<0.005	14	0.01	
Cadmium	<0.0002	<0.0002	<0.0002	7	<0.0002	<0.0002	<0.0002	6	<0.0002	<0.0002	<0.0002	7	0.007	
Chlorate Dissolved	0.107	0.080	0.129	14	0.112	0.090	0.141	12	0.172	0.120	0.229	14	1	
Chlorine, total	1.70	1.67	1.72	3	1.96	1.91	2.00	2	1.79	1.78	1.79	2	>0.5 and <3.0	>1.0 and <2.4
Chlorite Dissolved	<0.005	<0.005	<0.005	14	<0.005	<0.005	<0.005	12	<0.005	<0.005	<0.005	14	1	
Chromium	<0.0002	<0.0002	<0.0002	7	<0.0002	<0.0002	<0.0002	6	<0.0002	<0.0002	<0.0002	7	0.05	
Copper	<0.005	<0.005	<0.005	7	<0.005	<0.005	<0.005	6	<0.005	<0.005	<0.005	7	2 (1)	
Fluoride	0.67	0.63	0.72	7	0.68	0.66	0.71	6	0.70	0.67	0.72	7	1.5	0.6 - 0.8
Lead	<0.0002	<0.0002	<0.0002	7	<0.0002	<0.0002	<0.0002	6	<0.0002	<0.0002	<0.0002	7	0.005	
Manganese	0.004	<0.002	0.014	7	<0.002	<0.002	<0.002	6	<0.002	<0.002	<0.002	7	0.12 (0.02)	
Mercury	<0.0002	<0.0002	<0.0002	7	<0.0002	<0.0002	<0.0002	6	<0.0002	<0.0002	<0.0002	7	0.001	
Nitrate (as N) Dissolved	0.063	0.030	0.080	14	0.047	0.010	0.070	12	0.049	0.020	0.080	14	10	
Nitrite (as N) Dissolved	<0.010	<0.010	<0.010	14	<0.010	<0.010	<0.010	12	<0.010	<0.010	<0.010	14	1	
Selenium	0.0003	<0.0002	0.0003	7	0.0002	0.0002	0.0003	6	0.0002	<0.0002	0.0003	7	0.05	
Strontium	0.409	0.361	0.450	7	0.429	0.405	0.448	6	0.420	0.391	0.452	7	7.0	
Total Chlorine	1.60	1.21	2.03	46	1.90	1.55	2.23	50	1.68	1.10	2.29	50	>0.5 and <3.0	>1.0 and <2.4
Uranium	<0.0005	<0.0005	0.0005	7	<0.0005	<0.0005	<0.0005	6	<0.0005	<0.0005	<0.0005	7	0.02	
Primary Organics (ug/L) **														
Benzene	<0.5	<0.5	<0.5	7	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	7	5	
Carbon Tetrachloride	<1.0	<1.0	<1.0	7	<1.0	<1.0	<1.0	6	<1.0	<1.0	<1.0	7	2	
Chlorobenzene	<0.50	<0.50	<0.50	7	<0.50	<0.50	<0.50	6	<0.50	<0.50	<0.50	7	80 (30)	
Dichlorobenzene (1,2)	<0.50	<0.50	<0.50	7	<0.50	<0.50	<0.50	6	<0.50	<0.50	<0.50	7		
Dichlorobenzene (1,4)	<0.5	<0.5	<0.5	7	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	7	5 (1)	
Dichloroethylene (1,1)	<3.0	<3.0	<3.0	7	<3.0	<3.0	<3.0	6	<3.0	<3.0	<3.0	7	14	
Ethylbenzene	<0.50	<0.50	<0.50	7	<0.50	<0.50	<0.50	6	<0.50	<0.50	<0.50	7	140 (1.6)	
Methylene Chloride	<0.5	<0.5	<0.5	7	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	7	50	
Tetrachloroethylene	<0.5	<0.5	<0.5	7	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	7	10	

7.12 North Jasper Place, Ormsby, Papaschase 1 Reservoirs
2023

Parameter	North Jasper Place				Ormsby				Papaschase 1				Limits	
	Mean	Min	Max	Count	Mean	Min	Max	Count	Mean	Min	Max	Count	*Approval or GCDWQ MAC, (AO or OG)	EPCOR
Toluene	<0.50	<0.50	<0.50	7	<0.50	<0.50	<0.50	6	<0.50	<0.50	<0.50	7	60 (24)	
Total Xylenes	<3	<3	<3	7	<3	<3	<3	6	<3	<3	<3	7	90	
Trichloroethylene	<0.50	<0.50	<0.50	7	<0.50	<0.50	<0.50	6	<0.50	<0.50	<0.50	7	5	
Secondary Inorganics (mg/L) ***														
Alkalinity Total	119	105	132	7	119	112	125	6	118	111	127	7		
Aluminum	0.062	0.022	0.147	7	0.095	0.042	0.144	6	0.065	0.042	0.091	7	2.9	0.1/0.2
Beryllium	<0.0002	<0.0002	<0.0002	7	<0.0002	<0.0002	<0.0002	6	<0.0002	<0.0002	<0.0002	7		
Bromide Dissolved	<0.010	<0.010	<0.010	14	<0.010	<0.010	<0.010	12	<0.010	<0.010	<0.010	14		
Calcium	47.4	44.6	49.7	7	45.8	44.0	47.1	6	46.0	44.5	48.2	7		
Calcium Hardness	116	108	123	7	114	111	119	6	114	108	118	7		
Chloride Dissolved	6.3	5.2	8.5	14	6.4	4.8	7.1	12	6.2	5.4	7.1	14	(250)	
Cobalt	<0.0002	<0.0002	0.0002	7	<0.0002	<0.0002	<0.0002	6	<0.0002	<0.0002	<0.0002	7		
Iron	<0.006	<0.005	0.011	7	<0.005	<0.005	<0.005	6	0.011	0.008	0.014	7	(0.3)	0.3
Lanthanum	<Inoff	<Inoff	<Inoff	7	<Inoff	<Inoff	<Inoff	6	<0	<0	<0	7		
Lithium	0.0029	0.0021	0.0034	7	0.0031	0.0029	0.0032	6	0.0033	0.0031	0.0036	7		
Magnesium	13.6	12.2	14.9	7	13.9	13.4	14.2	6	13.8	13.3	14.5	7		
Molybdenum	0.0007	0.0005	0.0010	7	0.0007	0.0006	0.0011	6	0.0007	0.0007	0.0010	7		
Nickel	<0.0005	<0.0005	0.0007	7	<0.0005	<0.0005	<0.0005	6	<0.0005	<0.0005	<0.0005	7		
Ortho_P	0.75	<0.02	0.94	22	0.81	<0.02	1.32	26	0.74	<0.02	0.94	26		
Phosphorus	0.60	<0.02	0.91	7	0.78	<0.02	1.01	6	0.75	<0.02	0.93	7		
Potassium	0.81	0.70	1.00	7	0.73	0.60	0.80	6	0.77	0.70	0.90	7		
Silicon	2.00	1.64	2.39	7	1.83	1.60	1.94	6	1.86	1.64	2.16	7		
Silver	<0.0002	<0.0002	<0.0002	7	<0.0002	<0.0002	<0.0002	6	<0.0002	<0.0002	<0.0002	7		
Sodium	12.3	6.8	24.4	7	9.6	7.9	12.1	6	8.8	7.6	11.0	7	(200)	
Sulphate Dissolved	70	55	103	14	64	58	69	12	62	56	67	14	(500)	
Thallium	<0.0005	<0.0005	<0.0005	7	<0.0005	<0.0005	<0.0005	6	<0.0005	<0.0005	<0.0005	7		
Tin	<0.0005	<0.0005	0.0008	7	<0.0005	<0.0005	<0.0005	6	<0.0005	<0.0005	<0.0005	7		
Titanium	<0.0005	<0.0005	<0.0005	7	<0.0005	<0.0005	<0.0005	6	<0.0005	<0.0005	<0.0005	7		
Total Hardness	174	165	186	7	173	168	178	6	173	168	179	7		
Vanadium	<0.0005	<0.0005	<0.0005	7	<0.0005	<0.0005	<0.0005	6	<0.0005	<0.0005	<0.0005	7		
Zinc	<0.005	<0.005	<0.005	7	<0.005	<0.005	<0.005	6	<0.005	<0.005	<0.005	7	(5.0)	
Zirconium	<0.0010	<0.0010	<0.0010	7	<0.0010	<0.0010	<0.0010	6	<0.0010	<0.0010	<0.0010	7		
Secondary Organics (ug/L) ***														
Bromodichloromethane	<0.5	<0.5	<0.5	7	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	7		16
Bromoform	<1.0	<1.0	<1.0	7	<1.0	<1.0	<1.0	6	<1.0	<1.0	<1.0	7		
Chloroform	18.7	8.7	35.7	7	18.3	5.2	30.1	6	20.8	8.9	32.9	7		
Dibromochloromethane	<0.50	<0.50	<0.50	7	<0.50	<0.50	<0.50	6	<0.50	<0.50	<0.50	7		
Dichlorobenzene (1,3)	<0.50	<0.50	<0.50	7	<0.50	<0.50	<0.50	6	<0.50	<0.50	<0.50	7		

7.12 North Jasper Place, Ormsby, Papaschase 1 Reservoirs
2023

Parameter	North Jasper Place				Ormsby				Papaschase 1				Limits	
	Mean	Min	Max	Count	Mean	Min	Max	Count	Mean	Min	Max	Count	*Approval or GCDWQ MAC, (AO or OG)	EPCOR
Dichloroethylene, cis (1,2)	<0.50	<0.50	<0.50	7	<0.50	<0.50	<0.50	6	<0.50	<0.50	<0.50	7		
Dichloroethylene, trans (1,2)	<0.50	<0.50	<0.50	7	<0.50	<0.50	<0.50	6	<0.50	<0.50	<0.50	7		
Dichloropropane (1,2)	<0.5	<0.5	<0.5	7	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	7		
Methyl t-Butyl Ether (MTBE)	<0.5	<0.5	<0.5	7	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	7	(15)	
MIBK	<1.0	<1.0	<1.0	7	<1.0	<1.0	<1.0	6	<1.0	<1.0	<1.0	7		
Styrene	<0.50	<0.50	<0.50	7	<0.50	<0.50	<0.50	6	<0.50	<0.50	<0.50	7		
Tetrachloroethane (1,1,2,2)	<1.0	<1.0	<1.0	7	<1.0	<1.0	<1.0	6	<1.0	<1.0	<1.0	7		
Total Organic Carbon	1.4	1.0	2.0	7	1.3	0.8	1.6	6	1.3	1.0	1.7	7		
Total Volatile Organics (NonTHM)	<1.0	<1.0	<1.0	7	<1.0	<1.0	<1.0	6	<1.0	<1.0	<1.0	7		
Total Volatile Organics (Unknown)	<1.0	<1.0	<1.0	7	<1.0	<1.0	<1.0	6	<1.0	<1.0	<1.0	7		
Trichlorobenzene (1,2,4)	<0.5	<0.5	<0.5	7	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	7		
Trichloroethane (1,1,1)	<0.5	<0.5	<0.5	7	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	7		
Xylene (1,2)	<0.5	<0.5	<0.5	7	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	7		
Xylene (1,4)	<0.5	<0.5	<0.5	7	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	7		

TABLE EXPLANATIONS:

* Numbers with no brackets are Health Canada Guidelines for Canadian Drinking Water Quality (GCDWQ) Maximum Acceptable Concentrations (MAC) and/or a limit set out in the Alberta Environment and Parks (AEP) Operating Approval 638-04-00. Limits in brackets indicate Aesthetic Objectives or Operational Guidelines (OG) and are not Approval limits. The EPCOR limits are internal limits set by EPCOR in the Operations Program.

** Primary parameters are those that have health-based limits (MACs) according the AEP Operating Approval 638-04-00

*** Secondary parameters do not have health-based limits but may have aesthetic or operational objectives

7.13 Papaschase 2, Rosslyn 1, Rosslyn 2 Reservoirs
2023

Parameter	Papaschase 2				Rosslyn 1				Rosslyn 2				Limits	
	Mean	Min	Max	Count	Mean	Min	Max	Count	Mean	Min	Max	Count	*Approval or GCDWQ MAC, (AO or OG)	EPCOR
Physical														
Colour (TCU)	0.9	0.8	1.0	6	0.9	<0.5	2.1	7	0.8	<0.5	1.7	7	(15)	10
Conductivity (uS/cm)	382	360	403	6	370	359	378	7	382	355	414	7		
Odour	Inoff	Inoff	Inoff	6	Inoff	Inoff	Inoff	7	Inoff	Inoff	Inoff	7		
pH (N/A)	7.8	7.5	8.0	6	7.8	7.4	8.0	7	7.8	7.6	8.0	7	(7.0 - 10.5)	7.3 - 8.3
Turbidity (NTU)	0.09	0.04	0.22	51	0.12	0.06	0.28	44	0.12	0.06	0.27	52		1
Primary Inorganics (mg/L) **														
Antimony	<0.0002	<0.0002	0.0004	6	<0.0002	<0.0002	0.0003	7	<0.0002	<0.0002	0.0004	7	0.006	
Arsenic	<0.0002	<0.0002	0.0003	6	<0.0002	<0.0002	0.0003	7	<0.0002	<0.0002	0.0003	7	0.01	
Barium	0.060	0.050	0.066	6	0.057	0.051	0.064	7	0.061	0.050	0.071	7	2	
Boron	0.009	0.007	0.012	6	0.009	0.008	0.010	7	0.010	0.008	0.012	7	2	
Bromate Dissolved	<0.005	<0.005	<0.005	12	<0.005	<0.005	<0.005	14	<0.005	<0.005	<0.005	14	0.01	
Cadmium	<0.0002	<0.0002	<0.0002	6	<0.0002	<0.0002	<0.0002	7	<0.0002	<0.0002	<0.0002	7	0.007	
Chlorate Dissolved	0.157	0.126	0.217	12	0.166	0.121	0.201	14	0.172	0.128	0.223	14	1	
Chlorine, total	1.96	1.96	1.96	2	1.85	1.83	1.86	3	1.77	1.74	1.80	3	>0.5 and <3.0	>1.0 and <2.4
Chlorite Dissolved	<0.005	<0.005	<0.005	12	<0.005	<0.005	<0.005	14	<0.005	<0.005	<0.005	14	1	
Chromium	<0.0002	<0.0002	<0.0002	6	<0.0002	<0.0002	<0.0002	7	<0.0002	<0.0002	<0.0002	7	0.05	
Copper	<0.005	<0.005	<0.005	6	<0.005	<0.005	<0.005	7	<0.005	<0.005	<0.005	7	2 (1)	
Fluoride	0.70	0.66	0.78	6	0.69	0.66	0.71	7	0.69	0.66	0.71	7	1.5	0.6 - 0.8
Lead	<0.0002	<0.0002	<0.0002	6	<0.0002	<0.0002	<0.0002	7	<0.0002	<0.0002	<0.0002	7	0.005	
Manganese	<0.002	<0.002	<0.002	6	<0.002	<0.002	<0.002	7	<0.002	<0.002	0.005	7	0.12 (0.02)	
Mercury	<0.0002	<0.0002	<0.0002	6	<0.0002	<0.0002	<0.0002	7	<0.0002	<0.0002	<0.0002	7	0.001	
Nitrate (as N) Dissolved	0.050	0.020	0.070	12	0.065	0.020	0.206	14	0.054	0.030	0.080	14	10	
Nitrite (as N) Dissolved	<0.010	<0.010	0.010	12	<0.010	<0.010	<0.010	14	<0.010	<0.010	<0.010	14	1	
Selenium	0.0002	<0.0002	0.0003	6	0.0002	<0.0002	0.0003	7	0.0002	0.0002	0.0003	7	0.05	
Strontium	0.400	0.323	0.450	6	0.421	0.402	0.452	7	0.399	0.340	0.445	7	7.0	
Total Chlorine	1.89	1.53	2.17	49	1.66	1.31	1.88	41	1.65	1.21	2.20	49	>0.5 and <3.0	>1.0 and <2.4
Uranium	<0.0005	<0.0005	0.0005	6	<0.0005	<0.0005	<0.0005	7	<0.0005	<0.0005	0.0006	7	0.02	
Primary Organics (ug/L) **														
Benzene	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	7	5	
Carbon Tetrachloride	<1.0	<1.0	<1.0	6	<1.0	<1.0	<1.0	8	<1.0	<1.0	<1.0	7	2	
Chlorobenzene	<0.50	<0.50	<0.50	6	<0.50	<0.50	<0.50	8	<0.50	<0.50	<0.50	7	80 (30)	
Dichlorobenzene (1,2)	<0.50	<0.50	<0.50	6	<0.50	<0.50	<0.50	8	<0.50	<0.50	<0.50	7		
Dichlorobenzene (1,4)	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	7	5 (1)	
Dichloroethylene (1,1)	<3.0	<3.0	<3.0	6	<3.0	<3.0	<3.0	8	<3.0	<3.0	<3.0	7	14	
Ethylbenzene	<0.50	<0.50	<0.50	6	<0.50	<0.50	<0.50	8	<0.50	<0.50	<0.50	7	140 (1.6)	
Methylene Chloride	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	7	50	
Tetrachloroethylene	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	7	10	

7.13 Papaschase 2, Rosslyn 1, Rosslyn 2 Reservoirs
2023

Parameter	Papaschase 2				Rosslyn 1				Rosslyn 2				Limits	
	Mean	Min	Max	Count	Mean	Min	Max	Count	Mean	Min	Max	Count	*Approval or GCDWQ MAC, (AO or OG)	EPCOR
Toluene	<0.50	<0.50	<0.50	6	<0.50	<0.50	<0.50	8	<0.50	<0.50	<0.50	7	60 (24)	
Total Xylenes	<3	<3	<3	6	<3	<3	<3	8	<3	<3	<3	7	90	
Trichloroethylene	<0.50	<0.50	<0.50	6	<0.50	<0.50	<0.50	8	<0.50	<0.50	<0.50	7	5	
Secondary Inorganics (mg/L) * **														
Alkalinity Total	117	101	134	6	117	112	124	7	116	100	134	7		
Aluminum	0.059	0.023	0.110	6	0.066	0.037	0.099	7	0.060	0.029	0.092	7	2.9	0.1/0.2
Beryllium	<0.0002	<0.0002	<0.0002	6	<0.0002	<0.0002	<0.0002	7	<0.0002	<0.0002	<0.0002	7		
Bromide Dissolved	<0.012	<0.010	0.020	12	<0.010	<0.010	<0.010	14	<0.010	<0.010	<0.010	14		
Calcium	46.1	43.9	49.9	6	45.6	43.4	48.2	7	47.4	44.1	53.1	7		
Calcium Hardness	114	108	124	6	113	110	119	7	115	106	123	7		
Chloride Dissolved	5.8	5.2	6.5	12	6.3	5.5	7.0	14	6.0	5.1	6.7	14	(250)	
Cobalt	<0.0002	<0.0002	<0.0002	6	<0.0002	<0.0002	<0.0002	7	<0.0002	<0.0002	<0.0002	7		
Iron	<0.005	<0.005	<0.005	6	0.006	<0.005	0.010	7	<0.005	<0.005	0.006	7	(0.3)	0.3
Lanthanum	<Inoff	<Inoff	<Inoff	6	<Inoff	<Inoff	<Inoff	7	<0	<0	<0	7		
Lithium	0.0030	0.0022	0.0035	6	0.0033	0.0030	0.0036	7	0.0032	0.0022	0.0036	7		
Magnesium	13.5	11.9	15.3	6	13.6	12.8	14.3	7	13.8	11.7	16.0	7		
Molybdenum	0.0007	0.0006	0.0009	6	0.0007	0.0007	0.0010	7	0.0008	0.0006	0.0011	7		
Nickel	<0.0005	<0.0005	0.0006	6	<0.0005	<0.0005	<0.0005	7	<0.0005	<0.0005	0.0007	7		
Ortho_P	0.80	<0.02	0.92	25	0.72	<0.02	0.88	16	0.75	<0.02	0.92	23		
Phosphorus	0.60	<0.02	0.91	6	0.76	<0.02	0.94	7	0.65	<0.02	0.92	7		
Potassium	0.80	0.70	1.00	6	0.77	0.60	0.90	7	0.87	0.70	1.00	7		
Silicon	2.03	1.60	2.54	6	1.88	1.64	2.07	7	2.08	1.64	2.48	7		
Silver	<0.0002	<0.0002	<0.0002	6	<0.0002	<0.0002	<0.0002	7	<0.0002	<0.0002	<0.0002	7		
Sodium	10.7	6.5	18.6	6	9.1	7.6	11.0	7	11.3	6.7	19.6	7	(200)	
Sulphate Dissolved	67	55	88	12	63	55	68	14	69	56	93	14	(500)	
Thallium	<0.0005	<0.0005	<0.0005	6	<0.0005	<0.0005	<0.0005	7	<0.0005	<0.0005	<0.0005	7		
Tin	<0.0005	<0.0005	<0.0005	6	<0.0005	<0.0005	<0.0005	7	<0.0005	<0.0005	<0.0005	7		
Titanium	<0.0005	<0.0005	<0.0005	6	<0.0005	<0.0005	<0.0005	7	<0.0005	<0.0005	<0.0005	7		
Total Hardness	169	157	190	6	172	166	185	7	172	162	184	7		
Vanadium	<0.0005	<0.0005	<0.0005	6	<0.0005	<0.0005	<0.0005	7	<0.0005	<0.0005	<0.0005	7		
Zinc	<0.005	<0.005	<0.005	6	<0.005	<0.005	<0.005	7	<0.005	<0.005	<0.005	7	(5.0)	
Zirconium	<0.0010	<0.0010	<0.0010	6	<0.0010	<0.0010	<0.0010	7	<0.0010	<0.0010	<0.0010	7		
Secondary Organics (ug/L) * **														
Bromodichloromethane	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	7		16
Bromoform	<1.0	<1.0	<1.0	6	<1.0	<1.0	<1.0	8	<1.0	<1.0	<1.0	7		
Chloroform	20.2	10.9	33.1	6	18.8	<0.5	30.0	8	22.3	9.4	32.6	7		
Dibromochloromethane	<0.50	<0.50	<0.50	6	<0.50	<0.50	<0.50	8	<0.50	<0.50	<0.50	7		
Dichlorobenzene (1,3)	<0.50	<0.50	<0.50	6	<0.50	<0.50	<0.50	8	<0.50	<0.50	<0.50	7		

7.13 Papaschase 2, Rosslyn 1, Rosslyn 2 Reservoirs
2023

Parameter	Papaschase 2				Rosslyn 1				Rosslyn 2				Limits	
	Mean	Min	Max	Count	Mean	Min	Max	Count	Mean	Min	Max	Count	*Approval or GCDWQ MAC, (AO or OG)	EPCOR
Dichloroethylene, cis (1,2)	<0.50	<0.50	<0.50	6	<0.50	<0.50	<0.50	8	<0.50	<0.50	<0.50	7		
Dichloroethylene, trans (1,2)	<0.50	<0.50	<0.50	6	<0.50	<0.50	<0.50	8	<0.50	<0.50	<0.50	7		
Dichloropropane (1,2)	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	7		
Methyl t-Butyl Ether (MTBE)	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	7	(15)	
MIBK	<1.0	<1.0	<1.0	6	<1.0	<1.0	<1.0	8	<1.0	<1.0	<1.0	7		
Styrene	<0.50	<0.50	<0.50	6	<0.50	<0.50	<0.50	8	<0.50	<0.50	<0.50	7		
Tetrachloroethane (1,1,2,2)	<1.0	<1.0	<1.0	6	<1.0	<1.0	<1.0	8	<1.0	<1.0	<1.0	7		
Total Organic Carbon	1.5	1.1	2.1	6	1.4	0.9	1.8	7	1.6	0.9	2.4	7		
Total Volatile Organics (NonTHM)	<1.0	<1.0	<1.0	6	<1.0	<1.0	<1.0	8	<1.0	<1.0	<1.0	7		
Total Volatile Organics (Unknown)	<1.0	<1.0	<1.0	6	<1.0	<1.0	<1.0	8	<1.0	<1.0	<1.0	7		
Trichlorobenzene (1,2,4)	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	7		
Trichloroethane (1,1,1)	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	7		
Xylene (1,2)	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	7		
Xylene (1,4)	<0.5	<0.5	<0.5	6	<0.5	<0.5	<0.5	8	<0.5	<0.5	<0.5	7		

TABLE EXPLANATIONS:

* Numbers with no brackets are Health Canada Guidelines for Canadian Drinking Water Quality (GCDWQ) Maximum Acceptable Concentrations (MAC) and/or a limit set out in the Alberta Environment and Parks (AEP) Operating Approval 638-04-00. Limits in brackets indicate Aesthetic Objectives or Operational Guidelines (OG) and are not Approval limits. The EPCOR limits are internal limits set by EPCOR in the Operations Program.

** Primary parameters are those that have health-based limits (MACs) according the AEP Operating Approval 638-04-00

*** Secondary parameters do not have health-based limits but may have aesthetic or operational objectives

7.14 Thorncliff Reservoir
2023

Parameter	Thorncliff						Limits	
	Mean	Min	Max	Count			*Approval or GCDWQ MAC, (AO or OG)	EPCOR
Physical								
Colour (TCU)	0.9	0.6	1.3	6			(15)	10
Conductivity (uS/cm)	389	361	437	6				
Odour	Inoff	Inoff	Inoff	6				
pH (N/A)	7.7	7.6	7.9	6			(7.0 - 10.5)	7.3 - 8.3
Turbidity (NTU)	0.13	<0.04	0.31	52				1
Primary Inorganics (mg/L) **								
Antimony	<0.0002	<0.0002	0.0004	6			0.006	
Arsenic	<0.0002	<0.0002	0.0003	6			0.01	
Barium	0.060	0.050	0.069	6			2	
Boron	0.010	0.008	0.012	6			2	
Bromate Dissolved	<0.005	<0.005	<0.005	12			0.01	
Cadmium	<0.0002	<0.0002	<0.0002	6			0.007	
Chlorate Dissolved	0.105	0.080	0.125	12			1	
Chlorine, total	1.72	1.68	1.76	2			>0.5 and <3.0	>1.0 and <2.4
Chlorite Dissolved	<0.005	<0.005	<0.005	12			1	
Chromium	<0.0002	<0.0002	<0.0002	6			0.05	
Copper	<0.005	<0.005	<0.005	6			2 (1)	
Fluoride	0.68	0.65	0.76	6			1.5	0.6 - 0.8
Lead	<0.0002	<0.0002	<0.0002	6			0.005	
Manganese	0.004	<0.002	0.014	6			0.12 (0.02)	
Mercury	<0.0002	<0.0002	<0.0002	6			0.001	
Nitrate (as N) Dissolved	0.053	0.020	0.070	12			10	
Nitrite (as N) Dissolved	<0.010	<0.010	<0.010	12			1	
Selenium	0.0003	<0.0002	0.0004	6			0.05	
Strontium	0.408	0.350	0.447	6			7.0	
Total Chlorine	1.67	1.30	2.06	50			>0.5 and <3.0	>1.0 and <2.4
Uranium	<0.0005	<0.0005	0.0006	6			0.02	
Primary Organics (ug/L) **								
Benzene	<0.5	<0.5	<0.5	6			5	
Carbon Tetrachloride	<1.0	<1.0	<1.0	6			2	
Chlorobenzene	<0.50	<0.50	<0.50	6			80 (30)	
Dichlorobenzene (1,2)	<0.50	<0.50	<0.50	6				
Dichlorobenzene (1,4)	<0.5	<0.5	<0.5	6			5 (1)	
Dichloroethylene (1,1)	<3.0	<3.0	<3.0	6			14	
Ethylbenzene	<0.50	<0.50	<0.50	6			140 (1.6)	
Methylene Chloride	<0.5	<0.5	<0.5	6			50	
Tetrachloroethylene	<0.5	<0.5	<0.5	6			10	

7.14 Thorncliff Reservoir
2023

Parameter	Thorncliff						Limits	
	Mean	Min	Max	Count			*Approval or GCDWQ MAC, (AO or OG)	EPCOR
Toluene	<0.50	<0.50	<0.50	6			60 (24)	
Total Xylenes	<3	<3	<3	6			90	
Trichloroethylene	<0.50	<0.50	<0.50	6			5	
Secondary Inorganics (mg/L) * **								
Alkalinity Total	117	105	130	6				
Aluminum	0.074	0.032	0.157	6			2.9	0.1/0.2
Beryllium	<0.0002	<0.0002	<0.0002	6				
Bromide Dissolved	<0.012	<0.010	0.020	12				
Calcium	46.8	43.7	50.4	6				
Calcium Hardness	114	106	122	6				
Chloride Dissolved	6.4	5.4	8.0	12			(250)	
Cobalt	<0.0002	<0.0002	0.0002	6				
Iron	<0.005	<0.005	<0.005	6			(0.3)	0.3
Lanthanum	<Inoff	<Inoff	<Inoff	6				
Lithium	0.0029	0.0022	0.0033	6				
Magnesium	13.6	12.3	14.8	6				
Molybdenum	0.0007	0.0006	0.0010	6				
Nickel	<0.0005	<0.0005	0.0006	6				
Ortho_P	0.75	<0.02	0.94	26				
Phosphorus	0.62	<0.02	0.96	6				
Potassium	0.83	0.70	1.00	6				
Silicon	2.01	1.63	2.47	6				
Silver	<0.0002	<0.0002	<0.0002	6				
Sodium	12.7	6.9	24.1	6			(200)	
Sulphate Dissolved	70	55	100	12			(500)	
Thallium	<0.0005	<0.0005	<0.0005	6				
Tin	<0.0005	<0.0005	<0.0005	6				
Titanium	<0.0005	<0.0005	<0.0005	6				
Total Hardness	169	158	184	6				
Vanadium	<0.0005	<0.0005	<0.0005	6				
Zinc	<0.005	<0.005	<0.005	6			(5.0)	
Zirconium	<0.0010	<0.0010	<0.0010	6				
Secondary Organics (ug/L) * **								
Bromodichloromethane	<0.5	<0.5	<0.5	6				16
Bromoform	<1.0	<1.0	<1.0	6				
Chloroform	19.4	8.2	31.6	6				
Dibromochloromethane	<0.50	<0.50	<0.50	6				
Dichlorobenzene (1,3)	<0.50	<0.50	<0.50	6				

7.14 Thorncliff Reservoir
2023

Parameter	Thorncliff						Limits	
	Mean	Min	Max	Count			*Approval or GCDWQ MAC, (AO or OG)	EPCOR
Dichloroethylene, cis (1,2)	<0.50	<0.50	<0.50	6				
Dichloroethylene, trans (1,2)	<0.50	<0.50	<0.50	6				
Dichloropropane (1,2)	<0.5	<0.5	<0.5	6				
Methyl t-Butyl Ether (MTBE)	<0.5	<0.5	<0.5	6			(15)	
MIBK	<1.0	<1.0	<1.0	6				
Styrene	<0.50	<0.50	<0.50	6				
Tetrachloroethane (1,1,2,2)	<1.0	<1.0	<1.0	6				
Total Organic Carbon	1.4	0.9	2.0	6				
Total Volatile Organics (NonTHM)	<1.0	<1.0	<1.0	6				
Total Volatile Organics (Unknown)	<1.0	<1.0	<1.0	6				
Trichlorobenzene (1,2,4)	<0.5	<0.5	<0.5	6				
Trichloroethane (1,1,1)	<0.5	<0.5	<0.5	6				
Xylene (1,2)	<0.5	<0.5	<0.5	6				
Xylene (1,4)	<0.5	<0.5	<0.5	6				

TABLE EXPLANATIONS:

* Numbers with no brackets are Health Canada Guidelines for Canadian Drinking Water Quality (GCDWQ) Maximum Acceptable Concentrations (MAC) and/or a limit set out in the Alberta Environment and Parks (AEP) Operating Approval 638-04-00. Limits in brackets indicate Aesthetic Objectives or Operational Guidelines (OG) and are not Approval limits. The EPCOR limits are internal limits set by EPCOR in the Operations Program.

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*** Secondary parameters do not have health-based limits but may have aesthetic or operational objectives

7.15 Distribution System Disinfection By-products

2023

Parameter	Mean	Min	Max	Count	Limits: GCDWQ or Approval or MAC* or (AO or OG)	Limits: EPCOR single result
HAA (ug/L)					80	40
Far End of Distribution System						
Dead End	18.8	0.0	29.7	12		
Water Transfer to Regional Customers	19.1	0.0	30.9	10		
Middle of Distribution System						
Other Facilities	18.0	17.3	18.6	2		
Staff Residence	19.3	0.0	34.9	47		
	19.1	0.0	34.9	71		
NDMA (ng/L)					0.040	0.01
Far End of Distribution System						
Dead End	0.003	0.001	0.011	9		
Water Transfer to Regional Customers	0.004	0.001	0.010	4		
Middle of Distribution System						
Other Facilities	0.001	0.001	0.002	2		
Staff Residence	0.002	0.001	0.010	21		
	0.003	0.001	0.011	36		
Trihalomethanes (ug/L)					100	50
Far End of Distribution System						
Dead End	18.4	6.5	30.6	13		
Water Transfer to Regional Customers	20.1	6.1	33.1	10		
Middle of Distribution System						
Field Reservoirs	18.8	1.0	35.7	88		
Other Facilities	14.5	13.8	15.2	2		
Staff Residence	18.8	5.3	30.8	48		
	18.8	1.0	35.7	161		

7.16 Raw River Water: Physical, Inorganic, Organic and Pesticide Parameters

2023

	ROSSDALE				E.L. SMITH			
	Mean	Min	Max	Count	Mean	Min	Max	Count
Microbiologicals								
Microcystin	<0.20	<0.20	<0.20	4	<0.20	<0.20	<0.20	4
Physical								
Colour (TCU)	8.7	2.2	87.4	364	8.8	2.1	91.7	366
Conductivity (uS/cm)	342	298	390	52	337	296	391	53
FPA-Intensity (N/A)	0.55	0.25	1.44	59	0.56	0.25	1.50	59
pH (N/A)	8.1	7.7	8.4	12	8.2	7.7	8.4	13
Total Dissolved Solids (mg/L)	201	185	229	12	198	181	233	13
Total Suspended Solids	14	<3	41	12	14	<3	58	13
Turbidity (NTU)	19	1	857	364	19	1	1,150	366
Primary Inorganics (mg/L) **								
Antimony	<0.0002	<0.0002	0.0004	12	<0.0002	<0.0002	0.0004	13
Arsenic	0.0004	<0.0002	0.0007	12	0.0004	<0.0002	0.0008	13
Barium	0.066	0.054	0.080	12	0.066	0.052	0.084	13
Boron	0.010	0.007	0.014	12	0.010	0.007	0.014	13
Bromate Dissolved	<0.005	<0.005	<0.005	52	<0.005	<0.005	<0.005	53
Cadmium	<0.0002	<0.0002	<0.0002	12	<0.0002	<0.0002	<0.0002	13
Chlorate Dissolved	<0.010	<0.010	<0.010	52	<0.010	<0.010	<0.010	53
Chlorite Dissolved	<0.005	<0.005	<0.005	52	<0.005	<0.005	<0.005	53
Chromium	0.0006	<0.0002	0.0019	12	0.0007	<0.0002	0.0030	13
Copper	<0.005	<0.005	<0.005	12	<0.005	<0.005	<0.005	13
Cyanide Dissolved	<0.002	<0.002	<0.002	1	<0.002	<0.002	<0.002	1
Fluoride	0.10	0.08	0.12	52	0.10	0.08	0.14	53
Lead	0.0003	<0.0002	0.0007	12	0.0003	<0.0002	0.0008	13
Manganese	0.012	<0.002	0.034	12	0.013	0.004	0.042	13
Mercury	<0.0002	<0.000005	<0.0002	16	<0.0002	<0.000005	<0.0002	17
Nitrate (as N) Dissolved	0.048	<0.010	0.117	52	0.040	<0.010	0.080	53
Nitrite (as N) Dissolved	<0.010	<0.010	<0.010	52	<0.010	<0.010	<0.010	53
Selenium	0.0002	<0.0002	0.0003	12	0.0002	<0.0002	0.0003	13
Total Chlorine	<0	<0	<0	12	<0	<0	<0	13
Uranium	<0.0005	<0.0005	0.0006	12	<0.0005	<0.0005	0.0006	13

7.16 Raw River Water: Physical, Inorganic, Organic and Pesticide Parameters

2023

	ROSSDALE				E.L. SMITH			
	Mean	Min	Max	Count	Mean	Min	Max	Count
Primary Organics (ug/L) **								
2,4-D	<0.100	<0.050	<0.250	4	<0.100	<0.050	<0.250	4
Atrazine	<0.100	<0.100	<0.100	4	<0.100	<0.100	<0.100	4
Benzene	<0.5	<0.5	<0.5	368	<0.5	<0.5	<0.5	370
Benzo(a)pyrene	<0.01	<0.01	<0.01	4	<0.01	<0.01	<0.01	4
Bromoxynil	<0.100	<0.050	<0.250	4	<0.100	<0.050	<0.250	4
Carbon Tetrachloride	<1.0	<1.0	<1.0	364	<1.0	<1.0	<1.0	366
Chlorobenzene	<0.50	<0.50	<0.50	368	<0.50	<0.50	<0.50	370
Chlorpyrifos	<0.100	<0.100	<0.100	4	<0.100	<0.100	<0.100	4
Cyanazine	<0.100	<0.100	<0.100	4	<0.100	<0.100	<0.100	4
Diazinon	<0.100	<0.100	<0.100	4	<0.100	<0.100	<0.100	4
Dicamba	<0.200	<0.100	<0.500	4	<0.200	<0.100	<0.500	4
Dichlorobenzene (1,2)	<0.50	<0.50	<0.50	364	<0.50	<0.50	<0.50	366
Dichlorobenzene (1,4)	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	366
Dichloroethylene (1,1)	<3.00	<3.00	<3.00	364	<3.00	<3.00	<3.00	366
Dichlorophenol (2,4)	<0.30	<0.30	<0.30	4	<0.30	<0.30	<0.30	4
Diclofop-methyl	<0.10	<0.10	<0.10	4	<0.10	<0.10	<0.10	4
Dimethoate	<0.100	<0.100	<0.100	4	<0.100	<0.100	<0.100	4
Diuron	<1.0	<1.0	<1.0	4	<1.0	<1.0	<1.0	4
Ethylbenzene	<0.50	<0.50	<0.50	368	<0.50	<0.50	<0.50	370
Glyphosate	<0.20	<0.20	<0.20	4	<0.20	<0.20	<0.20	4
Malathion	<0.100	<0.100	<0.100	4	<0.100	<0.100	<0.100	4
MCPA	<0.100	<0.050	<0.250	4	<0.100	<0.050	<0.250	4
Methylene Chloride	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	366
Metolachlor	<0.100	<0.100	<0.100	4	<0.100	<0.100	<0.100	4
Metribuzin	<0.100	<0.100	<0.100	4	<0.100	<0.100	<0.100	4
NDMA (µg/L)	<0.00	<0.00	<0.00	2	<0.00	<0.00	<0.00	2
Nitrilotriacetic acid	<266.80	<0.40	<400.00	3	<200.15	<0.20	<400.00	4
Pentachlorophenol	<0.5	<0.5	<0.5	4	<0.5	<0.5	<0.5	4
Perfluorooctane sulfonic acid (PFOS)	<0.01	<0.01	<0.01	8	<0.01	<0.01	<0.01	8
Perfluorooctanoic acid (PFOA)	<0.01	<0.01	<0.01	8	<0.01	<0.01	<0.01	8
Phorate	<0.100	<0.100	<0.100	4	<0.100	<0.100	<0.100	4
Picloram	<0.200	<0.100	<0.500	4	<0.200	<0.100	<0.500	4
Simazine	<0.100	<0.100	<0.100	4	<0.100	<0.100	<0.100	4
Terbufos	<0.10	<0.10	<0.10	4	<0.10	<0.10	<0.10	4
Tetrachloroethylene	<0.5	<0.5	<0.5	368	<0.5	<0.5	<0.5	370
Toluene	<0.50	<0.50	<0.50	368	<0.50	<0.50	<0.50	370
Total Xylenes	<3	<3	<3	364	<3	<3	<3	366
Trichloroethylene	<0.50	<0.50	<0.50	368	<0.50	<0.50	<0.50	370
Trifluralin	<0.100	<0.100	<0.100	4	<0.100	<0.100	<0.100	4
Trihalomethanes	<1.0	<1.0	<1.0	364	<1.0	<1.0	<1.0	366
Radionuclides (Bq/L)								
Cesium-137	<0.08	<0.08	<0.08	2	<0.15	<0.10	<0.20	2
Gross Alpha	<0.14	<0.12	<0.15	2	<0.13	<0.12	<0.13	2
Gross Beta	<0.10	<0.08	0.12	2	<0.09	<0.05	0.12	2
Iodine-131	<0.40	<0.40	<0.40	2	<0.55	<0.50	<0.60	2
Lead-210	<0.02	<0.02	0.02	2	<0.02	<0.02	<0.02	2
Radium-226	<0.01	<0.01	<0.01	2	<0.01	<0.01	0.01	2
Strontium-90	<0.1	<0.1	<0.1	2	<0.1	<0.1	<0.1	2
Tritium	<40	<40	<40	2	<40	<40	<40	2

7.16 Raw River Water: Physical, Inorganic, Organic and Pesticide Parameters

2023

	ROSSDALE				E.L. SMITH			
	Mean	Min	Max	Count	Mean	Min	Max	Count
Secondary Inorganics (mg/L) ***								
Alkalinity Total	126	110	143	52	127	110	168	53
Alkalinity, PHP (mg CaCO3/L)	<3	<3	<3	12	<3	<3	<3	13
Aluminum	0.423	0.066	1.420	12	0.465	0.103	1.850	13
Ammonia as NH3	<0.05	<0.05	<0.05	59	<0.05	<0.05	<0.05	60
Beryllium	<0.0002	<0.0002	<0.0002	12	<0.0002	<0.0002	<0.0002	13
Bromide Dissolved	<0.010	<0.010	<0.010	52	<0.010	<0.010	<0.010	53
Calcium Dissolved	46.3	42.0	52.3	12	45.7	41.1	51.5	13
Calcium Hardness	109	88	129	52	107	86	128	53
Chloride Dissolved	1.26	0.50	4.43	52	0.63	0.40	1.72	53
Cobalt	<0.0003	<0.0002	0.0005	12	<0.0003	<0.0002	0.0006	13
Free Chlorine	<0	<0	<0	12	<0	<0	<0	13
Iron	0.386	0.049	1.200	12	0.411	0.101	1.570	13
Lanthanum	<0.001	<0.001	<0.001	12	<0.001	<0.001	<0.001	13
Lithium	0.0037	0.0029	0.0043	12	0.0036	0.0028	0.0045	13
Magnesium	14.0	12.6	15.8	12	14.0	12.4	15.7	13
Manganese Dissolved	<0.002	<0.002	0.002	12	<0.002	<0.002	0.003	13
Molybdenum	0.0008	0.0006	0.0012	12	0.0008	0.0005	0.0011	13
Nickel	0.0009	<0.0005	0.0022	12	0.0009	<0.0005	0.0024	13
Ortho_P	<0.02	<0.02	<0.02	16	<0.02	<0.02	<0.02	17
Phosphorus	0.03	<0.02	0.05	12	0.03	<0.02	0.06	13
Potassium	0.84	0.70	1.20	12	0.84	0.60	1.30	13
Silicon	2.63	1.60	5.67	12	2.75	1.45	6.40	13
Silver	<0.0002	<0.0002	<0.0002	12	<0.0002	<0.0002	<0.0002	13
Sodium	4.1	2.7	4.9	12	3.7	2.8	4.5	13
Strontium	0.428	0.381	0.482	12	0.436	0.375	0.481	13
Sulphate Dissolved	51.4	39.8	62.5	52	50.8	39.4	62.0	53
Sulphide	<0.002	<0.002	<0.002	1	<0.002	<0.002	<0.002	1
Thallium	<0.0005	<0.0005	<0.0005	12	<0.0005	<0.0005	<0.0005	13
Tin	<0.0005	<0.0005	<0.0005	12	<0.0005	<0.0005	<0.0005	13
Titanium	0.0094	0.0012	0.0353	12	0.0131	0.0020	0.0518	13
Total Hardness (mg/L CaCO3)	169	149	196	52	168	149	194	53
Total Kjeldahl Nitrogen	0.14	<0.10	0.20	12	0.12	<0.10	0.20	13
Vanadium	0.0012	<0.0005	0.0034	12	0.0013	<0.0005	0.0041	13
Zinc	<0.005	<0.005	0.008	12	<0.005	<0.005	0.007	13
Zirconium	<0.0011	<0.0010	0.0020	12	<0.0011	<0.0010	0.0020	13

Secondary Organics (ug/L) ***								
Aldicarb	<1.0	<1.0	<1.0	4	<1.0	<1.0	<1.0	4
Aldrin	<0.008	<0.008	<0.008	4	<0.008	<0.008	<0.008	4
Azinphos-methyl	<0.1	<0.1	<0.1	4	<0.1	<0.1	<0.1	4
Bromodichloromethane	<0.5	<0.5	<0.5	368	<0.5	<0.5	<0.5	370
Bromoform	<1.0	<0.5	<1.0	368	<1.0	<0.5	<1.0	370
Bromomethane	<0.5	<0.5	<0.5	4	<0.5	<0.5	<0.5	4
Carbaryl	<0.200	<0.200	<0.200	4	<0.200	<0.200	<0.200	4
Carbofuran	<0.200	<0.200	<0.200	4	<0.200	<0.200	<0.200	4
Chloroethane	<0.5	<0.5	<0.5	4	<0.5	<0.5	<0.5	4
Chloroform	<0.500	<0.500	<0.500	368	<0.500	<0.500	<0.500	370
Chloromethane	<5.0	<5.0	<5.0	4	<5.0	<5.0	<5.0	4
Dibromochloromethane	<0.50	<0.50	<0.50	368	<0.50	<0.50	<0.50	370
Dichlorobenzene (1,3)	<0.50	<0.50	<0.50	364	<0.50	<0.50	<0.50	366
Dichloroethylene, cis (1,2)	<0.50	<0.50	<0.50	364	<0.50	<0.50	<0.50	366
Dichloroethylene, trans (1,2)	<0.50	<0.50	<0.50	364	<0.50	<0.50	<0.50	366
Dichloropropane (1,2)	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	366
Dieldrin	<0.008	<0.008	<0.008	4	<0.008	<0.008	<0.008	4
Methyl t-Butyl Ether (MTBE)	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	366
MIBK	<1.0	<1.0	<1.0	364	<1.0	<1.0	<1.0	366
Parathion	<0.100	<0.100	<0.100	4	<0.100	<0.100	<0.100	4
Perfluorobutanoic acid (PFBA)	<0.8	<0.8	<0.8	8	<0.8	<0.8	<0.8	8
Perfluoroheptanoic acid (PFHpA)	<0.02	<0.02	<0.02	8	<0.02	<0.02	<0.02	8
Perfluorohexane sulfonic acid (PFHxS)	<0.02	<0.02	<0.02	8	<0.02	<0.02	<0.02	8
Perfluorohexanoic acid (PFHxA)	<0.02	<0.02	<0.02	8	<0.02	<0.02	<0.02	8
Perfluorononanoic acid (PFNA)	<0.02	<0.02	<0.02	8	<0.02	<0.02	<0.02	8
Perfluoropentanoic acid (PFPeA)	<0.02	<0.02	<0.02	8	<0.02	<0.02	<0.02	8
Styrene	<0.50	<0.50	<0.50	368	<0.50	<0.50	<0.50	370
Tetrachloroethane (1,1,2,2)	<1.0	<1.0	<1.0	364	<1.0	<1.0	<1.0	366
Total Organic Carbon	2.1	1.0	6.8	52	2.0	0.9	6.8	53
Total Volatile Organics (NonTHM)	<1.0	<1.0	<1.0	364	<1.0	<1.0	<1.0	366
Total Volatile Organics (Unknown)	<1.0	<1.0	<1.0	364	<1.0	<1.0	<1.0	366
Triallate	<0.100	<0.100	<0.100	4	<0.100	<0.100	<0.100	4
Trichloroacetic acid	<1	<1	<1	3	<1	<1	<1	3
Trichlorobenzene (1,2,4)	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	366
Trichloroethane (1,1,1)	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	366
Xylene (1,2)	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	366
Xylene (1,4)	<0.5	<0.5	<0.5	364	<0.5	<0.5	<0.5	366

TABLE EXPLANATIONS:

** Primary parameters are those that have health-based limits (MACs) according the AEP Operating Approval 638-04-00

*** Secondary parameters do not have health-based limits but may have aesthetic or operational objectives

7. 17 EPCOR Lead Management Program

EPCOR has had a proactive lead management program in place since 2008, which aims to reduce exposures to lead in drinking water. For many years a major focus of the lead management program was dealing with lead service lines. There are approximately 4,000 homes with a lead service line in Edmonton—on either the EPCOR side or the homeowner side, or both. These are homes located in older neighbourhoods that were typically built before 1950. They represent about 1.4% of the approximately 274,000 homes in the City supplied with EPCOR water.

On March 20, 2023 the major change in EPCOR's Lead Management Program was the start of full-scale orthophosphate dosing, as a lead inhibitor, from our two water treatment plants. Exposure to lead from drinking water sources was a key risk identified within our Drinking Water Safety Plan. Orthophosphate creates a protective coating on the inside of lead pipes and plumbing that prevents lead from leaching into drinking water, and thus reducing the risk to customers who may otherwise have been exposed to lead in drinking water. Orthophosphate is commonly used by water utilities across North America and the United Kingdom. It has no impact on the taste or odour of drinking water. It is naturally present in food and is a common additive to beverages and considered to be a safe additive.

Orthophosphate addition is the final stage of EPCOR's Lead Mitigation Strategy and it will ensure that lead levels remain low in homes/businesses with lead service lines. Ongoing customer communication and monitoring for lead at taps is required. EPCOR will begin to develop a monitoring plan that will include lead at the tap in 2024 and beyond to ensure the effectiveness orthophosphate within our Lead Mitigation Strategy.

EPCOR will also continue to work with, educate, and support customer with lead service line, as we always have, since the start of our lead management program.

7.18 REPORTABLE DETECTION LIMITS

Analyte	RDL	Unit
Alkalinity phenolphthalein	3	mg CaCO3/L
Alkalinity Total	6	mg CaCO3/L
Aluminum	0.005	mg/L
Ammonia as N	0.05	mg/L
Ammonia as NH3	0.05	mg/L
Antimony	0.0002	mg/L
Arsenic	0.0002	mg/L
Barium	0.002	mg/L
Benzene	0.5	µg/L
Beryllium	0.0002	mg/L
Boron	0.005	mg/L
Bromate Dissolved	0.005	mg/L
Bromide Dissolved	0.01	mg/L
Bromodichloromethane	0.5	µg/L
Bromoform	1.0	µg/L
Cadmium	0.0002	mg/L
Calcium	0.1	mg/L
Calcium Dissolved	0.1	mg/L
Calcium Hardness	2	mg/L CaCO3
Carbon Tetrachloride	1.0	µg/L
Cellular ATP	0.1	pg/mL
Chlorate Dissolved	0.01	mg/L
Chloride Dissolved	0.1	mg/L
Chlorite Dissolved	0.005	mg/L
Chlorobenzene	0.5	µg/L
Chloroform	0.5	µg/L
Chromium	0.0002	mg/L
Cobalt	0.0002	mg/L
Coliforms, total	1.0	MPN/100 mL
Colour	0.5	TCU
Conductivity	1	µS/cm
Copper	0.005	mg/L
Copper Dissolved	0.005	mg/L
Dibromochloromethane	0.5	µg/L
Dichlorobenzene (1,2)	0.5	µg/L
Dichlorobenzene (1,3)	0.5	µg/L
Dichlorobenzene (1,4)	0.5	µg/L
Dichloroethylene (1,1)	3.0	µg/L
Dichloroethylene, cis (1,2)	0.5	µg/L
Dichloroethylene, trans (1,2)	0.5	µg/L
Dichloropropane (1,2)	0.5	µg/L
E. coli	1.0	MPN/100 mL
Ethylbenzene	0.5	µg/L
Fluoride	0.05	mg/L
Free Chlorine	0.07	mg/L
Iron	0.005	mg/L
Lanthanum	0.001	mg/L
Lead	0.0002	mg/L
Lithium	0.0002	mg/L
Magnesium	0.1	mg/L

7.18 REPORTABLE DETECTION LIMITS

Analyte	RDL	Unit
Manganese	0.002	mg/L
Manganese Dissolved	0.002	mg/L
Mercury	0.0002	mg/L
Methyl t-Butyl Ether (MTBE)	0.5	µg/L
Methylene Chloride	0.5	µg/L
MIBK	1.0	µg/L
Molybdenum	0.0002	mg/L
Nickel	0.0005	mg/L
Nitrate (as N) Dissolved	0.01	mg/L
Nitrite (as N) Dissolved	0.01	mg/L
Ortho_P	0.02	mg/L as P
Phosphorus	0.02	mg/L
Potassium	0.1	mg/L
Selenium	0.0002	mg/L
Silicon	0.05	mg/L
Silver	0.0002	mg/L
Sodium	0.1	mg/L
Strontium	0.002	mg/L
Styrene	0.5	µg/L
Sulphate Dissolved	0.2	mg/L
Tetrachloroethane (1,1,2,2)	1.0	µg/L
Tetrachloroethylene	0.5	µg/L
Thallium	0.0005	mg/L
Tin	0.0005	mg/L
Titanium	0.0005	mg/L
Toluene	0.5	µg/L
Total Dissolved Solids	25	mg/L
Total Hardness	2	mg/L CaCO3
Total Kjeldahl Nitrogen	0.1	mg/L N
Total Organic Carbon	0.6	mg/L
Total Suspended Solids	2.5	mg/L
Total Volatile Organics (NonTHM)	1.0	µg/L
Total Volatile Organics (Unknown)	1.0	µg/L
Total Xylenes	2.5	µg/L
Trichlorobenzene (1,2,4)	0.5	µg/L
Trichloroethane (1,1,1)	0.5	µg/L
Trichloroethylene	0.5	µg/L
Trihalomethanes	1.0	µg/L
Turbidity	0.04	NTU
Uranium	0.0005	mg/L
UV 254 % Transmittance	99.8	%T/cm
Vanadium	0.0005	mg/L
Xylene (1,2)	0.5	µg/L
Xylene (1,4)	0.5	µg/L
Zinc	0.005	mg/L
Zirconium	0.001	mg/L
Zirconium Dissolved	0.001	mg/L

7.18 REPORTABLE DETECTION LIMITS

Analyte	RDL	Unit
Contract Lab Analysis		
Bromochloroacetic acid	1.00	ug/L
Cryptosporidium	2.1	oocysts/100L
Dibromoacetic acid	1.00	ug/L
Dichloroacetic acid	1.00	ug/L
Giardia	2.1	cysts/100L
Haloacetic Acids, total (HAA5)	5.00	ug/L
Monobromoacetic acid	1.00	ug/L
Monochloroacetic acid	1.00	ug/L
NDMA	0.00234	µg/L
Trichloroacetic acid	1.00	ug/L

7.19 EXPLANATION OF NOTATIONS USED

Concentrations are reported as mg/L unless otherwise indicated.
Alkalinity and Hardness (Ca and Total) are reported as mg $CaCO_3$/L

%T	=	% Transmission
- ve	=	Absent
+ ve	=	Present
µg/L	=	Micrograms per litre (1 µg/L = 0.001 mg/L)
µS/cm	=	Microsiemens per centimeter (unit of conductivity)
2/Y	=	Twice per Year
AO	=	Aesthetic Objective
Bq/L	=	Becquerel(s) per litre (unit of radionuclide concentration)
CCPP	=	Calcium Carbonate Precipitation Potential
CFU	=	Colony Forming Units
Comm	=	Commercial Laboratories
D	=	Daily
EWSI	=	EPCOR Water Services Inc.
FPA	=	Flavour Profile Analysis
GCDWQ	=	Guidelines for Canadian Drinking Water Quality
GM	=	Geometric Mean
HPC	=	Heterotrophic Plate Count
inoff	=	Inoffensive (no objectionable odour)
M	=	Monthly
MAC	=	Maximum Acceptable Concentration
MDL	=	Method Detection Limit
N/A	=	Not Available
ND	=	Not Detected
NTU	=	Nephelometric Turbidity Units
PA	=	Presence/Absence Testing
PBR	=	Performance Based Rates
PHP	=	phenolphthalein
PLPH	=	Provincial Laboratory of Public Health
ppb	=	Parts Per Billion
ppm	=	Parts Per Million
Q	=	Quarterly
QA	=	Quality Assurance
QC	=	Quality Control
RDL	=	Reportable Detection Limit
TCU	=	True Colour Units
TDS	=	Total Dissolved Solids
TOC	=	Total Organic Carbon
WL	=	Water Laboratory
WTP	=	Water Treatment Plant