Metropolitan Water Reclamation District of Greater Chicago

MONITORING AND RESEARCH DEPARTMENT

REPORT NO. 23-14

TUNNEL AND RESERVOIR PLAN McCOOK RESERVOIR ANNUAL GROUNDWATER MONITORING REPORT FOR 2022

April 2023

Protecting Our Water Environment

Metropolitan Water Reclamation District of Greater Chicago

CECIL LUE-HING RESEARCH AND DEVELOPMENT COMPLEX
6001 WEST PERSHING ROAD CICERO, ILLINOIS 60804-4112

Edward W. Podczerwinski, P.E.
Director of Monitoring and Research

April 21, 2023

Mr. Michael Summers, P.G.
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Illinois Environmental Protection Agency
Michael.Summers@Illinois.gov

Dear Mr. Summers:

Subject: Transmittal of the Report "Tunnel and Reservoir Plan McCook Reservoir Annual Groundwater Monitoring Report for 2022"

Please find attached the report entitled "Tunnel and Reservoir Plan McCook Reservoir Annual Groundwater Monitoring Report for 2022." The report was prepared for transmittal to the Illinois Environmental Protection Agency in accordance with the Chicagoland Underflow Plan McCook Reservoir Groundwater Monitoring and Analysis Plan.

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

Very truly yours,

Albert Cox

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

AC:BM:lf
Attachment
cc: Mr. B. O'Neil, USACE
Mr. E. Podczerwinski
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TUNNEL AND RESERVOIR PLAN McCOOK RESERVOIR ANNUAL GROUNDWATER MONITORING REPORT FOR 2022

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Edward W. Podczerwinski, Director **April 2023**

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°C	degrees Celsius
Ag	silver
As	arsenic
B	boron
Ba	barium
Be	beryllium
CCD	Chicago City Datum
Cd	cadmium
CFU	colony forming units
Cl^-	chloride
CN	cyanide
Co	cobalt
COD	chemical oxygen demand
Cr	chromium
CSF	combined sewer flow
Cu	copper
District	Metropolitan Water Reclamation District of Greater Chicago
EC	electrical conductivity
F	fluorine
Fe	iron
Hg	mercury
IAC	Illinois Administrative Code
IEPA	Illinois Environmental Protection Agency
MAP	Groundwater Monitoring and Analysis Plan
Mn	manganese
NH_3^--N	ammonia nitrogen
Ni	nickel
NO_3-N	nitrate nitrogen
P	phosphorus
Pb	lead
Ra	radium
Reservoir	Chicagoland Underflow Plan McCook Reservoir
Sb	antimony
Se	selenium
SO_4^{2-}	sulfate
TARP	Tunnel and Reservoir Plan
TDS	total dissolved solids
Tl	thallium
TL	tolerance limit
TOC	total organic carbon
USACE	United States Army Corps of Engineers
Zn	zinc

ACKNOWLEDGMENTS

The McCook Reservoir groundwater monitoring is conducted by the Monitoring and Research Department of the Metropolitan Water Reclamation District of Greater Chicago (District) under the Groundwater Monitoring and Analysis Plan prepared by the United States Army Corps of Engineers. Organic analyses were performed by Environmental Monitoring Technologies, Inc., inorganic analyses by the District's Analytical Laboratories Division, and fecal coliform analyses by the District's Analytical Bacteriology Laboratory. Special thanks to Mr. James Rivera, Ms. Barbara Covic, Mr. John Lahori, Ms. Mallory Coghlan, Mr. Daniel Lynch, and Ms. Sasha Powell for collecting samples and 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 Metropolitan Water Reclamation District of Greater Chicago.

TUNNEL AND RESERVOIR PLAN McCOOK RESERVOIR ANNUAL GROUNDWATER MONITORING REPORT FOR 2022

McCook Reservoir Site Description

The Chicagoland Underflow Plan McCook Reservoir (Reservoir), located within Lyons Township in western Cook County, is part of the Tunnel and Reservoir Plan (TARP). The Reservoir was designed to reduce flooding in the Chicago area by providing storage of combined sewer flow (CSF) during storms. The Reservoir construction has been divided into two phases. Phase I of the Reservoir is complete and has been in operation since January 2018. Phase II of the Reservoir is still under construction and is anticipated to begin operation in 2029. When the capacity of the sewer systems is exceeded, the CSF is conveyed to the Reservoir by the TARP tunnels for storage until it can be treated at the Stickney Water Reclamation Plant.

The groundwater protection system surrounding the Reservoir is designed to prevent exfiltration of CSF from the Reservoir to the surrounding groundwater during high-stage conditions and control seepage of groundwater into the Reservoir during low-stage conditions. The groundwater protection system consists of a double-row grout curtain that completely surrounds Phases I and II of the Reservoir to a depth of -320 ft Chicago City Datum (CCD). The grouted area has achieved permeabilities of less than 1 lugeon.

Groundwater Monitoring Program

A Groundwater Monitoring and Analysis Plan (MAP) (United States Army Corps of Engineers [USACE], 2014), including seven groundwater monitoring wells around the perimeter of the Reservoir (Figure 1), was developed by the USACE in coordination with the District and approved by the Illinois Environmental Protection Agency (IEPA) to monitor groundwater conditions and the performance of the groundwater protection system.

The objectives of the monitoring program as specified in the MAP are:

- To characterize local background groundwater quality by measuring Field, Routine, Organic, and Inorganic parameters prior to Reservoir operation.
- To assess potential exfiltration of CSF effluent into groundwater by measuring Field and Routine parameters while the Reservoir is in high-stage operation.
- To determine potential migration of groundwater contaminants into the Reservoir system from the surrounding area by measuring Field, Routine, Organic, and Inorganic parameters while the Reservoir is in low-stage operation.
- To evaluate long-term changes in groundwater quality associated with Reservoir operations.

FIGURE 1: MCCOOK RESERVOIR SITE AND MONITORING WELL LOCATIONS

To evaluate changes in groundwater quality, monitoring wells are installed 100 feet outside the grout curtain. However, due to physical constraints near the Reservoir where it would be impossible to install or access wells, some are located greater than 100 feet from the grout curtain. In the summer of 2016, a USACE investigation discovered that wells G-04 and G-05 exhibited signs of a compromised annular seal. These wells were re-drilled during fall 2017 and became operational for monitoring in November 2017.

Background Monitoring. Background monitoring began in the first quarter of 2016. Groundwater samples collected during the background monitoring program were analyzed for concentrations of organic and inorganic parameters and groundwater quality indicators based on Illinois Class I Potable Resource Groundwater standards constituents in 35 Illinois Administrative Code (IAC) 620.410 (Class I) and Illinois General Use Water Quality standards constituents in 35 IAC 302 B. Background monitoring results were used to determine upper tolerance limits (TLs) in each well for all measured groundwater quality parameters to enable future assessment of groundwater protection system efficacy. The TL for all parameters were established in 2019 using all background data and the statistical approaches recommended in the MAP. The details are documented in the Appendix of the 2018 McCook annual report.

High-Stage/Fill Event Monitoring. High-stage monitoring is initiated when water elevation in the Reservoir exceeds -220 ft CCD. The initial high-stage/fill event threshold of -280 ft CCD was increased to -265 ft CCD in January 2018 and was increased again to -220 ft CCD in January 2022 to reflect the Reservoir operating conditions. During high-stage monitoring, samples are collected every 14 days until the Reservoir water elevation falls below -220 ft CCD. The intent of the high-stage program is to monitor time-series data when the Reservoir is under large positive (outward) gradients that have the potential to exfiltrate CSF water. For the current Phase I of the Reservoir operation during high-stage monitoring events, only wells G-01, G-02, G-03, G-04, and G-05 must be monitored. The measurements and analyses include four Field and nine Routine Parameters as specified in Table 2 of the MAP.

Low-Stage Semiannual Monitoring. Low-stage monitoring is implemented on a semiannual basis to collect water quality data when the Reservoir is acting as a regional groundwater sink. Low-stage sampling requires that water elevation in the Reservoir is at or below the high-stage threshold elevation (-220 ft CCD). Low-stage samples can only be collected after low-stage operation has been maintained for at least four days to ensure that monitoring results are characteristic of the regional groundwater and do not reflect re-infiltration of groundwater constituents that exfiltrated during the high-stage operation. The first low-stage semiannual sampling occurs during the second quarter of each year (April-June), analyzing all eighty-one (81) Field, Routine, Organic, and Inorganic Parameters as specified in Tables 2, 3, and 4 of the MAP. The second low-stage semiannual sampling occurs during the fourth quarter of each year (October-December), analyzing only the Field and Routine Parameters. The two low-stage semiannual samplings require collecting samples from all seven wells.

This is the 2022 report under the groundwater monitoring program for the Reservoir. It presents field activities and analytical results for groundwater monitoring of Reservoir operations from January 1, 2022 – December 31, 2022.

Monitoring Activities for 2022

During 2022, there were nine high-stage events at the Reservoir. All high-stage events lasted for less than two weeks, requiring one sampling each. Due to pump malfunctioning in wells G-01 and G-02, sampling could not be conducted at these wells before April 14, 2022, and only seven high-stage events were sampled. The Reservoir operated at high stage for a total of 74 days in 2022. Water samples were collected and immediately analyzed in the field for pH and electrical conductivity, and water temperature and depth were recorded. Samples were packed in ice and transported to District laboratories for analysis of the nine Routine parameters.

The first low-stage semiannual monitoring sampling was conducted during the second quarter of 2022 on May 25 and 26, 2022, after the Reservoir had been at low stage for over four days. Water sample pH, electrical conductivity, temperature, and elevation were recorded in the field. Aliquots of each sample were packed in ice and transferred to Environmental Monitoring and Technologies, Inc. for analysis of Organic constituents in accordance with requirements specified in the MAP. Additional aliquots of each sample were packed in ice and taken to the District's laboratories for analysis of Routine and Inorganic parameters.

The second semiannual sampling was conducted on October 13 and 14, 2022, following low-stage operation at the Reservoir for over four days. Field parameters for each water sample were measured. Water samples were packed in ice and brought to the District's laboratories for analysis of Routine parameters.

Analytical Results for 2022

High-Stage/Fill Event Monitoring. All analytical results for all high-stage samples collected from wells G-01, G-02, G-03, G-04, and G-05 and the duplicate samples are reported in Tables 1 through 5, respectively. Analytical results that exceed Class I standards are shown in bold text in each table. Analytical results were compared to upper TLs based on the background monitoring data.

Total dissolved solids (TDS) exceeded the Class I standard in all samples from well G-01, eight samples from well G-03, and six samples from well G-05. The TDS for those six samples from well G-05 also exceeded the upper TL. Chloride concentrations exceeded Class I standards in all samples from wells G-01 and G-03 but did not exceed the upper TLs for these wells. Sulfate exceeded the Class I standard in all samples from well G-05, but did not exceed the upper TL for this well.

There were a few exceedances of upper TLs for parameters that do not have established limits under Class I standards. Total organic carbon (TOC) exceeded the upper TL in four samples from well G-02 and one sample from well G-03. The TOC was below reporting limits in all samples from well G-01 and three samples from well G-02, but the laboratory reporting limit for these samples was higher than the upper TLs at these wells. Chemical oxygen demand (COD) exceeded the upper TL in one sample from well G-01 and three samples from well G-02. Total phosphorus (P) exceeded the upper TL in four samples from well G-01. Total P was below reporting limits in all remaining samples from well G-01 and all samples from G-04, but the laboratory reporting limit was greater than the upper TLs at these well. Ammonia exceeded the

TABLE 1: ANALYSIS OF GROUNDWATER SAMPLED FROM MONITORING WELL G-01 AT THE McCOOK RESERVOIR SITE DURING HIGH-STAGE OPERATION IN 2022

Fill Event	Sample Date	pH	EC mS/m	TDS	TOC	COD	Cl^-	SO_4^{2-}	Total P	NH_3-N	Hardness	FC CFU/100 mL	Temp. °C	Elevation ft CCD
				mg/L										
Class I Standard[1]		**6.5–9.0**	**NS**[2]	**1,200**	**NS**	**NS**	**200**	**400**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**
Upper TL[3]		5.3–8.1	586	3,845	2.7	40	1,280	730	0.13	2.8	1,607	<1	15.7	-106
1[4]	02/23/22	No sample												
2[4]	03/25/22	No sample												
3	04/14/22	6.9	186	**1,506**	<5.0	<20	**449**	274	0.2	3.7	893	<1	12.5	-112
4	04/28/22	6.8	195	**1,706**	<5.0	22	**423**	372	<0.15	3.3	940	<1	12.6	-113
5	05/10/22	6.9	192	**1,676**	<5.0	24	**398**	NA[5]	<0.15	3.7	892	<1	12.9	-112
6	07/08/22	6.9	201	**1,584**	<5.0	<20	**383**	370	0.56	3.6	885	<1	13.1	-113
6DUP	07/08/22	6.9	201	**1,626**	<5.0	<20	**380**	367	0.15	3.6	948	<1	13.1	-113
7	07/27/22	6.9	241	**1,524**	<5.0	43	**368**	364	0.19	3.8	875	<1	12.8	-114
8	09/13/22	6.9	190	**1,608**	<5.0	<20	**404**	389	<0.15	3.6	807	<1	13.0	-113
9	12/15/22	6.9	184	**1,478**	<5.0	35	**372**	368	0.21	3.6	816	<1	12.5	-121

[1]Illinois Administrative Code (IAC) Title 35 Part 620.410 Class I Standards. Bold text indicates exceedance.
[2]No standard established by 35 IAC Part 620.410.
[3]For pH, upper and lower tolerance limits are shown.
[4]No sampling during fill events before April 14, 2022, due to pump failure.
[5]Not analyzed because thermal preservation did not meet method requirements.

TABLE 2: ANALYSIS OF GROUNDWATER SAMPLED FROM MONITORING WELL G-02 AT THE McCOOK RESERVOIR SITE DURING HIGH-STAGE OPERATION IN 2022

Fill Event	Sample Date	pH	EC mS/m	TDS	TOC	COD	Cl^-	SO_4^{2-}	Total P	NH_3-N	Hardness	FC CFU/100 mL	Temp. °C	Elevation ft CCD
				mg/L										
Class I Standard[1]		**6.5–9.0**	**NS**[2]	**1,200**	**NS**	**NS**	**200**	**400**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**
Upper TL[3]		5.7–8.1	182	1,214	4.3	31	383	207	0.68	2.2	791	<1	17.3	-69
1[4]	02/23/22	No sample												
2[4]	03/25/22	No sample												
3	04/14/22	7.0	111	850	7.0	40	187	143	0.43	1.7	654	<1	12.4	-81
4	04/28/22	6.9	114	962	7.7	25	180	143	0.23	1.7	666	<1	12.5	-81
5	05/10/22	7.0	119	970	9.3	35	178	NA[5]	0.15	1.8	598	<1	14.4	-81
6	07/12/22	6.9	113	936	<5.0	<20	179	146	0.17	1.8	646	<1	13.9	-82
7	07/27/22	6.9	154	890	<5.0	<20	182	157	0.38	1.6	705	<1	13.1	-86
7DUP	07/27/22	6.9	154	898	<5.0	<20	180	156	0.33	1.7	677	<1	13.1	-86
8	09/13/22	6.9	112	890	10.0	34	181	154	<0.15	1.7	566	<1	13.9	-81
9	12/15/22	6.9	112	876	<5.0	21	187	154	<0.15	1.6	633	<1	12.2	-82

[1]Illinois Administrative Code (IAC) Title 35 Part 620.410 Class I Standards. Bold text indicates exceedance.
[2]No standard established by 35 IAC Part 620.410.
[3]For pH, upper and lower tolerance limits are shown.
[4]No sampling during fill events before April 14, 2022, due to pump failure.
[5]Not analyzed because thermal preservation did not meet method requirements.

TABLE 3: ANALYSIS OF GROUNDWATER SAMPLED FROM MONITORING WELL G-03 AT THE McCOOK RESERVOIR SITE DURING HIGH-STAGE OPERATION IN 2022

Fill Event	Sample Date	pH	EC mS/m	TDS	TOC	COD	Cl^-	SO_4^{2-}	Total P	NH_3-N	Hardness	FC CFU/100 mL	Temp. °C	Elevation ft CCD
				mg/L										
Class I Standard[1]		**6.5−9.0**	**NS**[2]	**1,200**	**NS**	**NS**	**200**	**400**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**
Upper TL[3]		5.7−8.4	312	1,826	19.3	93	618	167	0.24	32.0	570	<1	18.3	-95
1	02/23/22	7.1	158	1,114	13	53	**412**	136	0.15	19.5	482	<1	13.7	-110
2	03/25/22	7.0	175	**1,230**	16	46	**389**	131	0.17	20.8	504	<1	13.9	-110
3	03/31/22	7.0	184	**1,328**	17	62	**409**	132	<0.15	23.0	540	<1	13.7	-109
3DUP	03/31/22	7.0	184	**1,336**	17	54	**396**	127	<0.15	23.5	512	<1	13.7	-109
4	04/28/22	7.0	179	**1,348**	17	61	**423**	135	<0.15	22.1	532	<1	13.8	-107
5	05/10/22	7.1	171	**1,340**	17	71	**416**	NA[4]	<0.15	22.1	526	<1	14.1	-103
6	07/07/22	7.0	173	**1,344**	16	66	**419**	135	<0.15	22.2	549	<1	15.3	-109
7	07/28/22	7.0	235	**1,372**	18	70	**458**	140	0.15	25.3	551	<1	14.7	-110
8	09/13/22	6.9	196	**1,384**	18	78	**467**	139	<0.15	26.6	505	<1	14.5	NRR[5]
8DUP	09/13/22	6.9	196	**1,396**	19	76	**464**	138	<0.15	27.1	496	<1	14.5	NRR
9	12/15/22	7.0	195	**1,414**	23	80	**484**	133	<0.15	26.7	546	<1	13.8	-118

[1]Illinois Administrative Code (IAC) Title 35 Part 620.410 Class I Standards. Bold text indicates exceedance.
[2]No standard established by 35 IAC Part 620.410.
[3]For pH, upper and lower tolerance limits are shown.
[4]Not analyzed because thermal preservation did not meet method requirements.
[5]No reportable result due to depth meter malfunctioning.

TABLE 4: ANALYSIS OF GROUNDWATER SAMPLED FROM MONITORING WELL G-04 AT THE McCOOK RESERVOIR SITE DURING HIGH-STAGE OPERATION IN 2022

Fill Event	Sample Date	pH	EC mS/m	TDS	TOC	COD	Cl^-	SO_4^{2-}	Total P	NH_3-N	Hardness	FC	Temp.	Elevation
				mg/L								CFU/100 mL	°C	ft CCD
Class I Std[1]		**6.5–9.0**	**NS[2]**	**1,200**	**NS**	**NS**	**200**	**400**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**
Upper TL[3]		6.3–9.2	179	1,100	8.1	30	213	584	0.11	19.0	746	<1	17.0	-34
1	02/23/22	6.9	136	1,006	<5.0	20	163	314	<0.15	10.2	641	<1	14.3	-34
1DUP	02/23/22	6.9	136	1,046	<5.0	<20	163	314	<0.15	10.0	668	<1	14.3	-34
2	03/29/22	7.0	138	1,130	5.3	<20	152	295	<0.15	9.8	690	<1	14.1	-34
3	04/01/22	6.9	139	1,130	5.1	<20	159	304	<0.15	10.2	687	<1	14.1	-30
4	04/27/22	6.9	137	1,112	<5.0	<20	162	311	<0.15	10.0	715	<1	14.3	-33
4DUP	04/27/22	6.9	137	1,120	<5.0	<20	164	315	<0.15	9.7	683	<1	14.3	-33
5	05/09/22	6.9	141	1,170	<5.0	<20	169	307	<0.15	10.9	718	<1	15.1	-27
6	07/07/22	6.9	144	1,118	<5.0	<20	166	307	<0.15	9.8	733	<1	15.8	-31
7	07/27/22	6.9	142	1,112	<5.0	<20	171	316	<0.15	10.6	703	<1	15.6	-25
8	09/13/22	6.9	139	1,098	<5.0	24	172	316	<0.15	10.5	636	<1	15.0	-29
9	12/16/22	6.9	135	1,068	<5.0	<20	160	311	<0.15	10.1	631	<1	14.3	-33
9DUP	12/16/22	6.9	135	1,056	<5.0	<20	157	306	<0.15	10.1	675	<1	14.3	-33

[1]Illinois Administrative Code Title 35 Part 620.410 Class I Standards. Bold text indicates exceedance.
[2]No standard established by 35 IAC Part 620.410.
[3]For pH, upper and lower tolerance limits are shown.

TABLE 5: ANALYSIS OF GROUNDWATER SAMPLED FROM MONITORING WELL G-05 AT THE McCOOK RESERVOIR SITE DURING HIGH-STAGE OPERATION IN 2022

Fill Event	Sample Date	pH	EC mS/m	TDS	TOC	COD	Cl^-	SO_4^{2-}	Total P	NH_3-N	Hardness	FC CFU/100 mL	Temp. °C	Elevation ft CCD
				mg/L										
Class I Standard[1]		**6.5–9.0**	**NS**[2]	**1,200**	**NS**	**NS**	**200**	**400**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**
Upper TL[3]		6.3–9.4	219	1,200	29.8	102	159	499	0.32	6.6	738	<1	15.3	-38
1	02/23/22	6.9	136	1,166	<5.0	<20	159	**431**	<0.15	5.7	743	<1	14.1	-36
2	03/29/22	6.9	140	**1,254**	<5.0	<20	146	**413**	<0.15	5.6	745	<1	13.5	-34
2DUP	03/29/22	6.9	140	**1,246**	<5.0	<20	145	**412**	<0.15	5.7	766	<1	13.5	-34
3	04/01/22	6.9	136	**1,250**	<5.0	<20	149	**419**	<0.15	5.8	766	<1	13.4	-35
4	04/27/22	6.9	137	**1,228**	<5.0	<20	155	**427**	<0.15	6.2	804	<1	13.9	-31
5	05/09/22	7.0	139	**1,260**	<5.0	<20	157	**428**	<0.15	6.0	821	<1	14.1	-31
5DUP	05/09/22	7.0	139	**1,286**	<5.0	<20	154	**420**	<0.15	6.1	819	<1	14.1	-31
6	07/12/22	6.9	132	**1,242**	<5.0	<20	154	**415**	<0.15	6.1	810	<1	14.4	-33
7	07/27/22	6.9	143	NA[4]	<5.0	<20	155	**428**	<0.15	5.6	778	<1	15.4	-34
8	09/13/22	6.9	143	**1,218**	<5.0	<20	154	**427**	<0.15	6.0	748	<1	14.4	-33
9	12/16/22	6.9	142	1,180	<5.0	<20	148	**414**	<0.15	6.3	800	<1	15.0	-36

[1]Illinois Administrative Code (IAC) Title 35 Part 620.410 Class I Standards. Bold text indicates exceedance.
[2]No standard established by 35 IAC Part 620.410.
[3]For pH, upper and lower tolerance limits are shown.
[4]Not analyzed due to broken sample container.

upper TL in all samples from well G-01. Hardness exceeded the upper TL in all samples from well G-05. Groundwater temperature exceeded the upper TL in one sample from well G-05. Groundwater elevation exceeded the upper TL during seven events in well G-04 and during all events in well G-05. Fecal coliform bacteria were not detected in any high-stage samples.

Low-Stage Semiannual Monitoring. All results for Field and Routine parameters for low-stage semiannual sampling and TLs for these parameters are reported in Table 6. The results for Inorganic and Radioactive parameters are reported in Table 7, and all associated upper TLs for parameters in Table 7 are listed in Table 8. The results for Organic parameters are reported in Table 9, and all associated upper TLs for parameters in Table 9 are listed in Table 10. Analytical results that exceed the Class I standards are shown in bold text in Tables 6, 7 and 9. Analytical results were compared to upper TLs based on the background monitoring data.

There were a few exceedances of Class I standards and upper TLs by Routine and Field parameters (Table 6). The TDS exceeded the Class I standard in both semiannual samples from wells G-01 and G-03, and in the first semiannual sample from well G-05. However, among these samples, it exceeded the upper TL only for well G-05. The chloride concentration exceeded the Class I standard in both semiannual samples from wells G-01, G-03, and G-07, but did not exceed the upper TLs for these wells. Sulfate concentrations exceeded the Class I standard in both semiannual samples from well G-05, but did not exceed the upper TL for this well.

There were a few exceedances of upper TLs among parameters without established Class I standards. The TOC exceeded the upper TLs in the first semiannual sample from wells G-01 and G-02. The TOC was below the reporting limit in the second semiannual sample from wells G-01, G-02, and in both samples from well G-06, but the reporting limit was higher than the upper TLs for these wells. The COD was below the reporting limit in both samples from well G-06, but the reporting limit was higher than the upper TL for this well. Total P exceeded the upper TL in both semiannual samples from well G-01. Total P was below the reporting limit in all samples from wells G-04 and G-06, but the reporting limit was higher than the upper TLs for these wells. Ammonia exceeded the upper TL in both semiannual samples from well G-01. Hardness exceeded the upper TL in the second semiannual sample from well G-05. Groundwater elevation exceeded the upper TLs during both semiannual monitoring events at wells G-04 and G-05. Fecal coliform bacteria were not detected in any low-stage semiannual sample.

Among the Inorganic parameters that are measured once per year during the first low-stage semiannual sampling event, only boron at wells G-04, G-05, and G-06 exceeded the Class I standard (Table 7). However, it did not exceed the upper TLs for these wells.

There were a few detections of Organic parameters in groundwater collected during the first low-stage semiannual sampling (Table 9). Vinyl chloride in wells G-05, G-06, and G-07 exceeded the Class I standard, but it only exceeded the upper TL for well G-07. Benzo[*a*]pyrene, bis(2-ethylhexyl) phthalate, and pentachlorophenol were below the reporting limits in all wells, but the reporting limits for each parameter were higher than the Class I standard and the upper TLs for all wells.

TABLE 6: ANALYSIS OF ROUTINE PARAMETERS IN GROUNDWATER SAMPLED FROM EACH MONITORING WELL AT THE McCOOK RESERVOIR SITE DURING LOW-STAGE SEMIANNUAL SAMPLING IN MAY AND OCTOBER 2022

Well	Sampling Event	Sample Date	pH	EC mS/m	TDS	TOC	COD	Cl^-	SO_4^{2-}	Total P	NH_3-N	Hardness	FC	Temp.	Elevation
					mg/L								CFU/100 mL	°C	ft CCD
Class I Standard[1]			**6.5–9.0**	**NS**[2]	**1,200**	**NS**	**NS**	**200**	**400**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**
G-01		Upper TL[3]	5.3–8.1	586	3,845	2.7	40	1,280	730	0.13	2.8	1,607	<1	15.7	-106
	1	05/25/2022	6.9	186	**1,490**	5.4	<20	**394**	349	0.17	4.0	873	<1	13.1	-112
	2	10/14/2022	6.9	187	**1,558**	<5.0	<20	**382**	373	0.43	3.4	837	<1	12.7	-117
	2DUP	10/14/2022	6.9	187	**1,560**	<5.0	28	**381**	373	0.32	3.4	821	<1	12.7	-117
G-02		Upper TL	5.7–8.1	182	1,214	4.3	31	383	207	0.68	2.2	791	<1	17.3	-69
	1	05/25/2022	6.9	117	902	7.7	25	180	143	0.19	1.6	556	<1	14.8	-81
	2	10/13/2022	7.0	107	896	<5.0	20	182	159	<0.15	1.7	651	<1	12.9	-82
G-03		Upper TL	5.7–8.4	312	1,826	19.3	93	618	167	0.24	32.0	570	<1	18.3	-95
	1	05/25/2022	7.0	190	**1,376**	18.9	67	**429**	139	<0.15	21.9	497	<1	14.5	-108
	2	10/13/2022	7.0	199	**1,428**	18.5	68	**445**	131	<0.15	25.7	523	<1	14.1	-108
G-04		Upper TL	6.3–9.2	179	1,100	8.1	30	213	584	0.11	19.0	746	<1	17.0	-34
	1	05/26/2022	6.9	142	1,170	<5.0	26	180	309	<0.15	10.8	655	<1	15.8	-32
	2	10/13/2022	6.9	135	1,104	<5.0	<20	162	299	<0.15	10.5	724	<1	14.6	-31
G-05		Upper TL	6.3–9.4	219	1,200	29.8	102	159	499	0.32	6.6	738	<1	15.3	-38
	1	05/26/2022	6.9	137	**1,270**	<5.0	<20	157	**430**	<0.15	5.9	690	<1	14.3	-34
	2	10/13/2022	6.9	135	1,198	<5.0	<20	145	**400**	<0.15	6.3	829	<1	14.1	-34
G-06		Upper TL	6.0–7.9	176	1,324	3.8	17	147	392	0.081	3.7	804	<1	16.2	-13
	1	05/26/2022	7.0	113	1,076	<5.0	<20	98	381	<0.15	3.0	652	<1	13.2	-19
	1DUP	05/26/2022	7.0	113	1,068	<5.0	<20	99	380	<0.15	3.1	652	<1	13.2	-19
	2	10/13/2022	7.0	112	1,026	<5.0	<20	88	361	<0.15	3.4	746	<1	13.1	-21

TABLE 6 (Continued): ANALYSIS OF ROUTINE PARAMETERS IN GROUNDWATER SAMPLED FROM EACH MONITORING WELL AT THE MCCOOK RESERVOIR SITE DURING LOW-STAGE SEMIANNUAL SAMPLING IN MAY AND OCTOBER 2022

Well	Sampling Event	Sample Date	pH	EC mS/m	TDS	TOC	COD	Cl^-	SO_4^{2-}	Total P	NH_3-N	Hardness	FC CFU/100 mL	Temp. °C	Elevation ft CCD
					mg/L										
Class I Standard[1]			**6.5−9.0**	**NS**	**1,200**	**NS**	**NS**	**200**	**400**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**
G-07		Upper TL	5.8−7.8	536	2,856	12.2	62	558	610	4.3	192[4]	1,430	<1	20.3	-3
	1	05/25/2022	7.1	152	900	7.0	27	**208**	198	0.75	73.7	405	<1	13.6	-6
	2	10/13/2022	7.1	146	888	5.3	36	**234**	191	0.56	73.2	449	<1	13.6	-5

[1]Illinois Administrative Code Title (IAC) 35 Part 620.410 Class I Standards. Bold text indicates exceedance.
[2]No standard established by 35 IAC Part 620.410.
[3]For pH, upper and lower tolerance limits are shown.
[4]McCook Reservoir site was previously unpaved biosolids lagoons. Elevated NH_3-N may reflect infiltration or drilling through old biosolids lagoon sediments.

TABLE 7: ANALYSIS OF INORGANIC AND RADIOACTIVE PARAMETERS IN GROUNDWATER SAMPLED FROM EACH MONITORING WELL AT THE McCOOK RESERVOIR SITE DURING THE FIRST LOW-STAGE SEMIANNUAL SAMPLING IN MAY 2022

Parameter	Units	Class I Standard[1]	G-01	G-02	G-03	G-04	G-05	G-06	G-06DUP[2]	G-07
Ag	mg/L	0.05	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
As	"	0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003
B	"	2.0	0.411	0.326	0.729	**2.16**	**2.09**	**3.24**	**3.31**	0.208
Ba	"	2.0	0.048	0.065	0.087	0.042	0.053	0.026	0.027	0.042
Be	"	0.004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cd	"	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Co	"	1.0	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cr	"	0.1	<0.004	0.090	0.005	<0.004	<0.004	<0.004	<0.004	<0.004
Cu	"	0.65	0.013	0.003	<0.002	<0.002	<0.002	<0.002	0.002	<0.002
CN	"	0.2	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
F	"	4.0	0.350	0.300	0.477	0.464	0.388	0.390	0.393	0.310
Fe	"	5.0	0.198	1.577	0.239	0.692	0.610	0.300	0.299	0.859
Hg	"	0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Mn	"	0.15	0.021	0.017	0.015	0.011	0.024	0.006	0.006	0.006
Ni	"	0.1	0.011	0.006	0.011	<0.002	<0.002	<0.002	<0.002	0.004
NO_3^--N	"	10	<0.250	<0.250	<0.250	<0.250	<0.250	<0.250	<0.250	<0.250
Pb	"	0.0075	0.004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Sb	"	0.006	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Se	"	0.05	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Tl	"	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Zn	"	5.0	1.00	0.017	<0.010	<0.010	<0.010	<0.010	<0.010	0.020
Ra-226	pCi/L	20	2.23	0.65	0.82	1.99	0.99	1.30	1.73	0.74
Ra-228	"	20	0.64	<0.57	2.44	NRR[3]	0.96	NRR	0.86	<1.03

[1]Illinois Administrative Code Title 35 Part 620.410 Class I Standards. Bold text indicates exceedance.
[2]Duplicate sample.
[3]No reportable result because the batch quality assurance/quality control sample did not meet method requirements and there was inadequate sample volume for reanalysis.

TABLE 8: UPPER TOLERANCE LIMITS FOR INORGANIC AND RADIOACTIVE PARAMETERS IN EACH MONITORING WELL AT THE McCOOK RESERVOIR SITE ESTABLISHED BY BACKGROUND MONITORING PRIOR TO OPERATION IN JANUARY 2018

Parameter	Units	G-01	G-02	G-03	G-04	G-05	G-06	G-07
Ag	mg/L	0.025	0.025	0.025	0.025	0.025	0.025	0.025
As	"	0.0018	0.025	0.0028	0.0035	0.0027	0.025	0.0086
B	"	0.598	0.51	1.09	2.5	2.5	7.1	0.59
Ba	"	0.048	0.092	0.15	0.095	0.053	0.058	0.09
Be	"	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Cd	"	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025
Co	"	0.035	0.0081	0.0032	0.035	0.035	0.035	0.0048
Cr	"	0.025	0.633	0.13	0.035	0.035	0.035	0.035
Cu	"	0.0044	0.015	0.0095	0.0031	0.0025	0.0062	0.0074
CN	"	0.1	0.1	0.1	0.1	0.1	0.1	0.1
F	"	0.05	0.05	0.33	0.4	0.35	0.37	0.05
Fe	"	4.92	10.5	4.48	1.37	0.95	1.43	2.44
Hg	"	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Mn	"	0.099	0.103	0.21	0.036	0.026	0.021	0.012
Ni	"	0.011	0.25	0.065	0.0092	0.0062	0.05	0.01
NO_3^--N	"	1.08	0.075	0.075	0.075	0.075	0.075	0.075
Pb	"	0.00375	0.00375	0.0056	0.0077	0.00375	0.00375	0.00375
Sb	"	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Se	"	0.025	0.025	0.025	0.025	0.025	0.025	0.025
Tl	"	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Zn	"	0.01	0.01	0.01	0.057	0.1	0.069	0.01
Ra-226	pCi/L	2.78	2.33	2.58	1.89	1.6	2.24	3.75
Ra-228	"	3.19	1.51	4.12	3.08	1.65	1.89	4.64

TABLE 9: ANALYSIS OF ORGANIC PARAMETERS IN GROUNDWATER SAMPLED FROM EACH MONITORING WELL AT THE MCCOOK RESERVOIR SITE DURING THE FIRST LOW-STAGE SEMIANNUAL SAMPLING IN MAY 2022

Parameter	Class I Standard[1]	Max RL[2]	G-01	G-02	G-03	G-04	G-05	G-06	G-06DUP[3]	G-07
	mg/L									
Herbicides										
2,4-D	0.07	0.00635	<0.00609	<0.00607	<0.00635	<0.00611	<0.00610	<0.00606	<0.00607	<0.00626
Silvex (2,4,5-TP)	0.05	0.00318	<0.00305	<0.00304	0.00394	<0.00305	<0.00305	<0.00303	<0.00303	<0.00313
Atrazine	0.003	0.00105	<0.00103	<0.00102	<0.00104	<0.00102	<0.00105	<0.00101	<0.00102	<0.00104
Dalapon	0.2	0.00199	<0.00199	<0.00197	<0.00188	<0.00188	<0.00199	<0.00198	<0.00194	<0.00196
Simazine	0.004	0.00105	<0.00103	<0.00102	<0.00104	<0.00102	<0.00105	<0.00101	<0.00102	<0.00104
PCBs, Total	0.0005	0.0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
Pesticides										
Alachlor	0.002	0.00105	<0.00103	<0.00102	<0.00104	<0.00102	<0.00105	<0.00101	<0.00102	<0.00104
Aldicarb	0.003	0.003	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300
Carbofuran	0.04	0.01	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Chlordane (technical)	0.002	0.00105	<0.00103	<0.00102	<0.00104	<0.00102	<0.00105	<0.00101	<0.00102	<0.00104
Endrin	0.002	0.0000422	<0.0000410	<0.0000407	<0.0000416	<0.0000409	<0.0000422	<0.0000405	<0.0000408	<0.0000418
gamma-BHC (Lindane)	0.0002	0.0000422	<0.0000410	<0.0000407	<0.0000416	<0.0000409	<0.0000422	<0.0000405	<0.0000408	<0.0000418
Heptachlor	0.0004	0.0000422	<0.0000410	<0.0000407	<0.0000416	<0.0000409	<0.0000422	<0.0000405	<0.0000408	<0.0000418
Heptachlor epoxide	0.0002	0.0000422	<0.0000410	<0.0000407	<0.0000416	<0.0000409	<0.0000422	<0.0000405	<0.0000408	<0.0000418
Methoxychlor	0.04	0.0000843	<0.0000821	<0.0000815	<0.0000832	<0.0000817	<0.0000843	<0.0000811	<0.0000815	<0.0000836
Toxaphene	0.003	0.00211	<0.00205	<0.00204	<0.00208	<0.00204	<0.00211	<0.00203	<0.00204	<0.00209
Volatile Organic Compounds										
1,1,1-Trichloroethane	0.2	0.0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
1,1,2-Trichloroethane	0.005	0.0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
1,1-Dichloroethene	0.007	0.0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
1,2-Dichloroethane	0.005	0.0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
1,2-Dichloropropane	0.005	0.0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
1,2-Dibromo-3-Chloropropane	0.0002	0.000143	<0.000143	<0.000143	<0.000139	<0.000132	<0.000143	<0.000139	<0.000139	<0.000143

TABLE 9 (Continued): ANALYSIS OF ORGANIC PARAMETERS IN GROUNDWATER SAMPLED FROM EACH MONITORING WELL AT THE McCOOK RESERVOIR SITE DURING THE FIRST LOW-STAGE SEMIANNUAL SAMPLING IN MAY 2022

Parameter	Class I Standard[1]	Max RL[2]	G-01	G-02	G-03	G-04	G-05	G-06	G-06DUP[3]	G-07
	mg/L									
Volatile Organic Compounds (Continued)										
Ethylene Dibromide	0.00005	0.00005	<0.0000500	<0.0000500	<0.0000500	<0.0000500	<0.0000500	<0.0000500	<0.0000500	<0.0000500
Benzene	0.005	0.0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	0.00096	0.00099	<0.000500
Carbon tetrachloride	0.005	0.0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
Chlorobenzene	0.1	0.0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
cis-1,2-Dichloroethene	0.07	0.0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	0.00902	0.00877	0.00707
Ethylbenzene	0.7	0.0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
Methylene Chloride	0.005	0.002	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Methyl tert-butyl ether	0.07	0.0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
Styrene	0.1	0.0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
Tetrachloroethene	0.005	0.0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
Toluene	1	0.0005	0.00122	0.18	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
trans-1,2-Dichloroethene	0.1	0.0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
Trichloroethene	0.005	0.0005	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
Vinyl chloride	0.002	0.001	<0.00100	<0.00100	<0.00100	<0.00100	**0.00207**	**0.178**	**0.166**	**0.00264**
Xylenes, Total	10	0.0015	<0.00150	<0.00150	<0.00150	<0.00150	<0.00150	<0.00150	<0.00150	<0.00150
Semivolatile Volatile Organic Compounds										
1,2,4-Trichlorobenzene	0.07	0.00219	<0.00203	<0.00208	<0.00211	<0.00202	<0.00219	<0.00203	<0.00202	<0.00206
1,2-Dichlorobenzene	0.6	0.00219	<0.00203	<0.00208	<0.00211	<0.00202	<0.00219	<0.00203	<0.00202	<0.00206
1,4-Dichlorobenzene	0.075	0.00219	<0.00203	<0.00208	<0.00211	<0.00202	<0.00219	<0.00203	<0.00202	<0.00206
Benzo[a]pyrene	0.0002	0.00219	<0.00203	<0.00208	<0.00211	<0.00202	<0.00219	<0.00203	<0.00202	<0.00206
Bis(2-ethylhexyl)phthalate	0.006	0.0219	<0.0203	<0.0208	<0.0211	<0.0202	<0.0219	<0.0203	<0.0202	<0.0206
Hexachlorocyclopentadiene	0.05	0.0164	<0.0152	<0.0156	<0.0158	<0.0152	<0.0164	<0.0152	<0.0151	<0.0155
Pentachlorophenol	0.001	0.00318	<0.00305	<0.00304	<0.00318	<0.00305	<0.00305	<0.00303	<0.00303	<0.00313
Phenolics, Total Recoverable	0.1	0.05	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500

[1]Illinois Administrative Code Title 35 Part 620.410 Class I Standards. Bold text indicates exceedance.
[2]Maximum Laboratory Reporting Limit for analyses of an analyte at all monitoring wells.
[3]Duplicate sample.

TABLE 10: UPPER TOLERANCE LIMITS FOR ORGANIC PARAMETERS IN EACH MONITORING WELL AT THE McCOOK RESERVOIR SITE ESTABLISHED BY BACKGROUND MONITORING PRIOR TO OPERATION IN JANUARY 2018

Parameter	G-01	G-02	G-03	G-04	G-05	G-06	G-07
	mg/L						
Herbicides							
2,4-D	0.005	0.005	0.005	0.005	0.005	0.005	0.005
Silvex (2,4,5-TP)	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Atrazine	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025
Dalapon	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Simazine	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PCBs, Total	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005
Pesticides							
Alachlor	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025
Aldicarb	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Carbofuran	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Chlordane (technical)	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005
Endrin	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005
gamma-BHC (Lindane)	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005
Heptachlor	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025	0.00025
Heptachlor epoxide	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Methoxychlor	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Toxaphene	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Volatile Organic Compounds							
1,1,1-Trichloroethane	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025
1,1,2-Trichloroethane	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025
1,1-Dichloroethene	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025
1,2-Dichloroethane	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025
1,2-Dichloropropane	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025
1,2-Dibromo-3-Chloropropane	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

TABLE 10 (Continued): UPPER TOLERANCE LIMITS FOR ORGANIC PARAMETERS IN EACH MONITORING WELL AT THE McCOOK RESERVOIR SITE ESTABLISHED BY BACKGROUND MONITORING PRIOR TO OPERATION IN JANUARY 2018

Parameter	G-01	G-02	G-03	G-04	G-05	G-06	G-07
	mg/L						
Volatile Organic Compounds (Continued)							
Ethylene Dibromide	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025
Benzene	0.0025	0.0025	0.0025	0.0025	0.0025	0.00057	0.0025
Carbon tetrachloride	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025
Chlorobenzene	0.001	0.001	0.001	0.001	0.001	0.001	0.001
cis-1,2-Dichloroethene	0.0025	0.0025	0.0025	0.0025	0.0025	0.0130	0.0029
Ethylbenzene	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025
Methylene Chloride	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025
Methyl tert-butyl ether	0.035	0.035	0.035	0.035	0.035	0.035	0.035
Styrene	0.005	0.005	0.005	0.005	0.005	0.005	0.005
Tetrachloroethene	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025
Toluene	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025
trans-1,2-Dichloroethene	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025
Trichloroethene	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0011
Vinyl chloride	0.001	0.001	0.001	0.001	0.0052	0.203	0.001
Xylenes, Total	0.0025	0.0025	0.0025	0.0025	0.0022	0.0025	0.0025
Semivolatile Organic Compounds							
1,2,4-Trichlorobenzene	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025
1,2-Dichlorobenzene	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025
1,4-Dichlorobenzene	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Benzo[a]pyrene	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Bis(2-ethylhexyl) phthalate	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Hexachlorocyclopentadiene	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025
Pentachlorophenol	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Phenolics, Total	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025

REFERENCES

Illinois Administrative Code Title 35, § 620.410 Groundwater Quality Standards for Class I: Potable Resource Groundwater (Amended at 36 Ill. Reg. 15206, effective October 5, 2012).

United States Army Corps of Engineers (USACE). 2014. Chicago Underflow Plan McCook Reservoir Lyons Township, Illinois. Groundwater Monitoring and Analysis Plan. Amended July 2014. Approved by IEPA April 2015.