

Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

***MONITORING AND RESEARCH
DEPARTMENT***

REPORT NO. 23-44

***THORNTON COMPOSITE RESERVOIR
GROUNDWATER MONITORING REPORT
THIRD QUARTER 2023***

December 2023

Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

100 EAST ERIE STREET CHICAGO, ILLINOIS 60611-3154 312.751.5190 f: 312.751.5194

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Edward W. Podczerwinski, P.E.

Director of Monitoring and Research
podczerwinski@mwr.org

November 28, 2023

Mr. Michael Summers
Groundwater Section Manager
Bureau of Water/Public Water Supplies
Illinois Environmental Protection Agency
1021 North Grand Avenue East
Springfield, IL 62794

Dear Mr. Summers:

Subject: Transmittal of the Report “Thornton Composite Reservoir Groundwater Monitoring Report Third Quarter 2023”

Please find attached the report entitled “Thornton Composite Reservoir Groundwater Monitoring Report Third Quarter 2023” transmitted electronically. The report is prepared for transmittal to the Illinois Environmental Protection Agency (IEPA) in accordance with the Thornton Composite Reservoir (TCR) Groundwater Monitoring Plan. Also attached is the Excel[®] spreadsheet of the TCR raw data as required by the IEPA.

If you have any questions or would like to have additional information, please contact Mr. Benjamin Morgan at (708) 588-3743 or MorganB@mwr.org.

Very truly yours,

Albert E. Cox, Ph.D.
Environmental Monitoring and Research Manager
Monitoring and Research Department

AC:BM:lf

Attachments

cc: Mr. M. Brown, IEPA
Mr. E. Podczerwinski

Metropolitan Water Reclamation District of Greater Chicago
100 East Erie Street Chicago, Illinois 60611-2803 (312) 751-5600

**THORNTON COMPOSITE RESERVOIR
GROUNDWATER MONITORING REPORT
THIRD QUARTER 2023**

By

**Benjamin Morgan
Environmental Soil Scientist**

**Guanglong Tian
Principal Environmental Scientist**

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**Heng Zhang
Assistant Director of Monitoring and Research
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LIST OF ABBREVIATIONS

Abbreviation	Definition
Ag	silver
B	boron
Be	beryllium
CCD	Chicago City Datum
CFU	colony forming units
Co	cobalt
Cr	chromium
CSF	combined sewer flow
Cu	copper
District	Metropolitan Water Reclamation District of Greater Chicago
EC	electrical conductivity
FC	fecal coliform
ft	feet
GMP	Groundwater Monitoring Plan
GPS	Groundwater Protection System
L	liter
m	meter
mg	milligram
Mn	manganese
mS	millisiemens
N	nitrogen
Se	selenium
TCR	Thornton Composite Reservoir
TDS	total dissolved solids
TOC	total organic carbon
USEPA	United States Environmental Protection Agency
Zn	zinc
mL	milliliter

ACKNOWLEDGMENTS

This report for the Thornton Composite Reservoir (TCR) Groundwater Monitoring was generated by the Monitoring and Research Department. All samples were collected by A3 Environmental Consultants (contractor) under TCR Contract 23-102-11. Analyses were performed by the Analytical Laboratories Division and the Analytical Microbiology Laboratory of the Metropolitan Water Reclamation District of Greater Chicago (District). Special thanks are due to Ms. Laura Franklin for typing and formatting this report.

DISCLAIMER

Mention of proprietary equipment and chemicals in this report does not constitute endorsement by the District.

INTRODUCTION

A Groundwater Protection System (GPS) was constructed for the Thornton Composite Reservoir (TCR) to protect against the exfiltration of combined sewer flow (CSF) into the surrounding dolomite aquifers. The CSF and minimal amounts of stormwater are stored in the reservoir during and after large storm events. To monitor the performance of the GPS, a network of monitoring wells located outside the perimeter of the GPS is being monitored as discussed in the Revised Groundwater Monitoring Plan (GMP) (Black & Veatch, 2016). As explained in the Revised GMP, one sample of reservoir water, one from the Main Quarry Sump, and one from each of the seven wells are collected annually and analyzed for the Illinois Administrative Code Title 35 Part 620 Class I (Class I) groundwater constituents. In addition, following a reservoir fill event or during a routine quarterly event, groundwater is sampled from the seven wells and the Main Quarry Sump and tested for a targeted list of parameters that are more likely to be detected in CSF water.

The monitoring well system consists of one deep well, TB-124, which monitors the underlying Galena Aquifer, and six vertical Westbay multi-level monitoring wells, TB-118, TB-119, TB-120, TB-121, TB-122, and TB-123, which monitor the Silurian dolomite aquifers. As discussed in the Revised GMP, following a reservoir fill event, sampling is required every two weeks while the water in the reservoir remains above an elevation of -280 feet Chicago City Datum (CCD). Groundwater is sampled from each well at the first sample interval port immediately below the reservoir water elevation. Each of the multilevel monitoring wells is capable of monitoring four distinct 20-foot intervals in the Silurian dolomite aquifer.

The locations of the monitoring wells, the quarry sump, the TCR, and the GPS are presented in [Figure 1](#). The Main Quarry Sump is located beyond the south boundary of the GPS and is not a component of the TCR but is an integral part of the Hanson Material Services mining quarry to the south of the TCR. This sump facilitates mining operations by minimizing the water level at the bottom of the quarry. It is possible that the bottom of this sump could extend beyond the lowest depth of the TCR (-297.5 feet CCD). The sump contains mainly groundwater and small quantities of surface runoff, and it is sampled quarterly and during fill events, along with the wells, to evaluate the potential migration of contaminants from the TCR to the sump.

[Table 1](#) lists the characteristics of all wells at the TCR site (well location coordinates, elevations, and depths, and the sampling port interval elevations).

Prior to the TCR becoming operational in November 2015, eight (8) sampling events were conducted on a quarterly basis for two years (May 2012 through March 2014) to provide background data on the existing groundwater quality. In order to evaluate the effectiveness of the grout curtain and the GPS, the Revised GMP (2016) presents the analysis of data for all samples collected during the background monitoring period and provides a baseline for comparison with routine monitoring data. Changes over time in groundwater calcium and magnesium concentrations would also be useful in tracking the occurrence of infiltration/exfiltration. Groundwater analytical data routinely generated for the monitoring wells, reservoir, and sump will also be compared with the Class I Groundwater Standards (Illinois Pollution Control Board,

FIGURE 1: MONITORING WELL AND MAIN QUARRY SUMP LOCATIONS

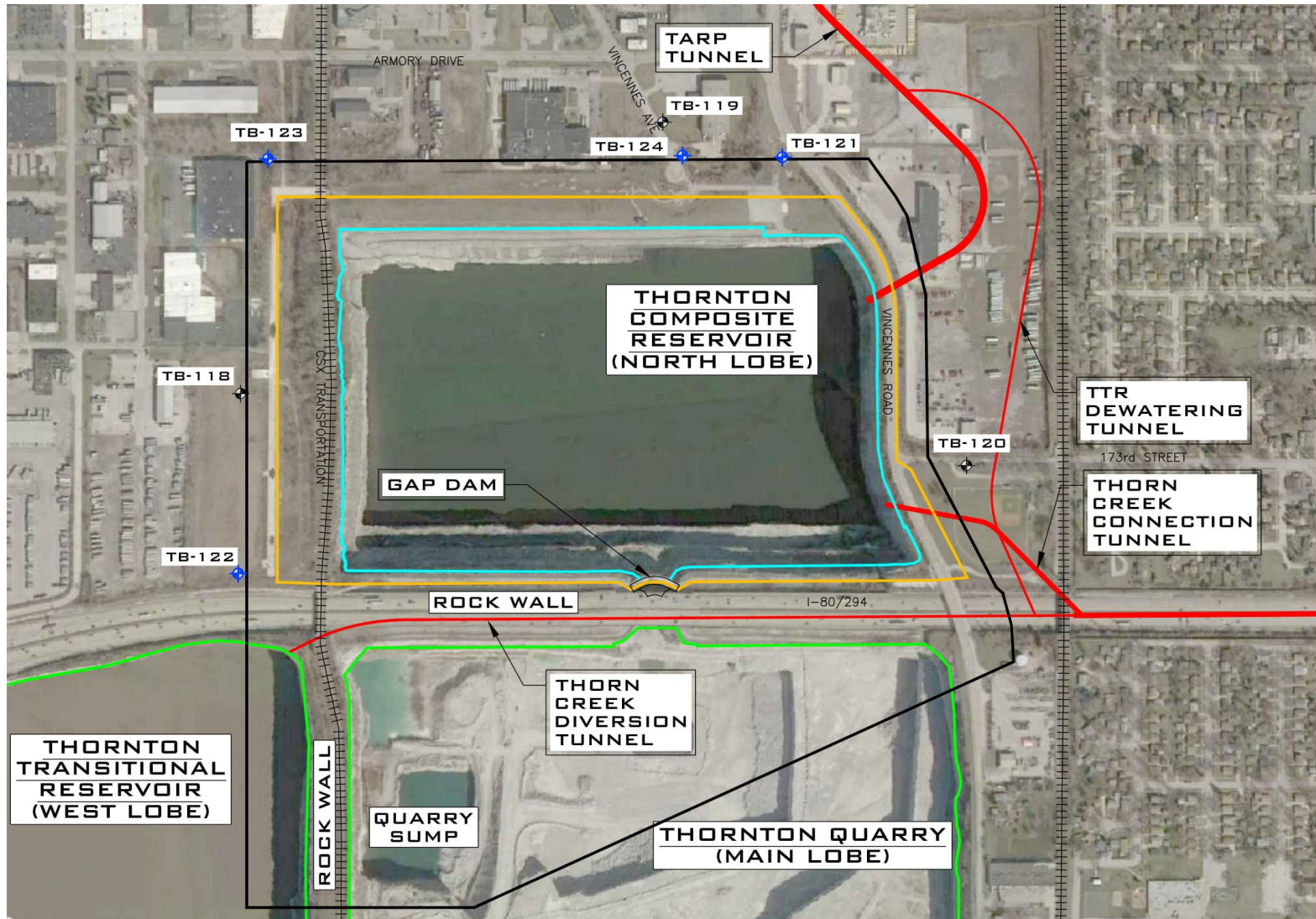


TABLE 1: CHARACTERISTICS OF MONITORING WELLS TB-118 THROUGH TB-124 AT THE THORNTON COMPOSITE RESERVOIR SITE

Well ID	Coordinates ¹		Ground Surface Elevation (ft, CCD ²)	Top of Riser Elevation (ft, CCD)	Depth of Well (ft)	Sampling Port Interval (ft, CCD)			
	Northing (ft)	Easting (ft)				Interval 1	Interval 2	Interval 3	Interval 4
TB-118	1,791,110.38	693,560.44	38.5	41.5	532	-85 to -105	-212 to -232	-283 to -303	-392 to -412
TB-119	1,792,316.63	695,509.39	27.9	29.5	529	-85 to -105	-212 to -232	-283 to -303	-392 to -412
TB-120	1,790,782.31	696,888.93	40.0	42.1	540	-86 to -106	-213 to -233	-284 to -304	-393 to -413
TB-121	1,792,193.10	696,044.98	29.4	30.4	461	-84 to -104	-211 to -231	-282 to -302	-391 to -411
TB-122	1,790,288.61	693,549.38	48.8	51.7	480	-85 to -105	-212 to -232	-283 to -303	-392 to -412
TB-123	1,792,185.60	693,685.69	28.9	31.8	460	-84 to -104	-211 to -231	-282 to -302	-391 to -411
TB-124 ³	1,792,200.77	695,591.56	29.6	29.2	728			-663 to -698	

¹Illinois State Plane Coordinate System (NAD 1927).

²Chicago City Datum (CCD).

³TB-124 is a conventional well screened from -663 to -698 ft CCD. Samples are taken at approximately 650 ft below ground surface.

Illinois Environmental Protection Agency, 2013) to evaluate any exceedances in groundwater standards.

There were two fill events during the third quarter of 2023 (the third and fourth events of 2023). The first fill event of the quarter (the third event of 2023) began on July 3 and lasted until August 2, requiring three biweekly samplings. The second fill event of the quarter (the fourth event of 2023) began on September 18 and lasted until September 26, requiring a single sampling.

This report presents field activities, observations, and analytical data for surface and groundwater monitoring samples taken at the Main Quarry Sump and at all monitoring wells from July 5 – September 19, 2023.

FIELD ACTIVITIES

For this report period, fill event samples were collected at the Main Quarry Sump, the deep well, and at sampling port interval 3 of all multilevel wells during the July 5–7, 2023, and July 19–21, 2023 samplings. Due to a malfunction, the sampling equipment was sent to the manufacturer for repairs in August 2023. Therefore, samples were collected only at the Main Quarry Sump and a partial set of multilevel wells at sampling port interval 3 during the August 2–3, 2023 sampling, and at the Main Quarry Sump and the deep well using a bailer at the September 19, 2023 sampling. Sample collection dates are shown in Table 2.

Using an Oakton PC450 pH/conductivity/temperature meter, the pH, electrical conductivity (EC), and temperature of each sample were measured and recorded immediately after collection.

Prior to sampling wells, hydrostatic pressure was measured at Port 3 of each multilevel well or at 650 feet below ground surface in the deep well to calculate the groundwater elevation. Table 3 lists the elevations at Port 3 of multilevel wells sampled during the fill event samplings in July and August prior to the equipment malfunction and the corresponding groundwater elevations.

All samples were packed in ice and shipped to the Metropolitan Water Reclamation District of Greater Chicago's (District's) Analytical Laboratories Division for the analysis of selected inorganic constituents (Class I Groundwater Standards) in accordance with the Revised GMP. Additional aliquots were also prepared in the field and shipped in ice to the District's Analytical Microbiology Laboratory for fecal coliform (FC) analysis.

TABLE 2: DEVICES AND CORRESPONDING DATES OF SAMPLING DURING FILL
EVENT SAMPLING IN JULY, AUGUST, AND SEPTEMBER 2023

Date of Sampling	Device/Structure Sampled
-----Fill Event #3, Sampling #1-----	
07/05/23	TB-119, TB-120, TB-121
07/06/23	TB-118, TB-122, TB-123
07/07/23	TB-124, Main Quarry Sump, Main Quarry Sump Duplicate
-----Fill Event #3, Sampling #2-----	
07/19/23	TB-119, TB-120, TB-121
07/20/23	TB-118, TB-118 Duplicate, TB-122, TB-123
07/21/23	TB-124, Main Quarry Sump
-----Fill Event #3, Sampling #3-----	
08/02/23	TB-119, TB-120, TB-121
08/03/23	TB-118, TB-122, Main Quarry Sump
-----Fill Event #4-----	
09/19/23	TB-124, Main Quarry Sump, Main Quarry Sump Duplicate

TABLE 3: SUMMARY OF ELEVATIONS AT SAMPLING PORT 3 OF EACH WELL AND CORRESPONDING GROUNDWATER ELEVATIONS DURING FILL EVENT SAMPLING IN JULY, AUGUST, AND SEPTEMBER 2023

Sample Date	Well ID	Sampling Port Elevation	Groundwater Elevation
----- (ft CCD ¹) -----			
----- Fill Event #3, Sampling #1 -----			
07/06/23	TB-118	-289	-84
07/05/23	TB-119	-289	-164
07/05/23	TB-120	-290	-217
07/05/23	TB-121	-288	-169
07/06/23	TB-122	-288	-163
07/06/23	TB-123	-288	-49
07/07/23	TB-124 ²	NA ³	-474
----- Fill Event #3, Sampling #2 -----			
07/20/23	TB-118	-289	-84
07/19/23	TB-119	-289	-164
07/19/23	TB-120	-290	-207
07/19/23	TB-121	-288	-168
07/20/23	TB-122	-288	-160
07/20/23	TB-123	-288	-47
07/21/23	TB-124 ²	NA	-421
----- Fill Event #3, Sampling #3 -----			
08/03/23	TB-118	-289	-85
08/02/23	TB-119	-289	-164
08/02/23	TB-120	-290	-217
08/02/23	TB-121	-288	-169
08/03/23	TB-122	-288	-161
----- Fill Event #4 -----			
09/19/23	TB-124 ²	NA	ND ⁴

¹Chicago City Datum.

²TB-124 is a conventional well screened from -663 to -698 ft CCD. Samples were taken at approximately 650 ft below ground surface during the fill event samplings in July and September 2023.

³Not applicable.

⁴No data available. Pressure readings could not be made due to equipment malfunction.

ANALYTICAL RESULTS

Table 4 lists the analytical methods used by the laboratory for measured parameters. Analytical results were reviewed to identify any analytes that exceeded the Class I groundwater standards.

The analytical data for all well samples and the Main Quarry Sump sample collected from July 5–7 for the first sampling of fill event monitoring in July are presented in Table 5. There were a few exceedances of the Class I groundwater standards, including pH, total dissolved solids (TDS), chloride, sulfate, and boron, as indicated in bold font in Table 5. Of these parameters, only pH exceeded the background maximum. Fecal coliform bacteria were detected in well TB-123, the Main Quarry Sump, and the Main Quarry Sump duplicate sample at 3, 35, and 40 CFU/100 mL, respectively (Table 5).

The analytical data for all well samples and the Main Quarry Sump sample collected from July 19–21 for the second sampling of fill event monitoring in July are presented in Table 6. There were a few exceedances of the Class I groundwater standards, including pH, TDS, chloride, sulfate, and boron, as indicated in bold font in Table 6. Of these parameters, only pH exceeded the background maximum. Fecal coliform bacteria were detected in wells TB-119, TB-121, TB-123, and the Main Quarry Sump at 7, 1, 35, and 2 CFU/100 mL, respectively (Table 6).

The analytical data for well samples and the Main Quarry Sump sample collected from August 2–3 for the fill event monitoring in August are presented in Table 7. There were a few exceedances of the Class I groundwater standards, including TDS, chloride, sulfate, and boron, as indicated in bold font in Table 7. Of these parameters, none exceeded the background maximum. Fecal coliform bacteria were detected in wells TB-118, TB-120, TB-121, TB-122 and the Main Quarry Sump at 12, 1, 5, 56, and 5 CFU/100 mL, respectively (Table 7).

The analytical data for the well and Main Quarry Sump samples collected on September 19 for the fill event monitoring in September are presented in Table 8. There were a few exceedances of the Class I groundwater standards, including pH, TDS, chloride, and sulfate, as indicated in bold font in Table 8. Of these parameters, only pH exceeded the background maximum. Fecal coliform bacteria were detected in the Main Quarry Sump and Main Quarry Sump duplicate samples at 56 and 65 CFU/100 mL, respectively (Table 8).

TABLE 4: ANALYTICAL METHODS USED FOR REQUIRED PARAMETERS

Parameters	Analytical Method
Ammonia (as N)	USEPA 350.1
Boron and Target Analyte List metals except calcium, magnesium, and mercury	USEPA 200.8
Chloride, sulfate	USEPA 300.0
Fecal coliform	SM 9222D
Hardness (as calcium and magnesium)	SM 3120B, SM 2340B
Mercury	SM 3112B
Phenols	USEPA 420.4
Total dissolved solids	SM 2540C
Total organic carbon	SM 5310B

TABLE 5: ANALYSIS OF GROUNDWATER SAMPLED FROM MONITORING WELLS TB-118 THROUGH TB-124 AND THE MAIN QUARRY SUMP AT THE THORNTON COMPOSITE RESERVOIR SITE FOR THE FIRST SAMPLING OF THE FILL EVENT IN JULY 2023

Parameter	Unit	Part 620 Groundwater			Well								
		Standard	Background	Lab RL ¹	TB-118	TB-119	TB-120	TB-121	TB-122	TB-123	TB-124	Sump	Sump-Dup ²
pH		6.5–9.0	8.4	NL ³	7.6	7.2	7.4	7.4	7.5	7.4	11.7	7.5	7.5
EC	mS/m	NL	415	NL	163	154	132	148	124	84	179	132	132
TDS	mg/L	1,200	2,960	25	1,328	572	652	1,086	876	584	1,274	1,162	1,226
TOC	"	NL	1	1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	12	<5.0	<5.0
Chloride	"	200	1,230	1	416	90	134	322	265	67	237	199	198
Sulfate	"	400	890	1	199	120	85	188	100	128	446	482	481
Ammonia as N	"	NL	ND ⁴	0.30	0.62	0.59	0.42	0.65	0.64	0.72	1.77	<0.30	<0.30
Total Phenol	"	0.1	0.06	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.016	<0.005	<0.005
Fecal Coliform	CFU/100 mL	NL	<1	1	<1	<1	<1	<1	<1	3	<1	35	40
Ag	mg/L	0.05	0.003	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
B	"	2	3.8	0.005	0.878	0.946	0.959	1.01	2.61	1.79	0.672	0.344	0.338
Be	"	0.004	0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Co	"	1	0.035	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.006	0.007
Cr	"	0.1	86.4	0.004	0.014	0.005	0.004	<0.004	0.007	<0.004	0.009	<0.004	<0.004
Cu	"	0.65	0.004	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Mn	"	0.15	0.183	0.002	0.011	0.006	0.004	0.003	0.006	0.002	0.003	0.005	0.007
Se	"	0.05	0.008	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
V	"	0.049	ND	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Zn	"	5	10	0.010	0.032	0.041	0.048	0.030	0.012	<0.010	0.637	<0.010	<0.010
Ca	"	NL	276	0.5	168	93.7	89.3	136	75.5	79.7	62.5	119	121
Mg	"	NL	153	0.5	82.8	47.8	45.1	70.5	39.0	42.3	2.74	93.8	94.1

¹Laboratory reporting limit.

²Duplicate sample.

³No existing limit.

⁴Not determined.

TABLE 6: ANALYSIS OF GROUNDWATER SAMPLED FROM MONITORING WELLS TB-118 THROUGH TB-124 AND THE MAIN QUARRY SUMP AT THE THORNTON COMPOSITE RESERVOIR SITE FOR THE SECOND SAMPLING OF THE FILL EVENT IN JULY 2023

Parameter	Unit	Part 620 Groundwater			Well								
		Standard	Background	Lab RL ¹	TB-118	TB-118-D ²	TB-119	TB-120	TB-121	TB-122	TB-123	TB-124	Sump
pH		6.5–9.0	8.4	NL ³	7.4	7.4	7.3	7.3	7.2	7.5	7.6	11.7	7.6
EC	mS/m	NL	415	NL	117	117	93	105	160	142	94	186	133
TDS	mg/L	1,200	2,960	25	1,532	1,546	626	694	1,138	976	632	1,256	1,254
TOC	"	NL	1	1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	13	<5.0
Chloride	"	200	1,230	1	516	521	87	131	313	271	66	229	229
Sulfate	"	400	890	1	206	207	114	82	180	100	124	420	431
Ammonia as N	"	NL	ND ⁴	0.30	1.47	1.29	0.60	0.45	0.63	0.62	1.56	1.68	<0.30
Total Phenol	"	0.1	0.06	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.015	<0.005
Fecal Coliform	CFU/100 mL	NL	<1	1	<1	<1	7	<1	1	<1	35	<1	2
Ag	mg/L	0.05	0.003	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
B	"	2	3.8	0.005	0.746	0.712	0.992	1.12	1.03	2.50	1.89	0.708	0.262
Be	"	0.004	0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Co	"	1	0.035	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003
Cr	"	0.1	86.4	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Cu	"	0.65	0.004	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	<0.002
Mn	"	0.15	0.183	0.002	0.004	0.005	0.009	0.004	0.003	0.003	<0.002	<0.002	0.007
Se	"	0.05	0.008	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
V	"	0.049	ND	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Zn	"	5	10	0.010	0.016	<0.010	0.021	0.025	0.015	0.018	<0.010	1.280	<0.010
Ca	"	NL	276	0.5	190	190	93.7	89.9	137	75.2	78.0	59.4	119
Mg	"	NL	153	0.5	90.2	89.7	48.2	45.7	71.1	39.4	42.4	<0.50	90.4

¹Laboratory reporting limit.

²Duplicate sample.

³No existing limit.

⁴Not determined.

TABLE 7: ANALYSIS OF GROUNDWATER SAMPLED FROM MONITORING WELLS TB-118 THROUGH TB-124 AND THE MAIN QUARRY SUMP AT THE THORNTON COMPOSITE RESERVOIR SITE FOR FILL EVENT SAMPLING IN AUGUST 2023

Parameter	Unit	Part 620 Groundwater Standard	Maximum Background	Lab RL ²	Well ¹							Sump
					TB-118	TB-119	TB-120	TB-121	TB-122	TB-123	TB-124	
pH		6.5–9.0	8.4	NL ³	7.2	7.2	7.6	7.0	7.1	NC ⁴	NC	7.9
EC	mS/m	NL	415	NL	96	100	118	171	180	NC	NC	173
TDS	mg/L	1,200	2,960	25	1,572	632	664	1,116	944	NC	NC	1,344
TOC	"	NL	1	5	<5.0	<5.0	<5.0	<5.0	<5.0	NC	NC	<5.0
Chloride	"	200	1,230	1	543	88	135	317	274	NC	NC	232
Sulfate	"	400	890	1	217	116	86	188	102	NC	NC	463
Ammonia as N	"	NL	ND ⁵	0.3	0.53	0.53	0.38	0.62	0.52	NC	NC	<0.30
Total Phenol	"	0.1	0.06	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	NC	NC	<0.005
Fecal Coliform	CFU/100 mL	NL	<1	1	12	<1	1	5	56	NC	NC	5
Ag	mg/L	0.05	0.003	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NC	NC	<0.004
B	"	2	3.8	0.005	0.622	0.899	1.01	0.385	2.42	NC	NC	0.338
Be	"	0.004	0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	NC	NC	<0.002
Co	"	1	0.035	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	NC	NC	0.005
Cr	"	0.1	86.4	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NC	NC	<0.004
Cu	"	0.65	0.004	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	NC	NC	<0.002
Mn	"	0.15	0.183	0.002	0.005	0.006	0.004	0.042	0.003	NC	NC	0.004
Se	"	0.05	0.008	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	NC	NC	<0.004
V	"	0.049	ND	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	NC	NC	<0.002
Zn	"	5	10	0.010	0.040	<0.010	<0.010	1.42	<0.010	NC	NC	<0.010
Ca	"	NL	276	0.5	172	93.9	89.8	78.7	72.7	NC	NC	126
Mg	"	NL	153	0.5	83.9	48.3	45.6	32.9	37.8	NC	NC	96.6

¹A well duplicate sample was inadvertently not collected.

²Laboratory reporting limit.

³No existing limit.

⁴Not collected due to equipment malfunction.

⁵Not determined.

TABLE 8: ANALYSIS OF GROUNDWATER SAMPLED FROM MONITORING WELLS TB-118 THROUGH TB-124 AND THE MAIN QUARRY SUMP AT THE THORNTON COMPOSITE RESERVOIR SITE FOR FILL EVENT SAMPLING IN SEPTEMBER 2023

Parameter	Unit	Part 620 Groundwater			Well									
		Standard	Background	Lab RL ¹	TB-118	TB-119	TB-120	TB-121	TB-122	TB-123	TB-124	Sump	Sump-Dup ²	
pH		6.5–9.0	8.4	NL ³	NC ⁴	NC	NC	NC	NC	NC	NC	11.6	7.2	7.2
EC	mS/m	NL	415	NL	NC	NC	NC	NC	NC	NC	NC	141	152	152
TDS	mg/L	1,200	2,960	25	NC	NC	NC	NC	NC	NC	1,234	1,180	1,196	
TOC	"	NL	1	1	NC	NC	NC	NC	NC	NC	NC	19	<5.0	<5.0
Chloride	"	200	1,230	1	NC	NC	NC	NC	NC	NC	NC	233	201	198
Sulfate	"	400	890	1	NC	NC	NC	NC	NC	NC	NC	429	470	462
Ammonia as N	"	NL	ND ⁵	0.30	NC	NC	NC	NC	NC	NC	NC	1.78	<0.30	<0.30
Total Phenol	"	0.1	0.06	0.005	NC	NC	NC	NC	NC	NC	NC	0.018	<0.005	<0.005
Fecal Coliform	CFU/100 mL	NL	<1	1	NC	NC	NC	NC	NC	NC	NC	<1	56	65
Ag	mg/L	0.05	0.003	0.004	NC	NC	NC	NC	NC	NC	NC	<0.004	<0.004	<0.004
B	"	2	3.8	0.005	NC	NC	NC	NC	NC	NC	NC	0.657	0.384	0.379
Be	"	0.004	0.002	0.002	NC	NC	NC	NC	NC	NC	NC	<0.002	<0.002	<0.002
Co	"	1	0.035	0.002	NC	NC	NC	NC	NC	NC	NC	<0.002	0.008	0.008
Cr	"	0.1	86.4	0.004	NC	NC	NC	NC	NC	NC	NC	<0.004	<0.004	<0.004
Cu	"	0.65	0.004	0.002	NC	NC	NC	NC	NC	NC	NC	<0.002	<0.002	<0.002
Mn	"	0.15	0.183	0.002	NC	NC	NC	NC	NC	NC	NC	<0.002	0.002	0.002
Se	"	0.05	0.008	0.004	NC	NC	NC	NC	NC	NC	NC	<0.004	<0.004	<0.004
V	"	0.049	ND	0.002	NC	NC	NC	NC	NC	NC	NC	<0.002	<0.002	<0.002
Zn	"	5	10	0.010	NC	NC	NC	NC	NC	NC	NC	0.565	<0.010	<0.010
Ca	"	NL	276	0.5	NC	NC	NC	NC	NC	NC	NC	62.2	119	112
Mg	"	NL	153	0.5	NC	NC	NC	NC	NC	NC	NC	<0.50	99.8	95.2

¹Laboratory reporting limit.

²Duplicate sample.

³No existing limit.

⁴Not collected due to equipment malfunction.

⁵Not determined.

REFERENCES

- Black & Veatch, 2014, “Background Groundwater Quality Report for Thornton Composite Reservoir,” prepared for the Metropolitan Water Reclamation District of Greater Chicago, July 2014.
- Black & Veatch, 2016, “Revised Groundwater Monitoring Plan, Groundwater Protection System for Thornton Composite Reservoir,” prepared for the Metropolitan Water Reclamation District of Greater Chicago, May 2016.
- Illinois Environmental Protection Agency, 2012, 35 Illinois Administrative Code Part 620 Class I Groundwater Standards, 2012.
- Illinois Pollution Control Board, 2013, Illinois Administrative Code Title 35: Environmental Protection, Subtitle F: Potable Water Supplies, Chapter I: Pollution Control Board, Part 620 – Groundwater Quality, October 7, 2013.