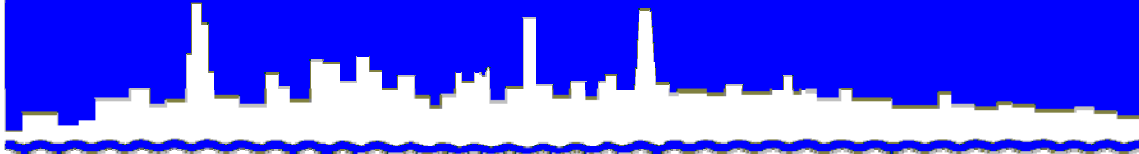


*Protecting Our Water Environment*



*Metropolitan Water Reclamation District of Greater Chicago*

***RESEARCH AND DEVELOPMENT  
DEPARTMENT***

*REPORT NO. 08-55*

***TUNNEL AND RESERVOIR PLAN  
UPPER DES PLAINES TUNNEL SYSTEM  
2007 ANNUAL GROUNDWATER MONITORING REPORT***

***SEPTEMBER 2008***

# Protecting Our Water Environment

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September 19, 2008

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

Dear Ms. Willhite:

Subject: Tunnel and Reservoir Plan, Upper Des Plaines Tunnel System, 2007 Annual Groundwater Monitoring Report

Enclosed are three copies of "Tunnel and Reservoir Plan, Upper Des Plaines Tunnel System, 2007 Annual Groundwater Monitoring Report."

Very truly yours,

Louis Kollias  
Director  
Research and Development

LK:HZ:lmf

Enclosures

cc w/enc: Ms. Sally K. Swanson (USEPA Region V—WC15J) (2)

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TUNNEL AND RESERVOIR PLAN  
UPPER DES PLAINES TUNNEL SYSTEM  
2007 ANNUAL GROUNDWATER MONITORING REPORT

## TABLE OF CONTENTS

	<u>Page</u>
LIST OF TABLES	ii
LIST OF FIGURES	iii
INTRODUCTION	1
Monitoring Data	1
Summary of Data	1
Monitoring Wells Water Level Elevation Data	1
Water Quality Monitoring Wells Data	1
APPENDICES	
AI—Location Map of Groundwater Quality Monitoring Wells MW-1 Through MW-6 (Upper Des Plaines 20), and MW-7 Through MW-9 (Upper Des Plaines 21) in the Upper Des Plaines Tunnel System	AI-1
AII—2007 Groundwater Level Elevation Data for Monitoring Wells MW-1 Through MW-6 (Upper Des Plaines 20), and MW-7 Through MW-9 (Upper Des Plaines 21) in the Upper Des Plaines Tunnel System	AII-1
AIII—2007 Groundwater Quality Data for Monitoring Wells MW-1 Through MW-6 (Upper Des Plaines 20), and MW-7 Through MW-9 (Upper Des Plaines 21) in the Upper Des Plaines Tunnel System	AIII-1

## LIST OF TABLES

<u>Table No.</u>		<u>Page</u>
1	Summary Statistics for 2007 Water Quality Data for the Monitoring Wells in Upper Des Plaines 20 Tunnel System: Wells MW-1 Through MW-6	3
2	Summary Statistics for 2007 Water Quality Data for the Monitoring Wells in Upper Des Plaines 21 Tunnel System: Wells MW-7 Through MW-9	5
AII-1	2007 Groundwater Level Elevation Data for Monitoring Wells MW-1 Through MW-6 in the Upper Des Plaines 20 Tunnel System	AII-1
AII-2	2007 Groundwater Level Elevation Data for Monitoring Wells MW-7 Through MW-9 in the Upper Des Plaines 21 Tunnel System	AII-2
AIII-1	2007 pH, Conductivity, Temperature, Hardness, Ammonia Nitrogen, and Chloride Data for Water Quality Monitoring Wells MW-1 Through MW-6 in the Upper Des Plaines 20 Tunnel System	AIII-1
AIII-2	2007 Sulfate, Total Organic Carbon, Total Dissolved Solids, Fecal Coliform, Water Elevation, and Recharge Data for Water Quality Monitoring Wells MW-1 Through MW-6 in the Upper Des Plaines 20 Tunnel System	AIII-3
AIII-3	2007 pH, Conductivity, Temperature, Hardness, Ammonia Nitrogen, and Chloride Data for Water Quality Monitoring Wells MW-7 Through MW-9 in the Upper Des Plaines 21 Tunnel System	AIII-5
AIII-4	2007 Sulfate, Total Organic Carbon, Total Dissolved Solids, Fecal Coliform, Water Elevation, and Recharge Data for Water Quality Monitoring Wells MW-7 Through MW-9 in the Upper Des Plaines 21 Tunnel System	AIII-6

## LIST OF FIGURES

<u>Figure No.</u>		<u>Page</u>
1	2007 Minimum, Mean, and Maximum Water Level Elevations for the Upper Des Plaines 20 Tunnel System Monitoring Wells	7
2	2007 Minimum, Mean, and Maximum Water Level Elevations for the Upper Des Plaines 21 Tunnel System Monitoring Wells	8
AI-1	Upper Des Plaines Tunnel System Location Map of Groundwater Quality Monitoring Wells	AI-1

## INTRODUCTION

This report contains data for the year 2007 for the Tunnel and Reservoir Plan Upper Des Plaines (UDP) System. This system consists of two sub-systems, UDP 20 and UDP 21. UDP 20 contains six water quality monitoring wells, MW-1 through MW-6, while UDP 21 contains three water quality monitoring wells, MW-7 through MW-9. These nine water quality monitoring wells are sampled six times per year with the exception of MW-1 which is sampled three times per year (IEPA memo July 9, 2004). Water levels were monitored once every two weeks as required.

### Monitoring Data

Appendix AI contains a location map of nine water quality monitoring wells, MW-1 through MW-9 for the TARP UDP System. Table AII-1 in Appendix AII contains groundwater elevation data for the year 2007 for monitoring wells MW-1 through MW-6 for the UDP 20 System, and Table AII-2 contains groundwater elevation data for the same period for monitoring wells MW-7 through MW-9 for the UDP 21 Tunnel System.

Tables AIII-1 and AIII-2 in Appendix AIII contain water quality data for UDP 20. Tables AIII-3 and AIII-4 in Appendix AIII contain water quality data for UDP 21 monitoring wells.

All of the wells in the UDP System were visited for the required number of samples. However, due to severe weather which caused the well cover to freeze, snow to block access, fallen trees, or road construction blocking well access, in some instances samples from the monitoring wells were not obtained. These instances are noted in Tables AII-1 and AII-2 for the given days and wells.

### Summary of Data

**Monitoring Wells Water Level Elevation Data.** In Figure 1, the 2007 groundwater level elevation data for monitoring wells MW-1 through MW-6 of the UDP 20 Tunnel System have been plotted. In this figure, mean, minimum, and maximum water level elevations of all six monitoring wells are plotted to show the fluctuations in the water level elevations during 2007.

Similarly, in Figure 2, the 2007 groundwater elevation data for monitoring wells MW-7 through MW-9 of the UDP 21 Tunnel System have been plotted. Also, mean, minimum, and maximum water level elevations of all three monitoring wells are plotted to show the fluctuations in the water level elevation during 2007.

**Water Quality Monitoring Wells Data.** Table 1 contains summary statistics of the water quality parameters for the year 2007 for the UDP 20 Tunnel System, and Table 2 contains summary statistics of the water quality parameters for the same period for the UDP 21 Tunnel System. The

summary statistics are computed from the water quality data collected in 2007 from UDP water quality monitoring wells MW-1 through MW-6 (UDP 20), and MW-7 through MW-9 (UDP 21). The summary statistics include minimum, mean, maximum, standard deviation (Std. Dev.), median, and coefficient of variation (Coeff. Var.) of the values of all nine water quality parameters analyzed for 2007. The nine water quality parameters are: chloride (Cl), conductivity (Cond.), fecal coliform (FC), hardness as CaCO<sub>3</sub> (Hard.), ammonia as NH<sub>4</sub><sup>+</sup>-N, pH, sulfate (SO<sub>4</sub>), total dissolved solids (TDS), and total organic carbon (TOC).



TABLE 1: SUMMARY STATISTICS FOR 2007 WATER QUALITY DATA  
FOR THE MONITORING WELLS IN UPPER DES PLAINES 20 TUNNEL SYSTEM:  
WELLS MW-1 THROUGH MW-6

Parameter		Well Number					
		MW-1	MW-2	MW-3	MW-4	MW-5	MW-6
Cl mg/L	Minimum	29	33	11	45	49	32
	Mean	37	36	13	55	315	41
	Maximum	46	40	14	68	961	53
	Std. Dev.	9	3	1	8	342	7
	Median	35	35	13	54	242	40
	Coeff. Var.	24	7	10	14	109	17
Cond. µmhos/cm	Minimum	500	489	502	545	501	450
	Mean	761	827	742	826	1,116	802
	Maximum	894	1,092	990	1,128	1,830	1,085
	Std. Dev.	226	264	249	291	633	268
	Median	890	901	736	818	1,097	894
	Coeff. Var.	30	32	34	35	57	33
FC <sup>1</sup> cfu/100 mL	Minimum	1	1	1	1	1	1
	Geo. Mean	1	1	1	1	4	2
	Maximum	1	1	1	1	1,700	25
	Geo. Std. Dev.	0	0	0	0	20	4
	Median	1	1	1	1	1	1
	Coeff. Var.	0	0	0	0	17,885	195
Hard. mg/L	Minimum	423	451	423	516	66	363
	Mean	424	456	433	528	224	373
	Maximum	425	460	438	543	359	380
	Std. Dev.	1	4	5	12	103	6
	Median	424	458	435	525	231	373
	Coeff. Var.	0	1	1	2	46	2
NH <sub>4</sub> <sup>+</sup> -N <sup>2</sup> mg/L	Minimum	0.23	0.50	0.27	0.03	0.02	0.36
	Mean	0.25	0.52	0.30	0.06	0.07	0.45
	Maximum	0.29	0.54	0.33	0.09	0.24	0.50
	Std. Dev.	0.03	0.02	0.03	0.03	0.09	0.05
	Median	0.24	0.51	0.30	0.06	0.02	0.46
	Coeff. Var.	12.69	3.42	8.51	41.55	127.46	10.42

TABLE 1 (CONTINUED): SUMMARY STATISTICS FOR 2007 WATER QUALITY DATA  
FOR THE MONITORING WELLS IN UPPER DES PLAINES 20 TUNNEL SYSTEM:  
WELLS MW-1 THROUGH MW-6

Parameter		Well Number					
		MW-1	MW-2	MW-3	MW-4	MW-5	MW-6
pH	Minimum	7.6	7.6	7.5	7.4	7.5	6.3
	Mean	7.7	7.7	7.7	7.6	7.7	7.6
	Maximum	7.8	7.8	7.8	7.8	7.9	8.0
	Std. Dev.	0.1	0.1	0.1	0.1	0.2	0.6
	Median	7.7	7.8	7.7	7.6	7.7	7.8
	Coeff. Var.	1.3	1.3	1.4	1.9	2.2	8.6
SO <sub>4</sub> mg/L	Minimum	342	384	386	339	92	310
	Mean	373	419	423	374	202	325
	Maximum	406	467	454	421	322	342
	Std. Dev.	32	33	25	32	86	12
	Median	370	410	424	369	181	324
	Coeff. Var.	9	8	6	9	43	4
TDS mg/L	Minimum	748	858	842	926	642	732
	Mean	777	873	862	955	1,029	763
	Maximum	792	888	896	1,012	2,166	802
	Std. Dev.	25	12	25	32	576	23
	Median	790	873	849	948	812	761
	Coeff. Var.	3	1	3	3	56	3
TOC mg/L	Minimum	0.6	0.6	0.5	0.4	0.5	0.8
	Mean	0.7	0.8	0.6	0.5	1.1	0.9
	Maximum	0.7	1.2	0.7	0.6	2.0	1.0
	Std. Dev.	0.1	0.2	0.1	0.1	0.6	0.1
	Median	0.7	0.8	0.6	0.5	1.0	0.9
	Coeff. Var.	8.7	24.8	12.9	14.6	55.2	9.4

<sup>1</sup>For purposes of statistical evaluation, fecal coliform values less than 1 were set equal to 1.

<sup>2</sup>For purposes of statistical evaluation, ammonium nitrogen values less than 0.02 mg/L were set equal to 0.02 mg/L.

TABLE 2: SUMMARY STATISTICS FOR 2007 WATER QUALITY DATA  
FOR THE MONITORING WELLS IN UPPER DES PLAINES 21 TUNNEL SYSTEM:  
WELLS MW-7 THROUGH MW-9

Parameter		Well Number		
		MW-7	MW-8	MW-9
Cl mg/L	Minimum	36	29	31
	Mean	37	53	41
	Maximum	41	77	63
	Std. Dev.	2	22	12
	Median	37	55	38
	Coeff. Var.	5	42	28
Cond. µmhos/cm	Minimum	506	447	542
	Mean	801	667	542
	Maximum	1,188	888	793
	Std. Dev.	273	167	958
	Median	778	673	174
	Coeff. Var.	34	25	863
FC <sup>1</sup> cfu/100 mL	Minimum	1	1	1
	Geo. Mean	2	1	1
	Maximum	210	2	1
	Geo. Std. Dev.	1	1	0
	Median	1	1	1
	Coeff. Var.	3,500	36	0
Hard. mg/L	Minimum	503	90	355
	Mean	512	296	383
	Maximum	519	403	395
	Std. Dev.	6	111	14
	Median	511	331	387
	Coeff. Var.	1	38	4
NH <sub>4</sub> <sup>+</sup> -N <sup>2</sup> mg/L	Minimum	0.44	0.02	0.33
	Mean	0.49	0.10	0.36
	Maximum	0.63	0.44	0.40
	Std. Dev.	0.07	0.17	0.02
	Median	0.47	0.02	0.36
	Coeff. Var.	14.29	165.34	6.93

TABLE 2 (Continued): SUMMARY STATISTICS FOR 2007 WATER QUALITY DATA FOR THE MONITORING WELLS IN UPPER DES PLAINES 21 TUNNEL SYSTEM: WELLS MW-7 THROUGH MW-9

Parameter		Well Number		
		MW-7	MW-8	MW-9
pH	Minimum	7.5	7.6	7.3
	Mean	7.6	8.1	7.7
	Maximum	7.8	8.9	8.0
	Std. Dev.	0.1	0.6	0.2
	Median	7.6	7.7	7.7
	Coeff. Var.	1.5	7.8	3.0
SO <sub>4</sub> mg/L	Minimum	384	68	284
	Mean	400	244	333
	Maximum	420	350	366
	Std. Dev.	13	102	29
	Median	399	266	340
	Coeff. Var.	3	42	9
TDS mg/L	Minimum	884	360	758
	Mean	916	646	773
	Maximum	940	804	806
	Std. Dev.	19	167	18
	Median	917	671	767
	Coeff. Var.	2	26	2
TOC mg/L	Minimum	0.4	0.6	0.7
	Mean	0.6	0.7	0.8
	Maximum	0.8	0.8	0.9
	Std. Dev.	0.2	0.1	0.1
	Median	0.5	0.7	0.9
	Coeff. Var.	29.5	11.0	9.8

<sup>1</sup>For purposes of statistical evaluation, fecal coliform values less than 1 were set equal to 1.

<sup>2</sup>For purposes of statistical evaluation, ammonium nitrogen values less than 0.02 mg/L were set equal to 0.02 mg/L.

FIGURE 1: 2007 MINIMUM, MEAN, AND MAXIMUM WATER LEVEL ELEVATIONS FOR THE UPPER DES PLAINES 20 MONITORING WELLS

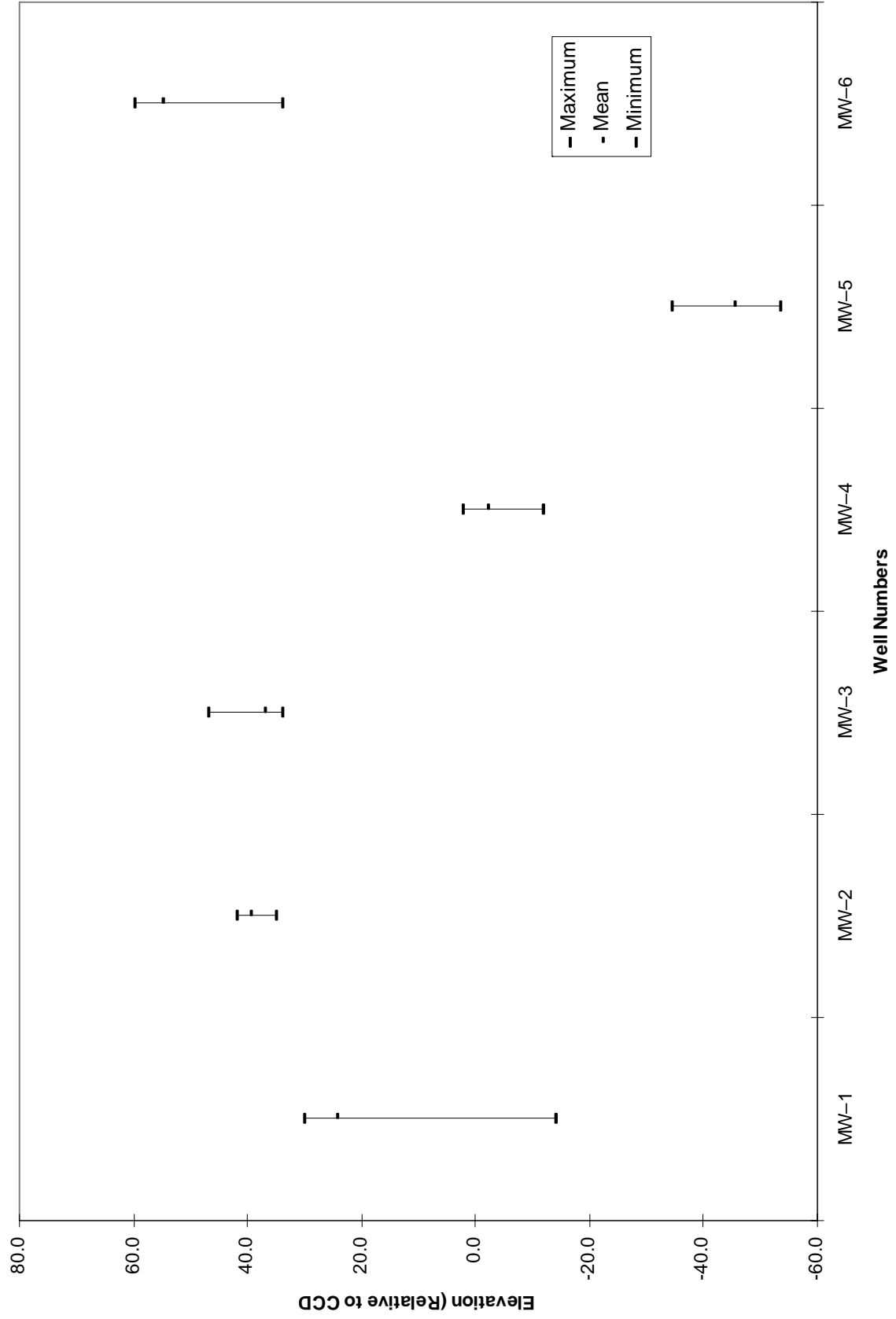
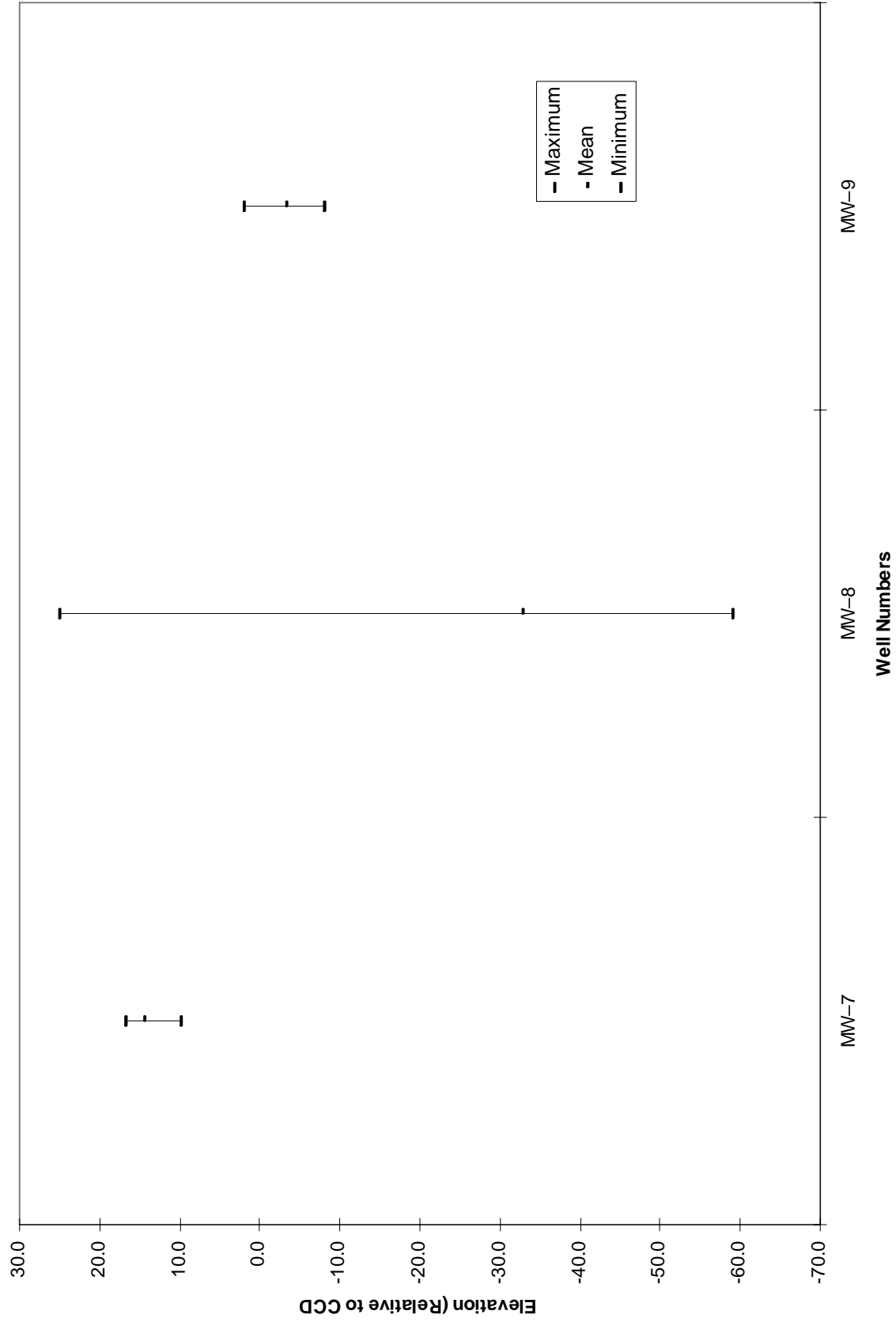


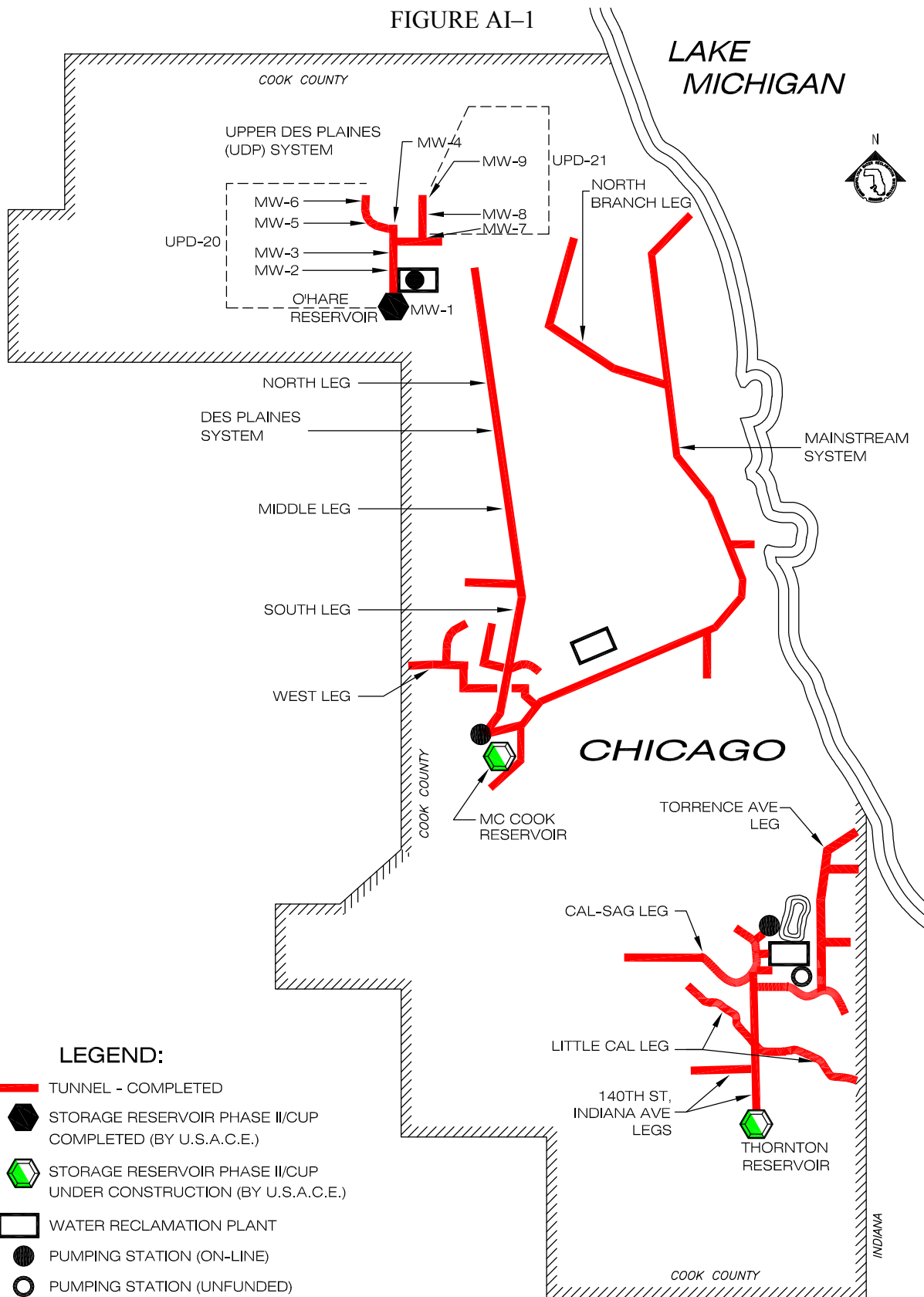
FIGURE 2: 2007 MINIMUM, MEAN, AND MAXIMUM WATER LEVEL ELEVATIONS FOR THE UPPER DES PLAINES 21 MONITORING WELLS



APPENDIX AI

LOCATION MAP OF GROUNDWATER QUALITY MONITORING WELLS  
MW-1 THROUGH MW-6 (UPPER DES PLAINES 20), AND  
MW-7 THROUGH MW-9 (UPPER DES PLAINES 21)  
IN THE UPPER DES PLAINES TUNNEL SYSTEM

FIGURE AI-1



**UPPER DES PLAINES TUNNEL SYSTEM  
LOCATION MAP OF GROUNDWATER  
QUALITY MONITORING WELLS**

METROPOLITAN WATER RECLAMATION  
DISTRICT OF GREATER CHICAGO



APPENDIX AII

2007 GROUNDWATER LEVEL ELEVATION DATA  
FOR MONITORING WELLS MW-1 THROUGH MW-6 (UPPER DES PLAINES 20),  
AND MW-7 THROUGH MW-9 (UPPER DES PLAINES 21)  
IN THE UPPER DES PLAINES TUNNEL SYSTEM

TABLE AII-1: 2007 GROUNDWATER LEVEL ELEVATION\* DATA FOR MONITORING WELLS MW-1 THROUGH MW-6 IN THE UPPER DES PLAINES 20 TUNNEL SYSTEM

Date	Monitoring Well					
	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6
	feet					
1/5/07	28.8	39.8	46.6	-1.1	-47.6	59.6
1/19/07	28.8	39.8	46.6	**	**	**
2/2/07	28.8	39.8	36.6	-1.1	-53.6	59.6
2/16/07	**	38.8	***	***	***	***
3/2/07	27.8	39.8	34.6	***	***	52.6
3/16/07	27.8	38.8	36.6	-7.1	-49.6	58.6
3/30/07	-14.2	38.8	36.6	-12.1	-48.6	59.6
4/6/07	27.8	39.8	35.6	-3.1	-48.6	33.6
4/27/07	28.8	34.8	33.6	-4.1	-52.6	34.6
5/11/07	27.8	37.8	34.6	-2.1	-47.6	34.6
5/25/07	-10.2	39.8	35.6	-1.1	-46.6	58.6
6/8/07	29.8	38.8	36.6	-1.1	-48.6	58.6
6/18/07	28.8	39.8	36.6	0.9	-46.6	56.6
6/29/07	27.8	38.8	36.6	-1.1	-47.6	55.6
7/6/07	26.8	37.8	36.6	-2.1	-46.6	54.6
7/20/07	29.8	38.8	37.6	0.9	-43.6	57.6
8/3/07	27.8	37.8	35.6	-2.1	-44.6	52.6
8/17/07	27.8	38.8	36.6	-2.1	-52.6	57.6
8/31/07	26.8	38.8	36.6	-2.1	-34.6	56.6
9/14/07	-5.2	39.8	37.6	-1.1	-36.6	58.6
9/28/07	29.8	39.8	34.6	-3.1	-53.6	57.6
10/19/07	27.8	39.8	36.6	-3.1	-34.6	57.6
10/26/07	28.8	41.8	34.6	-5.1	-41.6	58.6
11/9/07	26.8	39.8	36.6	-4.1	-38.6	59.6
11/21/07	27.8	39.8	35.6	-3.1	-43.6	54.6
11/30/07	29.8	37.8	35.6	1.9	-47.6	57.6
12/14/07	29.8	40.8	36.6	1.9	-46.6	57.6
12/21/07	27.8	39.8	35.6	-2.1	-42.6	55.6
Minimum	-14.2	34.8	33.6	-12.1	-53.6	33.6
Mean	24.1	39.2	36.8	-2.3	-45.8	54.6
Maximum	29.8	41.8	46.6	1.9	-34.6	59.6

\*Relative to Chicago City Datum.

\*\*Cover of well frozen.

\*\*\*Access to well blocked by snow.

TABLE AII-2: 2007 GROUNDWATER LEVEL ELEVATION\* DATA FOR MONITORING WELLS MW-7 THROUGH MW-9 IN THE UPPER DES PLAINES 21 TUNNEL SYSTEM

Date	Monitoring Well		
	MW-7	MW-8	MW-9
	feet		
1/5/07	14.7	-9.2	-1.2
1/19/07	14.7	-6.2	-2.2
2/2/07	14.7	-3.2	-1.2
2/16/07	13.7	**	**
3/2/07	13.7	**	**
3/16/07	14.7	24.8	-3.2
3/30/07	14.7	-54.2	-6.2
4/6/07	13.7	-13.2	-5.2
4/27/07	11.7	-34.2	-8.2
5/11/07	14.7	-32.2	-6.2
5/25/07	13.7	-41.2	-7.2
6/8/07	15.7	-53.2	0.8
6/18/07	15.7	***	1.8
6/29/07	16.7	-44.2	-0.2
7/6/07	15.7	-42.2	-0.2
7/20/07	15.7	-59.2	0.8
8/3/07	15.7	-52.2	-1.2
8/17/07	13.7	-40.2	-5.2
8/31/07	15.7	****	****
9/14/07	14.7	-23.2	-7.2
9/28/07	10.7	-42.2	-3.2
10/19/07	14.7	-42.2	-3.2
10/26/07	9.7	-47.2	-5.2
11/9/07	12.7	-33.2	-6.2
11/21/07	12.7	-51.2	-5.2
11/30/07	12.7	-27.2	-5.2
12/14/07	16.7	-33.2	-1.2
12/21/07	13.7	**	**
Minimum	9.7	-59.2	-8.2
Mean	14.2	-33.0	-3.4
Maximum	16.7	24.8	1.8

\*Relative to Chicago City Datum.

\*\*Access to well blocked by snow.

\*\*\*Access to well blocked by construction.

\*\*\*\*Access to well blocked by fallen trees.

APPENDIX AIII

2007 GROUNDWATER QUALITY DATA  
FOR MONITORING WELLS MW-1 THROUGH MW-6 (UPPER DES PLAINES 20),  
AND MW-7 THROUGH MW-9 (UPPER DES PLAINES 21)  
IN THE UPPER DES PLAINES TUNNEL SYSTEM

TABLE AIII-1: 2007 pH, CONDUCTIVITY, TEMPERATURE, HARDNESS, AMMONIA NITROGEN, AND CHLORIDE DATA FOR WATER QUALITY MONITORING WELLS MW-1 THROUGH MW-6 IN THE UPPER DES PLAINES 20 TUNNEL SYSTEM

Well	Date of Sampling	pH <sup>1</sup>	Cond. <sup>1</sup> µmhos/cm	Temp. °C	Hard. mg/L	NH <sub>4</sub> <sup>+</sup> -N mg/L	Cl mg/L
MW-1	3/29/07	7.7	890	14	425	0.29	46
MW-1	5/23/07	7.8	894	15	423	0.23	35
MW-1	7/12/07	7.6	500	15	424	0.24	29
MW-2	1/4/07	7.6	489	13	452	0.50	33
MW-2	2/22/07	7.8	1,063	12	460	0.50	34
MW-2	3/21/07	7.8	516	14	458	0.52	40
MW-2	5/31/07	7.8	922	15	459	0.50	37
MW-2	7/11/07	7.6	880	14	458	0.54	34
MW-2	9/11/07	7.8	1,092	14	451	0.53	35
MW-3	1/25/07	7.7	511	14	423	0.27	14
MW-3	3/15/07	7.8	990	14	435	0.27	13
MW-3	4/26/07	7.5	977	14	438	0.28	14
MW-3	8/9/07	7.6	940	17	435	0.31	12
MW-3	11/1/07	7.7	502	14	437	0.33	12
MW-3	12/6/07	7.6	532	13	432	0.31	11
MW-4	1/25/07	7.6	545	13	517	0.03	52
MW-4	3/15/07	7.8	1,128	13	540	0.04	51
MW-4	4/26/07	7.7	1,098	14	532	0.05	68
MW-4	8/9/07	7.5	1,045	16	543	0.09	58
MW-4	11/1/07	7.6	552	13	517	0.09	56
MW-4	12/6/07	7.4	590	11	516	0.07	45
MW-5	1/25/07	7.9	501	12	157	<0.02	153
MW-5	3/15/07	7.6	1,649	11	225	<0.02	961
MW-5	4/26/07	7.5	1,830	14	66	<0.02	330
MW-5	8/9/07	7.8	1,585	17	237	0.24	341
MW-5	11/1/07	7.8	520	14	299	0.10	49
MW-5	12/6/07	7.5	608	12	359	<0.02	54
MW-6	1/29/07	8.0	450	6	363	0.44	39
MW-6	2/21/07	8.0	1,085	12	380	0.46	42
MW-6	5/15/07	7.9	496	14	373	0.45	40
MW-6	6/13/07	6.3	830	14	371	0.46	40

TABLE AIII-1 (Continued): 2007 pH, CONDUCTIVITY, TEMPERATURE, HARDNESS, AMMONIA NITROGEN, AND CHLORIDE DATA FOR WATER QUALITY MONITORING WELLS MW-1 THROUGH MW-6 IN THE UPPER DES PLAINES 20 TUNNEL SYSTEM

Well	Date of Sampling	pH <sup>1</sup>	Cond. <sup>1</sup> µmhos/cm	Temp. °C	Hard. mg/L	NH <sub>4</sub> <sup>+</sup> -N mg/L	Cl mg/L
MW-6	9/13/07	7.7	957	14	372	0.36	32
MW-6	11/7/07	7.6	991	13	379	0.50	53

<sup>1</sup>Unfiltered samples, all others were filtered through 0.45 µm membrane.

TABLE AIII-2: 2007 SULFATE, TOTAL ORGANIC CARBON,  
TOTAL DISSOLVED SOLIDS, FECAL COLIFORM, WATER ELEVATION, AND  
RECHARGE DATA FOR WATER QUALITY MONITORING WELLS  
MW-1 THROUGH MW-6 IN THE UPPER DES PLAINES 20 TUNNEL SYSTEM

Well	Date of Sampling	SO <sub>4</sub> mg/L	TOC mg/L	TDS mg/L	FC <sup>1</sup> cfu/100 mL	Water Elevation <sup>2</sup> Feet	Recharge <sup>3</sup> Hours
MW-1	3/29/07	406	0.7	748	<1	7	<48
MW-1	5/23/07	342	0.7	792	<1	3	<48
MW-1	7/12/07	370	0.6	790	<1	1	<48
MW-2	1/4/07	414	0.8	872	<1	40	<48
MW-2	2/22/07	384	0.7	862	<1	40	<48
MW-2	3/21/07	467	0.8	874	<1	39	<48
MW-2	5/31/07	451	1.2	888	<1	39	<48
MW-2	7/11/07	390	0.6	884	<1	40	<48
MW-2	9/11/07	406	0.9	858	<1	38	<48
MW-3	1/25/07	430	0.5	892	<1	37	<48
MW-3	3/15/07	386	0.6	846	<1	35	<48
MW-3	4/26/07	408	0.6	842	<1	41	<48
MW-3	8/9/07	417	0.6	896	<1	35	<48
MW-3	11/1/07	454	0.5	844	<1	36	<48
MW-3	12/6/07	444	0.7	852	<1	36	<48
MW-4	1/25/07	421	0.5	970	<1	-6	<48
MW-4	3/15/07	339	0.5	944	<1	-7	<48
MW-4	4/26/07	349	0.6	952	<1	0	<48
MW-4	8/9/07	353	0.6	1,012	<1	-1	<48
MW-4	11/1/07	400	0.4	926	<1	-8	<48
MW-4	12/6/07	384	0.5	928	<1	-7	<48
MW-5	1/25/07	151	1.5	642	<1	-54	<48
MW-5	3/15/07	176	0.5	2,166	<1	-56	<48
MW-5	4/26/07	92	0.5	792	<1	-52	<48
MW-5	8/9/07	185	1.2	1,058	1,700	-51	<48
MW-5	11/1/07	284	0.8	684	2	-53	<48
MW-5	12/6/07	322	2.0	832	<1	-54	<48
MW-6	1/29/07	316	0.9	762	<1	59	<4
MW-6	2/21/07	322	0.9	732	<1	58	<4

TABLE AIII-2 (Continued): 2007 SULFATE, TOTAL ORGANIC CARBON, TOTAL DISSOLVED SOLIDS, FECAL COLIFORM, WATER ELEVATION, AND RECHARGE DATA FOR WATER QUALITY MONITORING WELLS MW-1 THROUGH MW-6 IN THE UPPER DES PLAINES 20 TUNNEL SYSTEM

Well	Date of Sampling	SO <sub>4</sub> mg/L	TOC mg/L	TDS mg/L	FC <sup>1</sup> cfu/100 mL	Water Elevation <sup>2</sup> Feet	Recharge <sup>3</sup> Hours
MW-6	5/15/07	310	1.0	760	<1	58	<4
MW-6	6/13/07	342	0.8	768	<1	57	<4
MW-6	9/13/07	325	0.8	752	25	58	<4
MW-6	11/7/07	336	0.8	802	<1	58	<48

<sup>1</sup>Unfiltered samples, all others were filtered through 0.45 µm membrane.

<sup>2</sup>Water level elevations are relative to Chicago City Datum.

<sup>3</sup>Refers to elapsed time after initial drawdown before the well recovered sufficiently for sampling.



TABLE AIII-3: 2007 pH, CONDUCTIVITY, TEMPERATURE, HARDNESS, AMMONIA NITROGEN, AND CHLORIDE DATA FOR WATER QUALITY MONITORING WELLS MW-7 THROUGH MW-9 IN THE UPPER DES PLAINES 21 TUNNEL SYSTEM

Well	Date of Sampling	pH <sup>1</sup>	Cond. <sup>1</sup> µmhos/cm	Temp. °C	Hard. mg/L	NH <sub>4</sub> <sup>+</sup> -N mg/L	Cl mg/L
MW-7	1/7/07	7.7	506	14	511	0.45	36
MW-7	3/7/07	7.6	606	14	519	0.46	41
MW-7	5/7/07	7.5	971	16	517	0.44	38
MW-7	7/7/07	7.8	950	15	510	0.48	36
MW-7	9/7/07	7.6	1,188	15	503	0.49	37
MW-7	11/7/07	7.5	584	14	511	0.63	36
MW-8	2/7/07	7.6	783	10	309	0.09	29
MW-8	3/7/07	8.9	447	14	90	<0.02	72
MW-8	5/7/07	8.8	752	15	265	<0.02	72
MW-8	7/7/07	7.8	594	14	357	<0.02	77
MW-8	9/7/07	7.6	888	15	353	0.44	33
MW-8	12/7/07	7.6	538	12	403	0.02	37
MW-9	2/7/07	7.3	958	12	391	0.33	34
MW-9	3/7/07	7.7	924	13	383	0.34	63
MW-9	5/7/07	8.0	866	15	390	0.35	40
MW-9	7/7/07	7.7	610	14	384	0.40	36
MW-9	9/7/07	7.6	860	14	355	0.36	39
MW-9	12/7/07	7.8	542	11	395	0.37	31

<sup>1</sup>Unfiltered samples, all others were filtered through 0.45 µm membrane.

TABLE AIII-4: 2007 SULFATE, TOTAL ORGANIC CARBON,  
TOTAL DISSOLVED SOLIDS, FECAL COLIFORM, WATER ELEVATION, AND  
RECHARGE DATA FOR WATER QUALITY MONITORING WELLS  
MW-7 THROUGH MW-9 IN THE UPPER DES PLAINES 21 TUNNEL SYSTEM

Well	Date of Sampling	SO <sub>4</sub> mg/L	TOC mg/L	TDS mg/L	FC <sup>1</sup> cfu/100 mL	Water Elevation <sup>2</sup> Feet	Recharge <sup>3</sup> Hours
MW-7	1/7/07	420	0.5	920	<1	15	<4
MW-7	3/7/07	398	0.5	914	<1	15	<4
MW-7	5/7/07	407	0.8	928	<1	16	<4
MW-7	7/7/07	389	0.4	940	<1	18	<4
MW-7	9/7/07	384	0.8	908	210	16	<4
MW-7	11/7/07	400	0.5	884	<1	13	<4
MW-8	2/7/07	206	0.7	590	<1	-51	<48
MW-8	3/7/07	68	0.6	360	<1	-43	<48
MW-8	5/7/07	226	0.6	600	<1	-57	<48
MW-8	7/7/07	305	0.7	780	<1	-60	<48
MW-8	9/7/07	306	0.8	742	2	-60	<48
MW-8	12/7/07	350	0.7	804	<1	-53	<48
MW-9	2/7/07	284	0.9	776	<1	-1	<48
MW-9	3/7/07	366	0.8	762	<1	-1	<48
MW-9	5/7/07	318	0.9	758	<1	0	<48
MW-9	7/7/07	351	0.7	806	<1	-1	<48
MW-9	9/7/07	334	0.8	762	<1	-9	<48
MW-9	12/7/07	346	0.9	772	<1	-4	<48

<sup>1</sup>Unfiltered samples, all others were filtered through 0.45 µm membrane.

<sup>2</sup>Water level elevations are relative to Chicago City Datum.

<sup>3</sup>Refers to elapsed time after initial drawdown before the well recovered sufficiently for sampling.