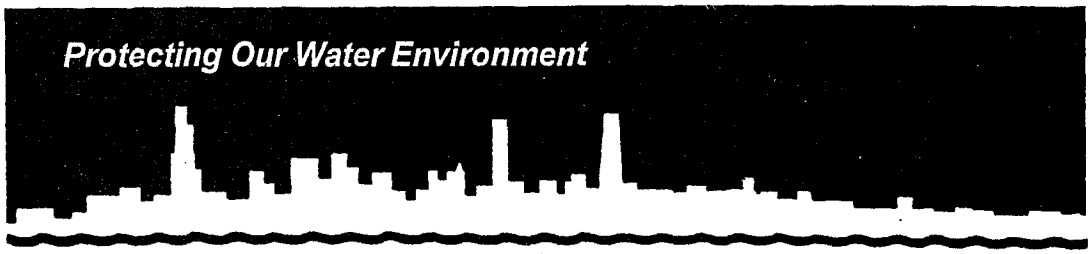

Metropolitan Water Reclamation District of Greater Chicago

RESEARCH AND DEVELOPMENT DEPARTMENT

REPORT NO. 03-17

WATER AND SEDIMENT QUALITY ALONG THE ILLINOIS WATERWAY FROM THE LOCKPORT LOCK TO THE PEORIA LOCK DURING 2002

September 2003

Metropolitan Water Reclamation District of Greater Chicago
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WATER AND SEDIMENT QUALITY ALONG THE ILLINOIS WATERWAY FROM THE LOCKPORT LOCK TO THE PEORIA LOCK DURING 2002

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September 2003

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DISCLAIMER

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

SUMMARY AND CONCLUSIONS

During May, August, and October of 2002, the Metropolitan Water Reclamation District of Greater Chicago (District) conducted water quality surveys at 49 monitoring stations along a 133 nautical mile reach of the Illinois Waterway from the Lockport Lock to the Peoria Lock. Sediment quality was assessed at 14 of the monitoring stations in October. Based on results from the 2002 surveys, the following conclusions can be made concerning the water and sediment quality along the study reach:

Water Quality

During 2002, the mean concentration of total suspended solids (TSS) increased in the downstream direction of the Illinois Waterway from the Lockport Pool (21 mg/L) to the lower Peoria Pool (60 mg/L).

There was a slight decrease in the mean concentration of five-day biochemical oxygen demand (BOD_5) from the Lockport Pool (4 mg/L) to the lower Peoria Pool (3 mg/L), with the highest mean BOD_5 occurring in the Starved Rock Pool (5 mg/L).

In 2002, the mean dissolved oxygen (DO) concentration increased substantially along the waterway from the Lockport Pool (4.7 mg/L) to the lower Peoria Pool (8.2 mg/L).

There was an increase in pH from the Lockport Pool (7.2) to the lower Peoria Pool (8.2) during 2002.

The mean ammonia nitrogen (NH_4-N), nitrite plus nitrate nitrogen (NO_2+NO_3-N), and total nitrogen (TN) concentrations decreased between the Lockport Pool and the lower Peoria Pool. The mean values decreased from 0.48, 5.07, and 6.58 mg/L, respectively, in the Lockport Pool to 0.09, 3.60, and 5.28 mg/L, respectively, in the lower Peoria Pool.

There was a slight increase in the mean concentration of un-ionized ammonia between the Lockport Pool (0.004 mg/L) and the lower Peoria Pool (0.007 mg/L). The lowest concentration, however, was recorded in the Starved Rock Pool (0.002 mg/L).

The mean total Kjeldahl nitrogen (TKN) concentration decreased from the Lockport Pool (1.51 mg/L) to the Marseilles Pool (1.06 mg/L), and then increased to a mean of 1.68 mg/L in the lower Peoria Pool.

There was a considerable decrease in the mean total phosphorus (TP) concentrations along the Illinois Waterway from the Lockport Pool (1.05 mg/L) to the lower Peoria Pool (0.54 mg/L).

Mean chlorophyll a substantially increased in concentration along the Illinois Waterway from the Lockport Pool (6.0 µg/L) to the lower Peoria Pool (55.6 µg/L).

The mean concentration of cyanide was 0.002 mg/L in the Brandon Road, Marseilles, Starved Rock, upper Peoria, and lower Peoria Pools, while the values in the Lockport and Dresden Island Pools were 0.004 and 0.003 mg/L, respectively, during 2002.

There was a slight decrease in mean phenols concentrations along the Illinois Waterway from the Lockport Pool (0.009 mg/L) to the lower Peoria Pool (0.006 mg/L).

The geometric mean of fecal coliforms (FC) generally decreased along the Illinois Waterway from the Lockport Pool (67 cfu/100 ml) to the lower Peoria Pool (19 cfu/100 ml).

With the exception of iron and manganese, the mean total concentrations of the other nine trace metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc) analyzed in surface waters remained fairly uniform in the Illinois Waterway from the Lockport Pool to the lower Peoria Pool. Iron and manganese increased in concentration in the lower Peoria Pool (1.554 and 0.1015 mg/L, respectively) compared to the Lockport Pool, (0.519 and 0.0278 mg/L, respectively) during the three sampling periods of 2002.

With the exception of manganese and zinc, the mean concentrations of the other nine dissolved trace metals analyzed in surface waters remained fairly uniform in the Illinois

Waterway from the Lockport Pool to the lower Peoria Pool. Unlike total manganese, dissolved manganese decreased from a mean of 0.0177 mg/L in the Lockport Pool to a mean of 0.0025 mg/L in the lower Peoria Pool. Dissolved zinc concentrations decreased from 0.014 mg/L in the Lockport Pool to a mean of 0.004 mg/L in the lower Peoria Pool.

Sediment Quality

Generally, the mean percent total solids (TS) in sediments increased between Lockport (39.1 percent) and the upper Peoria Pool (76.2 percent) and then decreased in the lower Peoria Pool (43.3 percent).

There was a decrease in the mean percent total volatile solids (TVS) from the Lockport Pool (13 percent) to the upper Peoria Pool (3 percent), and then a slight increase in the lower Peoria Pool (8 percent).

Ammonia nitrogen in sediments substantially decreased from 254 mg/kg in the Lockport Pool to a mean of 23 mg/kg in the lower Peoria Pool.

The mean concentration of TKN varied widely along the Illinois Waterway, but showed an overall mean decrease from the Lockport Pool (2,685 mg/kg) to the lower Peoria Pool (1,552 mg/kg).

Total phosphorus in the sediments varied along the Illinois Waterway with an overall decrease in mean concentration from the Lockport Pool (4,507 mg/kg) to the lower Peoria Pool (1,016 mg/kg).

The mean concentration of total cyanide in the sediments decreased between the Lockport Pool (0.640 mg/kg) and the upper Peoria Pool (0.025 mg/kg) and then increased to 0.067 mg/kg in the lower Peoria Pool.

There was a general decreasing trend in the concentration of phenols in the sediments moving downstream from the Lockport Pool (0.102 mg/kg) to the lower Peoria Pool (0.040 mg/kg).

While the concentrations of the 13 trace metals measured in the sediment were quite variable among the 14 monitoring stations, considerably higher levels of cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc were measured in the Lockport and Brandon Road Pools compared to the Dresden Island, Marseilles, and Starved Rock Pools. The Peoria Pools also had elevated levels of trace metals in some of the sediments.

INTRODUCTION

The Illinois Waterway provides a water resource for agricultural and urban drainage, commercial and recreational navigation, electric power generation, fishing, industrial and public water supply, and other recreational activities. A principal function of this waterway is for stormwater and treated wastewater conveyance. At the upstream end of the Illinois Waterway, the District operates three major water reclamation plants in Cook County, Illinois whose treated discharges make up approximately 90 percent of all point source treated wastewater flows entering the Illinois Waterway. These three water reclamation plants provided wastewater treatment for an average flow of 1,171 million gallons per day in 2002.

With the exception of 1998, the District has conducted annual water quality surveys from the Lockport Lock to the Peoria Lock, a distance of 133 river miles, since 1984. Forty-nine monitoring stations in six navigational pools were selected for study. The primary purpose of the monitoring program is to assess water quality changes downstream of the District's major point source wastewater discharges. A secondary

objective is to characterize the sediment chemistry at selected monitoring stations.

This report presents the results from the water and sediment quality surveys conducted during 2002. Data from previous years have been compiled in formal annual reports only for 1977, 1983-85, 1989, and 1991.

DESCRIPTION OF THE STUDY AREA

Illinois Waterway

The Illinois Waterway extends from Grafton, Illinois, located on the Mississippi River upstream of St. Louis, Missouri, to Lake Michigan in Chicago, Illinois. The 327-mile waterway is composed of a series of eight navigational pools (Lockport, Brandon Road, Dresden Island, Marseilles, Starved Rock, Peoria, La Grange, and Alton), whose lengths and U.S. Army Corps of Engineers waterway mile-point designations are presented in Table 1. The pools were created in the 1930s by lock and dam structures to maintain the water depths required for commercial navigation. The present study area is a 133-mile reach of the Illinois Waterway extending from the Lockport Lock to the Peoria Lock (Figures 1 and 2).

Monitoring Stations

Forty-nine monitoring stations were selected for the study (Figures 1 and 2). Two stations were located on the Chicago Sanitary and Ship Canal (Canal), 8 on the Des Plaines River, and 39 stations on the Illinois River. Table 2 lists the locations of the 49 monitoring stations.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 1

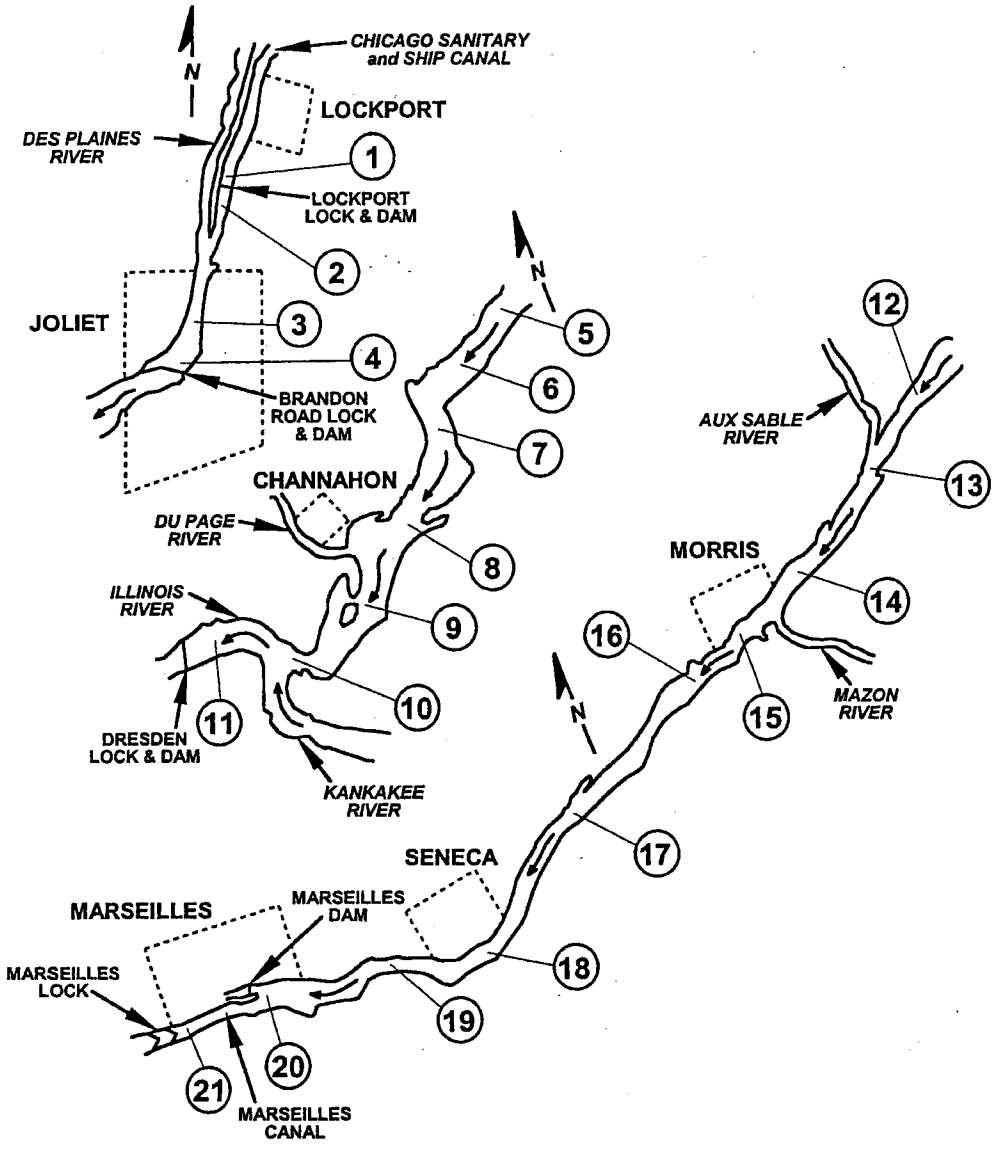
ILLINOIS WATERWAY NAVIGATIONAL POOLS

Pool	Inclusive Waterway Mile-Points	Length (Miles)
Lockport	327.2-291.0	36.2
Brandon Road	291.0-286.0	4.7
Dresden Island	286.0-271.5	14.5
Marseilles	271.5-247.0	24.5
Starved Rock	247.0-231.0	15.4
Peoria	231.0-157.6	73.4
LaGrange	157.6- 80.2	77.4
Alton	80.2- 0.0	80.2

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

FIGURE 1

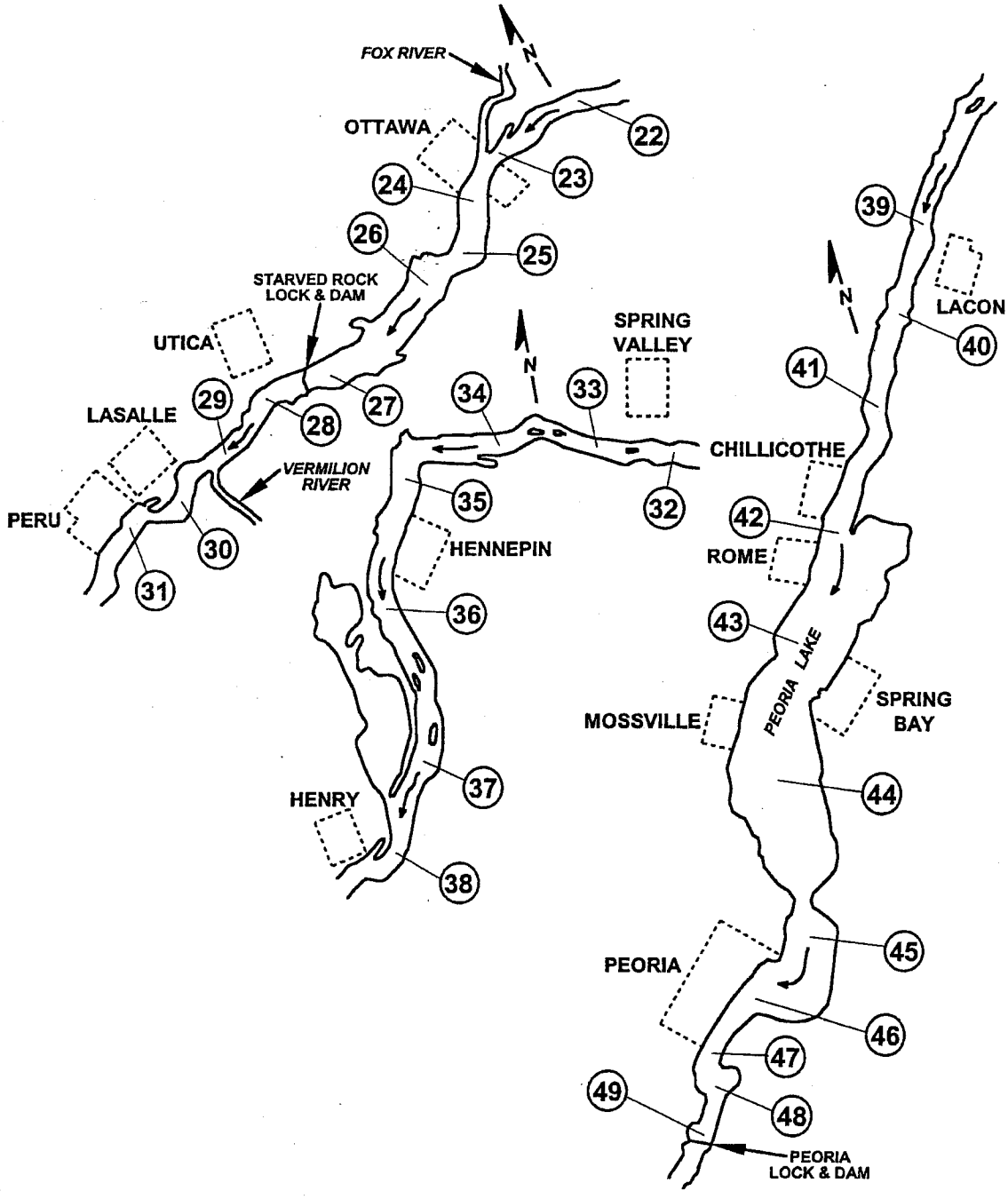
MAP OF THE ILLINOIS WATERWAY FROM LOCKPORT TO MARSEILLES
SHOWING SAMPLING STATIONS 1 TO 21



METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

FIGURE 2

MAP OF ILLINOIS WATERWAY FROM OTTAWA TO PEORIA
SHOWING SAMPLING STATIONS 22 TO 49



METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 2

MONITORING STATIONS ALONG THE ILLINOIS WATERWAY
FROM LOCKPORT LOCK TO PEORIA LOCK

Station Number	Waterway	Waterway Mile-Point Location	Navigational Pool
1	Chicago Sanitary and Ship Canal	291.5	Lockport
2	Chicago Sanitary and Ship Canal	290.5	Brandon Road
3	Des Plaines River	287.3	Brandon Road
4	Des Plaines River	286.5	Brandon Road
5	Des Plaines River	285.0	Dresden Island
6	Des Plaines River	282.8	Dresden Island
7	Des Plaines River	280.5	Dresden Island
8	Des Plaines River	278.0	Dresden Island
9	Des Plaines River	276.1	Dresden Island
10	Des Plaines River	274.0	Dresden Island
11	Illinois River	272.4	Dresden Island
12	Illinois River	270.0	Marseilles
13	Illinois River	268.9	Marseilles
14	Illinois River	265.0	Marseilles
15	Illinois River	263.0	Marseilles
16	Illinois River	261.6	Marseilles
17	Illinois River	256.0	Marseilles
18	Illinois River	253.0	Marseilles
19	Illinois River	250.0	Marseilles
20	Illinois River	247.5	Marseilles

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 2 (Continued)

MONITORING STATIONS ALONG THE ILLINOIS WATERWAY
FROM LOCKPORT LOCK TO PEORIA LOCK

Station Number	Waterway	Waterway Mile-Point Location	Navigational Pool
21	Illinois River	246.0	Starved Rock
22	Illinois River	243.7	Starved Rock
23	Illinois River	240.6	Starved Rock
24	Illinois River	238.5	Starved Rock
25	Illinois River	236.8	Starved Rock
26	Illinois River	234.5	Starved Rock
27	Illinois River	231.7	Starved Rock
28	Illinois River	229.6	Peoria
29	Illinois River	226.9	Peoria
30	Illinois River	224.7	Peoria
31	Illinois River	222.6	Peoria
32	Illinois River	219.8	Peoria
33	Illinois River	217.1	Peoria
34	Illinois River	213.4	Peoria
35	Illinois River	209.4	Peoria
36	Illinois River	205.0	Peoria
37	Illinois River	200.4	Peoria
38	Illinois River	196.9	Peoria
39	Illinois River	190.0	Peoria
40	Illinois River	186.4	Peoria

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 2 (Continued)

MONITORING STATIONS ALONG THE ILLINOIS WATERWAY
FROM LOCKPORT LOCK TO PEORIA LOCK

Station Number	Waterway	Waterway Mile-Point Location	Navigational Pool
41	Illinois River	183.2	Peoria
42	Illinois River	179.0	Peoria
43	Illinois River	174.9	Peoria
44	Illinois River	170.9	Peoria
45	Illinois River	165.3	Peoria
46	Illinois River	162.8	Peoria
47	Illinois River	160.6	Peoria
48	Illinois River	159.4	Peoria
49	Illinois River	158.2	Peoria

MATERIALS AND METHODS

Field Monitoring and Laboratory Analysis

WATER

Chemical Constituents. Water samples for chemical analyses were collected from the 49 monitoring stations on May 6-10, May 13-17, August 5-9, August 12-16, October 7-11, and October 14-18 in 2002. Samples were collected at a depth of three feet below the water surface in the center of the waterway with a submersible drainage pump. Water samples were collected for trace metal analysis by EM&R personnel with an air-driven Teflon bellows pump. Samples were filtered in the field through a 0.45 µm high capacity in-line groundwater sampling capsule (Gelman Laboratory) attached to the bellows pump. Prior to sample collection, filters were flushed with 1 gallon of de-ionized water followed by river water for 2 minutes. Except for fecal coliform, all water samples were transported to the Cecil Lue-Hing R&D Laboratory in iced, insulated chests within 24 hours of collection. PDC Laboratories in Peoria, Illinois were contracted to retrieve water samples from EM&R personnel and perform FC analysis.

The constituents analyzed in water, sample containers used, and preservation methods are presented in Table 3. Water

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 3

CONSTITUENTS ANALYZED, SAMPLE CONTAINERS, AND PRESERVATION METHODS FOR WATER SAMPLES COLLECTED FROM THE ILLINOIS WATERWAY STUDY AREA

Constituent and Abbreviation	Units of Measure	Sample Container	Preservative
Water Temperature	°C	NA	Measured in Field
Total Suspended Solids (TSS)	mg/L	Plastic	Cool, 4°C
Turbidity	NTU	NA	Measured in Field
Conductivity	µS/cm	NA	Measured in Field
Five-Day Biochemical Oxygen Demand (BOD_5)	mg/L	Plastic	Cool, 4°C
Dissolved Oxygen	mg/L	NA	Measured in Field
pH	units	NA	Measured in Field
Ammonia Nitrogen (NH_4-N)	mg/L	Plastic	Cool, 4°C, H_2SO_4 to pH <2
Total Kjeldahl Nitrogen (TKN)	mg/L	Plastic	Cool, 4°C, H_2SO_4 to pH <2
Nitrite plus Nitrate Nitrogen (NO_2+NO_3-N)	mg/L	Plastic	Cool, 4°C, H_2SO_4 to pH <2
Total Phosphorus (TP)	mg/L	Plastic	Cool, 4°C
Chlorophyll a	µg/L	Plastic, Amber	Cool, 4°C, $MgCO_3$
Total Cyanide (TCN)	mg/L	Plastic	NaOH to pH 12
Phenols	mg/L	Glass	H_2SO_4 to pH <2
Total and Soluble Metals (Arsenic, Cadmium, Chromium, Copper, Iron, Lead, Manganese, Mercury, Nickel, Silver, and Zinc)	mg/L	Plastic	HNO_3 to pH <2
Fecal Coliform (FC)	cfu/100 ml	Sterile Plastic	Cool, 4°C, EDTA, and Thiosulfate

NA = Not Applicable.

temperature, turbidity, conductivity, DO, and pH were measured in the field using a calibrated Yellow Springs Incorporated (YSI) Model 6600 water quality monitor. In the laboratory, all constituents were analyzed using procedures established by the United States Environmental Protection Agency (USEPA) or described in the 19th Edition of Standard Methods for the Examination of Water and Wastewater (Standard Methods)(1995).

The concentration of un-ionized ammonia was calculated according to the following equation:

$$U = \frac{N}{\left[0.94412\left(1+10^{x}\right)+0.0559\right]}$$

Where:

$$X = 0.09018 + \frac{2729.92}{\left(T+273.16\right)} - pH$$

U =Concentration of un-ionized ammonia as N in mg/L.

N =Concentration of total ammonia nitrogen as N in mg/L.

T =Water temperature in degrees Celsius.

Fecal Coliform. Water samples for FC analyses were collected from the 49 stations on the same day and at the same time as the chemical constituents. Fecal coliform samples were collected with a submersible drainage pump at a depth of

three feet below the water surface in the center of the waterway. The sample was poured into a sterile, 175-ml plastic bottle containing 0.3 ml of a 15 percent solution of sodium thiosulfate and 0.1 ml of a 10 percent solution of EDTA. The FC samples were kept cool in iced, insulated chests. The analyses were performed within 24 hours by membrane filter analysis as described in Standard Methods.

Chlorophyll. Water samples for chlorophyll analysis were collected at 11 selected monitoring stations (1, 3, 7, 11, 15, 20, 25, 31, 37, 41, and 44) in the same manner as described for chemical constituents. The sample was poured into a 1-liter, wide-mouth, amber plastic bottle containing 1 mg of magnesium carbonate. The water sample was stored in iced, insulated chests. In the laboratory, the water samples were analyzed for chlorophyll a, b, and c using a modified Standard Methods technique.

SEDIMENT

Chemical Constituents. Sediment samples were collected during the 2002 survey at 14 of the 49 monitoring stations (1, 2, 5, 8, 12, 18, 23, 28, 32, 35, 38, 41, 44, and 48). Over the period of October 7-10, 2002, one sediment sample was taken with a 6x6 Ponar grab sampler from each of the 14

stations. The sediment sample was transferred to a wide-mouth quart glass jar and analyzed for TS, TVS, ammonia, TKN, TP, TCN, phenols, arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, silver, and zinc. The constituents analyzed, sample containers, and preservation methods are summarized in Table 4. All constituents were analyzed according to procedures found in Standard Methods.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 4

CONSTITUENTS ANALYZED, SAMPLE CONTAINERS, AND PRESERVATION METHODS FOR SEDIMENT SAMPLES COLLECTED FROM THE ILLINOIS WATERWAY STUDY AREA

Constituent and Abbreviation	Units of Measure[1]	Sample Container	Preservative
Total Solids (TS)	percent	Glass	Cool, 4°C
Total Volatile Solids (TVS)	percent	Glass	Cool, 4°C
Ammonia Nitrogen (NH_4-N)	mg/kg	Glass	Cool, 4°C
Total Kjeldahl Nitrogen (TKN)	mg/kg	Glass	Cool, 4°C
Total Phosphorus (TP)	mg/kg	Glass	Cool, 4°C
Total Cyanide (TCN)	mg/kg	Glass	Cool, 4°C
Phenols	mg/kg	Glass	Cool, 4°C
Total and Soluble Metals (Arsenic, Cadmium, Chromium, Copper, Iron, Lead, Manganese, Mercury, Nickel, Silver, and Zinc)	mg/kg	Glass	Cool, 4°C

[1]Expressed on a dry weight basis.

RESULTS AND DISCUSSION

Water Quality

Water quality in lotic ecosystems can be evaluated by assessing a combination of biological, chemical, and physical parameters, including bacterial levels, the concentrations of dissolved gasses, dissolved and suspended inorganic and organic compounds, nutrients, water temperature, and rate of flow. Methods for measuring the biological and chemical constituents, and the physical properties of water are well defined, and they have considerable precision. While sediment data can reflect long-term conditions, water samples are indicative of the water quality only at the time of monitoring.

In order to describe water quality in the Illinois Waterway, the 133-mile study area was divided by navigational pool; (1) Lockport (Station 1), (2) Brandon Road (Stations 2-4), (3) Dresden Island (Stations 5-11), (4) Marseilles (Stations 12-20), (5) Starved Rock (Stations 21-27), (6) Upper Peoria (Stations 28-41), and (7) Lower Peoria (Stations 42-49). The Peoria Pool was subdivided based on geo-morphological differences between the upper and lower reaches.

The concentrations of the 38 constituents measured at each of the 49 monitoring stations, including calculated

values for un-ionized ammonia and total nitrogen, are presented in Appendices AI through AVII. When the analytical result was less than the Method Detection Limit (MDL), the MDL value was used to calculate the mean. Dissolved mercury data are not reported in the appendices because all of the values were less than the MDL of 0.00008 mg/L. The water quality data is summarized by navigational pool in Table 5.

The Illinois Pollution Control Board (IPCB) has designated water uses for particular waters within the State of Illinois. All waters in Illinois are designated as General Use except those designated as Secondary Contact and Indigenous Aquatic Life Waters. The Canal and the Des Plaines River from its confluence with the Canal to the Interstate 55 (I-55) bridge are classified as Secondary Contact Waters (Stations 1-8). The Des Plaines River downstream of the I-55 bridge (Station 9) and the Illinois River are General Use Waters (Stations 10-49).

LOCKPORT POOL

Water Temperature. The maximum water temperature recorded during the three sampling periods of 2002 was 31.3°C on August 5 at Station 1, while the minimum temperature was 17.2°C at Station 1 on May 17. The mean water temperature for the three monitoring periods was 24.4°C.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 5

SUMMARY OF WATER QUALITY FROM THE LOCKPORT, BRANDON ROAD, DRESDEN ISLAND, MARSEILLES, STARVED ROCK, AND PEORIA POOLS OF THE ILLINOIS WATERWAY, MAY, AUGUST, AND OCTOBER, 2002

Navigational Pool	Constituents[a]	Range	Average
LOCKPORT	Water Temperature (°C)[b]	17.2-31.3	24.4
	TSS	9-40	21
	Turbidity (NTU)[b]	7-38	18
	Conductivity (µS/cm)[b]	594-1,000	756
	BOD_5	<2-6	4
	Dissolved Oxygen (DO)[b]	3.8-5.6	4.7
	pH (units)[b]	7.0-7.6	7.2
	NH_4-N	0.09-0.78	0.46
	Un-ionized Ammonia	0.002-0.007	0.004
	TKN	1.06-2.02	1.51
	NO_2+NO_3-N	3.62-6.38	5.07
	TN	5.05-8.20	6.58
	TP	0.67-1.69	1.05
	Chlorophyll a (µg/L)	3.1-14.8	6.0
	Total Cyanide	0.002-0.006	0.004
	Phenols	0.003-0.015	0.009
	FC (cfu/100 ml)[c]	10-140	39
BRANDON ROAD	Water Temperature (°C)[b]	15.2-32.1	23.5
	TSS	9-35	22
	Turbidity (NTU)[b]	7-47	22
	Conductivity (µS/cm)[b]	582-1,093	769
	BOD_5	<2-6	3
	Dissolved Oxygen (DO)[b]	3.9-7.3	5.6
	pH (units)[b]	7.0-7.7	7.2
	NH_4-N	0.17-0.64	0.34

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 5 (CONTINUED)

SUMMARY OF WATER QUALITY FROM THE LOCKPORT, BRANDON ROAD, DRESDEN ISLAND, MARSEILLES, STARVED ROCK, AND PEORIA POOLS OF THE ILLINOIS WATERWAY, MAY, AUGUST, AND OCTOBER, 2002

Navigational Pool	Constituents[a]	Range	Average
BRANDON ROAD (Continued)	Un-ionized Ammonia	0.001-0.007	0.003
	TKN	0.27-1.75	1.27
	NO_2+NO_3-N	3.50-6.46	4.68
	TN	4.84-8.21	5.95
	TP	0.44-1.31	0.87
	Chlorophyll a (µg/L)	3.6-19.6	9.0
	Total Cyanide	0.002-0.004	0.003
	Phenols	0.003-0.014	0.009
	FC (cfu/100 ml)[c]	<10-520	82
DRESDEN ISLAND	Water Temperature (°C)[b]	14.2-34.1	23.5
	TSS	5.0-97.0	26.7
	Turbidity (NTU)[b]	6.7-164.3	33.7
	Conductivity (µS/cm)[b]	591-1,121	795
	BOD_5	<2-8	3
	Dissolved Oxygen (DO)[b]	5.9-10.7	7.9
	pH (units)[b]	7.1-8.5	7.5
	NH_4-N	0.07-0.30	0.19
	Un-ionized Ammonia	0.001-0.013	0.004
	TKN	0.46-1.56	1.20
	NO_2+NO_3-N	2.39-6.18	4.61
	TN	3.63-7.42	5.81
	TP	0.36-1.59	0.90
	Chlorophyll a (µg/L)	4.5-35.8	13.3
	Total Cyanide	<0.002-0.005	0.003

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 5 (CONTINUED)

SUMMARY OF WATER QUALITY FROM THE LOCKPORT, BRANDON ROAD, DRESDEN ISLAND, MARSEILLES, STARVED ROCK, AND PEORIA POOLS OF THE ILLINOIS WATERWAY, MAY, AUGUST, AND OCTOBER, 2002

Navigational Pool	Constituents[a]	Range	Average
DRESDEN ISLAND (Continued)	Phenols	0.001-0.019	0.010
	FC (cfu/100 ml)[c]	10-430	59
MARSEILLES	Water Temperature (°C)[b]	14.9-30.8	22.0
	TSS	14-146	41
	Turbidity (NTU)[b]	10-255	60
	Conductivity (µS/cm)[b]	454-810	696
	BOD_5	<2-13	4
	Dissolved Oxygen (DO)[b]	7.1-9.8	8.5
	pH (units)[b]	7.3-8.4	7.8
	NH_4-N	<0.02-0.019	0.09
	Un-ionized Ammonia	<0.001-0.008	0.003
	TKN	0.35-1.68	1.06
	NO_2+NO_3-N	2.29-5.98	4.56
	TN	3.77-7.03	5.62
	TP	0.24-1.44	0.75
	Chlorophyll a (µg/L)	5.1-36.8	18.2
	Total Cyanide	<0.002-0.004	0.002
	Phenols	0.001-0.014	0.007
	FC (cfu/100 ml)[c]	<10-160	18
STARVED ROCK	Water Temperature (°C)[b]	14.8-30.5	21.0
	TSS	10-308	46
	Turbidity (NTU)[b]	10-520	70
	Conductivity (µS/cm)[b]	462-814	704
	BOD_5	<2-9	5

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 5 (CONTINUED)

SUMMARY OF WATER QUALITY FROM THE LOCKPORT, BRANDON ROAD, DRESDEN ISLAND, MARSEILLES, STARVED ROCK, AND PEORIA POOLS OF THE ILLINOIS WATERWAY, MAY, AUGUST, AND OCTOBER, 2002

Navigational Pool	Constituents[a]	Range	Average
STARVED ROCK (Continued)	Dissolved Oxygen (DO)[b]	6.9-12.8	9.1
	pH (units)[b]	7.2-8.7	8.0
	NH_4-N	<0.02-0.14	0.04
	Un-ionized Ammonia	<0.001-0.008	0.002
	TKN	0.58-2.02	1.26
	NO_2+NO_3-N	2.01-6.01	4.14
	TN	3.63-7.77	5.40
	TP	0.19-1.07	0.66
	Chlorophyll a (µg/L)	5.2-88.4	44.2
	Total Cyanide	<0.002-0.003	0.002
	Phenols	0.001-0.012	0.007
	FC (cfu/100 ml)[c]	<10-500	16
UPPER PEORIA	Water Temperature (°C)[b]	13.7-29.5	20.2
	TSS	16-174	53
	Turbidity (NTU)[b]	22-333	77
	Conductivity (µS/cm)[b]	405-830	710
	BOD_5	<2-9	4
	Dissolved Oxygen (DO)[b]	4.7-12.3	9.0
	pH (units)[b]	6.5-8.6	8.1
	NH_4-N	<0.02-0.32	0.07
	Un-ionized Ammonia	<0.001-0.041	0.006
	TKN	0.60-2.56	1.45
	NO_2+NO_3-N	1.64-6.60	4.05
	TN	3.51-8.69	5.50

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 5 (CONTINUED)

SUMMARY OF WATER QUALITY FROM THE LOCKPORT, BRANDON ROAD, DRESDEN ISLAND, MARSEILLES, STARVED ROCK, AND PEORIA POOLS OF THE ILLINOIS WATERWAY, MAY, AUGUST, AND OCTOBER, 2002

Navigational Pool	Constituents[a]	Range	Average
UPPER PEORIA (Continued)	TP	0.16-1.10	0.62
	Chlorophyll a (µg/L)	2.4-74.3	40.9
	Total Cyanide	<0.002-0.003	0.002
	Phenols	0.004-0.014	0.007
	FC (cfu/100 ml)[c]	<10-500	21
LOWER PEORIA	Water Temperature (°C)[b]	13.4-28.8	19.6
	TSS	29-160	60
	Turbidity (NTU)[b]	35-215	82
	Conductivity (µS/cm)[b]	492-836	752
	BOD_5	<2-7	3
	Dissolved Oxygen (DO)[b]	4.5-11.3	8.2
	pH (units)[b]	6.9-8.7	8.2
	NH_4-N	<0.02-0.33	0.09
	Un-ionized Ammonia	<0.001-0.031	0.007
	TKN	0.82-3.67	1.68
	NO_2+NO_3-N	1.23-6.66	3.60
	TN	3.61-8.18	5.28
	TP	0.18-0.95	0.54
	Chlorophyll a (µg/L)	28.4-91.5	55.6
	Total Cyanide	<0.002-0.002	0.002
	Phenols	0.002-0.011	0.006
	FC (cfu/100 ml)[c]	<10-360	19

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

Total Suspended Solids. Total suspended solids ranged from 9 (May 6 and August 5) to 40 mg/L (October 18) at Station 1 during 2002. The mean TSS concentration was 21 mg/L during May, August, and October of 2002.

Turbidity. The maximum turbidity value recorded during the three sampling periods during 2002 was 38 NTU on May 17 at Station 1, while the minimum value was 7 NTU at Station 1 on August 5. The mean turbidity for the three monitoring periods was 18 NTU.

Conductivity. Conductivity measured ranged from 594 (August 5) to 1000 µS/cm (May 6) at Station 1 during 2002. The mean conductivity was 756 µS/cm during May, August, and October of 2002.

Five-Day Biochemical Oxygen Demand. The maximum BOD_5 recorded during the three sampling periods of 2002 was 6 mg/L on October 18 at Station 1, while the minimum BOD_5 was less than 2 mg/L on August 16 at Station 1. The mean BOD_5 for the three monitoring periods was 4 mg/L.

Dissolved Oxygen. Dissolved oxygen ranged from 3.8 (October 7) to 5.6 mg/L (May 17) at Station 1 during 2002.

The mean DO concentration was 4.7 mg/L during May, August, and October of 2002.

pH. The maximum pH recorded during the three sampling periods of 2002 was 7.6 on October 18 at Station 1, while the minimum pH was 7.0 on August 5 at the same station. The mean pH for the three monitoring periods was 7.2.

Ammonia Nitrogen. Ammonia nitrogen ranged from 0.25 (October 18) to 0.78 mg/L (August 16) at Station 1 during 2002. The mean ammonia nitrogen concentration was 0.48 mg/L during May, August, and October of 2002.

Un-ionized Ammonia. The maximum calculated un-ionized ammonia value during the three sampling periods of 2002 was 0.007 mg/L on August 16 at Station 1, while the minimum calculated un-ionized ammonia concentration was 0.001 mg/L at Station 1 on May 17. The mean calculated un-ionized ammonia value for the three monitoring periods was 0.004 mg/L.

Total Kjeldahl Nitrogen. Total Kjeldahl nitrogen ranged from 1.06 (October 7) to 2.02 mg/L (August 16) at Station 1 during 2002. The mean TKN concentration was 1.51 mg/L during May, August, and October of 2002.

Nitrite plus Nitrate Nitrogen. The maximum NO_2+NO_3-N concentration recorded during the three sampling periods of 2002 was 6.38 mg/L on May 6 at Station 1, while the minimum NO_2+NO_3-N value was 3.62 mg/L at Station 1 on August 5. The mean concentration of NO_2+NO_3-N for the three monitoring periods was 5.07 mg/L.

Total Nitrogen. Total nitrogen ranged from 5.05 (August 5) to 8.20 mg/L (May 6) at Station 1 during 2002. The mean TN concentration was 6.58 mg/L during May, August, and October of 2002.

Total Phosphorus. The maximum TP concentration during the three sampling periods of 2002 was 1.69 mg/L on October 18 at Station 1, while the minimum value was 0.67 mg/L at Station 1 on May 17. The mean concentration of TP for the three monitoring periods was 1.05 mg/L.

Chlorophyll a. Chlorophyll a values ranged from 3.1 (October 7) to 14.8 µg/L (August 16) at Station 1 during 2002. The mean chlorophyll a concentration was 6.0 µg/L during May, August, and October of 2002.

Total Cyanide. The maximum TCN concentration recorded during the three sampling periods of 2002 was 0.006 mg/L on May 17 at Station 1, while the minimum TCN concentration was 0.002 mg/L at Station 1 on August 5. The mean TCN value for the three monitoring periods was 0.004 mg/L.

Phenols. Phenols ranged from 0.003 (August 5) to 0.015 mg/L (May 17) at Station 1 during 2002. The mean concentration of phenols was 0.009 mg/L during May, August, and October of 2002.

Total Metals. In the Lockport Pool, total arsenic, cadmium, lead, mercury, and silver concentrations were generally below MDLs of 0.02, 0.0009, 0.03, 0.00008, and 0.004 mg/L, respectively, during the surveys conducted in 2002. Total chromium, copper, iron, manganese, nickel, and zinc ranged from lows of <0.007, 0.010, 0.343, 0.0204, <0.002, 0.030 mg/L, respectively, to highs of 0.039, 0.027, 1.036, 0.0386, 0.008, and 0.050 mg/L, respectively, at Station 1.

Dissolved Metals. Dissolved arsenic, cadmium, lead, and silver concentrations at Station 1 in the Lockport Pool were generally below MDLs of 0.02, 0.0005, 0.02, and 0.003 mg/L, respectively, during the 2002 surveys. The ranges for

dissolved chromium, copper, iron, manganese, nickel, and zinc were <0.005-0.009, <0.003-0.007, 0.006-0.171, 0.0103-0.0251, <0.002-0.007, and 0.005-0.020 mg/L, respectively, at Station 1.

Fecal Coliform. Fecal coliform levels at Station 1 ranged from 10 (May 6) to 140 cfu/100 ml (August 5) during 2002. The FC geometric mean was 67 cfu/100 ml during May, August, and October of 2002.

BRANDON ROAD POOL

Water Temperature. The maximum water temperature recorded during the three sampling periods of 2002 was 32.1°C on August 5 at Station 4, while the minimum temperature was 15.2°C on May 17 at the same station. The mean water temperature for the three monitoring periods was 23.5°C.

Total Suspended Solids. Total suspended solids ranged from 9 (May 6) at Station 2 to 35 mg/L (May 17 and October 18) at Stations 3 and 4 during 2002. The mean TSS concentration was 22 mg/L during May, August, and October of 2002.

Turbidity. The maximum turbidity recorded during the three sampling periods of 2002 was 47 NTU on May 17 at Station 3, while the minimum turbidity was 7 NTU on August 5 at

Station 4. The mean turbidity for the three monitoring periods was 22 NTU.

Conductivity. Conductivity ranged from 582 (August 16) to 1,093 µS/cm (May 6) at Station 4 during 2002. The mean conductivity was 769 µS/cm during May, August, and October of 2002.

Five-Day Biochemical Oxygen Demand. The maximum BOD_5 recorded during the three sampling periods of 2002 was 6 mg/L on October 7 at Stations 2 and 3, while the minimum BOD_5 was <2 mg/L at Station 4 on August 5 and 16. The mean BOD_5 for the three monitoring periods was 3 mg/L.

Dissolved Oxygen. Dissolved oxygen ranged from 3.9 (October 7) at Station 2 to 7.3 mg/L (May 17) at Station 3 during 2002. The mean DO concentration was 5.6 mg/L during May, August, and October of 2002.

pH. The maximum pH recorded during the three sampling periods of 2002 was 7.7 on October 18 at Station 2, while the minimum pH was 7.0 at Stations 2 and 4 on October 7. The mean pH for the three monitoring periods was 7.2.

Ammonia Nitrogen. Ammonia nitrogen ranged from 0.17 (May 17) at Station 3 to 0.64 mg/L (October 7) at Station 2 during 2002. The mean NH_4-N concentration was 0.34 mg/L during May, August, and October of 2002.

Un-ionized Ammonia. The maximum calculated un-ionized ammonia value during the three sampling periods of 2002 was 0.007 mg/L on August 16 at Station 2 and on October 18 at Station 4, while the minimum calculated concentration was 0.001 mg/L on May 17 at Stations 2, 3, and 4. The mean calculated un-ionized ammonia value for the three monitoring periods was 0.003 mg/L.

Total Kjeldahl Nitrogen. Total Kjeldahl nitrogen ranged from 0.27 (October 18) at Station 3 to 1.75 mg/L (May 6) at Station 2 during 2002. The mean TKN concentration was 1.27 mg/L during May, August, and October of 2002.

Nitrite plus Nitrate Nitrogen. The maximum NO_2+NO_3-N recorded during the three sampling periods of 2002 was 6.46 mg/L on May 6 at Station 2, while the minimum NO_2+NO_3-N value was 3.50 mg/L at Station 4 on August 16. The mean concentration of NO_2+NO_3-N for the three monitoring periods was 4.68 mg/L.

Total Nitrogen. Total nitrogen ranged from 4.84 (August 16) at Station 4 to 8.21 mg/L (May 6) at Station 2 during 2002. The mean TN concentration was 5.95 mg/L during May, August, and October of 2002.

Total Phosphorus. The maximum TP concentration recorded during the three sampling periods of 2002 was 1.31 mg/L on May 17 at Station 4, while the minimum TP value was 0.44 mg/L at Station 2 on August 16. The mean TP concentration for the three monitoring periods was 0.87 mg/L.

Chlorophyll a. Chlorophyll a ranged from 3.6 (August 16) at Station 3 to 19.6 µg/L (May 6) at Station 3 during 2002. The mean chlorophyll a concentration was 9.0 µg/L during May, August, and October of 2002.

Total Cyanide. The maximum TCN concentration recorded during the three sampling periods of 2002 was 0.004 mg/L on several dates at Stations 2 and 4, while the minimum TCN value of 0.002 mg/L was recorded at stations 2, 3, and 4 on several dates. The mean TCN concentration for the three monitoring periods was 0.003 mg/L.

Phenols. Phenols ranged from 0.003 (August 5) at Stations 2 and 4 to 0.014 mg/L (May 17 and October 7) at Stations 2 and 3. The mean concentration of phenols was 0.009 mg/L during May, August, and October of 2002.

Total Metals. In the Brandon Road Pool, total arsenic, cadmium, lead, and mercury concentrations were generally below the MDLs of 0.02, 0.0009, 0.03, and 0.00008 mg/L, respectively, during the surveys conducted in 2002. Total chromium, copper, iron, manganese, nickel, silver and zinc ranged from lows of <0.007, 0.010, 0.395, 0.0239, 0.005, <0.004, and 0.024 mg/L, respectively, to highs of 0.045, 0.044, 1.267, 0.0508, 0.009, 0.009, and 0.061 mg/L, respectively.

Dissolved Metals. Dissolved arsenic, cadmium, and lead concentrations were below MDLs of 0.02, 0.0005, and 0.02 mg/L, respectively, during the 2002 surveys. The ranges for dissolved chromium, copper, iron, manganese, nickel, silver, and zinc were <0.005-.041, <0.003-0.008, 0.008-0.181, 0.0100-0.0248, <0.002-0.007, <0.003-0.007, and 0.007-0.021 mg/L, respectively.

Fecal Coliform. Fecal coliform levels ranged from <10 (May 17) at Station 4 to 520 cfu/100 ml (August 5) at Station

3 during 2002. The FC geometric mean was 82 cfu/100 ml during May, August, and October of 2002.

DRESDEN ISLAND POOL

Water Temperature. The maximum water temperature recorded during the three sampling periods of 2002 was 34.1°C on August 5 at Station 6, while the minimum temperature was 14.2°C on May 6 at Station 5. The mean water temperature for the three monitoring periods was 23.5°C.

Total Suspended Solids. Total suspended solids ranged from 5 (May 6) at Station 8 to 97 mg/L (May 16) at Station 11 during 2002. The mean TSS concentration was 27 mg/L during May, August, and October of 2002.

Turbidity. The maximum turbidity recorded during the three sampling periods of 2002 was 164 NTU on May 16 at Station 11, while the minimum turbidity was 7 NTU on August 5 at Station 8. The mean turbidity for the three monitoring periods was 34 NTU.

Conductivity. Conductivity ranged from 591 (May 16) at Station 11 to 1,121 µS/cm (May 6) at Station 5 during 2002.

The mean conductivity was 795 µS/cm during May, August, and October of 2002.

Five-Day Biochemical Oxygen Demand. The maximum BOD_5 recorded during the three sampling periods of 2002 was 8 mg/L on October 18 at Station 8, while the minimum BOD_5 was <2 mg/L at Stations 5-11 on several dates. The mean for the three monitoring periods was 3 mg/L.

Dissolved Oxygen. Dissolved oxygen ranged from 5.9 (August 6) at Station 10 to 10.7 mg/L (May 6) at Station 5 during 2002. The mean DO concentration was 7.9 mg/L during May, August, and October of 2002.

pH. The maximum pH recorded during the three sampling periods of 2002 was 8.5 on October 17 at Station 11, while the minimum pH was 7.1 at Station 5 on October 7. The mean pH for the three monitoring periods was 7.5.

Ammonia Nitrogen. Ammonia nitrogen ranged from 0.07 (October 17) at Station 11 to 0.30 mg/L (May 6) at Station 5 during 2002. The mean NH_4-N concentration was 0.19 mg/L during May, August, and October of 2002.

Un-ionized Ammonia. The maximum calculated un-ionized ammonia value during the three sampling periods of 2002 was 0.013 mg/L on October 17 at Station 11, while the minimum calculated concentration was 0.001 mg/L on several dates at Stations 5-11. The mean calculated un-ionized ammonia value for the three monitoring periods was 0.004 mg/L.

Total Kjeldahl Nitrogen. Total Kjeldahl nitrogen ranged from 0.46 (October 17) at Station 11 to 1.56 mg/L (August 5) at Station 8 during 2002. The mean TKN concentration was 1.20 mg/L during May, August, and October of 2002.

Nitrite plus Nitrate Nitrogen. The maximum NO_2+NO_3-N recorded during the three sampling periods of 2002 was 6.18 mg/L on October 18 at Station 5, while the minimum NO_2+NO_3-N value was 2.39 mg/L at Station 10 on May 16. The mean concentration of NO_2+NO_3-N for the three monitoring periods was 4.61 mg/L.

Total Nitrogen. Total nitrogen ranged from 3.63 (May 16) at Station 10 to 7.42 mg/L (October 7) at Station 8 during 2002. The mean TN concentration was 5.81 mg/L during May, August, and October of 2002.

Total Phosphorus. The maximum TP concentration recorded during the three sampling periods of 2002 was 1.59 mg/L on

October 7 at Station 8, while the minimum TP value was 0.36 mg/L at Station 10 on May 16. The mean TP concentration for the three monitoring periods was 0.90 mg/L.

Chlorophyll a. Chlorophyll a ranged from 4.5 (October 7) at Station 7 to 35.8 µg/L (May 6) at Station 7 during 2002. The mean chlorophyll a concentration was 13.3 µg/L during May, August, and October of 2002.

Total Cyanide. The maximum TCN concentration recorded during the three sampling periods of 2002 was 0.005 mg/L on May 17 at Station 6, while the minimum TCN value of <0.002 mg/L was recorded at Stations 6, 7, 9, 10, and 11 on several dates. The mean TCN concentration for the three monitoring periods was 0.003 mg/L.

Phenols. Phenols ranged from 0.001 (August 6) at Station 10 to 0.019 mg/L (October 7) at Station 6. The mean concentration of phenols was 0.010 mg/L during May, August, and October of 2002.

Total Metals. In the Dresden Island Pool, total arsenic, cadmium, and lead concentrations were generally below the MDLs of 0.02, 0.0009, and 0.03 mg/L, respectively, during the surveys

conducted in 2002. Total chromium, copper, iron, manganese, mercury, nickel, silver, and zinc ranged from lows of <0.007, 0.009, 0.303, 0.0232, <0.00008, <0.002, <0.004, and 0.021 mg/L, respectively, to highs of 0.036, 0.051, 4.075, 0.0966, 0.00022, 0.013, 0.007, and 0.235 mg/L, respectively.

Dissolved Metals. Dissolved arsenic, cadmium, and lead concentrations were below MDLs of 0.02, 0.0005, and 0.02 mg/L, respectively, during the 2002 surveys. The ranges for dissolved chromium, copper, iron, manganese, nickel, silver, and zinc were <0.005-0.021, <0.003-0.012, <0.003-0.215, <0.0004-0.0240, <0.002-0.007, <0.003-0.007, and <0.002-0.032 mg/L, respectively.

Fecal Coliform. Fecal coliform levels ranged from <10 (several dates) at Stations 6, 7, 10, and 11 to 430 cfu/100 ml (May 17) at Station 9 during 2002. The FC geometric mean was 59 cfu/100 ml during May, August, and October of 2002.

MARSEILLES POOL

Water Temperature. The maximum water temperature recorded during the three sampling periods of 2002 was 30.8°C on August 6 at Station 17, while the minimum temperature was

14.9°C on May 16 at Stations 15 and 16. The mean water temperature for the three monitoring periods was 22.0°C.

Total Suspended Solids. Total suspended solids ranged from 14 (August 15) at Station 14 to 146 mg/L (May 16) at Station 15 during 2002. The mean TSS concentration was 41 mg/L during May, August, and October of 2002.

Turbidity. The maximum turbidity recorded during the three sampling periods of 2002 was 255 NTU on August 15 at Station 19, while the minimum turbidity was 10 NTU on August 6 at Station 16. The mean turbidity for the three monitoring periods was 60 NTU.

Conductivity. Conductivity ranged from 454 (May 16) at Station 12 to 810 µS/cm (October 8) at Station 16 during 2002. In the Marseilles Pool, the mean conductivity was 696 µS/cm during May, August, and October of 2002.

Five-Day Biochemical Oxygen Demand. The maximum BOD_5 recorded during the three sampling periods of 2002 was 13 mg/L on May 16 at Station 19, while the minimum BOD_5 was <2 mg/L at Stations 12, 13, 14, and 20 on several dates. The mean BOD_5 for the three monitoring periods was 4 mg/L.

Dissolved Oxygen. Dissolved oxygen ranged from 7.1 (August 6) at Stations 14, 15, and 16 to 9.8 mg/L (May 7 and October 17) at Stations 13 and 20 during 2002. The mean DO concentration was 8.5 mg/L during May, August, and October of 2002.

pH. The maximum pH recorded during the three sampling periods of 2002 was 8.4 on October 17 at Station 18, while the minimum pH was 7.3 at Stations 13-20 on several dates. The mean pH for the three monitoring periods was 7.8.

Ammonia Nitrogen. Ammonia nitrogen ranged from <0.02 (October 17) at Station 18 to 0.19 mg/L (August 15) at Stations 12 and 14 during 2002. The mean NH_4-N concentration was 0.09 mg/L during May, August, and October of 2002.

Un-ionized Ammonia. The maximum calculated un-ionized ammonia value during the three sampling periods of 2002 was 0.008 mg/L on October 17 at Station 12, while the minimum calculated concentration was <0.001 mg/L on several dates at Stations 12-20. The mean calculated un-ionized ammonia for the three monitoring periods was 0.003 mg/L.

Total Kjeldahl Nitrogen. Total Kjeldahl nitrogen ranged from 0.35 (October 17) at Station 20 to 1.68 mg/L (May 16) at

Station 14 during 2002. The mean TKN concentration was 1.06 mg/L during May, August, and October of 2002.

Nitrite plus Nitrate Nitrogen. The maximum NO_2+NO_3-N recorded during the three sampling periods of 2002 was 5.98 mg/L on May 7 at Station 17, while the minimum NO_2+NO_3-N value was 2.29 mg/L at Station 16 on August 6. The mean concentration of NO_2+NO_3-N for the three monitoring periods was 4.56 mg/L.

Total Nitrogen. Total nitrogen ranged from 3.77 (August 6) at Station 16 to 7.03 mg/L (May 16) at Station 14 during 2002. The mean TN concentration was 5.62 mg/L during May, August, and October of 2002.

Total Phosphorus. The maximum TP concentration recorded during the three sampling periods of 2002 was 1.44 mg/L on October 8 at Station 14, while the minimum TP value was 0.24 mg/L at Station 17 on May 7. The mean TP concentration for the three monitoring periods was 0.75 mg/L.

Chlorophyll a. Chlorophyll a ranged from 5.1 (May 16) at Station 20 to 36.8 µg/L (August 15) at Station 20 during 2002. The mean chlorophyll a concentration was 18.2 µg/L during May, August, and October of 2002.

Total Cyanide. The maximum TCN concentration recorded during the three sampling periods of 2002 was 0.004 mg/L on October 8 at Stations 13 and 14, while the minimum TCN value of <0.002 mg/L was recorded at Stations 12-20 on several dates. The mean TCN concentration for the three monitoring periods was 0.002 mg/L.

Phenols. Phenols ranged from 0.001 (August 6) at Station 20 to 0.014 mg/L (May 16) at Station 12. The mean concentration of phenols was 0.007 mg/L during May, August, and October of 2002.

Total Metals. In the Marseilles Pool, total arsenic, lead, and mercury concentrations were below the MDLs of 0.02, 0.03, and 0.00008 mg/L, respectively, during the surveys conducted in 2002. Total cadmium, chromium, copper, iron, manganese, nickel, silver and zinc ranged from lows of <0.0009, <0.007, <0.006, 0.320, 0.0239, <0.002, <0.004, and 0.013 mg/L, respectively, to highs of 0.0022, 0.056, 0.029, 6.548, 0.1739, 0.013, 0.009, and 0.049 mg/L, respectively.

Dissolved Metals. Dissolved arsenic and lead concentrations were below MDLs of 0.02 mg/L during the 2002 surveys. The ranges for dissolved cadmium, chromium, copper, iron, manganese,

nickel, silver, and zinc were <0.0005-0.0013, <0.005-0.021, <0.003-0.011, <0.004-0.199, <0.0004-0.0095, <0.002-0.008, and <0.003-0.008, and <0.002-0.031 mg/L, respectively.

Fecal Coliform. Fecal coliform levels ranged from <10 (several dates) at Stations 12-20 to 160 cfu/100 ml (May 16) at Station 20 during 2002. The FC geometric mean was 18 cfu/100 ml during May, August, and October of 2002.

STARVED ROCK POOL

Water Temperature. The maximum water temperature recorded during the three sampling periods of 2002 was 30.5°C on August 7 at Station 22, while the minimum temperature was 14.8°C on May 15 at Station 27. The mean water temperature for the three monitoring periods was 21.0°C.

Total Suspended Solids. Total suspended solids ranged from 10 (August 15) at Station 21 to 308 mg/L (May 16) at Station 21 during 2002. The mean TSS concentration was 46 mg/L during May, August, and October of 2002.

Turbidity. The maximum turbidity recorded during the three sampling periods of 2002 was 520 NTU on May 16 at Station 21, while the minimum turbidity was 10 NTU on August 6 at

Station 25. The mean turbidity for the three monitoring periods was 70 NTU.

Conductivity. Conductivity ranged from 462 (May 16) at Station 21 to 814 µS/cm (October 9) at Station 27 during 2002. The mean conductivity was 704 µS/cm during May, August, and October of 2002.

Five-Day Biochemical Oxygen Demand. The maximum BOD_5 recorded during the three sampling periods of 2002 was 9 mg/L on May 16 at Station 24, while the minimum BOD_5 was <2 mg/L at Station 27 on May 8. The mean BOD_5 for the three monitoring periods was 5 mg/L.

Dissolved Oxygen. Dissolved oxygen ranged from 6.9 (August 15) at Station 24 to 12.8 mg/L (October 16) at Station 27 during 2002. The mean DO concentration was 9.1 mg/L during May, August, and October of 2002.

pH. The maximum pH recorded during the three sampling periods of 2002 was 8.7 on October 16 at Station 27, while the minimum pH was 7.2 at Station 21 on May 16. The mean pH for the three monitoring periods was 8.0.

Ammonia Nitrogen. Ammonia nitrogen ranged from <0.02 (October 8, 9, and 17) at Stations 24-27 to 0.14 mg/L (May 16) at Station 21 during 2002. The mean NH_4-N concentration was 0.04 mg/L during May, August, and October of 2002.

Un-ionized Ammonia. The maximum calculated un-ionized ammonia value during the three sampling periods of 2002 was 0.008 mg/L on August 15 at Station 25, while the minimum calculated concentration was <0.001 mg/L on several dates at Stations 24-27. The mean calculated un-ionized ammonia value for the three monitoring periods was 0.002 mg/L.

Total Kjeldahl Nitrogen. Total Kjeldahl nitrogen ranged from 0.58 (October 8) at Station 24 to 2.02 mg/L (August 14) at Station 27 during 2002. The mean TKN concentration was 1.26 mg/L during May, August, and October of 2002.

Nitrite plus Nitrate Nitrogen. The maximum NO_2+NO_3-N recorded during the three sampling periods of 2002 was 6.01 mg/L on May 16 at Station 22, while the minimum NO_2+NO_3-N value was 2.01 mg/L at Station 26 on August 15. The mean concentration of NO_2+NO_3-N for the three monitoring periods was 4.14 mg/L.

Total Nitrogen. Total nitrogen ranged from 3.63 (August 15) at Station 26 to 7.77 mg/L (May 15) at Station 27 during

2002. The mean TN concentration was 5.40 mg/L during May, August, and October of 2002.

Total Phosphorus. The maximum TP concentration recorded during the three sampling periods of 2002 was 1.07 mg/L on October 8 at Station 22, while the minimum TP value was 0.19 mg/L at Station 27 on May 8. The mean TP concentration for the three monitoring periods was 0.66 mg/L.

Chlorophyll a. Chlorophyll a ranged from 5.2 (May 16) at Station 25 to 88.4 µg/L (August 15) at Station 25 during 2002. The mean chlorophyll a concentration was 44.2 µg/L during May, August, and October of 2002.

Total Cyanide. The maximum TCN concentration recorded during the three sampling periods of 2002 was 0.003 mg/L on August 6 and October 8 at Stations 21 and 26, while the minimum TCN value of <0.002 mg/L was recorded at Stations 21-27 on several dates. The mean TCN concentration for the three monitoring periods was 0.002 mg/L.

Phenols. Phenols ranged from 0.001 (several dates) at Stations 23 and 24 to 0.012 mg/L (several dates) at Stations

21, 23, 25, and 26. The mean concentration of phenols was 0.007 mg/L during May, August, and October of 2002.

Total Metals. In the Starved Rock Pool, total arsenic, lead, and mercury concentrations were below the MDLs of 0.02, 0.03, and 0.00008 mg/L, respectively, during the surveys conducted in 2002. Total cadmium, chromium, copper, iron, manganese, nickel, silver, and zinc ranged from lows of <0.0009, <0.007, <0.006, 0.303, 0.0249, <0.002, <0.004, and 0.012 mg/L, respectively, to highs of 0.0095, 0.040, 0.029, 11.090, 0.2826, 0.015, 0.011, and 0.065 mg/L, respectively.

Dissolved Metals. Dissolved arsenic and lead concentrations were below MDLs of 0.02 mg/L during the 2002 surveys. The ranges for dissolved cadmium, chromium, copper, iron, manganese, nickel, silver, and zinc were <0.0005-0.0017, <0.005-0.034, <0.003-0.011, 0.004-0.201, <0.0004-0.0907, <0.002-0.007, and <0.003-0.008, and <0.002-0.031 mg/L, respectively.

Fecal Coliform. Fecal coliform levels ranged from <10 (several dates) at Stations 20-27 to 500 cfu/100 ml (May 15) at Station 27 during 2002. The FC geometric mean was 16 cfu/100 ml during May, August, and October of 2002.

UPPER PEORIA POOL

Water Temperature. The maximum water temperature recorded during the three sampling periods of 2002 was 29.5°C on August 7 at Station 37, while the minimum temperature was 13.7°C on May 15 at Station 39. The mean water temperature for the three monitoring periods was 20.2°C.

Total Suspended Solids. Total suspended solids ranged from 16 (May 8) at Station 39 to 174 mg/L (May 15) at Station 36 during 2002. The mean TSS concentration was 53 mg/L during May, August, and October of 2002.

Turbidity. The maximum turbidity recorded during the three sampling periods of 2002 was 333 NTU on May 15 at Station 36, while the minimum turbidity was 22 NTU on August 14 at Station 31. The mean turbidity for the three monitoring periods was 77 NTU.

Conductivity. Conductivity ranged from 405 (May 15) at Station 37 to 830 µS/cm (August 14) at Station 36 during 2002. The mean conductivity was 710 µS/cm during May, August, and October of 2002.

Five-Day Biochemical Oxygen Demand. The maximum BOD_5 recorded during the three sampling periods of 2002 was 9 mg/L on May 15 at Station 35, while the minimum BOD_5 was <2 mg/L at Stations 31, 35, 37, 38, and 39 on several dates. The mean BOD_5 for the three monitoring periods was 4 mg/L.

Dissolved Oxygen. Dissolved oxygen ranged from 4.7 (August 14) at Station 41 to 12.3 mg/L (October 16) at Station 29 during 2002. The mean DO concentration was 9.0 mg/L during May, August, and October of 2002.

pH. The maximum pH recorded during the three sampling periods of 2002 was 8.6 on August 7 and 14 at several stations, while the minimum pH was 6.5 at Stations 38 and 39 on May 15. The mean pH for the three monitoring periods was 8.1.

Ammonia Nitrogen. Ammonia nitrogen ranged from <0.02 (several dates) at Stations 28-41 to 0.32 mg/L (August 14) at Station 41 during 2002. The mean NH_4-N concentration was 0.07 mg/L during May, August, and October of 2002.

Un-ionized Ammonia. The maximum calculated un-ionized ammonia value during the three sampling periods of 2002 was 0.041 mg/L on August 14 at Station 37, while the minimum calculated concentration was <0.001 mg/L on several dates at

Stations 28-41. The mean calculated un-ionized ammonia value for the three monitoring periods was 0.006 mg/L.

Total Kjeldahl Nitrogen. Total Kjeldahl nitrogen ranged from 0.60 (October 16) at Station 31 to 2.56 mg/L (May 15) at Station 39 during 2002. The mean TKN concentration was 1.45 mg/L during May, August, and October of 2002.

Nitrite plus Nitrate Nitrogen. The maximum NO_2+NO_3-N recorded during the three sampling periods of 2002 was 6.60 mg/L on May 8 at Station 41, while the minimum NO_2+NO_3-N value was 1.64 mg/L at Station 40 on August 14. The mean concentration of NO_2+NO_3-N for the three monitoring periods was 4.05 mg/L.

Total Nitrogen. Total nitrogen ranged from 3.51 (August 7) at Station 35 to 8.69 mg/L (May 15) at Station 39 during 2002. The mean TN concentration was 5.50 mg/L during May, August, and October of 2002.

Total Phosphorus. The maximum TP concentration recorded during the three sampling periods of 2002 was 1.10 mg/L on October 9 at Station 35, while the minimum TP value was 0.16 mg/L at Station 39 on May 8. The mean TP concentration for the three monitoring periods was 0.62 mg/L.

Chlorophyll a. Chlorophyll a ranged from 2.4 (May 15) at Station 37 to 74.3 µg/L (August 14) at Station 31 during 2002. The mean chlorophyll a concentration was 40.9 µg/L during May, August, and October of 2002.

Total Cyanide. The maximum TCN concentration recorded during the three sampling periods of 2002 was 0.003 mg/L on several dates at Stations 30, 31, 36, 37, and 40, while the minimum TCN value of <0.002 mg/L was recorded at all stations on several dates. The mean TCN concentration for the three monitoring periods was 0.002 mg/L.

Phenols. Phenols ranged from 0.004 (several dates) at Stations 30, 31, 33, 34, 36-38, and 40 to 0.014 mg/L (May 15) at Station 38. The mean concentration of phenols was 0.007 mg/L during May, August, and October of 2002.

Total Metals. In the upper Peoria Pool, total arsenic, lead, and mercury concentrations were generally below the MDLs of 0.02, 0.03, and 0.00008 mg/L, respectively, during the surveys conducted in 2002. Total cadmium, chromium, copper, iron, manganese, nickel, silver, and zinc ranged from lows of <0.0009, <0.007, <0.006, 0.154, 0.0295, <0.002, <0.004, and

0.010 mg/L, respectively, to highs of 0.0059, 0.055, 0.025, 6.186, 0.1286, 0.014, 0.011, and 0.046 mg/L, respectively.

Dissolved Metals. Dissolved arsenic and lead concentrations were generally below MDLs of 0.02 mg/L during the 2002 surveys. The ranges for dissolved cadmium, chromium, copper, iron, manganese, nickel, silver, and zinc were <0.0005-0.0075, <0.005-0.025, <0.003-0.008, <0.003-0.397, <0.0007-0.0181, <0.002-0.007, and <0.003-0.008, and <0.002-0.027 mg/L, respectively.

Fecal Coliform. Fecal coliform levels ranged from <10 (several dates) at Stations 28-41 to 500 cfu/100 ml (May 15) at Station 28 during 2002. The FC geometric mean was 21 cfu/100 ml during May, August, and October of 2002.

LOWER PEORIA POOL

Water Temperature. The maximum water temperature recorded during the three sampling periods of 2002 was 28.8°C on August 7 at Station 42, while the minimum temperature was 13.4°C on October 15 at Station 45. The mean water temperature for the three monitoring periods was 19.6°C.

Total Suspended Solids. Total suspended solids ranged from 29 (May 9) at Station 44 to 160 mg/L (August 13) at

Station 43 during 2002. The mean TSS concentration was 60 mg/L during May, August, and October of 2002.

Turbidity. The maximum turbidity recorded during the three sampling periods of 2002 was 215 NTU on May 15 at Station 42, while the minimum turbidity was 35 NTU on May 8 and 9 at Stations 42 and 44. The mean turbidity for the three monitoring periods was 82 NTU.

Conductivity. Conductivity ranged from 492 (May 15) at Station 42 to 836 µS/cm (October 15) at Station 48 during 2002. The mean conductivity was 752 µS/cm during May, August, and October of 2002.

Five-Day Biochemical Oxygen Demand. The maximum BOD_5 recorded during the three sampling periods of 2002 was 7 mg/L on August 8 and October 15 at Stations 44 and 49, while the minimum BOD_5 was <2 mg/L at Stations 42-49 on several dates. The mean BOD_5 for the three monitoring periods was 3 mg/L.

Dissolved Oxygen. Dissolved oxygen ranged from 4.5 (August 14) at Station 42 to 11.3 mg/L (May 8) at Station 42 during 2002. The mean DO concentration was 8.2 mg/L during May, August, and October of 2002.

pH. The maximum pH recorded during the three sampling periods of 2002 was 8.7 on May 9 at Stations 45-49, while the minimum pH was 6.9 at Station 42 on May 15. The mean pH for the three monitoring periods was 8.2.

Ammonia Nitrogen. Ammonia nitrogen ranged from <0.02 (several dates) at Stations 43-49 to 0.33 mg/L (August 14) at Station 42 during 2002. The mean NH_4-N concentration was 0.09 mg/L during May, August, and October of 2002.

Un-ionized Ammonia. The maximum calculated un-ionized ammonia value during the three sampling periods of 2002 was 0.031 mg/L on August 13 at Station 43, while the minimum calculated concentration was <0.001 mg/L on several dates at Stations 42-45, 48, and 49. The mean calculated un-ionized ammonia value for the three monitoring periods was 0.007 mg/L.

Total Kjeldahl Nitrogen. Total Kjeldahl nitrogen ranged from 0.82 (October 10) at Station 43 to 3.67 mg/L (August 13) at Station 48 during 2002. The mean TKN concentration was 1.68 mg/L during May, August, and October of 2002.

Nitrite plus Nitrate Nitrogen. The maximum NO_2+NO_3-N recorded during the three sampling periods of 2002 was 6.66 mg/L on May 8 at Station 42, while the minimum NO_2+NO_3-N value was

1.23 mg/L at Station 49 on August 8. The mean concentration of NO_2+NO_3-N for the three monitoring periods was 3.60 mg/L.

Total Nitrogen. Total nitrogen ranged from 3.61 (August 13) at Station 49 to 8.18 mg/L (May 9) at Station 45 during 2002. The mean TN concentration was 5.28 mg/L during May, August, and October of 2002.

Total Phosphorus. The maximum TP concentration recorded during the three sampling periods of 2002 was 0.95 mg/L on August 13 at Station 43, while the minimum TP value was 0.18 mg/L at Station 44 on May 9. The mean TP concentration for the three monitoring periods was 0.54 mg/L.

Chlorophyll a. Chlorophyll a ranged from 28.4 (May 14) at Station 44 to 91.5 µg/L (May 9) at Station 44 during 2002. The mean chlorophyll a concentration was 55.6 µg/L during May, August, and October of 2002.

Total Cyanide. The maximum TCN concentration recorded during the three sampling periods of 2002 was 0.002 mg/L on several dates at Stations 42-49, while the minimum TCN value of <0.002 mg/L was recorded at all stations on several dates.

The mean TCN concentration for the three monitoring periods was 0.002 mg/L.

Phenols. Phenols ranged from 0.002 (August 8) at Station 45 to 0.011 mg/L (May 15) at Station 42. The mean concentration of phenols was 0.006 mg/L during May, August, and October of 2002.

Total Metals. In the lower Peoria Pool, total lead, and mercury concentrations were generally below the MDLs of 0.03, and 0.00008 mg/L, respectively, during the surveys conducted in 2002. Total arsenic, cadmium, chromium, copper, iron, manganese, nickel, silver, and zinc ranged from lows of <0.02, <0.0009, <0.007, <0.006, 0.842, 0.0414, <0.002, <0.004, and 0.011 mg/L, respectively, to highs of 0.04, 0.0040, 0.046, 0.048, 2.873, 0.1811, 0.015, 0.010, and 0.010 mg/L, respectively.

Dissolved Metals. Dissolved arsenic and lead concentrations were generally below MDLs of 0.02 mg/L during the 2002 surveys. The ranges for dissolved cadmium, chromium, copper, iron, manganese, nickel, silver, and zinc were <0.0005-0.0013, <0.005-0.040, <0.003-0.014, 0.004-0.195, 0.0007-0.0082, <0.002-0.007, and <0.003-0.007, and <0.002-0.010 mg/L, respectively.

Fecal Coliform. Fecal coliform levels ranged from <10 (several dates) at Stations 42-49 to 360 cfu/100 ml (May 9) at Station 49 during 2002. The FC geometric mean was 19 cfu/100 ml during May, August, and October of 2002.

SPATIAL VARIABILITY ALONG THE ILLINOIS WATERWAY

Total Suspended Solids. As shown in Figure 3, TSS generally increased in concentration from Lockport to the Peoria Pool. The increase in TSS along the Illinois Waterway may be related to an increase in agricultural runoff.

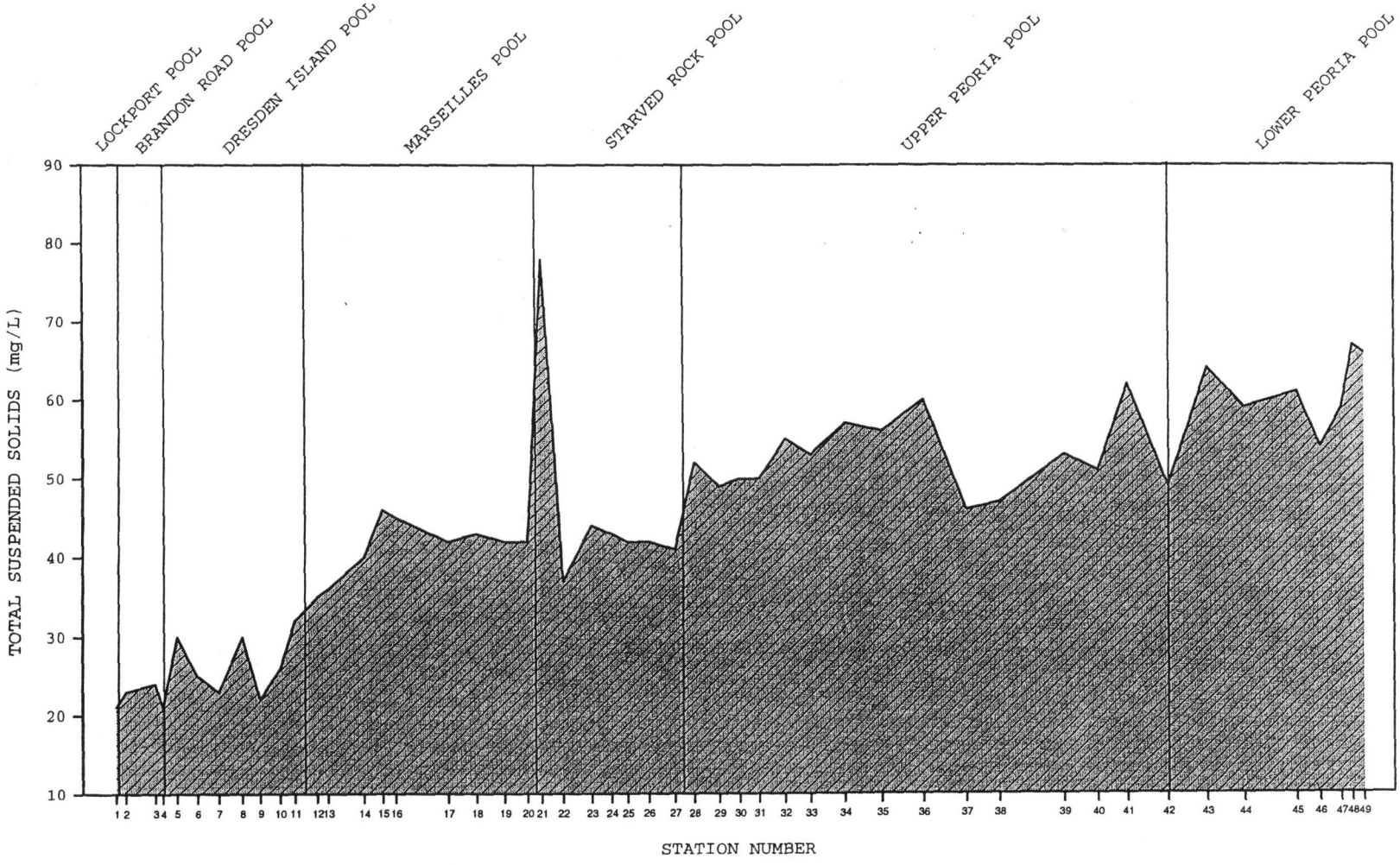
Dissolved Oxygen. Dissolved oxygen concentration trends along the Illinois Waterway are shown in Figure 4. The dramatic increase in DO between Stations 4 and 5 is directly attributable to the natural reaeration resulting from water passing over the Brandon Road Dam. The mean DO concentration along the Illinois Waterway is above 6.0 mg/L below the Brandon Road Lock and Dam.

Ammonia Nitrogen. Ammonia nitrogen rapidly decreases in concentration in the Brandon Road, Dresden Island, and Marseilles Pools (Figure 5). A slight increase in NH_4-N occurs in the upper Peoria Pool and eventually decreases in the lower Peoria Pool.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

FIGURE 3

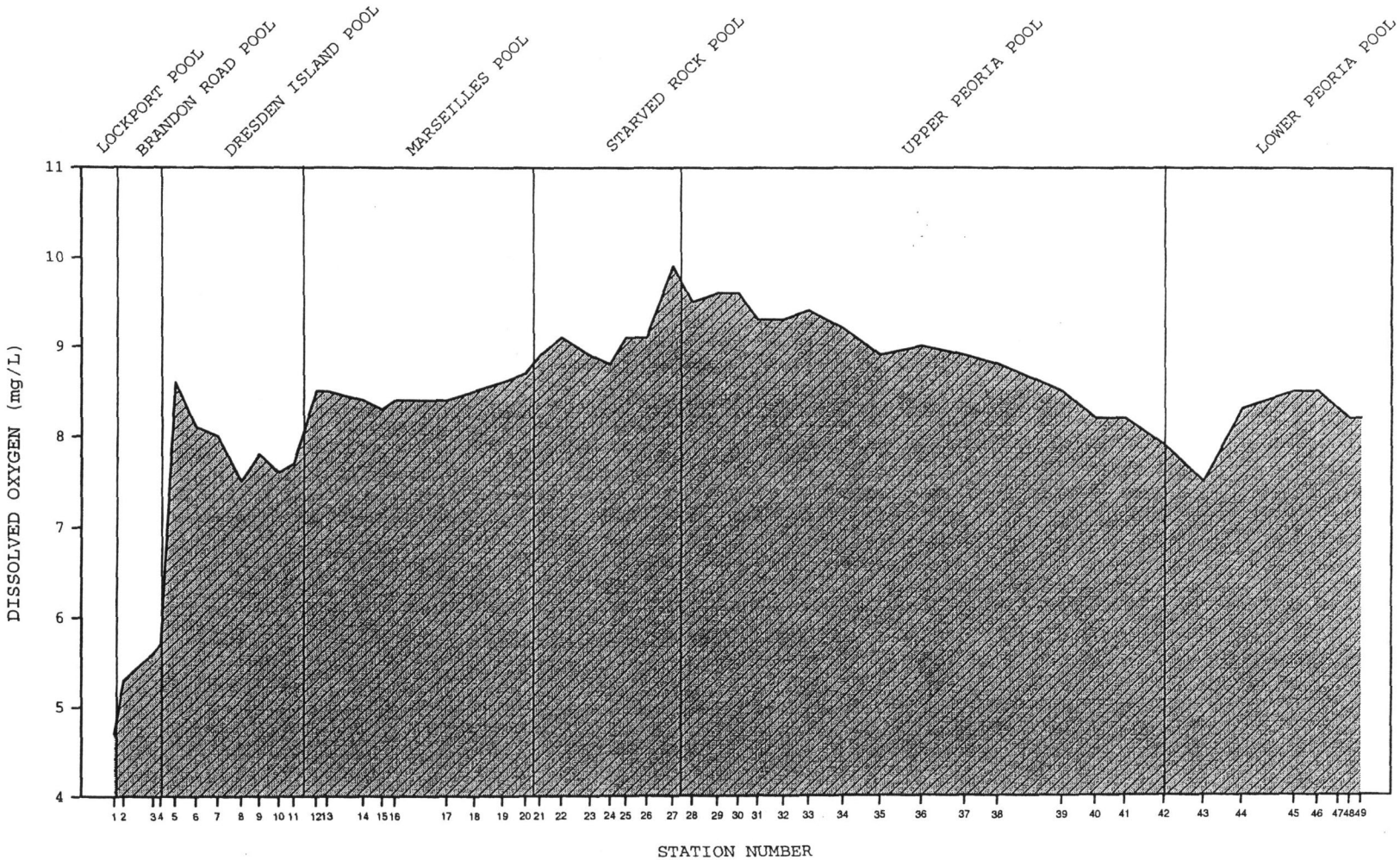
MEAN TOTAL SUSPENDED SOLIDS CONCENTRATION AT 49 STATIONS ALONG THE ILLINOIS WATERWAY FROM THE LOCKPORT LOCK TO THE PEORIA LOCK DURING MAY, AUGUST, AND OCTOBER, 2002



METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

FIGURE 4

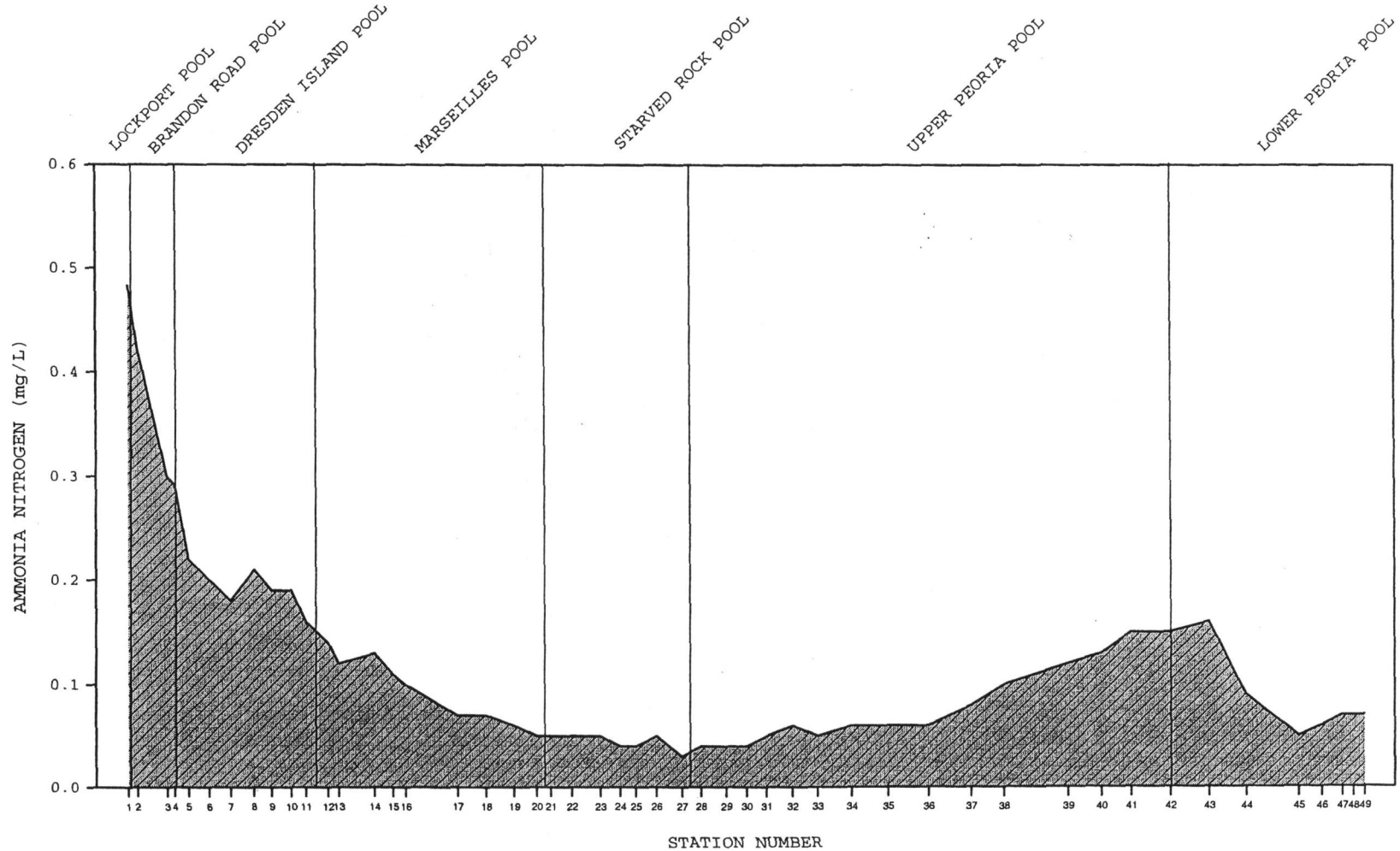
MEAN DISSOLVED OXYGEN CONCENTRATION AT 49 STATIONS ALONG THE ILLINOIS WATERWAY FROM THE LOCKPORT LOCK TO THE PEORIA LOCK DURING MAY, AUGUST, AND OCTOBER, 2002



METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

FIGURE 5

MEAN AMMONIA NITROGEN CONCENTRATION AT 49 STATIONS ALONG THE ILLINOIS WATERWAY FROM THE LOCKPORT LOCK TO THE PEORIA LOCK DURING MAY, AUGUST, AND OCTOBER, 2002



Total Nitrogen. Mean total nitrogen concentrations along the Illinois Waterway are quite variable. As shown in Figure 6, no obvious trend is observed.

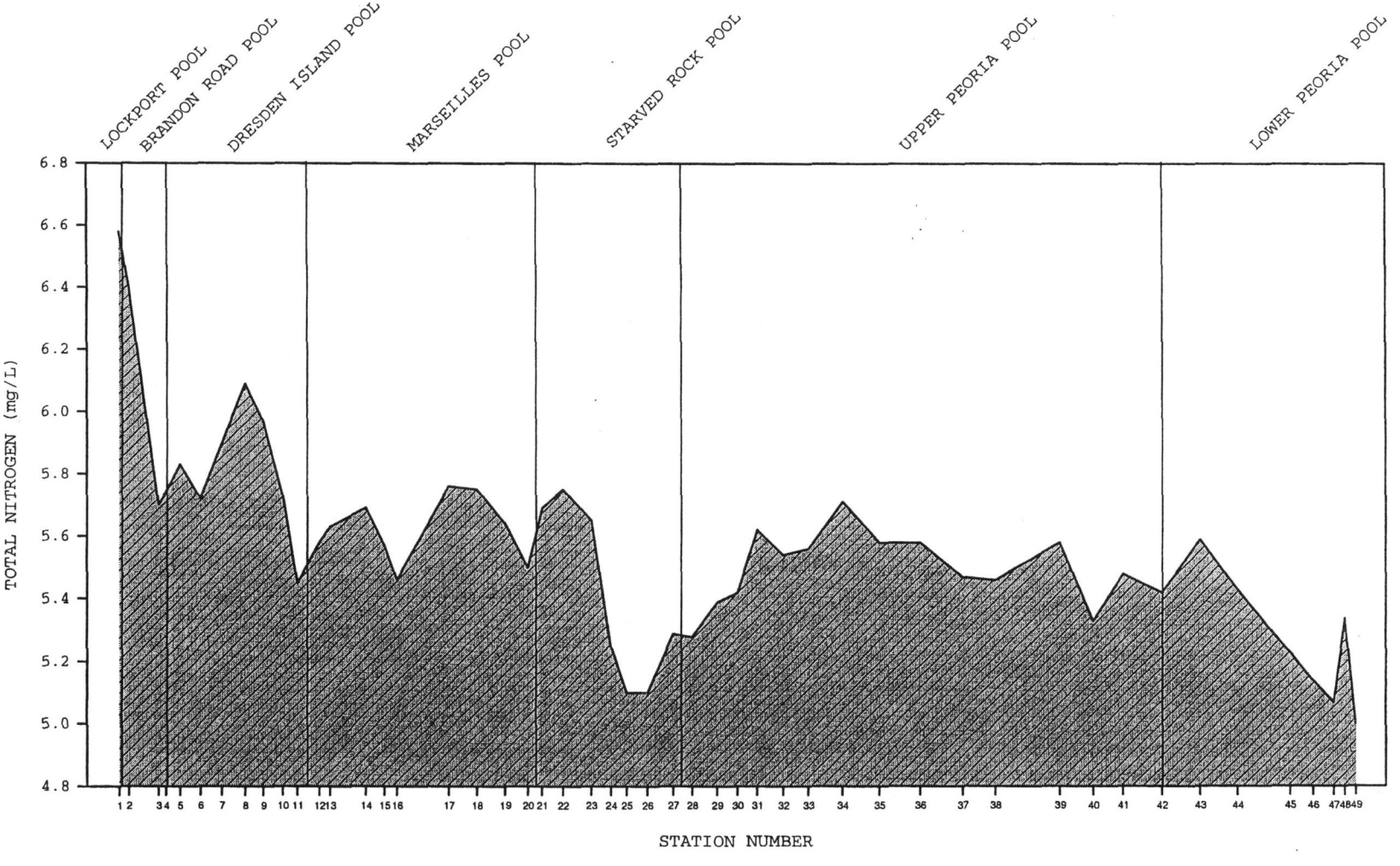
Total Phosphorus. Mean concentrations of TP show a general decrease along the Illinois Waterway from the Lockport Pool to the lower Peoria Pool as shown in Figure 7.

Fecal Coliform. Fecal coliform levels decrease drastically along the Dresden Island Pool and then remain fairly uniform along the Illinois Waterway to the Peoria Pool (see Figure 8).

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

FIGURE 6

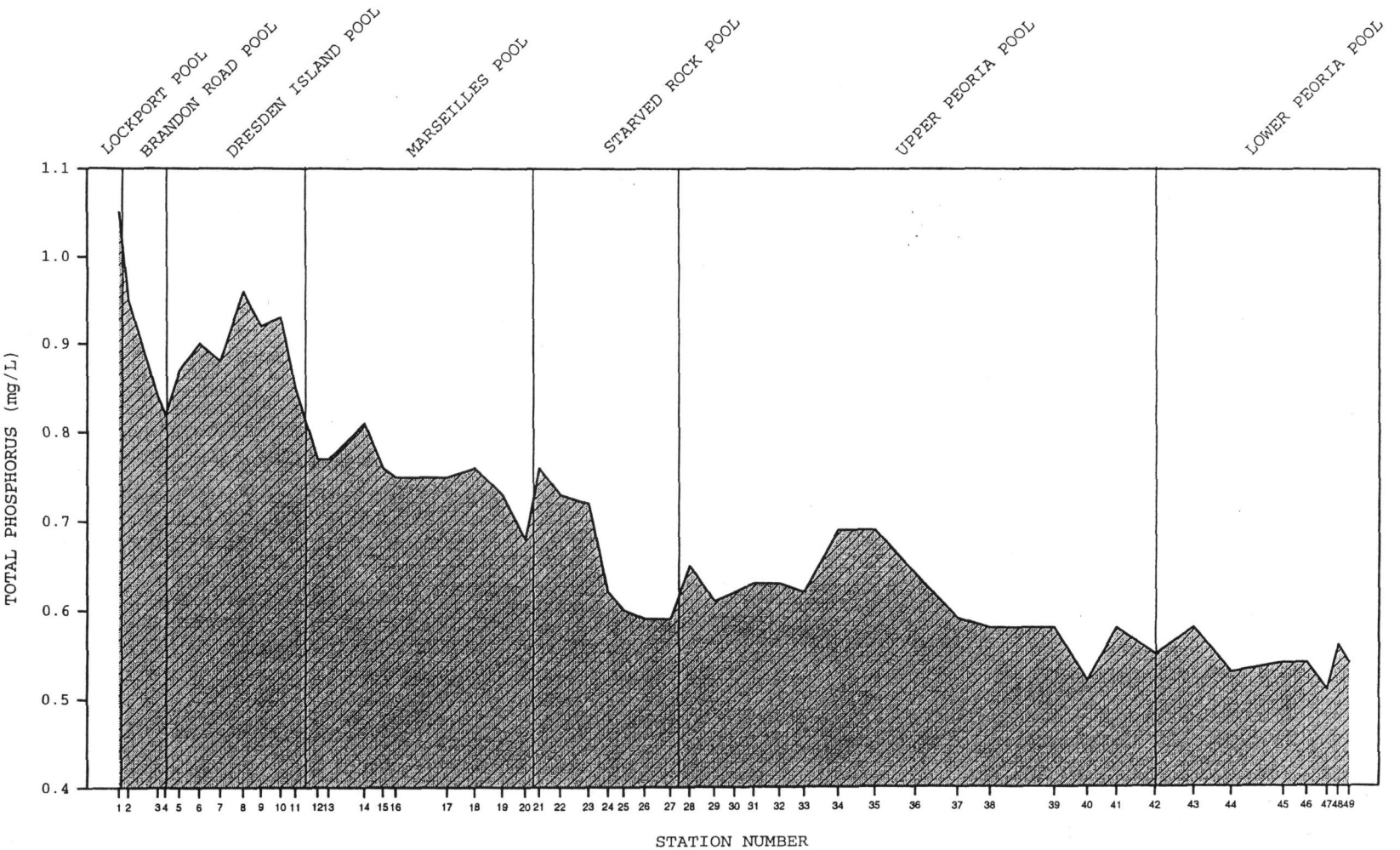
MEAN TOTAL NITROGEN CONCENTRATION AT 49 STATIONS ALONG THE ILLINOIS WATERWAY FROM THE LOCKPORT LOCK TO THE PEORIA LOCK DURING MAY, AUGUST, AND OCTOBER, 2002



METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

FIGURE 7

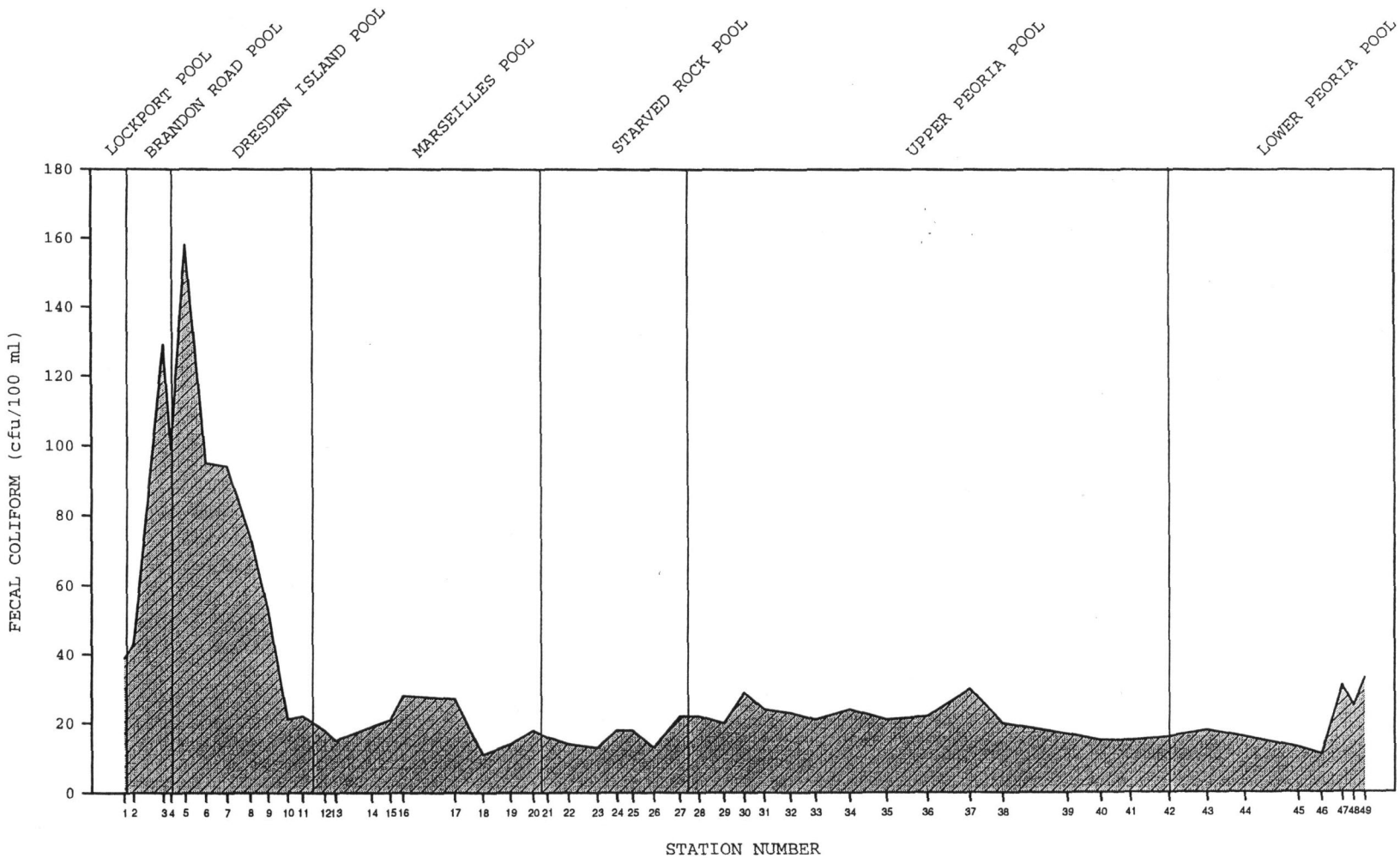
MEAN TOTAL PHOSPHORUS CONCENTRATION AT 49 STATIONS ALONG THE ILLINOIS WATERWAY FROM THE LOCKPORT LOCK TO THE PEORIA LOCK DURING MAY, AUGUST, AND OCTOBER, 2002



METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

FIGURE 8

GEOMETRIC MEAN FECAL COLIFORM AT 49 STATIONS ALONG THE ILLINOIS WATERWAY FROM THE LOCKPORT LOCK TO THE PEORIA LOCK DURING MAY, AUGUST, AND OCTOBER, 2002



Sediment Quality

Sediment quality can considerably impact overlying water quality, benthic community structure, food chain dynamics, and other elements of freshwater ecosystems. Since sediment acts as a reservoir for persistent or bioaccumulative contaminants, sediment data reflects a long term record of quality.

The concentrations of the 8 general chemistry constituents measured in sediment at each of the 14 selected monitoring stations are presented in Table 6. The 13 measured trace metal concentrations for these same stations are presented in Table 7.

LOCKPORT POOL

General Chemistry. The percent TS and total volatile solids (TVS) in sediment at Station 1 during October of 2002 were 39.1 and 13.0, respectively. Nutrient levels measured in sediment included NH_4-N (254 mg/kg), TKN (2,658 mg/kg), and TP (4,507 mg/kg). Total cyanide and phenols concentrations in sediment were 0.640 and 0.102 mg/kg, respectively.

Trace Metals. During October of 2002, total arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, silver, and zinc concentrations measured in sediment

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 6

CHEMICAL CHARACTERISTICS OF SEDIMENT COLLECTED FROM MONITORING STATIONS IN THE LOCKPORT, BRANDON ROAD, DRESDEN ISLAND, MARSEILLES, STARVED ROCK, AND PEORIA POOLS OF THE ILLINOIS WATERWAY, OCTOBER, 2002

Station Number	Navigational Pool	Constituents (Expressed on a dry weight basis)						
		Total Solids (%)	Total Volatile Solids (%)	Ammonia Nitrogen (mg/kg)	Total Kjeldahl Nitrogen (mg/kg)	Total Phos-phorus (mg/kg)	Total Cyanide (mg/kg)	Phenols (mg/kg)
1	Lockport	39.1	13	254	2,685	4,507	0.640	0.102
2	Brandon Road	24.8	15	2	33	190	0.345	0.069
5	Dresden Island	81.5	6	17	3,315	5,683	0.074	0.022
8	Dresden Island	59.9	10	2	100	530	0.253	0.051
12	Marseilles	54.8	5	5	420	1,464	0.033	0.018
18	Marseilles	84.4	1	2	95	88	0.004	0.019
23	Starved Rock	82.0	3	27	1,119	1,667	0.022	0.015
28	Peoria	74.3	1	3	107	234	0.010	0.031
32	Peoria	79.4	2	2	36	153	0.018	0.019
35	Peoria	74.8	1	3	77	209	0.026	0.028
38	Peoria	46.9	7	35	1,507	1,168	0.069	0.009

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 6 (Continued)

CHEMICAL CHARACTERISTICS OF SEDIMENT COLLECTED FROM MONITORING STATIONS IN THE LOCKPORT, BRANDON ROAD, DRESDEN ISLAND, MARSEILLES, STARVED ROCK, AND PEORIA POOLS OF THE ILLINOIS WATERWAY, OCTOBER, 2002

Station Number	Navigational Pool	Constituents (Expressed on a dry weight basis)						
		Total Solids (%)	Total Volatile Solids (%)	Ammonia Nitrogen (mg/kg)	Total Kjeldahl Nitrogen (mg/kg)	Total Phos-phorus (mg/kg)	Total Cyanide (mg/kg)	Phenols (mg/kg)
41	Peoria	92.7	2	<1	<1	<1	0.004	0.028
44	Peoria	40.1	9	27	1,904	1,280	0.077	0.028
48	Peoria	46.4	6	19	1,199	751	0.056	0.040

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 7

TRACE METALS IN SEDIMENTS COLLECTED FROM MONITORING STATIONS IN THE LOCKPORT, BRANDON ROAD, DRESDEN ISLAND, MARSEILLES, STARVED ROCK, AND PEORIA POOLS OF THE ILLINOIS WATERWAY, OCTOBER, 2002

Station Number	Navigational Pool	Arsenic	Cadmium	Chromium	Copper	Iron	Lead
		(mg/kg dry weight)					
1	Lockport	6	10.0	173	157	30,000	225
2	Brandon Road	5	11.6	180	161	28,300	214
5	Dresden Island	1	0.3	27	10	10,000	99
8	Dresden Island	3	1.4	50	38	18,500	47
12	Marseilles	<1	0.5	18	6	11,300	15
18	Marseilles	<1	<0.1	17	4	6,060	8
23	Starved Rock	1	<0.1	16	6	7,970	27
28	Peoria	<1	0.4	16	4	5,590	7
32	Peoria	1	<0.1	15	3	6,760	6
35	Peoria	2	0.2	13	5	5,370	6
38	Peoria	5	1.3	28	21	16,900	27
41	Peoria	<1	0.2	22	<1	10,200	6
44	Peoria	5	2.0	48	37	26,100	37
48	Peoria	6	0.6	37	21	21,400	20

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 7 (Continued)

TRACE METALS IN SEDIMENTS COLLECTED FROM MONITORING STATIONS IN THE LOCKPORT, BRANDON ROAD, DRESDEN ISLAND, MARSEILLES, STARVED ROCK, AND PEORIA POOLS OF THE ILLINOIS WATERWAY, OCTOBER, 2002

Station Number	Navigational Pool	Manganese	Mercury	Nickel	Silver	Zinc
		(mg/kg dry weight)				
1	Lockport	478	0.4670	45	3.9	820
2	Brandon Road	536	0.6360	43	1.9	719
5	Dresden Island	275	0.1020	27	<0.1	86
8	Dresden Island	381	0.3870	32	0.1	219
12	Marseilles	330	0.0719	12	<0.1	68
18	Marseilles	246	0.0183	12	<0.1	34
23	Starved Rock	225	0.0486	15	<0.1	48
28	Peoria	151	0.2060	10	0.6	47
32	Peoria	165	0.0256	10	<0.1	56
35	Peoria	138	0.0538	9	<0.1	48
38	Peoria	456	0.2530	18	1.8	134
41	Peoria	443	0.0105	11	<0.1	26
44	Peoria	671	0.2840	27	<0.1	198
48	Peoria	593	0.1300	22	<0.1	105

at Station 1 were 6, 10.0, 173, 157, 30,000, 225, 478, 0.4670, 45, 3.9, and 820 mg/kg, respectively.

BRANDON ROAD POOL

General Chemistry. The percent TS and TVS in sediment of Station 2 during October of 2002 were 24.8 and 15.0, respectively. Nutrient levels measured in sediment included NH_4-N (2 mg/kg), TKN (33 mg/kg), and TP (190 mg/kg). Total cyanide and phenols concentrations in sediment were 0.345 and 0.069 mg/kg, respectively.

Trace Metals. During October of 2002, total arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, silver, and zinc concentrations measured in sediment at Station 2 were 5, 11.6, 180, 161, 28,300, 214, 536, 0.6360, 43, 1.9, and 719 mg/kg, respectively.

DRESDEN ISLAND POOL

General Chemistry. Total solids and TVS in sediments at Stations 5 and 8 ranged from 59.9-81.5 and 6-10 percent, respectively, during October of 2002. Ammonia nitrogen, TKN, and TP in sediment measured 17, 3315, and 5,683 mg/kg, respectively, at Station 5, and 2, 100, and 530 mg/kg, respectively,

at Station 8. The total cyanide concentration in sediment ranged from 0.074 mg/kg at Station 5 to 0.253 mg/kg at Station 8. The concentration of phenols ranged from 0.022-0.051 mg/kg at Stations 5 and 8, respectively.

Trace Metals. During October of 2002, total arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, silver, and zinc concentrations measured in sediment were 1, 0.3, 27, 10, 10,000, 99, 275, 0.1020, 27, <0.1, and 86 mg/kg at Station 5, and 3, 1.4, 50, 38, 18,500, 47, 381, 0.3870, 32, 0.1, and 219 mg/kg, respectively, at Station 8.

MARSEILLES POOL

General Chemistry. Total solids and TVS in sediments at Stations 12 and 18 ranged from 54.8-84.4 percent, respectively, during October of 2002. Ammonia nitrogen, TKN, and TP in sediment measured 5, 420, and 1,464 mg/kg, respectively, at Station 12, and 2, 95, and 88 mg/kg, respectively, at Station 18. The total cyanide concentration in sediment ranged from 0.004 mg/kg at Station 18 to 0.033 mg/kg at Station 12. Values for phenols ranged from 0.018-0.019 mg/kg at Stations 12 and 18, respectively.

Trace Metals. During October of 2002, total arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, silver, and zinc concentrations measured in sediment were <1, 0.5, 18, 6, 11,300, 15, 330, 0.0719, 12, <0.1, and 68 mg/kg at Station 12, and <1, <.1, 17, 4, 6,060, 8, 246, 0.0183, 12, <0.1, and 34 mg/kg, respectively, at Station 18.

STARVED ROCK POOL

General Chemistry. The percent TS and TVS in sediments at Station 23 measured 82.0 and 3.0, respectively. Nutrient levels measured in sediment included NH_4-N (27 mg/kg), TKN (1,119 mg/kg), and TP (1,667 mg/kg). Total cyanide and phenols concentrations were 0.022 and 0.015 mg/kg, respectively.

Trace Metals. During October of 2002, total arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, silver, and zinc concentrations measured in sediment at Station 23 were 1, <0.1, 16, 6, 7,970, 27, 225, 0.0486, 15, <0.1, and 48 mg/kg, respectively.

UPPER PEORIA POOL

General Chemistry. Total solids and TVS in sediments at Stations 28, 32, 35, 38, and 41 ranged from 46.9-92.7 and 1-7 percent, respectively, during October of 2002. Ammonia

nitrogen, TKN, and TP in sediment ranged from <1-35, <1-1,507, and <1-1,168 mg/kg, respectively. The total cyanide concentration in sediment ranged from 0.004 mg/kg at Station 41 to 0.069 mg/kg at Station 38. The phenols values ranged from 0.009-0.031 mg/kg at Stations 38 and 28, respectively.

Trace Metals. During October of 2002, total arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, silver, and zinc concentrations measured in sediment ranged from <1-5, <0.1-1.3, 13-28, <1-21, 5,370-16,900, 6-27, 138-456, 0.0105-0.2530, 9-18, <0.1-1.8, and 26-134 mg/kg, respectively.

LOWER PEORIA POOL

General Chemistry. Total solids and TVS in sediments at Stations 44 and 48 ranged from 40.1-46.4 and 6-9 percent, respectively, during October of 2002. Ammonia nitrogen, TKN, and TP in sediment measured 27, 1,904, and 1,280 mg/kg, respectively, at Station 44 and 19, 1,199, and 751 mg/kg, respectively, at Station 48. The total cyanide concentration in sediment ranged from 0.056 mg/kg at Station 48 to 0.077 mg/kg at Station 44. The phenols values ranged from 0.028-0.040 mg/kg at Stations 44 and 48, respectively.

Trace Metals. During October of 2002, total arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, silver, and zinc concentrations measured in sediment were 5, 2.0, 48, 37, 26,100, 37, 671, 0.2840, 27, <0.1, and 198 mg/kg, respectively, at Station 44, and 6, 0.6, 37, 21, 21,400, 20, 593, 0.1300, 22, <0.1, and 105 mg/kg, respectively, at Station 48.

APPENDIX AI

WATER QUALITY AT STATION 1 IN THE LOCKPORT NAVIGATIONAL POOL MAY, AUGUST, AND OCTOBER, 2002

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-1

WATER QUALITY AT STATION 1 IN THE CHICAGO SANITARY AND SHIP CANAL
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	17.2[b]	31.3[b]	24.4[b]
Total Suspended Solids	9	40	21
Turbidity (NTU)	7[b]	38[b]	18[b]
Conductivity (µS/cm)	594[b]	1,000[b]	756[b]
Five-Day Biochemical Oxygen Demand	<2	6	4
Dissolved Oxygen	3.8[b]	5.6[b]	4.7[b]
pH (units)	7.0[b]	7.6[b]	7.2[b]
Ammonia Nitrogen	0.25	0.78	0.48
Un-ionized Ammonia	0.001	0.007	0.004
Total Kjeldahl Nitrogen	1.06	2.02	1.51
Nitrite plus Nitrate Nitrogen	3.62	6.38	5.07
Total Nitrogen	5.05	8.20	6.58
Total Phosphorus	0.67	1.69	1.05
Chlorophyll a (µg/L)	3.1	14.8	6.0
Total Cyanide	0.002	0.006	0.004
Phenols	0.003	0.015	0.009
Total Arsenic	<0.02	0.02	0.02
Dissolved Arsenic	<0.02	0.02	0.02
Total Cadmium	<0.0009	<0.0009	0.0009
Dissolved Cadmium	<0.0005	<0.0005	0.0005
Total Chromium	<0.007	0.039	0.015
Dissolved Chromium	<0.005	0.009	0.005
Total Copper	0.010	0.027	0.018
Dissolved Copper	<0.003	0.007	0.003
Total Iron	0.343	1.036	0.519
Dissolved Iron	0.006	0.171	0.083
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0204	0.0386	0.0278
Dissolved Manganese	0.0103	0.0251	0.0177
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	<0.002	0.008	0.006
Dissolved Nickel	<0.002	0.007	0.002
Total Silver	<0.004	<0.004	0.004
Dissolved Silver	<0.003	0.006	0.003
Total Zinc	0.030	0.050	0.043
Dissolved Zinc	0.005	0.020	0.014
Fecal Coliform (cfu/100 ml)	10	140	39[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

APPENDIX AII

WATER QUALITY AT STATIONS 2-4 IN THE BRANDON ROAD NAVIGATIONAL POOL MAY, AUGUST, AND OCTOBER, 2002

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AII-1

WATER QUALITY AT STATION 2 IN THE CHICAGO SANITARY AND SHIP CANAL
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.3[b]	31.3[b]	24.3[b]
Total Suspended Solids	9	34	23
Turbidity (NTU)	13[b]	45[b]	21[b]
Conductivity (µS/cm)	587[b]	1,010[b]	752[b]
Five-Day Biochemical Oxygen Demand	3	6	4
Dissolved Oxygen	3.9[b]	7.0[b]	5.3[b]
pH (units)	7.0[b]	7.7[b]	7.2[b]
Ammonia Nitrogen	0.20	0.64	0.42
Un-ionized Ammonia	0.001	0.007	0.004
Total Kjeldahl Nitrogen	0.91	1.75	1.36
Nitrite plus Nitrate Nitrogen	3.74	6.46	5.03
Total Nitrogen	4.87	8.21	6.40
Total Phosphorus	0.60	1.31	0.95
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	0.002	0.004	0.003
Phenols	0.003	0.014	0.009
Total Arsenic	<0.02	0.02	0.02
Dissolved Arsenic	<0.02	<0.02	0.02
Total Cadmium	<0.0009	<0.0009	0.0009
Dissolved Cadmium	<0.0005	<0.0005	0.0005
Total Chromium	<0.007	0.026	0.010
Dissolved Chromium	<0.005	0.024	0.008
Total Copper	0.010	0.027	0.018
Dissolved Copper	<0.003	0.007	0.003
Total Iron	0.399	1.250	0.612
Dissolved Iron	0.008	0.181	0.086
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0246	0.0427	0.0297
Dissolved Manganese	0.0110	0.0248	0.0176
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	0.005	0.008	0.006
Dissolved Nickel	<0.002	0.006	0.002
Total Silver	<0.004	0.009	0.004
Dissolved Silver	<0.003	0.006	0.003
Total Zinc	0.036	0.061	0.046
Dissolved Zinc	0.011	0.020	0.015
Fecal Coliform (cfu/100 ml)	10	180	43[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AII-2

WATER QUALITY AT STATION 3 IN THE DES PLAINES RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.4[b]	31.8[b]	22.5[b]
Total Suspended Solids	12	35	24
Turbidity (NTU)	8[b]	47[b]	23[b]
Conductivity (µS/cm)	604[b]	1,086[b]	775[b]
Five-Day Biochemical Oxygen Demand	<2	6	2
Dissolved Oxygen	4.5[b]	7.3[b]	5.6[b]
pH (units)	7.1[b]	7.6[b]	7.3[b]
Ammonia Nitrogen	0.17	0.48	0.30
Un-ionized Ammonia	0.001	0.005	0.003
Total Kjeldahl Nitrogen	0.27	1.64	1.18
Nitrite plus Nitrate Nitrogen	3.57	5.78	4.53
Total Nitrogen	4.90	6.66	5.70
Total Phosphorus	0.51	1.05	0.84
Chlorophyll a (µg/L)	3.6	19.6	9.0
Total Cyanide	0.002	0.003	0.003
Phenols	0.004	0.014	0.009
Total Arsenic	<0.02	0.02	0.02
Dissolved Arsenic	<0.02	0.02	0.02
Total Cadmium	<0.0009	<0.0009	0.0009
Dissolved Cadmium	<0.0005	<0.0005	0.0005
Total Chromium	<0.007	0.045	0.012
Dissolved Chromium	<0.005	0.041	0.008
Total Copper	0.012	0.044	0.021
Dissolved Copper	<0.003	0.006	0.003
Total Iron	0.367	1.267	0.616
Dissolved Iron	0.009	0.174	0.087
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0250	0.0508	0.0347
Dissolved Manganese	0.0123	0.0235	0.0168
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	0.005	0.007	0.006
Dissolved Nickel	<0.002	0.005	0.002
Total Silver	<0.004	0.004	0.004
Dissolved Silver	<0.003	0.005	0.003
Total Zinc	0.024	0.051	0.038
Dissolved Zinc	0.007	0.021	0.014
Fecal Coliform (cfu/100 ml)	20	520	129[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AII-3

WATER QUALITY AT STATION 4 IN THE DES PLAINES RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.2[b]	32.1[b]	22.6[b]
Total Suspended Solids	10	35	21
Turbidity (NTU)	7[b]	42[b]	22[b]
Conductivity (µS/cm)	582[b]	1,093[b]	780[b]
Five-Day Biochemical Oxygen Demand	<2	4	2
Dissolved Oxygen	4.6[b]	7.2[b]	5.7[b]
pH (units)	7.0[b]	7.6[b]	7.3[b]
Ammonia Nitrogen	0.19	0.37	0.29
Un-ionized Ammonia	0.001	0.007	0.003
Total Kjeldahl Nitrogen	0.96	1.53	1.26
Nitrite plus Nitrate Nitrogen	3.50	5.93	4.48
Total Nitrogen	4.84	6.96	5.74
Total Phosphorus	0.44	1.03	0.82
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	0.002	0.004	0.003
Phenols	0.003	0.013	0.009
Total Arsenic	<0.02	0.02	0.02
Dissolved Arsenic	<0.02	0.02	0.02
Total Cadmium	<0.0009	<0.0009	0.0009
Dissolved Cadmium	<0.0005	<0.0005	0.0005
Total Chromium	<0.007	0.010	0.007
Dissolved Chromium	<0.005	0.022	0.011
Total Copper	0.014	0.032	0.019
Dissolved Copper	<0.003	0.008	0.003
Total Iron	0.295	1.007	0.599
Dissolved Iron	0.011	0.177	0.087
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0239	0.0445	0.0331
Dissolved Manganese	0.0100	0.0225	0.0168
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	0.005	0.009	0.007
Dissolved Nickel	<0.002	0.007	0.002
Total Silver	<0.004	0.008	0.004
Dissolved Silver	<0.003	0.007	0.003
Total Zinc	0.026	0.055	0.040
Dissolved Zinc	0.008	0.021	0.013
Fecal Coliform (cfu/100 ml)	<10	340	99[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

APPENDIX AIII

WATER QUALITY AT STATIONS 5-11 IN THE DRESDEN ISLAND NAVIGATIONAL POOL
MAY, AUGUST, AND OCTOBER, 2002

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AIII-1

WATER QUALITY AT STATION 5 IN THE DES PLAINES RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	14.2[b]	32.5[b]	22.3[b]
Total Suspended Solids	16	59	30
Turbidity (NTU)	8.5[b]	101.3[b]	38.4[b]
Conductivity (µS/cm)	597[b]	1,121[b]	791[b]
Five-Day Biochemical Oxygen Demand	<2	6	3
Dissolved Oxygen	6.9[b]	10.7[b]	8.6[b]
pH (units)	7.1[b]	7.7[b]	7.4[b]
Ammonia Nitrogen	0.16	0.30	0.22
Un-ionized Ammonia	0.001	0.006	0.003
Total Kjeldahl Nitrogen	1.07	1.49	1.29
Nitrite plus Nitrate Nitrogen	3.50	6.18	4.54
Total Nitrogen	4.94	7.25	5.83
Total Phosphorus	0.47	1.11	0.87
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.004	0.003
Phenols	0.006	0.014	0.010
Total Arsenic	<0.02	0.02	0.02
Dissolved Arsenic	<0.02	0.02	0.02
Total Cadmium	<0.0009	<0.0009	0.0009
Dissolved Cadmium	<0.0005	<0.0005	0.0005
Total Chromium	<0.007	0.011	0.007
Dissolved Chromium	<0.005	0.021	0.007
Total Copper	0.015	0.051	0.024
Dissolved Copper	<0.003	0.012	0.006
Total Iron	0.593	2.400	0.987
Dissolved Iron	0.024	0.194	0.094
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0256	0.0678	0.0400
Dissolved Manganese	0.0095	0.0229	0.0167
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	<0.002	0.007	0.006
Dissolved Nickel	<0.002	0.007	0.002
Total Silver	<0.004	0.005	0.004
Dissolved Silver	<0.003	0.005	0.003
Total Zinc	0.034	0.235	0.077
Dissolved Zinc	0.007	0.029	0.016
Fecal Coliform (cfu/100 ml)	30	320	158[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AIII-2

WATER QUALITY AT STATION 6 IN THE DES PLAINES RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.4[b]	34.1[b]	25.2[b]
Total Suspended Solids	13	53	25
Turbidity (NTU)	9[b]	85[b]	30[b]
Conductivity (µS/cm)	606[b]	1,121[b]	802[b]
Five-Day Biochemical Oxygen Demand	<2	6	3
Dissolved Oxygen	6.6[b]	10.2[b]	8.1[b]
pH (units)	7.3[b]	7.9[b]	7.5[b]
Ammonia Nitrogen	0.17	0.24	0.20
Un-ionized Ammonia	0.001	0.008	0.004
Total Kjeldahl Nitrogen	0.74	1.53	1.15
Nitrite plus Nitrate Nitrogen	3.47	6.02	4.57
Total Nitrogen	4.96	6.95	5.72
Total Phosphorus	0.47	1.18	0.90
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.005	0.003
Phenols	0.006	0.019	0.011
Total Arsenic	<0.02	<0.02	0.02
Dissolved Arsenic	<0.02	0.02	0.02
Total Cadmium	<0.0009	<0.0009	0.0009
Dissolved Cadmium	<0.0005	<0.0005	0.0005
Total Chromium	<0.007	0.019	0.007
Dissolved Chromium	<0.005	0.018	0.005
Total Copper	0.011	0.022	0.018
Dissolved Copper	<0.003	0.010	0.003
Total Iron	0.310	1.948	0.718
Dissolved Iron	0.010	0.175	0.086
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0256	0.0574	0.0340
Dissolved Manganese	0.0100	0.0228	0.0153
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	<0.002	0.008	0.006
Dissolved Nickel	<0.002	0.006	0.002
Total Silver	<0.004	0.007	0.004
Dissolved Silver	<0.003	0.005	0.003
Total Zinc	0.029	0.051	0.038
Dissolved Zinc	0.007	0.021	0.014
Fecal Coliform (cfu/100 ml)	<10	270	95[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AIII-3

WATER QUALITY AT STATION 7 IN THE DES PLAINES RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.7[b]	32.3[b]	24.4[b]
Total Suspended Solids	13	44	23
Turbidity (NTU)	17[b]	86[b]	33[b]
Conductivity (µS/cm)	647[b]	1,089[b]	799[b]
Five-Day Biochemical Oxygen Demand	<2	5	3
Dissolved Oxygen	6.3[b]	10.1[b]	8.0[b]
pH (units)	7.3[b]	7.9[b]	7.5[b]
Ammonia Nitrogen	0.17	0.19	0.18
Un-ionized Ammonia	0.001	0.007	0.004
Total Kjeldahl Nitrogen	0.82	1.41	1.20
Nitrite plus Nitrate Nitrogen	3.69	6.01	4.70
Total Nitrogen	5.10	6.83	5.90
Total Phosphorus	0.42	1.25	0.88
Chlorophyll a (µg/L)	4.5	35.8	14.1
Total Cyanide	<0.002	0.004	0.003
Phenols	0.005	0.015	0.010
Total Arsenic	<0.02	<0.02	0.02
Dissolved Arsenic	<0.02	<0.02	0.02
Total Cadmium	<0.0009	<0.0009	0.0009
Dissolved Cadmium	<0.0005	<0.0005	0.0005
Total Chromium	<0.007	0.018	0.007
Dissolved Chromium	<0.005	0.011	0.005
Total Copper	0.015	0.022	0.019
Dissolved Copper	<0.003	0.007	0.003
Total Iron	0.330	1.410	0.641
Dissolved Iron	0.019	0.168	0.100
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0247	0.0561	0.0353
Dissolved Manganese	0.0053	0.0238	0.0135
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	<0.002	0.008	0.005
Dissolved Nickel	<0.002	0.006	0.005
Total Silver	<0.004	0.007	0.004
Dissolved Silver	<0.003	0.004	0.003
Total Zinc	0.024	0.044	0.035
Dissolved Zinc	0.005	0.032	0.019
Fecal Coliform (cfu/100 ml)	20	210	94[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AIII-4

WATER QUALITY AT STATION 8 IN THE DES PLAINES RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.1[b]	32.6[b]	23.8[b]
Total Suspended Solids	5	72	30
Turbidity (NTU)	7[b]	66[b]	32[b]
Conductivity (µS/cm)	690[b]	1,074[b]	812[b]
Five-Day Biochemical Oxygen Demand	<2	8	4
Dissolved Oxygen	6.3[b]	8.9[b]	7.5[b]
pH (units)	7.3[b]	7.8[b]	7.5[b]
Ammonia Nitrogen	0.18	0.28	0.21
Un-ionized Ammonia	0.001	0.007	0.004
Total Kjeldahl Nitrogen	0.74	1.56	1.24
Nitrite plus Nitrate Nitrogen	3.82	6.16	4.85
Total Nitrogen	5.38	7.42	6.09
Total Phosphorus	0.51	1.59	0.96
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	0.002	0.004	0.003
Phenols	0.005	0.014	0.011
Total Arsenic	<0.02	0.02	0.02
Dissolved Arsenic	<0.02	0.04	0.02
Total Cadmium	<0.0009	<0.0009	0.0009
Dissolved Cadmium	<0.0005	<0.0005	0.0005
Total Chromium	<0.007	0.036	0.013
Dissolved Chromium	<0.005	0.014	0.005
Total Copper	0.014	0.025	0.019
Dissolved Copper	<0.003	0.007	0.003
Total Iron	0.303	1.467	0.797
Dissolved Iron	<0.003	0.177	0.087
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0239	0.0572	0.0388
Dissolved Manganese	<0.0004	0.0229	0.0121
Total Mercury	<0.00008	0.00009	0.00008
Total Nickel	<0.002	0.009	0.006
Dissolved Nickel	<0.002	0.007	0.002
Total Silver	<0.004	0.004	0.004
Dissolved Silver	<0.003	0.005	0.003
Total Zinc	0.032	0.079	0.048
Dissolved Zinc	0.008	0.029	0.017
Fecal Coliform (cfu/100 ml)	20	190	74[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AIII-5

WATER QUALITY AT STATION 9 IN THE DES PLAINES RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.5[b]	32.5[b]	22.9[b]
Total Suspended Solids	11	41	22
Turbidity (NTU)	7[b]	65[b]	25[b]
Conductivity (µS/cm)	706[b]	1,081[b]	817[b]
Five-Day Biochemical Oxygen Demand	<2	6	3
Dissolved Oxygen	6.5[b]	9.3[b]	7.8[b]
pH (units)	7.3[b]	7.7[b]	7.5[b]
Ammonia Nitrogen	0.16	0.23	0.19
Un-ionized Ammonia	0.001	0.007	0.004
Total Kjeldahl Nitrogen	0.65	1.52	1.21
Nitrite plus Nitrate Nitrogen	3.72	6.16	4.76
Total Nitrogen	5.19	7.18	5.97
Total Phosphorus	0.50	1.38	0.92
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.003	0.002
Phenols	0.002	0.015	0.009
Total Arsenic	<0.02	<0.02	0.02
Dissolved Arsenic	<0.02	0.02	0.02
Total Cadmium	<0.0009	<0.0009	0.0009
Dissolved Cadmium	<0.0005	<0.0005	0.0005
Total Chromium	<0.007	0.032	0.010
Dissolved Chromium	<0.005	0.019	0.005
Total Copper	0.009	0.018	0.014
Dissolved Copper	<0.003	0.008	0.003
Total Iron	0.307	1.393	0.596
Dissolved Iron	<0.003	0.173	0.085
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0232	0.0524	0.0324
Dissolved Manganese	<0.0004	0.0240	0.0104
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	0.005	0.009	0.007
Dissolved Nickel	<0.002	0.006	0.002
Total Silver	<0.004	<0.004	0.004
Dissolved Silver	<0.003	0.007	0.003
Total Zinc	0.021	0.038	0.032
Dissolved Zinc	0.003	0.019	0.012
Fecal Coliform (cfu/100 ml)	10	430	53

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AIII-6

WATER QUALITY AT STATION 10 IN THE DES PLAINES RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.2[b]	29.8[b]	22.4[b]
Total Suspended Solids	14	55	26
Turbidity (NTU)	15[b]	78[b]	30[b]
Conductivity (µS/cm)	686[b]	1,086[b]	806[b]
Five-Day Biochemical Oxygen Demand	<2	7	4
Dissolved Oxygen	5.9[b]	8.6[b]	7.6[b]
pH (units)	7.3[b]	7.8[b]	7.5[b]
Ammonia Nitrogen	0.12	0.26	0.19
Un-ionized Ammonia	0.001	0.009	0.004
Total Kjeldahl Nitrogen	0.56	1.51	1.19
Nitrite plus Nitrate Nitrogen	2.39	5.98	4.54
Total Nitrogen	3.63	7.02	5.73
Total Phosphorus	0.36	1.41	0.93
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.003	0.002
Phenols	0.001	0.014	0.008
Total Arsenic	<0.02	0.03	0.02
Dissolved Arsenic	<0.02	<0.02	0.02
Total Cadmium	<0.0009	<0.0009	0.0009
Dissolved Cadmium	<0.0005	<0.0005	0.0005
Total Chromium	<0.007	0.026	0.008
Dissolved Chromium	<0.005	0.015	0.005
Total Copper	0.009	0.030	0.018
Dissolved Copper	<0.003	0.007	0.003
Total Iron	0.416	2.031	0.775
Dissolved Iron	0.011	0.185	0.090
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0278	0.0579	0.0367
Dissolved Manganese	<0.0004	0.0169	0.0087
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	0.006	0.013	0.008
Dissolved Nickel	<0.002	0.006	0.002
Total Silver	<0.004	0.005	0.004
Dissolved Silver	<0.003	0.003	0.003
Total Zinc	0.026	0.048	0.039
Dissolved Zinc	0.005	0.020	0.011
Fecal Coliform (cfu/100 ml)	<10	70	21[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AIII-7

WATER QUALITY AT STATION 11 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.5[b]	30.5[b]	23.2[b]
Total Suspended Solids	11	97	32
Turbidity (NTU)	13[b]	164[b]	48[b]
Conductivity (µS/cm)	591[b]	891[b]	738[b]
Five-Day Biochemical Oxygen Demand	<2	7	4
Dissolved Oxygen	6.3[b]	8.7[b]	7.7[b]
pH (units)	7.2[b]	8.5[b]	7.7[b]
Ammonia Nitrogen	0.07	0.26	0.16
Un-ionized Ammonia	0.001	0.013	0.005
Total Kjeldahl Nitrogen	0.46	1.51	1.12
Nitrite plus Nitrate Nitrogen	3.72	4.66	4.33
Total Nitrogen	4.43	5.99	5.45
Total Phosphorus	0.36	1.32	0.85
Chlorophyll a (µg/L)	6.1	17.3	12.4
Total Cyanide	<0.002	0.003	0.002
Phenols	0.006	0.013	0.010
Total Arsenic	<0.02	0.02	0.02
Dissolved Arsenic	<0.02	<0.02	0.02
Total Cadmium	<0.0009	<0.0009	0.0009
Dissolved Cadmium	<0.0005	<0.0005	0.0005
Total Chromium	<0.007	0.020	0.007
Dissolved Chromium	<0.005	0.019	0.005
Total Copper	0.013	0.021	0.017
Dissolved Copper	<0.003	<0.003	0.003
Total Iron	0.356	4.075	1.076
Dissolved Iron	0.006	0.215	0.093
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0267	0.0966	0.0419
Dissolved Manganese	<0.0004	0.0141	0.0066
Total Mercury	<0.00008	0.00022	0.00008
Total Nickel	0.005	0.011	0.007
Dissolved Nickel	<0.002	0.006	0.002
Total Silver	<0.004	<0.004	0.004
Dissolved Silver	<0.003	0.003	0.003
Total Zinc	0.023	0.044	0.035
Dissolved Zinc	<0.002	0.014	0.009
Fecal Coliform (cfu/100 ml)	<10	50	22[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

APPENDIX AIV

WATER QUALITY AT STATIONS 12-20 IN THE MARSEILLES NAVIGATIONAL POOL MAY, AUGUST, AND OCTOBER, 2002

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AIV-1

WATER QUALITY AT STATION 12 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.1[b]	30.5[b]	22.3[b]
Total Suspended Solids	16	107	35
Turbidity (NTU)	15[b]	225[b]	57[b]
Conductivity (µS/cm)	454[b]	802[b]	701[b]
Five-Day Biochemical Oxygen Demand	<2	5	4
Dissolved Oxygen	7.4[b]	9.7[b]	8.5[b]
pH (units)	7.3[b]	8.3[b]	7.8[b]
Ammonia Nitrogen	0.09	0.19	0.14
Un-ionized Ammonia	0.001	0.008	0.005
Total Kjeldahl Nitrogen	0.51	1.54	1.08
Nitrite plus Nitrate Nitrogen	2.88	5.29	4.50
Total Nitrogen	4.25	6.50	5.58
Total Phosphorus	0.33	1.31	0.77
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.003	0.002
Phenols	0.003	0.014	0.008
Total Arsenic	<0.02	0.02	0.02
Dissolved Arsenic	<0.02	0.02	0.02
Total Cadmium	<0.0009	<0.0009	0.0009
Dissolved Cadmium	<0.0005	<0.0005	0.0005
Total Chromium	<0.007	0.056	0.012
Dissolved Chromium	<0.005	0.021	0.008
Total Copper	0.009	0.021	0.016
Dissolved Copper	<0.003	0.005	0.003
Total Iron	0.384	4.667	1.233
Dissolved Iron	0.009	0.199	0.092
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0292	0.1133	0.0534
Dissolved Manganese	<0.0004	0.0095	0.0004
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	<0.002	0.010	0.007
Dissolved Nickel	<0.002	0.007	0.002
Total Silver	<0.004	<0.004	0.004
Dissolved Silver	<0.003	0.008	0.004
Total Zinc	0.020	0.038	0.030
Dissolved Zinc	<0.002	0.024	0.010
Fecal Coliform (cfu/100 ml)	<10	50	18[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AIV-2

WATER QUALITY AT STATION 13 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.0[b]	30.5[b]	22.0[b]
Total Suspended Solids	17	116	36
Turbidity (NTU)	16[b]	228[b]	58[b]
Conductivity (µS/cm)	467[b]	793[b]	693[b]
Five-Day Biochemical Oxygen Demand	<2	5	3
Dissolved Oxygen	7.4[b]	9.8[b]	8.5[b]
pH (units)	7.3[b]	8.2[b]	7.7[b]
Ammonia Nitrogen	0.06	0.18	0.12
Un-ionized Ammonia	0.001	0.006	0.004
Total Kjeldahl Nitrogen	0.46	1.36	0.97
Nitrite plus Nitrate Nitrogen	2.79	5.45	4.66
Total Nitrogen	3.87	6.81	5.63
Total Phosphorus	0.27	1.22	0.77
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.004	0.002
Phenols	0.003	0.013	0.008
Total Arsenic	<0.02	<0.02	0.02
Dissolved Arsenic	<0.02	0.02	0.02
Total Cadmium	<0.0009	<0.0009	0.0009
Dissolved Cadmium	<0.0005	<0.0005	0.0005
Total Chromium	<0.007	0.019	0.007
Dissolved Chromium	<0.005	0.020	0.006
Total Copper	<0.006	0.021	0.016
Dissolved Copper	<0.003	0.006	0.003
Total Iron	0.320	4.977	1.276
Dissolved Iron	0.008	0.133	0.077
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0281	0.1190	0.0538
Dissolved Manganese	0.0012	0.0053	0.0025
Total Mercury	<0.00008	0.00010	0.00008
Total Nickel	<0.002	0.013	0.007
Dissolved Nickel	<0.002	0.005	0.004
Total Silver	<0.004	<0.004	0.004
Dissolved Silver	<0.003	<0.003	0.003
Total Zinc	0.015	0.038	0.029
Dissolved Zinc	<0.002	0.016	0.008
Fecal Coliform (cfu/100 ml)	<10	40	15

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AIV-3

WATER QUALITY AT STATION 14 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.0[b]	30.4[b]	22.0[b]
Total Suspended Solids	14	122	40
Turbidity (NTU)	14[b]	242[b]	59[b]
Conductivity (µS/cm)	463[b]	802[b]	701[b]
Five-Day Biochemical Oxygen Demand	<2	5	3
Dissolved Oxygen	7.1[b]	9.7[b]	8.4[b]
pH (units)	7.3[b]	8.0[b]	7.7[b]
Ammonia Nitrogen	0.07	0.19	0.13
Un-ionized Ammonia	0.001	0.007	0.004
Total Kjeldahl Nitrogen	0.49	1.68	1.09
Nitrite plus Nitrate Nitrogen	2.57	5.55	4.61
Total Nitrogen	4.03	7.03	5.69
Total Phosphorus	0.33	1.44	0.81
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.004	0.002
Phenols	0.004	0.012	0.008
Total Arsenic	<0.02	<0.02	0.02
Dissolved Arsenic	<0.02	<0.02	0.02
Total Cadmium	<0.0009	0.0014	0.0009
Dissolved Cadmium	<0.0005	0.0012	0.0005
Total Chromium	<0.007	0.040	0.009
Dissolved Chromium	<0.005	0.015	0.007
Total Copper	0.011	0.029	0.018
Dissolved Copper	<0.003	0.003	0.003
Total Iron	0.431	5.018	1.497
Dissolved Iron	0.009	0.162	0.100
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0380	0.1301	0.0631
Dissolved Manganese	0.0013	0.0068	0.0027
Total Mercury	<0.00008	0.00011	0.00008
Total Nickel	0.006	0.009	0.008
Dissolved Nickel	0.002	0.006	0.004
Total Silver	<0.004	0.007	0.004
Dissolved Silver	<0.003	0.005	0.003
Total Zinc	0.020	0.038	0.029
Dissolved Zinc	<0.002	0.031	0.011
Fecal Coliform (cfu/100 ml)	<10	90	19[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AIV-4

WATER QUALITY AT STATION 15 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	14.9[b]	30.3[b]	22.0[b]
Total Suspended Solids	22	146	46
Turbidity (NTU)	17[b]	255[b]	64[b]
Conductivity (µS/cm)	461[b]	808[b]	696[b]
Five-Day Biochemical Oxygen Demand	3	5	4
Dissolved Oxygen	7.1[b]	9.7[b]	8.3[b]
pH (units)	7.3[b]	8.3[b]	7.8[b]
Ammonia Nitrogen	0.07	0.15	0.11
Un-ionized Ammonia	<.001	0.006	0.004
Total Kjeldahl Nitrogen	0.39	1.55	1.11
Nitrite plus Nitrate Nitrogen	2.46	5.42	4.47
Total Nitrogen	3.87	6.97	5.57
Total Phosphorus	0.30	1.32	0.76
Chlorophyll a (µg/L)	5.5	24.8	13.7
Total Cyanide	<0.002	0.003	0.002
Phenols	0.002	0.011	0.006
Total Arsenic	<0.02	0.02	0.02
Dissolved Arsenic	<0.02	<0.02	0.02
Total Cadmium	<0.0009	0.0011	0.0009
Dissolved Cadmium	<0.0005	0.0012	0.0005
Total Chromium	<0.007	0.044	0.010
Dissolved Chromium	<0.005	0.010	0.005
Total Copper	0.005	0.024	0.014
Dissolved Copper	<0.003	0.007	0.003
Total Iron	0.505	5.409	1.441
Dissolved Iron	0.011	0.160	0.093
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0341	0.1455	0.0680
Dissolved Manganese	0.0012	0.0083	0.0036
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	0.002	0.010	0.006
Dissolved Nickel	<0.002	0.008	0.004
Total Silver	<0.004	0.007	0.004
Dissolved Silver	<0.003	0.006	0.003
Total Zinc	0.023	0.049	0.035
Dissolved Zinc	<0.002	0.019	0.008
Fecal Coliform (cfu/100 ml)	<10	70	21[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AIV-5

WATER QUALITY AT STATION 16 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	14.9[b]	30.4[b]	22.0[b]
Total Suspended Solids	18	132	45
Turbidity (NTU)	10[b]	250[b]	62[b]
Conductivity (µS/cm)	474[b]	810[b]	698[b]
Five-Day Biochemical Oxygen Demand	3	6	4
Dissolved Oxygen	7.1[b]	9.6[b]	8.4[b]
pH (units)	7.3[b]	8.3[b]	7.8[b]
Ammonia Nitrogen	0.06	0.15	0.10
Un-ionized Ammonia	0.001	0.006	0.004
Total Kjeldahl Nitrogen	0.48	1.48	1.06
Nitrite plus Nitrate Nitrogen	2.29	5.44	4.40
Total Nitrogen	3.77	6.53	5.46
Total Phosphorus	0.30	1.30	0.75
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.002	0.002
Phenols	0.002	0.012	0.008
Total Arsenic	<0.02	<0.02	0.02
Dissolved Arsenic	<0.02	<0.02	0.02
Total Cadmium	<0.0009	0.0022	0.0011
Dissolved Cadmium	<0.0005	0.0008	0.0005
Total Chromium	<0.007	0.023	0.007
Dissolved Chromium	<0.005	0.011	0.005
Total Copper	0.015	0.027	0.020
Dissolved Copper	<0.003	0.008	0.003
Total Iron	0.467	4.756	1.410
Dissolved Iron	0.008	0.135	0.082
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0342	0.1280	0.0691
Dissolved Manganese	0.0011	0.0056	0.0024
Total Mercury	<0.00008	0.00008	0.00008
Total Nickel	0.003	0.010	0.007
Dissolved Nickel	<0.002	0.006	0.003
Total Silver	<0.004	0.009	0.004
Dissolved Silver	<0.003	0.008	0.003
Total Zinc	0.021	0.045	0.034
Dissolved Zinc	<0.002	0.016	0.008
Fecal Coliform (cfu/100 ml)	<10	60	28[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AIV-6

WATER QUALITY AT STATION 17 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.0[b]	30.8[b]	21.9[b]
Total Suspended Solids	16	136	42
Turbidity (NTU)	11[b]	243[b]	61[b]
Conductivity (µS/cm)	498[b]	795[b]	697[b]
Five-Day Biochemical Oxygen Demand	3	9	5
Dissolved Oxygen	7.6[b]	9.6[b]	8.4[b]
pH (units)	7.3[b]	8.3[b]	7.8[b]
Ammonia Nitrogen	0.03	0.11	0.07
Un-ionized Ammonia	0.001	0.004	0.002
Total Kjeldahl Nitrogen	0.67	1.40	1.07
Nitrite plus Nitrate Nitrogen	2.90	5.98	4.69
Total Nitrogen	4.30	6.93	5.76
Total Phosphorus	0.24	1.28	0.75
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.003	0.002
Phenols	0.004	0.011	0.007
Total Arsenic	<0.02	0.02	0.02
Dissolved Arsenic	<0.02	0.03	0.02
Total Cadmium	<0.0009	0.0014	0.0009
Dissolved Cadmium	<0.0005	0.0012	0.0005
Total Chromium	<0.007	0.015	0.007
Dissolved Chromium	<0.005	0.013	0.005
Total Copper	0.015	0.023	0.019
Dissolved Copper	<0.003	0.006	0.003
Total Iron	0.495	6.548	1.613
Dissolved Iron	0.006	0.171	0.087
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0375	0.1739	0.0705
Dissolved Manganese	0.0007	0.0055	0.0021
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	<0.002	0.010	0.006
Dissolved Nickel	<0.002	0.005	0.002
Total Silver	<0.004	0.008	0.004
Dissolved Silver	<0.003	0.007	0.003
Total Zinc	0.023	0.049	0.033
Dissolved Zinc	<0.002	0.016	0.009
Fecal Coliform (cfu/100 ml)	<10	140	27[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AIV-7

WATER QUALITY AT STATION 18 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.0[b]	30.6[b]	21.9[b]
Total Suspended Solids	19	129	43
Turbidity (NTU)	13[b]	238[b]	58[b]
Conductivity (µS/cm)	491[b]	789[b]	696[b]
Five-Day Biochemical Oxygen Demand	4	10	6
Dissolved Oxygen	7.4[b]	9.6[b]	8.5[b]
pH (units)	7.3[b]	8.4[b]	7.8[b]
Ammonia Nitrogen	<0.02	0.11	0.07
Un-ionized Ammonia	<0.001	0.004	0.002
Total Kjeldahl Nitrogen	0.66	1.47	1.08
Nitrite plus Nitrate Nitrogen	3.11	5.66	4.67
Total Nitrogen	4.54	6.91	5.75
Total Phosphorus	0.27	1.17	0.76
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.003	0.002
Phenols	0.002	0.012	0.007
Total Arsenic	<0.02	<0.02	0.02
Dissolved Arsenic	<0.02	0.02	0.02
Total Cadmium	<0.0009	0.0010	0.0009
Dissolved Cadmium	<0.0005	0.0013	0.0006
Total Chromium	<0.007	0.017	0.007
Dissolved Chromium	<0.005	<0.005	0.005
Total Copper	0.015	0.018	0.017
Dissolved Copper	<0.003	0.011	0.003
Total Iron	0.444	5.477	1.464
Dissolved Iron	0.007	0.134	0.080
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0299	0.1247	0.0584
Dissolved Manganese	0.0011	0.0035	0.0021
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	0.002	0.008	0.006
Dissolved Nickel	<0.002	0.005	0.004
Total Silver	<0.004	0.009	0.004
Dissolved Silver	<0.003	0.004	0.003
Total Zinc	0.015	0.045	0.032
Dissolved Zinc	<.002	0.021	0.010
Fecal Coliform (cfu/100 ml)	<10	20	11[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AIV-8

WATER QUALITY AT STATION 19 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.0[b]	30.4[b]	21.8[b]
Total Suspended Solids	15	133	42
Turbidity (NTU)	10[b]	244[b]	59[b]
Conductivity (µS/cm)	486[b]	786[b]	693[b]
Five-Day Biochemical Oxygen Demand	3	13	5
Dissolved Oxygen	7.6[b]	9.5[b]	8.6[b]
pH (units)	7.3[b]	8.3[b]	7.8[b]
Ammonia Nitrogen	0.02	0.11	0.06
Un-ionized Ammonia	0.001	0.002	0.002
Total Kjeldahl Nitrogen	0.61	1.47	1.08
Nitrite plus Nitrate Nitrogen	3.15	5.77	4.56
Total Nitrogen	4.51	6.99	5.64
Total Phosphorus	0.29	1.07	0.73
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.002	0.002
Phenols	0.004	0.011	0.007
Total Arsenic	<0.02	<0.02	0.02
Dissolved Arsenic	<0.02	<0.02	0.02
Total Cadmium	<0.0009	0.0012	0.0009
Dissolved Cadmium	<0.0005	<0.0005	0.0005
Total Chromium	0.002	0.040	0.011
Dissolved Chromium	<0.005	0.018	0.006
Total Copper	0.017	0.020	0.019
Dissolved Copper	<0.003	0.003	0.003
Total Iron	0.386	5.602	1.473
Dissolved Iron	0.006	0.131	0.079
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0302	0.1302	0.0592
Dissolved Manganese	0.0005	0.0036	0.0021
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	0.003	0.008	0.006
Dissolved Nickel	<0.002	0.005	0.003
Total Silver	<0.004	<0.004	0.004
Dissolved Silver	<0.003	0.008	0.003
Total Zinc	0.018	0.043	0.032
Dissolved Zinc	<0.002	0.017	0.006
Fecal Coliform (cfu/100 ml)	<10	40	14[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AIV-9

WATER QUALITY AT STATION 20 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.0[b]	30.5[b]	21.7[b]
Total Suspended Solids	18	136	42
Turbidity (NTU)	14[b]	241[b]	60[b]
Conductivity (µS/cm)	488[b]	800[b]	693[b]
Five-Day Biochemical Oxygen Demand	<2	5	3
Dissolved Oxygen	7.8[b]	9.8[b]	8.7[b]
pH (units)	7.3[b]	8.3[b]	7.8[b]
Ammonia Nitrogen	0.02	0.10	0.05
Un-ionized Ammonia	0.001	0.003	0.002
Total Kjeldahl Nitrogen	0.35	1.30	1.00
Nitrite plus Nitrate Nitrogen	3.17	5.92	4.50
Total Nitrogen	4.35	6.95	5.50
Total Phosphorus	0.26	1.03	0.68
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.002	0.002
Phenols	0.001	0.011	0.006
Total Arsenic	<0.02	<0.02	0.02
Dissolved Arsenic	<0.02	0.02	0.02
Total Cadmium	<0.0009	0.0021	0.0009
Dissolved Cadmium	<0.0005	0.0011	0.0005
Total Chromium	0.003	0.018	0.010
Dissolved Chromium	<0.005	0.016	0.005
Total Copper	0.010	0.025	0.016
Dissolved Copper	<0.003	0.005	0.003
Total Iron	0.346	5.696	1.449
Dissolved Iron	0.004	0.133	0.081
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0239	0.1174	0.0523
Dissolved Manganese	<0.0004	0.0028	0.0018
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	0.004	0.008	0.007
Dissolved Nickel	<0.002	0.006	0.004
Total Silver	<0.004	<0.004	0.004
Dissolved Silver	<0.003	0.006	0.003
Total Zinc	0.013	0.043	0.027
Dissolved Zinc	<0.002	0.018	0.007
Fecal Coliform (cfu/100 ml)	<10	160	18[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

APPENDIX AV

WATER QUALITY AT STATIONS 21-27 IN THE STARVED ROCK NAVIGATIONAL POOL MAY, AUGUST, AND OCTOBER, 2002

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AV-1

WATER QUALITY AT STATION 21 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.0[b]	30.2[b]	21.6[b]
Total Suspended Solids	10	308	78
Turbidity (NTU)	12[b]	520[b]	121[b]
Conductivity (µS/cm)	462[b]	801[b]	691[b]
Five-Day Biochemical Oxygen Demand	3	8	5
Dissolved Oxygen	7.7[b]	10.7[b]	8.9[b]
pH (units)	7.2[b]	8.5[b]	7.9[b]
Ammonia Nitrogen	0.02	0.14	0.05
Un-ionized Ammonia	0.001	0.002	0.001
Total Kjeldahl Nitrogen	0.83	1.77	1.30
Nitrite plus Nitrate Nitrogen	2.97	5.97	4.39
Total Nitrogen	4.24	7.37	5.69
Total Phosphorus	0.39	0.97	0.76
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.003	0.002
Phenols	0.003	0.012	0.008
Total Arsenic	<0.02	0.04	0.02
Dissolved Arsenic	<0.02	0.02	0.02
Total Cadmium	<0.0009	0.0016	0.0010
Dissolved Cadmium	<0.0005	0.0007	0.0005
Total Chromium	<0.007	0.040	0.012
Dissolved Chromium	<0.005	<0.005	0.005
Total Copper	0.009	0.020	0.015
Dissolved Copper	<0.003	0.005	0.003
Total Iron	0.376	11.090	3.764
Dissolved Iron	0.099	0.143	0.123
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0339	0.2826	0.1197
Dissolved Manganese	0.0008	0.0907	0.0247
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	<0.002	0.015	0.007
Dissolved Nickel	<0.002	0.007	0.003
Total Silver	<0.004	<0.004	0.004
Dissolved Silver	<0.003	0.008	0.003
Total Zinc	0.012	0.065	0.029
Dissolved Zinc	<0.002	0.031	0.010
Fecal Coliform (cfu/100 ml)	<10	180	16[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AV-2

WATER QUALITY AT STATION 22 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.1[b]	30.5[b]	21.7[b]
Total Suspended Solids	17	86	37
Turbidity (NTU)	17[b]	251[b]	70[b]
Conductivity (µS/cm)	481[b]	801[b]	693[b]
Five-Day Biochemical Oxygen Demand	3	5	5
Dissolved Oxygen	7.9[b]	10.2[b]	9.1[b]
pH (units)	7.3[b]	8.5[b]	7.9[b]
Ammonia Nitrogen	0.02	0.10	0.05
Un-ionized Ammonia	0.001	0.002	0.002
Total Kjeldahl Nitrogen	0.88	1.74	1.28
Nitrite plus Nitrate Nitrogen	3.05	6.01	4.47
Total Nitrogen	4.63	7.22	5.75
Total Phosphorus	0.28	1.07	0.73
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.002	0.002
Phenols	0.006	0.011	0.008
Total Arsenic	<0.02	0.02	0.02
Dissolved Arsenic	<0.02	0.02	0.02
Total Cadmium	<0.0009	0.0054	0.0016
Dissolved Cadmium	<0.0005	0.0006	0.0005
Total Chromium	<0.007	0.027	0.007
Dissolved Chromium	<0.005	0.017	0.006
Total Copper	<0.006	0.026	0.016
Dissolved Copper	<0.003	0.005	0.003
Total Iron	0.485	6.918	1.820
Dissolved Iron	0.005	0.201	0.092
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0308	0.1444	0.0647
Dissolved Manganese	<0.0004	0.0053	0.0021
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	<0.002	0.009	0.005
Dissolved Nickel	<0.002	0.006	0.004
Total Silver	<0.004	<0.004	0.004
Dissolved Silver	<0.003	0.005	0.003
Total Zinc	0.025	0.047	0.032
Dissolved Zinc	<0.002	0.017	0.006
Fecal Coliform (cfu/100 ml)	<10	40	14[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AV-3

WATER QUALITY AT STATION 23 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.0[b]	30.4[b]	21.4[b]
Total Suspended Solids	13	148	44
Turbidity (NTU)	19[b]	251[b]	66[b]
Conductivity (µS/cm)	482[b]	802[b]	693[b]
Five-Day Biochemical Oxygen Demand	3	8	5
Dissolved Oxygen	7.2[b]	9.7[b]	8.9[b]
pH (units)	7.3[b]	8.6[b]	7.9[b]
Ammonia Nitrogen	0.02	0.11	0.05
Un-ionized Ammonia	0.001	0.003	0.002
Total Kjeldahl Nitrogen	0.77	1.67	1.19
Nitrite plus Nitrate Nitrogen	3.05	5.93	4.46
Total Nitrogen	4.48	7.21	5.65
Total Phosphorus	0.41	1.01	0.72
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.002	0.002
Phenols	0.001	0.012	0.008
Total Arsenic	<0.02	0.02	0.02
Dissolved Arsenic	<0.02	<0.02	0.02
Total Cadmium	<0.0009	0.0018	0.0009
Dissolved Cadmium	<0.0005	0.0007	0.0005
Total Chromium	<0.007	0.040	0.013
Dissolved Chromium	<0.005	0.013	0.007
Total Copper	0.008	0.028	0.017
Dissolved Copper	<0.003	<0.003	0.003
Total Iron	0.398	6.585	1.755
Dissolved Iron	0.004	0.132	0.080
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0259	0.1303	0.0598
Dissolved Manganese	0.0005	0.0026	0.0011
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	0.001	0.009	0.005
Dissolved Nickel	0.003	0.006	0.004
Total Silver	<0.004	0.007	0.004
Dissolved Silver	<0.003	0.004	0.003
Total Zinc	0.020	0.046	0.033
Dissolved Zinc	<0.002	0.017	0.006
Fecal Coliform (cfu/100 ml)	<10	20	13[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AV-4

WATER QUALITY AT STATION 24 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.1[b]	29.9[b]	20.9[b]
Total Suspended Solids	16	118	43
Turbidity (NTU)	13[b]	217[b]	58[b]
Conductivity (µS/cm)	517[b]	803[b]	710[b]
Five-Day Biochemical Oxygen Demand	3	9	5
Dissolved Oxygen	6.9[b]	10.0[b]	8.8[b]
pH (units)	7.4[b]	8.4[b]	8.0[b]
Ammonia Nitrogen	<0.02	0.10	0.04
Un-ionized Ammonia	<0.001	0.006	0.002
Total Kjeldahl Nitrogen	0.58	1.72	1.18
Nitrite plus Nitrate Nitrogen	2.69	5.57	4.07
Total Nitrogen	4.22	6.91	5.25
Total Phosphorus	0.26	0.88	0.62
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.002	0.002
Phenols	0.001	0.011	0.005
Total Arsenic	<0.02	0.02	0.02
Dissolved Arsenic	<0.02	<0.02	0.02
Total Cadmium	<0.0009	0.0095	0.0021
Dissolved Cadmium	<0.0005	0.0011	0.0005
Total Chromium	<0.007	0.025	0.009
Dissolved Chromium	<0.005	0.024	0.009
Total Copper	0.012	0.025	0.019
Dissolved Copper	<0.003	0.009	0.003
Total Iron	0.317	5.319	1.452
Dissolved Iron	0.005	0.166	0.091
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0249	0.1153	0.0571
Dissolved Manganese	0.0007	0.0036	0.0019
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	<0.002	0.009	0.005
Dissolved Nickel	<0.002	0.005	0.003
Total Silver	<0.004	0.007	0.004
Dissolved Silver	<0.003	0.004	0.003
Total Zinc	0.015	0.040	0.025
Dissolved Zinc	<0.002	0.026	0.007
Fecal Coliform (cfu/100 ml)	<10	40	18[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AV-5

WATER QUALITY AT STATION 25 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.0[b]	29.8[b]	20.7[b]
Total Suspended Solids	15	136	42
Turbidity (NTU)	10[b]	243[b]	62[b]
Conductivity (µS/cm)	485[b]	809[b]	714[b]
Five-Day Biochemical Oxygen Demand	4	6	5
Dissolved Oxygen	7.1[b]	10.7[b]	9.1[b]
pH (units)	7.3[b]	8.4[b]	8.0[b]
Ammonia Nitrogen	<0.02	0.10	0.04
Un-ionized Ammonia	<0.001	0.008	0.002
Total Kjeldahl Nitrogen	0.82	1.97	1.31
Nitrite plus Nitrate Nitrogen	2.31	5.49	3.79
Total Nitrogen	4.09	6.89	5.10
Total Phosphorus	0.26	0.86	0.60
Chlorophyll a (µg/L)	5.2	88.4	44.2
Total Cyanide	<0.002	0.002	0.002
Phenols	0.003	0.012	0.007
Total Arsenic	<0.02	0.02	0.02
Dissolved Arsenic	<0.02	0.02	0.02
Total Cadmium	<0.0009	0.0017	0.0009
Dissolved Cadmium	<0.0005	0.0011	0.0005
Total Chromium	<0.007	0.019	0.007
Dissolved Chromium	<0.005	0.024	0.006
Total Copper	<0.006	0.020	0.014
Dissolved Copper	<0.003	0.003	0.003
Total Iron	0.303	6.457	1.530
Dissolved Iron	0.006	0.147	0.089
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0277	0.1293	0.0580
Dissolved Manganese	0.0006	0.0043	0.0019
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	0.002	0.008	0.005
Dissolved Nickel	0.002	0.005	0.004
Total Silver	<0.004	0.011	0.004
Dissolved Silver	<0.003	0.004	0.003
Total Zinc	0.012	0.043	0.025
Dissolved Zinc	0.002	0.019	0.008
Fecal Coliform (cfu/100 ml)	<10	30	18[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AV-6

WATER QUALITY AT STATION 26 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.0[b]	29.9[b]	20.7[b]
Total Suspended Solids	14	131	42
Turbidity (NTU)	17[b]	240[b]	63[b]
Conductivity (µS/cm)	491[b]	811[b]	712[b]
Five-Day Biochemical Oxygen Demand	3	5	5
Dissolved Oxygen	7.3[b]	10.3[b]	9.1[b]
pH (units)	7.3[b]	8.5[b]	8.0[b]
Ammonia Nitrogen	<0.02	0.11	0.05
Un-ionized Ammonia	<0.001	0.007	0.003
Total Kjeldahl Nitrogen	0.77	1.65	1.20
Nitrite plus Nitrate Nitrogen	2.01	5.87	3.90
Total Nitrogen	3.63	6.93	5.10
Total Phosphorus	0.27	0.82	0.59
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.003	0.002
Phenols	0.003	0.012	0.007
Total Arsenic	<0.02	0.02	0.02
Dissolved Arsenic	<0.02	<0.02	0.02
Total Cadmium	<0.0009	0.0016	0.0007
Dissolved Cadmium	<0.0005	0.0017	0.0005
Total Chromium	<0.007	0.039	0.014
Dissolved Chromium	<0.005	0.034	0.009
Total Copper	0.005	0.027	0.014
Dissolved Copper	<0.003	0.010	0.003
Total Iron	0.385	5.236	1.466
Dissolved Iron	0.004	0.140	0.087
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0293	0.1273	0.0610
Dissolved Manganese	0.0009	0.0025	0.0015
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	0.003	0.009	0.006
Dissolved Nickel	<0.002	0.006	0.003
Total Silver	<0.004	0.008	0.004
Dissolved Silver	<0.003	0.004	0.003
Total Zinc	0.015	0.037	0.023
Dissolved Zinc	<0.002	0.013	0.006
Fecal Coliform (cfu/100 ml)	<10	30	13[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AV-7

WATER QUALITY AT STATION 27 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	14.8[b]	28.4[b]	20.3[b]
Total Suspended Solids	20	122	41
Turbidity (NTU)	14[b]	186[b]	51[b]
Conductivity (µS/cm)	547[b]	814[b]	719[b]
Five-Day Biochemical Oxygen Demand	<2	5	4
Dissolved Oxygen	8.0[b]	12.8[b]	9.9[b]
pH (units)	7.3[b]	8.7[b]	8.2[b]
Ammonia Nitrogen	<0.02	0.09	0.03
Un-ionized Ammonia	<0.001	0.004	0.001
Total Kjeldahl Nitrogen	0.79	2.02	1.37
Nitrite plus Nitrate Nitrogen	2.42	5.96	3.92
Total Nitrogen	3.85	7.77	5.29
Total Phosphorus	0.19	0.94	0.59
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.002	0.002
Phenols	0.005	0.010	0.007
Total Arsenic	<0.02	0.02	0.02
Dissolved Arsenic	<0.02	<0.02	0.02
Total Cadmium	<0.0009	0.0011	0.0009
Dissolved Cadmium	<0.0005	0.0006	0.0005
Total Chromium	<0.007	<0.007	0.007
Dissolved Chromium	<0.005	0.018	0.008
Total Copper	0.013	0.029	0.019
Dissolved Copper	<0.003	0.011	0.003
Total Iron	0.423	0.722	0.515
Dissolved Iron	0.005	0.121	0.060
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0372	0.0481	0.0433
Dissolved Manganese	0.0009	0.0012	0.0011
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	0.005	0.012	0.008
Dissolved Nickel	0.003	0.005	0.004
Total Silver	<0.004	<0.004	0.004
Dissolved Silver	<0.003	<0.003	0.003
Total Zinc	0.029	0.038	0.033
Dissolved Zinc	0.004	0.012	0.009
Fecal Coliform (cfu/100 ml)	<10	500	22[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

APPENDIX AVI

WATER QUALITY AT STATIONS 28-41 IN THE UPPER PEORIA NAVIGATIONAL POOL MAY, AUGUST, AND OCTOBER, 2002

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AVI-1

WATER QUALITY AT STATION 28 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	14.6[b]	28.1[b]	19.9[b]
Total Suspended Solids	27	141	52
Turbidity (NTU)	23[b]	223[b]	66[b]
Conductivity (µS/cm)	507[b]	816[b]	712[b]
Five-Day Biochemical Oxygen Demand	3	6	4
Dissolved Oxygen	8.4[b]	12.0[b]	9.5[b]
pH (units)	7.2[b]	8.5[b]	8.1[b]
Ammonia Nitrogen	<0.02	0.12	0.04
Un-ionized Ammonia	<0.001	0.011	0.002
Total Kjeldahl Nitrogen	0.98	1.95	1.36
Nitrite plus Nitrate Nitrogen	2.24	5.58	3.92
Total Nitrogen	3.61	7.28	5.28
Total Phosphorus	0.31	0.98	0.65
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanides	<0.002	0.002	0.002
Phenols	0.006	0.012	0.008
Total Arsenic	<0.02	0.02	0.02
Dissolved Arsenic	<0.02	<0.02	0.02
Total Cadmium	<0.0009	0.0019	0.0009
Dissolved Cadmium	<0.0005	0.0011	0.0005
Total Chromium	<0.007	0.039	0.009
Dissolved Chromium	<0.005	0.022	0.008
Total Copper	<0.006	0.021	0.013
Dissolved Copper	<0.003	0.004	0.003
Total Iron	0.437	3.417	1.210
Dissolved Iron	0.003	0.143	0.088
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0375	0.1147	0.0628
Dissolved Manganese	0.0008	0.0067	0.0027
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	0.004	0.010	0.007
Dissolved Nickel	<0.002	0.005	0.003
Total Silver	<0.004	0.005	0.004
Dissolved Silver	<0.003	0.008	0.003
Total Zinc	0.018	0.040	0.031
Dissolved Zinc	0.002	0.017	0.009
Fecal Coliform (cfu/100 ml)	<10	500	22[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AVI-2

WATER QUALITY AT STATION 29 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	14.6[b]	28.2[b]	20.0[b]
Total Suspended Solids	23	139	49
Turbidity (NTU)	23[b]	243[b]	67[b]
Conductivity (µS/cm)	490[b]	820[b]	712[b]
Five-Day Biochemical Oxygen Demand	3	5	4
Dissolved Oxygen	8.2[b]	12.3[b]	9.6[b]
pH (units)	7.2[b]	8.5[b]	8.1[b]
Ammonia Nitrogen	<0.02	0.12	0.04
Un-ionized Ammonia	<0.001	0.007	0.002
Total Kjeldahl Nitrogen	0.96	2.11	1.43
Nitrite plus Nitrate Nitrogen	2.12	5.64	3.96
Total Nitrogen	3.68	7.60	5.39
Total Phosphorus	0.17	0.97	0.61
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.002	0.002
Phenols	0.006	0.012	0.008
Total Arsenic	<0.02	0.02	0.02
Dissolved Arsenic	<0.02	<0.02	0.02
Total Cadmium	<0.0009	0.0018	0.0009
Dissolved Cadmium	<0.0005	<0.0005	0.0005
Total Chromium	<0.007	0.049	0.011
Dissolved Chromium	<0.005	0.015	0.005
Total Copper	<0.006	0.022	0.014
Dissolved Copper	<0.003	0.003	0.003
Total Iron	0.532	3.342	1.147
Dissolved Iron	0.010	0.139	0.085
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0362	0.1154	0.0600
Dissolved Manganese	0.0008	0.0053	0.0021
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	0.003	0.012	0.007
Dissolved Nickel	<0.002	0.006	0.004
Total Silver	<0.004	0.010	0.004
Dissolved Silver	<0.003	0.005	0.003
Total Zinc	0.013	0.043	0.031
Dissolved Zinc	<0.002	0.027	0.009
Fecal Coliform (cfu/100 ml)	<10	300	20[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AVI-3

WATER QUALITY AT STATION 30 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	14.5[b]	28.3[b]	20.0[b]
Total Suspended Solids	25	132	50
Turbidity (NTU)	25[b]	245[b]	67[b]
Conductivity (µS/cm)	476[b]	821[b]	709[b]
Five-Day Biochemical Oxygen Demand	3	8	5
Dissolved Oxygen	8.3[b]	11.9[b]	9.6[b]
pH (units)	7.1[b]	8.5[b]	8.1[b]
Ammonia Nitrogen	<0.02	0.12	0.04
Un-ionized Ammonia	<0.001	0.017	0.003
Total Kjeldahl Nitrogen	0.71	1.93	1.42
Nitrite plus Nitrate Nitrogen	2.01	5.78	4.00
Total Nitrogen	3.56	7.62	5.42
Total Phosphorus	0.24	1.04	0.62
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.003	0.002
Phenols	0.004	0.011	0.007
Total Arsenic	<0.02	<0.02	0.02
Dissolved Arsenic	<0.02	0.02	0.02
Total Cadmium	<0.0009	0.0016	0.0009
Dissolved Cadmium	<0.0005	0.0007	0.0005
Total Chromium	<0.007	0.023	0.007
Dissolved Chromium	<0.005	0.010	0.005
Total Copper	<0.006	0.023	0.012
Dissolved Copper	<0.003	0.005	0.003
Total Iron	0.570	2.281	1.069
Dissolved Iron	0.004	0.158	0.091
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0395	0.1031	0.0627
Dissolved Manganese	0.0007	0.0053	0.0021
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	<0.002	0.012	0.006
Dissolved Nickel	<0.002	0.007	0.004
Total Silver	<0.004	0.011	0.004
Dissolved Silver	<0.003	0.006	0.003
Total Zinc	0.020	0.032	0.026
Dissolved Zinc	<0.002	0.013	0.008
Fecal Coliform (cfu/100 ml)	<10	200	29[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AVI-4

WATER QUALITY AT STATION 31 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	14.4[b]	28.3[b]	20.0[b]
Total Suspended Solids	22	138	50
Turbidity (NTU)	22[b]	236[b]	65[b]
Conductivity (µS/cm)	472[b]	825[b]	712[b]
Five-Day Biochemical Oxygen Demand	<2	6	3
Dissolved Oxygen	7.6[b]	11.6[b]	9.3[b]
pH (units)	7.0[b]	8.6[b]	8.1[b]
Ammonia Nitrogen	<0.02	0.12	0.05
Un-ionized Ammonia	<0.001	0.021	0.004
Total Kjeldahl Nitrogen	0.60	2.16	1.42
Nitrite plus Nitrate Nitrogen	2.11	6.52	4.21
Total Nitrogen	3.59	7.89	5.62
Total Phosphorus	0.24	0.97	0.63
Chlorophyll a (µg/L)	7.5	74.3	45.7
Total Cyanide	<0.002	0.003	0.002
Phenols	0.004	0.013	0.007
Total Arsenic	<0.02	0.03	0.02
Dissolved Arsenic	<0.02	0.02	0.02
Total Cadmium	<0.0009	0.0059	0.0015
Dissolved Cadmium	<0.0005	<0.0005	0.0005
Total Chromium	<0.007	0.042	0.008
Dissolved Chromium	<0.005	0.019	0.005
Total Copper	0.009	0.021	0.016
Dissolved Copper	<0.003	0.003	0.003
Total Iron	0.490	2.281	1.045
Dissolved Iron	0.004	0.174	0.098
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0377	0.1031	0.0605
Dissolved Manganese	0.0013	0.0063	0.0033
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	<0.002	0.012	0.006
Dissolved Nickel	0.003	0.006	0.005
Total Silver	<0.004	0.006	0.004
Dissolved Silver	<0.003	0.006	0.003
Total Zinc	0.020	0.040	0.030
Dissolved Zinc	<0.002	0.015	0.009
Fecal Coliform (cfu/100 ml)	<10	180	24[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AVI-5

WATER QUALITY AT STATION 32 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	14.3[b]	28.4[b]	20.1[b]
Total Suspended Solids	26	140	55
Turbidity (NTU)	26[b]	262[b]	71[b]
Conductivity (µS/cm)	463[b]	825[b]	712[b]
Five-Day Biochemical Oxygen Demand	3	6	4
Dissolved Oxygen	7.9[b]	11.5[b]	9.3[b]
pH (units)	7.0[b]	8.5[b]	8.1[b]
Ammonia Nitrogen	<0.02	0.15	0.06
Un-ionized Ammonia	<0.001	0.030	0.006
Total Kjeldahl Nitrogen	0.65	2.29	1.38
Nitrite plus Nitrate Nitrogen	2.03	6.39	4.16
Total Nitrogen	3.63	8.01	5.54
Total Phosphorus	0.26	0.85	0.63
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.002	0.002
Phenols	0.005	0.012	0.007
Total Arsenic	<0.02	<0.02	0.02
Dissolved Arsenic	<0.02	<0.02	0.02
Total Cadmium	<0.0009	0.0020	0.0009
Dissolved Cadmium	<0.0005	0.0010	0.0005
Total Chromium	<0.007	0.027	0.009
Dissolved Chromium	<0.005	0.025	0.008
Total Copper	<0.006	0.025	0.012
Dissolved Copper	<0.003	0.006	0.003
Total Iron	0.563	2.902	1.207
Dissolved Iron	0.003	0.193	0.095
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0385	0.1046	0.0637
Dissolved Manganese	0.0009	0.0066	0.0023
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	0.002	0.009	0.006
Dissolved Nickel	0.002	0.005	0.003
Total Silver	<0.004	0.005	0.004
Dissolved Silver	<0.003	0.006	0.003
Total Zinc	0.020	0.046	0.033
Dissolved Zinc	<0.002	0.013	0.007
Fecal Coliform (cfu/100 ml)	<10	350	23[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AVI-6

WATER QUALITY AT STATION 33 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	14.1[b]	28.7[b]	20.2[b]
Total Suspended Solids	26	134	53
Turbidity (NTU)	27[b]	259[b]	75[b]
Conductivity (µS/cm)	458[b]	825[b]	710[b]
Five-Day Biochemical Oxygen Demand	3	8	5
Dissolved Oxygen	8.7[b]	11.1[b]	9.4[b]
pH (units)	6.9[b]	8.6[b]	8.1[b]
Ammonia Nitrogen	0.02	0.12	0.05
Un-ionized Ammonia	<0.001	0.014	0.004
Total Kjeldahl Nitrogen	0.97	2.08	1.40
Nitrite plus Nitrate Nitrogen	2.04	6.55	4.17
Total Nitrogen	3.80	7.52	5.56
Total Phosphorus	0.22	0.96	0.62
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.002	0.002
Phenols	0.004	0.012	0.007
Total Arsenic	<0.02	0.03	0.02
Dissolved Arsenic	<0.02	0.03	0.02
Total Cadmium	<0.0009	0.0014	0.0009
Dissolved Cadmium	<0.0005	0.0006	0.0005
Total Chromium	<0.007	0.021	0.007
Dissolved Chromium	<0.005	0.019	0.008
Total Copper	0.009	0.022	0.014
Dissolved Copper	<0.003	0.004	0.003
Total Iron	0.465	3.345	1.325
Dissolved Iron	0.003	0.342	0.141
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0484	0.1080	0.0670
Dissolved Manganese	0.0010	0.0181	0.0050
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	0.003	0.010	0.006
Dissolved Nickel	0.002	0.007	0.004
Total Silver	<0.004	0.009	0.004
Dissolved Silver	<0.003	0.006	0.003
Total Zinc	0.013	0.046	0.034
Dissolved Zinc	0.003	0.010	0.007
Fecal Coliform (cfu/100 ml)	<10	440	21[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AVI-7

WATER QUALITY AT STATION 34 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	14.2[b]	28.6[b]	20.1[b]
Total Suspended Solids	24	156	57
Turbidity (NTU)	27[b]	298[b]	78[b]
Conductivity (µS/cm)	428[b]	822[b]	707[b]
Five-Day Biochemical Oxygen Demand	3	6	4
Dissolved Oxygen	7.9[b]	11.3[b]	9.2[b]
pH (units)	6.8[b]	8.5[b]	8.0[b]
Ammonia Nitrogen	<0.02	0.16	0.06
Un-ionized Ammonia	<0.001	0.027	0.005
Total Kjeldahl Nitrogen	1.01	2.24	1.50
Nitrite plus Nitrate Nitrogen	2.02	6.37	4.21
Total Nitrogen	3.70	8.61	5.71
Total Phosphorus	0.25	1.02	0.69
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.002	0.002
Phenols	0.004	0.013	0.008
Total Arsenic	<0.02	<0.02	0.02
Dissolved Arsenic	<0.02	<0.02	0.02
Total Cadmium	<0.0009	0.0014	0.0009
Dissolved Cadmium	<0.0005	0.0010	0.0005
Total Chromium	<0.007	0.026	0.010
Dissolved Chromium	<0.005	0.017	0.005
Total Copper	0.009	0.025	0.016
Dissolved Copper	<0.003	<0.003	0.003
Total Iron	0.535	1.871	1.072
Dissolved Iron	0.003	0.188	0.095
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0396	0.0952	0.0633
Dissolved Manganese	0.0012	0.0065	0.0022
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	0.005	0.011	0.007
Dissolved Nickel	0.002	0.005	0.004
Total Silver	<0.004	0.004	0.004
Dissolved Silver	<0.003	0.004	0.003
Total Zinc	0.025	0.041	0.032
Dissolved Zinc	<0.002	0.013	0.005
Fecal Coliform (cfu/100 ml)	<10	430	24[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AVI-8

WATER QUALITY AT STATION 35 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	13.9[b]	29.0[b]	20.4[b]
Total Suspended Solids	29	161	56
Turbidity (NTU)	35[b]	313[b]	86[b]
Conductivity (µS/cm)	428[b]	828[b]	706[b]
Five-Day Biochemical Oxygen Demand	<2	9	5
Dissolved Oxygen	7.4[b]	10.4[b]	8.9[b]
pH (units)	6.8[b]	8.6[b]	8.0[b]
Ammonia Nitrogen	<0.02	0.16	0.06
Un-ionized Ammonia	<0.001	0.033	0.006
Total Kjeldahl Nitrogen	0.78	2.25	1.49
Nitrite plus Nitrate Nitrogen	1.93	6.11	4.10
Total Nitrogen	3.51	8.21	5.58
Total Phosphorus	0.21	1.10	0.69
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.002	0.002
Phenols	0.005	0.013	0.007
Total Arsenic	<0.02	0.02	0.02
Dissolved Arsenic	<0.02	0.02	0.02
Total Cadmium	<0.0009	0.0014	0.0009
Dissolved Cadmium	<0.0005	0.0075	0.0018
Total Chromium	<0.007	0.025	0.008
Dissolved Chromium	<0.005	0.022	0.008
Total Copper	0.010	0.021	0.015
Dissolved Copper	<0.003	0.006	0.003
Total Iron	0.507	2.349	1.101
Dissolved Iron	0.005	0.141	0.087
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0445	0.0993	0.0640
Dissolved Manganese	0.0018	0.0039	0.0025
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	0.004	0.010	0.007
Dissolved Nickel	<0.002	0.005	0.003
Total Silver	<0.004	0.006	0.004
Dissolved Silver	<0.003	0.003	0.003
Total Zinc	0.016	0.041	0.030
Dissolved Zinc	<0.002	0.017	0.007
Fecal Coliform (cfu/100 ml)	<10	430	21[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AVI-9

WATER QUALITY AT STATION 36 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	13.9[b]	29.2[b]	20.7[b]
Total Suspended Solids	26	174	60
Turbidity (NTU)	31[b]	333[b]	87[b]
Conductivity (µS/cm)	417[b]	830[b]	708[b]
Five-Day Biochemical Oxygen Demand	3	5	4
Dissolved Oxygen	8.0[b]	10.3[b]	9.0[b]
pH (units)	6.7[b]	8.6[b]	8.0[b]
Ammonia Nitrogen	<0.02	0.18	0.06
Un-ionized Ammonia	<0.001	0.033	0.006
Total Kjeldahl Nitrogen	0.72	2.39	1.43
Nitrite plus Nitrate Nitrogen	1.98	6.41	4.15
Total Nitrogen	3.79	8.46	5.58
Total Phosphorus	0.25	0.82	0.64
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.003	0.002
Phenols	0.004	0.012	0.007
Total Arsenic	<0.02	0.03	0.02
Dissolved Arsenic	<0.02	0.03	0.02
Total Cadmium	<0.0009	0.0014	0.0009
Dissolved Cadmium	<0.0005	0.0037	0.0009
Total Chromium	<0.007	0.030	0.010
Dissolved Chromium	<0.005	0.014	0.006
Total Copper	0.008	0.022	0.014
Dissolved Copper	<0.003	0.005	0.003
Total Iron	0.647	2.472	1.189
Dissolved Iron	0.004	0.143	0.084
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0467	0.1040	0.0669
Dissolved Manganese	0.0012	0.0036	0.0021
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	0.004	0.010	0.007
Dissolved Nickel	<0.002	0.007	0.003
Total Silver	<0.004	<0.004	0.004
Dissolved Silver	<0.003	0.005	0.003
Total Zinc	0.019	0.041	0.030
Dissolved Zinc	<0.002	0.018	0.007
Fecal Coliform (cfu/100 ml)	<10	420	22[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AVI-10

WATER QUALITY AT STATION 37 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	13.9[b]	29.5[b]	20.6[b]
Total Suspended Solids	24	112	46
Turbidity (NTU)	25[b]	307[b]	79[b]
Conductivity (µS/cm)	405[b]	818[b]	705[b]
Five-Day Biochemical Oxygen Demand	<2	4	3
Dissolved Oxygen	7.0[b]	10.0[b]	8.9[b]
pH (units)	6.6[b]	8.5[b]	8.0[b]
Ammonia Nitrogen	<0.02	0.20	0.08
Un-ionized Ammonia	<0.001	0.041	0.009
Total Kjeldahl Nitrogen	0.77	2.10	1.41
Nitrite plus Nitrate Nitrogen	1.91	6.48	4.07
Total Nitrogen	3.58	8.16	5.47
Total Phosphorus	0.19	0.81	0.59
Chlorophyll a (µg/L)	2.4	59.6	37.2
Total Cyanide	<0.002	0.003	0.002
Phenols	0.004	0.013	0.007
Total Arsenic	<0.02	<0.02	0.02
Dissolved Arsenic	<0.02	<0.02	0.02
Total Cadmium	<0.0009	0.0016	0.0009
Dissolved Cadmium	<0.0005	0.0007	0.0005
Total Chromium	<0.007	0.045	0.010
Dissolved Chromium	<0.005	0.015	0.007
Total Copper	0.008	0.025	0.016
Dissolved Copper	<0.003	0.008	0.003
Total Iron	0.154	3.719	1.189
Dissolved Iron	0.003	0.142	0.078
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0425	0.0854	0.0620
Dissolved Manganese	0.0012	0.0029	0.0019
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	0.005	0.012	0.007
Dissolved Nickel	<0.002	0.006	0.004
Total Silver	<0.004	0.007	0.004
Dissolved Silver	<0.003	0.008	0.003
Total Zinc	0.021	0.038	0.029
Dissolved Zinc	<0.002	0.014	0.008
Fecal Coliform (cfu/100 ml)	10	250	30[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AVI-11

WATER QUALITY AT STATION 38 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	13.9[b]	29.5[b]	20.3[b]
Total Suspended Solids	24	102	47
Turbidity (NTU)	30[b]	295[b]	82[b]
Conductivity (µS/cm)	412[b]	816[b]	704[b]
Five-Day Biochemical Oxygen Demand	<2	4	2
Dissolved Oxygen	6.0[b]	10.4[b]	8.8[b]
pH (units)	6.5[b]	8.5[b]	8.0[b]
Ammonia Nitrogen	0.02	0.24	0.10
Un-ionized Ammonia	<0.001	0.032	0.009
Total Kjeldahl Nitrogen	0.69	2.45	1.46
Nitrite plus Nitrate Nitrogen	1.90	6.41	4.00
Total Nitrogen	3.59	8.46	5.46
Total Phosphorus	0.18	0.78	0.58
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.002	0.002
Phenols	0.004	0.014	0.007
Total Arsenic	<0.02	0.02	0.02
Dissolved Arsenic	<0.02	0.02	0.02
Total Cadmium	<0.0009	0.0013	0.0009
Dissolved Cadmium	<0.0005	0.0007	0.0005
Total Chromium	<0.007	0.023	0.008
Dissolved Chromium	<0.005	0.017	0.007
Total Copper	0.007	0.024	0.015
Dissolved Copper	<0.003	0.008	0.003
Total Iron	0.706	6.186	1.762
Dissolved Iron	0.003	0.143	0.087
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0385	0.0982	0.0683
Dissolved Manganese	0.0011	0.0035	0.0023
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	0.002	0.009	0.006
Dissolved Nickel	<0.002	0.006	0.004
Total Silver	<0.004	<0.004	0.004
Dissolved Silver	<0.003	0.003	0.003
Total Zinc	0.012	0.044	0.029
Dissolved Zinc	<0.002	0.013	0.006
Fecal Coliform (cfu/100 ml)	<10	230	20[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AVI-12

WATER QUALITY AT STATION 39 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	13.7[b]	29.1[b]	20.5[b]
Total Suspended Solids	16	136	53
Turbidity (NTU)	22[b]	322[b]	92[b]
Conductivity (µS/cm)	421[b]	819[b]	706[b]
Five-Day Biochemical Oxygen Demand	<2	7	4
Dissolved Oxygen	5.8[b]	11.4[b]	8.5[b]
pH (units)	6.5[b]	8.5[b]	8.0[b]
Ammonia Nitrogen	<0.02	0.25	0.12
Un-ionized Ammonia	<0.001	0.039	0.011
Total Kjeldahl Nitrogen	0.79	2.56	1.57
Nitrite plus Nitrate Nitrogen	1.89	6.53	4.02
Total Nitrogen	3.81	8.69	5.58
Total Phosphorus	0.16	0.76	0.58
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.002	0.002
Phenols	0.005	0.012	0.007
Total Arsenic	<0.02	0.02	0.02
Dissolved Arsenic	<0.02	<0.02	0.02
Total Cadmium	<0.0009	0.0023	0.0009
Dissolved Cadmium	<0.0005	0.0008	0.0005
Total Chromium	<0.007	0.012	0.007
Dissolved Chromium	<0.005	0.021	0.009
Total Copper	0.013	0.020	0.016
Dissolved Copper	<0.003	<0.003	0.003
Total Iron	0.559	3.961	1.648
Dissolved Iron	0.003	0.148	0.089
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0295	0.1286	0.0765
Dissolved Manganese	0.0016	0.0043	0.0029
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	<0.002	0.012	0.007
Dissolved Nickel	<0.002	0.005	0.004
Total Silver	<0.004	0.007	0.004
Dissolved Silver	<0.003	0.004	0.003
Total Zinc	0.011	0.040	0.028
Dissolved Zinc	<0.002	0.009	0.004
Fecal Coliform (cfu/100 ml)	<10	270	17[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AVI-13

WATER QUALITY AT STATION 40 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	13.9[b]	28.5[b]	20.0[b]
Total Suspended Solids	21	84	51
Turbidity (NTU)	24[b]	223[b]	83[b]
Conductivity (µS/cm)	479[b]	826[b]	716[b]
Five-Day Biochemical Oxygen Demand	3	6	4
Dissolved Oxygen	4.9[b]	11.7[b]	8.2[b]
pH (units)	6.8[b]	8.5[b]	8.1[b]
Ammonia Nitrogen	<0.02	0.29	0.13
Un-ionized Ammonia	<0.001	0.036	0.009
Total Kjeldahl Nitrogen	0.76	2.39	1.43
Nitrite plus Nitrate Nitrogen	1.64	6.58	3.90
Total Nitrogen	3.59	7.62	5.33
Total Phosphorus	0.16	0.68	0.52
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.003	0.002
Phenols	0.004	0.012	0.007
Total Arsenic	<0.02	0.02	0.02
Dissolved Arsenic	<0.02	<0.02	0.02
Total Cadmium	<0.0009	0.0020	0.0009
Dissolved Cadmium	<0.0005	0.0009	0.0005
Total Chromium	<0.007	0.055	0.013
Dissolved Chromium	<0.005	0.018	0.005
Total Copper	0.012	0.018	0.015
Dissolved Copper	<0.003	<0.003	0.003
Total Iron	0.638	3.344	1.359
Dissolved Iron	0.003	0.139	0.053
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0302	0.1159	0.0747
Dissolved Manganese	0.0015	0.0047	0.0027
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	<0.002	0.007	0.005
Dissolved Nickel	<0.002	0.005	0.004
Total Silver	<0.004	0.007	0.004
Dissolved Silver	<0.003	<0.003	0.003
Total Zinc	0.010	0.040	0.026
Dissolved Zinc	<0.002	0.007	0.004
Fecal Coliform (cfu/100 ml)	<10	120	15[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AVI-14

WATER QUALITY AT STATION 41 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	13.9[b]	29.1[b]	20.2[b]
Total Suspended Solids	22	123	62
Turbidity (NTU)	28[b]	238[b]	86[b]
Conductivity (µS/cm)	468[b]	825[b]	715[b]
Five-Day Biochemical Oxygen Demand	3	5	4
Dissolved Oxygen	4.7[b]	12.0[b]	8.2[b]
pH (units)	6.7[b]	8.6[b]	8.1[b]
Ammonia Nitrogen	<0.02	0.32	0.15
Un-ionized Ammonia	<0.001	0.036	0.013
Total Kjeldahl Nitrogen	1.02	2.22	1.58
Nitrite plus Nitrate Nitrogen	1.80	6.60	3.90
Total Nitrogen	3.78	8.32	5.48
Total Phosphorus	0.29	0.71	0.58
Chlorophyll a (µg/L)	7.7	60.7	39.9
Total Cyanide	<0.002	0.002	0.001
Phenols	0.006	0.011	0.007
Total Arsenic	<0.02	0.02	0.02
Dissolved Arsenic	<0.02	0.03	0.02
Total Cadmium	<0.0009	0.0013	0.0009
Dissolved Cadmium	<0.0005	0.0005	0.0005
Total Chromium	<0.007	0.011	0.007
Dissolved Chromium	<0.005	0.021	0.007
Total Copper	0.009	0.018	0.015
Dissolved Copper	<0.003	0.005	0.003
Total Iron	0.731	2.300	1.390
Dissolved Iron	0.004	0.397	0.139
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0366	0.1195	0.0814
Dissolved Manganese	0.0021	0.0061	0.0038
Total Mercury	<0.00008	0.00010	0.00008
Total Nickel	0.004	0.014	0.008
Dissolved Nickel	<0.002	0.005	0.004
Total Silver	<0.004	<0.004	0.004
Dissolved Silver	<0.003	<0.003	0.003
Total Zinc	0.013	0.040	0.028
Dissolved Zinc	<0.002	0.016	0.005
Fecal Coliform (cfu/100 ml)	<10	120	15[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

APPENDIX AVII

WATER QUALITY AT STATIONS 42-49 IN THE LOWER PEORIA NAVIGATIONAL POOL MAY, AUGUST, AND OCTOBER, 2002

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AVII-1

WATER QUALITY AT STATION 42 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	13.8[b]	28.8[b]	20.0[b]
Total Suspended Solids	32	95	49
Turbidity (NTU)	35[b]	215[b]	74[b]
Conductivity (µS/cm)	492[b]	824[b]	724[b]
Five-Day Biochemical Oxygen Demand	<2	6	4
Dissolved Oxygen	4.5[b]	11.3[b]	7.9[b]
pH (units)	6.9[b]	8.6[b]	8.1[b]
Ammonia Nitrogen	0.02	0.33	0.15
Un-ionized Ammonia	<0.001	0.028	0.011
Total Kjeldahl Nitrogen	1.14	1.95	1.51
Nitrite plus Nitrate Nitrogen	1.94	6.66	3.91
Total Nitrogen	3.75	7.88	5.42
Total Phosphorus	0.28	0.68	0.55
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.002	0.002
Phenols	0.003	0.011	0.006
Total Arsenic	<0.02	0.03	0.02
Dissolved Arsenic	<0.02	<0.02	0.02
Total Cadmium	<0.0009	0.0015	0.0009
Dissolved Cadmium	<0.0005	0.0009	0.0005
Total Chromium	<0.007	0.027	0.007
Dissolved Chromium	<0.005	0.015	0.005
Total Copper	0.012	0.030	0.020
Dissolved Copper	<0.003	0.014	0.004
Total Iron	0.851	2.873	1.437
Dissolved Iron	0.005	0.195	0.098
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0469	0.1735	0.0902
Dissolved Manganese	0.0013	0.0059	0.0025
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	0.002	0.015	0.008
Dissolved Nickel	0.003	0.006	0.004
Total Silver	<0.004	0.010	0.004
Dissolved Silver	<0.003	0.007	0.003
Total Zinc	0.015	0.189	0.055
Dissolved Zinc	<0.002	0.007	0.003
Fecal Coliform (cfu/100 ml)	<10	190	16[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AVII-2

WATER QUALITY AT STATION 43 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	14.1[b]	27.3[b]	19.9[b]
Total Suspended Solids	31	160	64
Turbidity (NTU)	43[b]	121[b]	76[b]
Conductivity (µS/cm)	614[b]	829[b]	746[b]
Five-Day Biochemical Oxygen Demand	<2	4	3
Dissolved Oxygen	5.2[b]	10.1[b]	7.5[b]
pH (units)	7.6[b]	8.3[b]	8.2[b]
Ammonia Nitrogen	<0.02	0.29	0.16
Un-ionized Ammonia	<0.001	0.031	0.013
Total Kjeldahl Nitrogen	0.82	2.98	1.67
Nitrite plus Nitrate Nitrogen	1.86	6.58	3.93
Total Nitrogen	4.19	7.95	5.59
Total Phosphorus	0.21	0.95	0.58
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.002	0.002
Phenols	0.003	0.009	0.007
Total Arsenic	<0.02	0.03	0.02
Dissolved Arsenic	<0.02	<0.02	0.02
Total Cadmium	<0.0009	0.0018	0.0009
Dissolved Cadmium	<0.0005	0.0013	0.0005
Total Chromium	<0.007	0.037	0.008
Dissolved Chromium	<0.005	0.012	0.006
Total Copper	0.006	0.026	0.017
Dissolved Copper	<0.003	0.008	0.003
Total Iron	1.063	1.702	1.295
Dissolved Iron	0.006	0.154	0.092
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0454	0.1465	0.0858
Dissolved Manganese	0.0028	0.0082	0.0046
Total Mercury	<0.00008	0.00008	0.00008
Total Nickel	0.006	0.012	0.008
Dissolved Nickel	<0.002	0.006	0.004
Total Silver	<0.004	0.004	0.004
Dissolved Silver	<0.003	0.003	0.003
Total Zinc	0.011	0.136	0.042
Dissolved Zinc	<0.002	0.008	0.004
Fecal Coliform (cfu/100 ml)	<10	180	18[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AVII-3

WATER QUALITY AT STATION 44 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	13.9[b]	27.1[b]	19.3[b]
Total Suspended Solids	29	82	59
Turbidity (NTU)	35[b]	97[b]	78[b]
Conductivity (µS/cm)	623[b]	823[b]	746[b]
Five-Day Biochemical Oxygen Demand	<2	7	3
Dissolved Oxygen	5.7[b]	10.3[b]	8.3[b]
pH (units)	7.6[b]	8.6[b]	8.3[b]
Ammonia Nitrogen	<0.02	0.21	0.09
Un-ionized Ammonia	<0.001	0.026	0.007
Total Kjeldahl Nitrogen	1.08	2.43	1.67
Nitrite plus Nitrate Nitrogen	1.72	6.64	3.76
Total Nitrogen	4.15	7.92	5.43
Total Phosphorus	0.18	0.71	0.53
Chlorophyll a (µg/L)	28.4	91.5	55.6
Total Cyanide	<0.002	0.002	0.002
Phenols	0.003	0.010	0.006
Total Arsenic	<0.02	0.04	0.02
Dissolved Arsenic	<0.02	<0.02	0.02
Total Cadmium	<0.0009	0.0040	0.0012
Dissolved Cadmium	<0.0005	0.0006	0.0005
Total Chromium	<0.007	0.041	0.009
Dissolved Chromium	<0.005	0.020	0.007
Total Copper	0.008	0.046	0.022
Dissolved Copper	<0.003	0.007	0.003
Total Iron	0.918	2.522	1.500
Dissolved Iron	0.005	0.153	0.092
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0414	0.1601	0.0947
Dissolved Manganese	0.0019	0.0048	0.0030
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	<0.002	0.012	0.007
Dissolved Nickel	<0.002	0.006	0.004
Total Silver	<0.004	0.004	0.004
Dissolved Silver	<0.003	0.003	0.003
Total Zinc	0.018	0.037	0.027
Dissolved Zinc	<0.002	0.005	0.002
Fecal Coliform (cfu/100 ml)	<10	160	16[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AVII-4

WATER QUALITY AT STATION 45 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	13.4[b]	27.0[b]	19.2[b]
Total Suspended Solids	47	84	61
Turbidity (NTU)	60[b]	103[b]	89[b]
Conductivity (µS/cm)	680[b]	824[b]	757[b]
Five-Day Biochemical Oxygen Demand	<2	5	3
Dissolved Oxygen	6.5[b]	11.1[b]	8.5[b]
pH (units)	7.7[b]	8.7[b]	8.3[b]
Ammonia Nitrogen	<0.02	0.09	0.05
Un-ionized Ammonia	<0.001	0.018	0.004
Total Kjeldahl Nitrogen	1.29	2.34	1.72
Nitrite plus Nitrate Nitrogen	1.29	6.56	3.51
Total Nitrogen	3.63	8.18	5.23
Total Phosphorus	0.22	0.73	0.54
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.002	0.002
Phenols	0.002	0.008	0.006
Total Arsenic	<0.02	<0.02	0.02
Dissolved Arsenic	<0.02	<0.02	0.02
Total Cadmium	<0.0009	0.0009	0.0009
Dissolved Cadmium	<0.0005	0.0007	0.0005
Total Chromium	<0.007	0.034	0.010
Dissolved Chromium	<0.005	0.015	0.007
Total Copper	0.012	0.029	0.020
Dissolved Copper	<0.003	0.003	0.003
Total Iron	1.266	2.445	1.749
Dissolved Iron	0.007	0.130	0.087
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0557	0.1811	0.1118
Dissolved Manganese	0.0010	0.0032	0.0022
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	0.006	0.014	0.009
Dissolved Nickel	0.003	0.006	0.005
Total Silver	<0.004	0.008	0.004
Dissolved Silver	<0.003	0.006	0.003
Total Zinc	0.018	0.037	0.026
Dissolved Zinc	0.002	0.010	0.005
Fecal Coliform (cfu/100 ml)	<10	50	13[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AVII-5

WATER QUALITY AT STATION 46 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	13.5[b]	27.1[b]	19.2[b]
Total Suspended Solids	40	75	54
Turbidity (NTU)	55[b]	105[b]	80[b]
Conductivity (µS/cm)	694[b]	826[b]	758[b]
Five-Day Biochemical Oxygen Demand	<2	6	3
Dissolved Oxygen	6.2[b]	11.1[b]	8.5[b]
pH (units)	7.8[b]	8.7[b]	8.3[b]
Ammonia Nitrogen	<0.02	0.12	0.06
Un-ionized Ammonia	0.001	0.019	0.005
Total Kjeldahl Nitrogen	1.08	2.61	1.68
Nitrite plus Nitrate Nitrogen	1.44	6.56	3.47
Total Nitrogen	3.90	8.11	5.14
Total Phosphorus	0.25	0.74	0.54
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.002	0.002
Phenols	0.004	0.008	0.006
Total Arsenic	<0.02	0.02	0.02
Dissolved Arsenic	<0.02	<0.02	0.02
Total Cadmium	<0.0009	0.0020	0.0009
Dissolved Cadmium	<0.0005	0.0008	0.0005
Total Chromium	<0.007	0.016	0.007
Dissolved Chromium	<0.005	0.040	0.008
Total Copper	<0.006	0.027	0.015
Dissolved Copper	<0.003	0.008	0.004
Total Iron	0.842	1.858	1.398
Dissolved Iron	0.004	0.132	0.087
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0444	0.1682	0.0971
Dissolved Manganese	0.0010	0.0047	0.0026
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	0.004	0.010	0.007
Dissolved Nickel	0.002	0.005	0.004
Total Silver	<0.004	0.006	0.004
Dissolved Silver	<0.003	0.004	0.003
Total Zinc	0.017	0.031	0.023
Dissolved Zinc	<0.002	0.009	0.005
Fecal Coliform (cfu/100 ml)	<10	20	11[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AVII-6

WATER QUALITY AT STATION 47 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	14.4[b]	28.0[b]	19.6[b]
Total Suspended Solids	50	68	59
Turbidity (NTU)	62[b]	103[b]	84[b]
Conductivity (µS/cm)	694[b]	828[b]	762[b]
Five-Day Biochemical Oxygen Demand	<2	5	3
Dissolved Oxygen	6.2[b]	11.1[b]	8.3[b]
pH (units)	7.7[b]	8.7[b]	8.2[b]
Ammonia Nitrogen	<0.02	0.11	0.07
Un-ionized Ammonia	0.001	0.021	0.006
Total Kjeldahl Nitrogen	1.06	2.37	1.63
Nitrite plus Nitrate Nitrogen	1.30	6.57	3.45
Total Nitrogen	3.66	8.06	5.07
Total Phosphorus	0.22	0.70	0.51
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.002	0.002
Phenols	0.003	0.009	0.006
Total Arsenic	<0.02	0.02	0.02
Dissolved Arsenic	<0.02	<0.02	0.02
Total Cadmium	<0.0009	0.0019	0.0009
Dissolved Cadmium	<0.0005	0.0008	0.0005
Total Chromium	<0.007	0.039	0.009
Dissolved Chromium	<0.005	0.010	0.005
Total Copper	0.009	0.024	0.015
Dissolved Copper	<0.003	0.013	0.003
Total Iron	1.129	1.866	1.595
Dissolved Iron	0.006	0.133	0.089
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0569	0.1747	0.1100
Dissolved Manganese	0.0010	0.0024	0.0017
Total Mercury	<0.00008	<0.00008	0.00008
Total Nickel	0.003	0.014	0.008
Dissolved Nickel	0.004	0.005	0.005
Total Silver	<0.004	<0.004	0.004
Dissolved Silver	<0.003	0.006	0.003
Total Zinc	0.020	0.028	0.025
Dissolved Zinc	<0.002	0.009	0.003
Fecal Coliform (cfu/100 ml)	<10	170	31[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AVII-7

WATER QUALITY AT STATION 48 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	14.4[b]	27.8[b]	19.6[b]
Total Suspended Solids	58	76	67
Turbidity (NTU)	74[b]	124[b]	95[b]
Conductivity (µS/cm)	689[b]	836[b]	761[b]
Five-Day Biochemical Oxygen Demand	<2	6	4
Dissolved Oxygen	5.9[b]	10.9[b]	8.2[b]
pH (units)	7.9[b]	8.7[b]	8.3[b]
Ammonia Nitrogen	<0.02	0.13	0.07
Un-ionized Ammonia	<0.001	0.022	0.006
Total Kjeldahl Nitrogen	1.16	3.67	1.94
Nitrite plus Nitrate Nitrogen	1.36	6.44	3.40
Total Nitrogen	4.03	8.01	5.34
Total Phosphorus	0.26	0.79	0.56
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.002	0.002
Phenols	0.004	0.008	0.006
Total Arsenic	<0.02	0.02	0.02
Dissolved Arsenic	<0.02	<0.02	0.02
Total Cadmium	<0.0009	0.0019	0.0009
Dissolved Cadmium	<0.0005	0.0007	0.0005
Total Chromium	<0.007	0.033	0.011
Dissolved Chromium	<0.005	0.020	0.009
Total Copper	0.012	0.020	0.017
Dissolved Copper	<0.003	0.010	0.004
Total Iron	1.109	2.499	1.808
Dissolved Iron	0.005	0.181	0.100
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0713	0.1695	0.1147
Dissolved Manganese	0.0010	0.0030	0.0018
Total Mercury	<0.00008	0.00021	0.00008
Total Nickel	0.005	0.015	0.009
Dissolved Nickel	<0.002	0.007	0.005
Total Silver	<0.004	0.004	0.004
Dissolved Silver	<0.003	<0.003	0.003
Total Zinc	0.020	0.029	0.025
Dissolved Zinc	0.002	0.007	0.004
Fecal Coliform (cfu/100 ml)	<10	200	25[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AVII-8

WATER QUALITY AT STATION 49 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER, 2002

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	14.4[b]	27.7[b]	19.7[b]
Total Suspended Solids	47	95	66
Turbidity (NTU)	68[b]	101[b]	83[b]
Conductivity (µS/cm)	697[b]	835[b]	764[b]
Five-Day Biochemical Oxygen Demand	<2	7	3
Dissolved Oxygen	5.8[b]	10.9[b]	8.2[b]
pH (units)	7.8[b]	8.7[b]	8.2[b]
Ammonia Nitrogen	<0.02	0.11	0.07
Un-ionized Ammonia	<0.001	0.014	0.004
Total Kjeldahl Nitrogen	1.04	2.52	1.63
Nitrite plus Nitrate Nitrogen	1.23	6.39	3.36
Total Nitrogen	3.61	7.94	5.00
Total Phosphorus	0.30	0.68	0.54
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	<0.002	0.002	0.002
Phenols	0.004	0.008	0.006
Total Arsenic	<0.02	<0.02	0.02
Dissolved Arsenic	<0.02	<0.02	0.02
Total Cadmium	<0.0009	0.0018	0.0009
Dissolved Cadmium	<0.0005	0.0008	0.0005
Total Chromium	<0.007	0.046	0.011
Dissolved Chromium	<0.005	0.014	0.005
Total Copper	<0.006	0.048	0.022
Dissolved Copper	<0.003	0.005	0.003
Total Iron	1.212	2.747	1.647
Dissolved Iron	0.004	0.132	0.088
Total Lead	<0.03	<0.03	0.03
Dissolved Lead	<0.02	<0.02	0.02
Total Manganese	0.0741	0.1541	0.1080
Dissolved Manganese	0.0007	0.0031	0.0015
Total Mercury	<0.00008	0.00013	0.00008
Total Nickel	0.004	0.014	0.008
Dissolved Nickel	<0.002	0.006	0.003
Total Silver	<0.004	0.006	0.004
Dissolved Silver	<0.003	0.005	0.003
Total Zinc	0.019	0.031	0.026
Dissolved Zinc	<0.002	0.007	0.003
Fecal Coliform (cfu/100 ml)	<10	360	33[c]

[a]Expressed in mg/L except where noted.
[b]Field measurement.
[c]Geometric mean.