

*Protecting Our Water Environment*



***Metropolitan Water Reclamation District of Greater Chicago***

*MONITORING AND RESEARCH  
DEPARTMENT*

***REPORT NO. 17-13***

***THORNTON COMPOSITE RESERVOIR***

***GROUNDWATER MONITORING REPORT***

***THIRD QUARTER 2016***

***March 2017***

# Protecting Our Water Environment

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## Metropolitan Water Reclamation District of Greater Chicago

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March 22, 2017

Richard P. Cobb, P.G.  
Deputy Division Manager  
Division of Public Water Supplies  
Illinois Environmental Protection Agency  
1021 North Grand Avenue East  
Springfield, IL 62794

Dear Mr. Cobb:

Subject: Transmittal of the Report "Thornton Composite Reservoir Groundwater Monitoring Report Third Quarter 2016"

Please find attached the report entitled "Thornton Composite Reservoir Groundwater Monitoring Report Third Quarter 2016" transmitted electronically. The report is prepared for transmittal to the Illinois Environmental Protection Agency (IEPA) in accordance with the Thornton Composite Reservoir Groundwater Monitoring Plan. Also attached is a PDF of the Thornton Composite Reservoir raw data from Grace Analytical Laboratory as required by the IEPA.

If you have any questions or would like to have additional information, please contact Dr. Pauline Lindo at (708) 588-4109 or [pauline.lindo@mwrdr.org](mailto:pauline.lindo@mwrdr.org).

Very truly yours,

Albert E. Cox, Ph.D.  
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**Thornton Composite Reservoir  
Groundwater Monitoring Report  
Third Quarter 2016**

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## **ACKNOWLEDGEMENTS**

The draft report for the Thornton Composite Reservoir Groundwater Monitoring was generated for the Engineering Department by the consultants of Black and Veatch, according to Engineering Contract 04-203-4F. All samples were collected and reports drafted by Black and Veatch, and all analyses performed by Grace Analytical Laboratory, Inc. The final report was produced according to the format guidelines of the Metropolitan Water Reclamation District of Greater Chicago's (District) Monitoring and Research (M&R) Department. Special thanks are due to Ms. Coleen Maurovich for converting the draft report to the M&R Department's format.

## **DISCLAIMER**

Mention of proprietary equipment and chemicals in this report does not constitute endorsement by the Metropolitan Water Reclamation District of Greater Chicago.

## LIST OF ACRONYMS

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Acronym	Definition
Ca	Calcium
CCD	Chicago City Datum
CSO	Combined Sewer Overflow
FC	Fecal Coliform
GMP	Groundwater Monitoring Plan
GPS	Groundwater Protection System
IAC	Illinois Administrative Code
Mg	Magnesium
M&R	Monitoring and Research
TCR	Thornton Composite Reservoir
TDS	Total Dissolved Solids
UCLs	Upper Control Limits

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## INTRODUCTION

A Groundwater Protection System (GPS) was constructed for the Thornton Composite Reservoir (TCR) to protect against the exfiltration of combined sewer overflow (CSO) into the surrounding dolomite aquifers. The CSOs and minimal amounts of storm water runoff 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, according to the Revised Groundwater Monitoring Plan (Revised GMP) (Black & Veatch, 2016). As explained in the Revised GMP, one sample of reservoir water, one of the Main Quarry Sump, and one from each of the seven wells are collected annually and analyzed for the Illinois Administrative Code (IAC) Title 35 Part 620 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 CSO 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, bi-weekly sampling is required as long as the water in the reservoir is above an elevation of -280 CCD (Chicago City Datum [CCD] in feet). Groundwater is sampled from each well at the first sample interval port immediately below the reservoir water elevation. Each of the multi-level monitoring wells is capable of monitoring four distinct 20-ft intervals in the Silurian Dolomite aquifer.

The locations of monitoring wells, Main Quarry Sump, 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 CCD). The sump contains mainly groundwater and minimal amounts of surface runoff, and it is sampled quarterly, 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) background sampling events were conducted on a quarterly basis for two years (May 2012 through March 2014) to characterize the existing groundwater quality. The Background Groundwater Quality Report (B&V, 2014) presents the analysis of data for all samples collected during the background monitoring period and provides a baseline for comparison with routine monitoring data to evaluate the effectiveness of the grout curtain GPS. In addition, changes over time in groundwater calcium (Ca) and magnesium (Mg) concentrations and their ratios would be useful in tracking the occurrence of infiltration/exfiltration. Groundwater analytical data routinely

FIGURE 1: MONITORING WELL AND MAIN QUARRY SUMP LOCATIONS



LEGEND		
	Grout Curtain	
	MWRD Tunnels	
	A-Line Grout Hole	
	B-Line Grout Hole	

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

Well ID	Coordinates <sup>1</sup>		Ground Surface El (ft, CCD <sup>2</sup> )	Top of Riser El (ft, CCD <sup>2</sup> )	Depth of Well (ft)	Sampling Port Interval (ft, CCD)			
	Northing (ft)	Easting (ft)				Interval 1	Interval 2	Interval 3	Interval 4
TB-118	1791110.38	693560.44	38.5	41.5	532	-85 to -105	-212 to -232	-283 to -303	-392 to -412
TB-119	1792316.63	695509.39	27.9	29.5	529	-85 to -105	-212 to -232	-283 to -303	-392 to -412
TB-120	1790782.31	696888.93	40.0	42.1	540	-86 to -106	-213 to -233	-284 to -304	-393 to -413
TB-121	1792193.10	696044.98	29.4	30.4	461	-84 to -104	-211 to -231	-282 to -302	-391 to -411
TB-122	1790288.61	693549.38	48.8	51.7	480	-85 to -105	-212 to -232	-283 to -303	-392 to -412
TB-123	1792185.60	693685.69	28.9	31.8	460	-84 to -104	-211 to -231	-282 to -302	-391 to -411
TB-124	1792200.77	695591.56	29.6	29.2	728	-663 to -698			

<sup>1</sup>Illinois State Plane Coordinate System (NAD 1927).

<sup>2</sup>Chicago City Datum (CCD).

generated for the monitoring wells, reservoir, and sump will also be compared with Part 620 Class I Groundwater Standards (Illinois EPA, 2012) to assess any exceedances in groundwater standards.

For the third quarter of 2016, there was one planned reservoir “fill” event during June 9 - 17, followed by three precipitation-induced fill events during July 25 - 28, August 8 - 9, and August 25 - 26, 2016. During the June eight-day planned “fill” event, Thorn Creek storm water was transferred from Thornton Transitional Reservoir (TTR) to the Thornton Composite Reservoir for the purpose of odor control. In such an event, groundwater sampling is not required since this is not considered a true fill event but a planned event. The three precipitation-induced fill events during July and August required sampling of the wells and sump.

## FIELD ACTIVITIES

For this report, fill-event monitoring samples were collected at the deep well and from sampling port Interval 3 at all multi-level wells. On July 25, 2016, duplicate samples were collected at Well TB-122. On July 26, one sample each was taken at Wells TB-119, -123, and -124 and on July 27 at the Main Quarry Sump and at Wells TB-118, -120, and -121. There were two additional reservoir fill events during the quarter: August 8 - 9, and August 25 - 26, 2016. Following the second fill event, samples were collected on August 8 at Wells TB-118, -122 (original and duplicate), and -123. On August 9, during the second fill event, samples were collected at Wells TB-118, -122 (original and duplicate), and -123. Following the third fill event, samples were collected at Wells TB-119, -120, -121, -124 and at the Main Quarry Sump from August 25 - 26.

Using a WTW Multi 3400i pH/conductivity/temperature meter, each well sample collected was immediately analyzed in the field for pH and electrical conductivity (EC), and temperature was recorded.

Prior to the sampling of the multi-level wells, hydrostatic pressure was measured to calculate the groundwater elevation at the port sampled for each well. Table 2 lists the elevations at Port 3 of each well and corresponding groundwater elevations at the third-quarter fill event monitoring.

All samples were packed in ice after collection and submitted for analysis on the same day to Grace Analytical Laboratory, Inc., an IL State ELAP/NELAC-certified lab.



TABLE 2: SUMMARY OF ELEVATIONS AT PORT 3 OF EACH WELL AND CORRESPONDING GROUNDWATER ELEVATIONS DURING THE JULY AND AUGUST 2016 MONITORING

Well and Interval ID	Sampling Port 003 Elevation (ft CCD <sup>1</sup> )	Interval 3 Groundwater Elevation (ft CCD) (July 25 - 28)	Interval 3 Groundwater Elevation (ft CCD) (August 8 - 9)	Interval 3 Groundwater Elevation (ft CCD) (August 25 - 26)
TB-118-003	-289	-95	-95	-95
TB-119-003	-289	-175	-174	-174
TB-120-003	-290	-206	-215	-204
TB-121-003	-288	-177	-176	-176
TB-122-003	-288	-172	-171	-169
TB-123-003	-288	-56	-55	-54
TB-124 <sup>2</sup>	-663	-171	-376	-382

<sup>1</sup>Chicago City Datum.

<sup>2</sup>TB-124 is a conventional well screened from -663 to -698 CCD; sample was taken at an elevation of approximately -650 ft CCD during the July and August fill events.

## ANALYTICAL RESULTS

Table 3 lists the analytical methods for parameters used by the laboratory. The analytical data for all well samples and the Main Quarry Sump sample collected during July and August 2016 are presented in Tables 4, 5, and 6, respectively. Analytical results were reviewed to identify any analytes that exceeded the Illinois Class I Groundwater Standards (35 IAC Part 620).

During the July and both August 2016 samplings, boron was present in Well TB-122-003 at concentrations ranging from 2.2 to 2.5 mg/L, exceeding the Tier 1 groundwater standard of 2.0 mg/L. This exceedance occurred during several background sampling events. The maximum detectable background concentration of 3.8 mg/L was measured in TB-122-004 during the fifth-quarter background sampling.

Chloride in TB-118-003, TB-121-003, and TB-124 (230, 201, and 299 mg/L, respectively, during July, and maximum values of 240, 207, and 284 mg/L, respectively, during August) all exceeded the Tier 1 groundwater standard of 200 mg/L, similar to occurrences during several background sampling events. A maximum concentration (1,230 mg/L) was detected in TB-122-002 during the second-quarter background sampling.

Sulfate was measured in TB-124 and in the Main Quarry Sump at concentrations of 690 and 440 mg/L, respectively, during July and at 640-700 and 440-450 mg/L, respectively, following both August events. These all exceeded the Tier I groundwater standard of 400 mg/L. During the first quarter background sampling event, however, the maximum sulfate concentration was 890 mg/L.

In addition, the concentrations of total dissolved solids (TDS) in TB-121-003 (1,230 mg/L), TB-124 (1,620 mg/L), and the Main Quarry Sump (1,620 mg/L) during July exceeded the Tier 1 groundwater standard of 1,200 mg/L. During August, TB-124 and TB-118 contained 1,630 - 1,710 and 1,180 - 1,540 mg/L TDS, respectively, also exceeding the Tier I standard. During the second-quarter background sampling, the maximum concentration (2,960 mg/L) was recorded at TB-122-002.

All pH field measurements (6.9 - 8.2) for all three periods were within the Tier 1 pH groundwater standard (6.5 to 9.0). During this reporting period, the pH at Well TB-124 (7.8 - 8.2) was sustained within the acceptable range of the Tier I groundwater, with a significant decline from 12 during the two sampling events of December 2015 and January 2016. The present pH at TB-124 is more comparable with its pH readings of 8.1 to 8.4 during all quarterly background sampling events.

Conductivity readings for all wells ranged from 81 to 237 mS/m. The conductivity readings for duplicate samples at Well TB-122-003 were 125 and 137 mS/m following the July fill event and 136 - 140 mS/m following the two fill events of August, much lower than the previous quarter's readings of 851 and 1,180 mS/m.

TABLE 3: ANALYTICAL METHODS USED FOR REQUIRED PARAMETERS

Inorganic Chemical Parameters:	Analytical Method <sup>1</sup>
Chloride	325.2
Alkalinity, Bicarbonate	2320B
Total Dissolved Solids	2540C
Sulfate	4500-SO4-2 C or D
TAL metals	6010B & 7470A
Ammonia (as N)	350.1R2.0
Hardness	2340B
TOC	5310C
Others:	
Phenols	SVOC/8270C
Fecal Coliform	SM 9221E

<sup>1</sup>All standard EPA methods used by NELAC-certified and other laboratories.



TABLE 4: ANALYSIS OF GROUNDWATER SAMPLED FROM MONITORING WELLS TB-118-003 THROUGH TB-124 AND THE MAIN QUARRY SUMP AT THE THORNTON COMPOSITE RESERVOIR SITE DURING THE JULY 25 – 26, 2016, MONITORING

Parameter	Unit	Part 620 Groundwater Standard	Maximum Background	Lab RL <sup>1</sup>	Well								Sump
					TB-118- 003	TB-119- 003	TB-120- 003	TB-121- 003	TB-122- 003	TB-122- 003D	TB-123- 003	TB-124	
pH		6.5 - 9.0	8.4	NL <sup>2</sup>	7.7	7.2	7.7	7.6	7.8	7.8	7.3	8.0	8.2
Electrical Conductivity	mS/m	NL	415	0.5	159	82	124	139	125	137	90	236	134
Total Dissolved Solids	mg/L	1,200	2,960	NL	1,040	771	757	1,230	773	821	584	1,620	1,620
Total Organic Carbon	"	NL	1.0	0.1	2.1	1.6	1.5	1.2	1.5	1.4	1.7	0.2	1.6
Chloride	"	200	1,230	5	230	54	161	201	156	187	49	299	150
Sulfate	"	400	890	15	238	99	141	222	71	80	131	690	440
Ammonia as N	"	NL	NA <sup>3</sup>	0.10	0.34	0.20	0.29	0.42	0.47	0.43	0.44	0.68	<0.10
Phenol	"	0.10	0.06	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fecal Coliform	CFU/ 100 mL	NL	<1	2	<2	<2	<2	<2	<2	<2	<2	<2	80
Ag	mg/L	0.05	0.003	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
B	"	2	3.8	0.05	0.87	0.80	0.92	0.93	<0.05	2.2	1.7	1.1	0.25
Be	"	0.004	0.002	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Co	"	1	0.035	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.012
Cr	"	0.1	86.4	0.005	<0.005	<0.005	0.008	<0.005	0.009	<0.005	<0.005	<0.005	<0.005
Cu	"	0.65	0.004	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Mn	"	0.15	0.183	0.005	<0.005	0.009	<0.005	<0.005	<0.005	<0.005	<0.005	0.010	<0.005
Se	"	0.05	0.008	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
V	"	0.049	NA	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zn	"	5	10	0.010	<0.010	0.020	0.019	0.028	0.012	<0.010	0.029	0.556	<0.010
Ca	"	NL <sup>2</sup>	276	0.5	130	70	85	110	65	59	70	87	97
Mg	"	NL	153	0.5	64	36	43	57	30	27	38	49	67

<sup>1</sup>Lab reporting limit.

<sup>2</sup>No existing limit.

<sup>3</sup>No analysis performed.

TABLE 5: ANALYSIS OF GROUNDWATER SAMPLED FROM MONITORING WELLS TB-118-003 THROUGH TB-124 AND MAIN QUARRY SUMP AT THE THORNTON COMPOSITE RESERVOIR SITE DURING THE AUGUST 8 – 9, 2016, MONITORING

Parameter	Unit	Part 620 Groundwater Standard	Maximum Background	Lab RL <sup>1</sup>	Well								Sump
					TB-118- 003	TB-119- 003	TB-120- 003	TB-121- 003	TB-122- 003	TB-122- 003D	TB-123- 003	TB-124	
pH		6.5 - 9.0	8.4	NL <sup>2</sup>	6.9	7.2	7.1	7.1	7.1	7.3	7.2	7.8	7.8
Electrical Conductivity	mS/m	NL	415	0.5	166	82	124	140	137	138	90	237	132
Total Dissolved Solids	mg/L	1,200	2,960	NL	1,180	517	763	1,130	835	815	568	1,630	1,040
Total Organic Carbon	"	NL	1.0	0.1	2.0	1.7	1.6	1.2	1.5	1.5	1.8	0.4	1.9
Chloride	"	200	1,230	5	239	53	157	195	186	190	50	280	130
Sulfate	"	400	890	15	250	103	131	220	89	150	150	700	440
Ammonia as N	"	NL	NA <sup>3</sup>	0.10	0.33	0.29	0.24	0.42	0.32	0.30	0.43	0.68	<0.10
Phenol	"	0.10	0.06	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fecal Coliform	CFU/ 100 mL	NL	<1	2	<2	<2	<2	<2	<2	<2	<2	<2	50
Ag	mg/L	0.05	0.003	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
B	"	2	3.8	0.05	0.92	0.87	1.0	1.0	2.4	2.4	1.8	1.2	0.32
Be	"	0.004	0.002	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Co	"	1	0.035	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.020
Cr	"	0.1	86.4	0.005	<0.005	<0.005	0.006	0.007	0.007	0.016	0.010	0.010	<0.005
Cu	"	0.65	0.004	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Mn	"	0.15	0.183	0.005	0.005	0.009	<0.005	<0.005	<0.005	<0.005	<0.005	0.010	0.018
Se	"	0.05	0.008	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
V	"	0.049	NA	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zn	"	5	10	0.010	<0.010	<0.010	0.020	0.226	0.011	<0.010	0.048	1.14	<0.010
Ca	"	NL <sup>2</sup>	276	0.5	140	79	96	118	61	61	73	92	125
Mg	"	NL	153	0.5	69	39	47	61	30	30	38	55	80

<sup>1</sup>Lab reporting limit.

<sup>2</sup>No existing limit.

<sup>3</sup>No analysis performed.

TABLE 6: ANALYSIS OF GROUNDWATER SAMPLED FROM MONITORING WELLS TB-118-003 THROUGH TB-124 AND MAIN QUARRY SUMP AT THE THORNTON COMPOSITE RESERVOIR SITE DURING THE AUGUST 25 – 26, 2016, MONITORING

Parameter	Unit	Part 620 Groundwater Standard	Maximum Background	Lab RL <sup>1</sup>	Well								Sump
					TB-118- 003	TB-119- 003	TB-120- 003	TB- 121- 003	TB-122- 003	TB-122- 003D	TB-123- 003	TB-124	
pH		6.5 - 9.0	8.4	NL <sup>2</sup>	7.3	7.5	7.2	7.2	7.6	7.5	7.3	8.2	7.9
Electrical Conductivity	mS/m	NL	415	0.5	171	81	122	141	136	140	90	232	131
Total Dissolved Solids	mg/L	1,200	2,960	NL	1,540	539	905	1,200	991	839	564	1,710	1,160
Total Organic Carbon	"	NL	1.0	0.1	2.1	1.4	1.4	1.5	1.5	1.4	1.7	0.2	1.1
Chloride	"	200	1,230	5	240	51	157	207	176	187	50	284	118
Sulfate	"	400	890	15	240	85	112	198	88	95	145	640	450
Ammonia as N	"	NL	NA <sup>3</sup>	0.10	0.40	0.40	0.36	0.69	0.44	0.44	0.53	0.85	0.12
Phenol	"	0.10	0.06	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fecal Coliform	CFU/ 100 mL	NL	<1	2	<2	<2	<2	<2	<2	<2	<2	<2	2
Ag	mg/L	0.05	0.003	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
B	"	2	3.8	0.05	0.87	0.89	1.0	1.0	2.5	2.5	1.8	1.2	0.42
Be	"	0.004	0.002	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Co	"	1	0.035	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.020
Cr	"	0.1	86.4	0.005	0.007	0.005	0.020	0.007	0.008	0.005	0.011	0.006	<0.005
Cu	"	0.65	0.004	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Mn	"	0.15	0.183	0.005	0.006	0.009	0.006	<0.005	<0.005	<0.005	<0.005	0.006	0.010
Se	"	0.05	0.008	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
V	"	0.049	NA	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zn	"	5	10	0.010	0.012	0.018	0.034	0.070	0.021	<0.010	0.016	1.26	<0.010
Ca	"	NL <sup>2</sup>	276	0.5	142	77	93	120	65	64	74	78	127
Mg	"	NL	153	0.5	75	42	50	66	35	34	42	66	86

<sup>1</sup>Lab reporting limit.

<sup>2</sup>No existing limit.

<sup>3</sup>No analysis performed.

The fecal coliform (FC) populations of samples from monitoring wells were all <2 CFU/100 mL. The Main Quarry Sump contained 80, 50, and 2 CFU/100 mL following each of the three fill events, respectively .

There were no other exceedances detected in any of the samples. All other analytes measured, including all metals, were within the limits of the Tier I groundwater standards.

## REFERENCES

Black & Veatch, 2014, "Background Groundwater Quality Report for Thornton Composite Reservoir," prepared for the Metropolitan Water Reclamation District of Greater Chicago, July 2014.

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Illinois EPA, 2012, 35 Illinois Administrative Code (IAC) 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.