

*Protecting Our Water Environment*



*Metropolitan Water Reclamation District of Greater Chicago*

***MONITORING AND RESEARCH  
DEPARTMENT***

*REPORT NO. 21-28*

*TUNNEL AND RESERVOIR PLAN GLORIA ALITTO MAJEWSKI  
CHICAGO UNDERFLOW PLAN RESERVOIR WATER QUALITY  
MONITORING WELLS ANNUAL GROUNDWATER MONITORING  
REPORT FOR 2020*

*July 2021*

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July 19, 2021

Chief  
Bureau of Water  
Illinois Environmental Protection Agency  
P. O. Box 19276  
Springfield, IL 62794-9276

Dear Sir or Madam:

Subject: Tunnel and Reservoir Plan Gloria Alitto Majewski Chicago Underflow Plan  
Reservoir Water Quality Monitoring Wells Annual Groundwater Monitoring  
Report for 2020

Attached are three copies of "Tunnel and Reservoir Plan Gloria Alitto Majewski Chicago Underflow Plan Reservoir Water Quality Monitoring Wells Annual Groundwater Monitoring Report for 2020."

Very truly yours,



Albert Cox  
Environmental Monitoring and Research Manager  
Monitoring and Research Department

AC:EE:lf  
Attachment  
cc: Mr. Ryan Bahr (USEPA Region 5 - WC15J) - (2)  
    Mr. E. Podczerwinski  
    Dr. H. Zhang  
cc w/o att: Mr. J. Murray  
            Mr. S. Serafino

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**TUNNEL AND RESERVOIR PLAN GLORIA ALITTO MAJEWSKI CHICAGO  
UNDERFLOW PLAN RESERVOIR WATER QUALITY MONITORING WELLS  
ANNUAL GROUNDWATER MONITORING REPORT FOR 2020**

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## TABLE OF CONTENTS

|                                  | <u>Page</u> |
|----------------------------------|-------------|
| TABLE OF CONTENTS                | i           |
| LIST OF TABLES                   | ii          |
| LIST OF FIGURES                  | iii         |
| LIST OF ABBREVIATIONS            | iv          |
| ANNUAL DATA FOR MONITORING WELLS | 1           |
| Introduction                     | 1           |
| Summary of Data                  | 1           |

## LIST OF TABLES

| <u>Table No.</u> |   | <u>Page</u> |
|------------------|---|-------------|
| 1                | Analysis of Chemical and Physical Parameters and Fecal Coliform in Groundwater from Monitoring Wells Adjacent to the Gloria Alitto Majewski Chicagoland Underflow Plan Reservoir of the Tunnel and Reservoir Plan During 2020 | 3           |

**LIST OF FIGURES**

| <u>Figure No.</u> |  | <u>Page</u> |
|-------------------|--|-------------|
| 1                 | Map of Four Water Quality Monitoring Wells and Nine Private Wells Surrounding the Gloria Alitto Majewski Chicago Underflow Plan Reservoir of the Tunnel and Reservoir Plan | 2           |

## LIST OF ABBREVIATIONS

|                               |                          |
|-------------------------------|--------------------------|
| °C                            | degrees Celsius          |
| CCD                           | Chicago City Datum       |
| CFU                           | colony forming units     |
| Cl <sup>-</sup>               | chloride                 |
| Coeff. of Var.                | coefficient of variation |
| EC                            | electrical conductivity  |
| FC                            | fecal coliform           |
| L                             | liter                    |
| m                             | meter                    |
| mg                            | milligram                |
| mS                            | millisiemens             |
| NH <sub>3</sub> -N            | ammonia nitrogen         |
| Std. Dev.                     | standard deviation       |
| SO <sub>4</sub> <sup>2-</sup> | sulfate                  |
| TDS                           | total dissolved solids   |
| Temp.                         | temperature              |
| TOC                           | total organic carbon     |

# ANNUAL DATA FOR MONITORING WELLS

## Introduction

Four monitoring wells, QK-1 through QK-4, are located on the perimeter of the Gloria Alitto Majewski Chicagoland Underflow Plan Reservoir (Reservoir). Well QK-1 is positioned at the northwest corner of the Reservoir, with QK-2, QK-3, and QK-4 at the northeast, southeast, and southwest corners, respectively ([Figure 1](#)). In addition, there are nine privately owned water supply wells, W1X through W9X, which are located within 1,000 feet of the Reservoir. The four monitoring wells are sampled quarterly and for at least six consecutive weeks following each Reservoir fill event in which the Reservoir is used to store combined sewer flow from the Metropolitan Water Reclamation District of Greater Chicago's Tunnel and Reservoir Plan system (Illinois Environmental Protection Agency memorandum dated October 14, 1997). Fill-event samples may substitute for quarterly samples, depending on the occurrence of fill events. Groundwater elevations are also measured during each sampling event. There are no observation wells associated with this site.

Three fill events were observed during 2020. The first fill event occurred on March 17, 2020. The second and third fill events occurred on April 28, 2020, and May 14, 2020, respectively. Sampling of monitoring wells was not conducted for these fill events due to the suspension of the TARP monitoring program during the COVID-19 pandemic, from mid-March through early June 2020, per IEPA's approval. The monitoring wells were sampled quarterly on the following dates: March 3, 2020, June 10, 2020, September 17, 2020, and December 1, 2020.

## Summary of Data

**Monitoring Wells.** The analytical data for groundwater sampled during 2020 from monitoring wells QK-1 through QK-4 are presented in [Table 1](#). Physical characteristics, such as elevation, groundwater temperature, and estimated time of recharge for each well between initial pumpdown and sampling, are also included.



FIGURE 1: MAP OF FOUR WATER QUALITY MONITORING WELLS AND NINE PRIVATE WELLS SURROUNDING THE GLORIA ALITTO MAJEWSKI CHICAGO UNDERFLOW PLAN RESERVOIR OF THE TUNNEL AND RESERVOIR PLAN

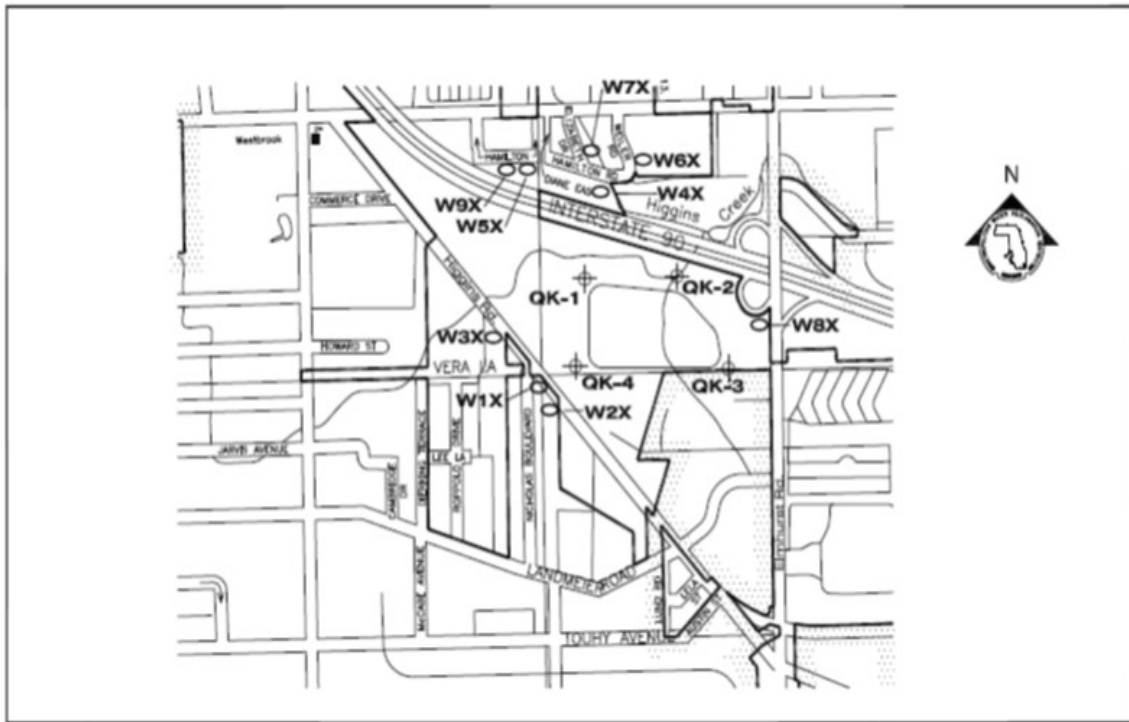


TABLE 1: ANALYSIS OF CHEMICAL AND PHYSICAL PARAMETERS AND FECAL COLIFORM IN GROUNDWATER FROM MONITORING WELLS ADJACENT TO THE GLORIA ALITTO MAJEWSKI CHICAGOLAND UNDERFLOW PLAN RESERVOIR OF THE TUNNEL AND RESERVOIR PLAN DURING 2020

| Quarter of Year | Number Well | Date Sampled | pH  | EC <sup>1</sup> mS/m | TDS <sup>1</sup> | TOC <sup>1</sup> | Cl <sup>-</sup> | SO <sub>4</sub> <sup>2-</sup> mg/L | NH <sub>3</sub> -N | Hardness | Fecal Coliform CFU/100 mL | Temp. °C | Water Elevation <sup>2</sup> feet | Recharge Time hours |
|-----------------|-------------|--------------|-----|----------------------|------------------|------------------|-----------------|------------------------------------|--------------------|----------|---------------------------|----------|-----------------------------------|---------------------|
| 1               | QK-1        | 03/03/20     | 7.0 | 60                   | 1,818            | 2.5              | 68              | 962                                | 0.45               | 1,126    | 1                         | 11.7     | -75                               | <4                  |
| 2               | QK-1        | 06/10/20     | 7.1 | 163                  | 2,250            | 2                | 74              | 1,406                              | 1.68               | 1,575    | 1,400                     | 14.9     | -76                               | <4                  |
| 3               | QK-1        | 09/17/20     | 6.9 | 102                  | 1,460            | <5.0             | 106             | 748                                | <0.30              | 944      | 5                         | 13.4     | -79                               | <4                  |
| 4               | QK-1        | 12/01/20     | 7.0 | 132                  | 1,814            | <5.0             | 82              | 954                                | <0.30              | 1,125    | <1                        | 11.9     | NA <sup>3</sup>                   | <4                  |
| 1               | QK-2        | 03/03/20     | 7.4 | 54                   | 922              | 1.5              | 6               | 540                                | 0.40               | 462      | <1                        | 12.3     | -84                               | <4                  |
| 2               | QK-2        | 06/10/20     | 7.6 | 87                   | 1,004            | 1.2              | 5               | 606                                | <0.30              | 558      | <1                        | 14.3     | -84                               | <4                  |
| 3               | QK-2        | 09/17/20     | 7.6 | 72                   | 934              | <5.0             | 6               | 563                                | 0.34               | 564      | <1                        | 13.6     | -84                               | <4                  |
| 4               | QK-2        | 12/01/20     | 7.4 | 79                   | 914              | <5.0             | 5               | 533                                | 0.32               | 479      | <1                        | 11.9     | -84                               | <4                  |

TABLE 1 (Continued): ANALYSIS OF CHEMICAL AND PHYSICAL PARAMETERS AND FECAL COLIFORM IN GROUNDWATER FROM MONITORING WELLS ADJACENT TO THE GLORIA ALITTO MAJEWSKI CHICAGOLAND UNDERFLOW PLAN RESERVOIR OF THE TUNNEL AND RESERVOIR PLAN DURING 2020

| Quarter of Year | Number Well | Date Sampled | pH  | EC <sup>1</sup> mS/m | TDS <sup>1</sup> | TOC <sup>1</sup> | Cl <sup>-</sup> | SO <sub>4</sub> <sup>2-</sup> mg/L | NH <sub>3</sub> -N | Hardness | Fecal Coliform CFU/100 mL | Temp. °C | Water Elevation <sup>2</sup> feet | Recharge Time hours |
|-----------------|-------------|--------------|-----|----------------------|------------------|------------------|-----------------|------------------------------------|--------------------|----------|---------------------------|----------|-----------------------------------|---------------------|
| 1               | QK-3        | 03/03/20     | 7.3 | 83                   | 764              | 1.1              | 63              | 295                                | 0.63               | 434      | 2                         | 11.7     | -89                               | <4                  |
| 2               | QK-3        | 06/10/20     | 7.5 | 70                   | 766              | 1.7              | 65              | 306                                | 0.55               | 456      | 400                       | 13.7     | -84                               | <4                  |
| 3               | QK-3        | 09/17/20     | 7.5 | 64                   | 810              | <5.0             | 63              | 328                                | 0.60               | 504      | <1                        | 13.3     | -90                               | <4                  |
| 4               | QK-3        | 12/01/20     | 7.4 | 69                   | 720              | <5.0             | 64              | 288                                | 0.59               | 415      | <1                        | 12       | NA                                | <4                  |
| 1               | QK-4        | 03/03/20     | 7.2 | 60                   | 838              | 1.5              | 122             | 275                                | 0.68               | 463      | <1                        | 11.6     | -65                               | <4                  |
| 2               | QK-4        | 06/10/20     | 7.4 | 81                   | 798              | 1.6              | 107             | 298                                | 0.68               | 499      | 140                       | 13.8     | -67                               | <4                  |
| 3               | QK-4        | 09/17/20     | 7.4 | 64                   | 828              | <5.0             | 93              | 346                                | 0.71               | 488      | 2                         | 12.2     | -69                               | <4                  |
| 4               | QK-4        | 12/01/20     | 7.4 | 79                   | 836              | <5.0             | 122             | 270                                | 0.67               | 480      | <1                        | 11.9     | -65                               | <4                  |

<sup>1</sup>EC = electrical conductivity; TDS = total dissolved solids; TOC = total organic carbon.

<sup>2</sup>Relative to Chicago City Datum (579.48 feet above mean sea level) at the intersection of State and Madison Streets.

<sup>3</sup>NA: No reportable result due to error in measurements.