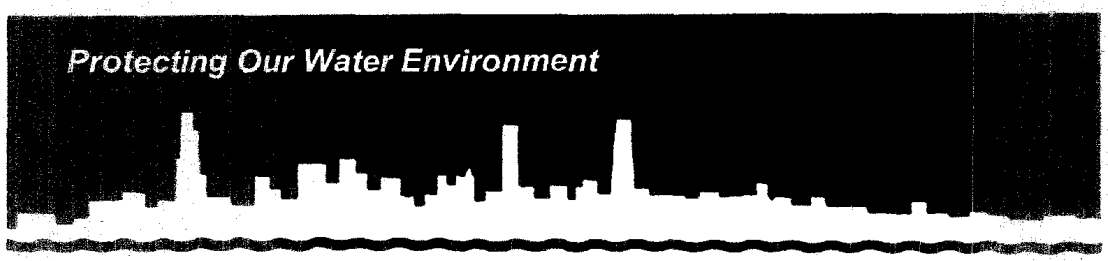

Metropolitan Water Reclamation District of Greater Chicago

RESEARCH AND DEVELOPMENT DEPARTMENT

REPORT NO. 04-15

WATER AND SEDIMENT QUALITY ALONG THE ILLINOIS WATERWAY FROM THE LOCKPORT LOCK TO THE PEORIA LOCK DURING 2003

September 2004

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 2003

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September 2004

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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 2003, 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 2003 surveys, the following conclusions can be made concerning the water and sediment quality along the study reach:

Water Quality

During 2003, the mean concentration of total suspended solids (TSS) increased in the downstream direction of the Illinois Waterway from the Lockport Pool (15 mg/L) to the lower Peoria Pool (86 mg/L).

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

In 2003, the mean dissolved oxygen (DO) concentration increased substantially along the waterway from the Lockport Pool (4.9 mg/L) to the upper Peoria Pool where DO peaked (9.9 mg/L). In the lower Peoria Pool, mean DO fell slightly (8.1 mg/L).

There was an increase in pH from the Lockport Pool (6.8) to the lower Peoria Pool (8.2) during 2003.

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 0.60, 4.69, and 6.18 mg/L, respectively, in the Lockport Pool to 0.20, 2.98, and 4.40 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 (0.016 mg/L).

The mean total Kjeldahl nitrogen (TKN) concentration decreased from the Lockport Pool (1.49 mg/L) to the Marseilles Pool (0.99 mg/L), and then increased to a mean of 1.42 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 (0.97 mg/L) to the lower Peoria Pool (0.59 mg/L).

Mean chlorophyll *a* substantially increased in concentration along the Illinois Waterway from the Brandon Road Pool (9.8 µg/L) to the lower Peoria Pool (52.0 µg/L).

The mean concentration of cyanide was 0.003 mg/L in the Lockport, Brandon Road, and Dresden Island Pools, while the value in the Marseilles, Starved Rock, upper and lower Peoria Pools was 0.002 mg/L during 2003.

There was a slight decrease in mean phenols concentrations along the Illinois Waterway from the Lockport Pool (0.012 mg/L) to the lower Peoria Pool (0.005 mg/L).

There was a dramatic drop in the geometric mean of fecal coliform in the Illinois Waterway throughout the Dresden Island Pool. Fecal coliform then remained fairly uniform from Marseilles to the lower Peoria Pool. The overall decrease from Lockport to the lower Peoria Pool was from 277 to 20 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 (8.962 and 0.3810 mg/L, respectively), compared to the Lockport Pool (3.649 and 0.1685 mg/L, respectively), during the three sampling periods of 2003.

With the exception of lead, manganese and zinc, the mean concentrations of the other eight dissolved trace metals analyzed in surface waters remained fairly uniform in the Illinois Waterway from the Lockport Pool to the lower Peoria Pool. In the Lockport Pool, the mean dissolved lead concentration measured 0.0044 mg/L and decreased to 0.0017 mg/L in the lower Peoria Pool. Unlike total manganese, dissolved manganese decreased from a mean of 0.0216 mg/L in the Lockport Pool to a mean of 0.0036 mg/L in the lower Peoria Pool. Dissolved zinc concentrations decreased from 0.021 mg/L in the Lockport Pool to a mean of 0.003 mg/L in the lower Peoria Pool.

Sediment Quality

The mean percent total solids (TS) in sediments increased between Lockport (37.3 percent) and the Marseilles Pool (82.6 percent) and then decreased along the Illinois Waterway until the lower Peoria Pool (60.3 percent).

There was generally a decrease in the mean percent total volatile solids (TVS) from the Lockport Pool (11 percent) to the Starved Rock Pool (1 percent), and then a slight increase until the lower Peoria Pool (5 percent).

Ammonia nitrogen in sediments substantially decreased from 100 mg/kg in the Lockport Pool to a mean of 1 mg/kg in the Starved Rock Pool. Ammonia nitrogen increased again from Starved Rock to the Lower Peoria Pool where the mean was 14.5 mg/kg.

The mean concentration of TKN decreased from the Lockport Pool (1,614 mg/kg) to the Starved Rock Pool (5 mg/kg) and increased downstream to the lower Peoria Pool (421 mg/kg).

Total phosphorus in the sediments varied along the Illinois Waterway with an overall decrease in mean concentration from the Lockport Pool (2,476 mg/kg) to the lower Peoria Pool (205 mg/kg).

The mean concentration of total cyanide in the sediments decreased between the Lockport Pool (0.819 mg/kg) and the upper Peoria Pool (0.057 mg/kg) and then increased to 0.390 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 (0.061 mg/kg) to the lower Peoria Pool (0.033 mg/kg).

Although 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, iron, lead, manganese, 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 sediment.

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 1,159 million gallons per day in 2003.

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 2003. Data from previous years have been compiled in formal annual reports only for 1977, 1983–85, 1989, 1991, and 2002.

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.

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

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).

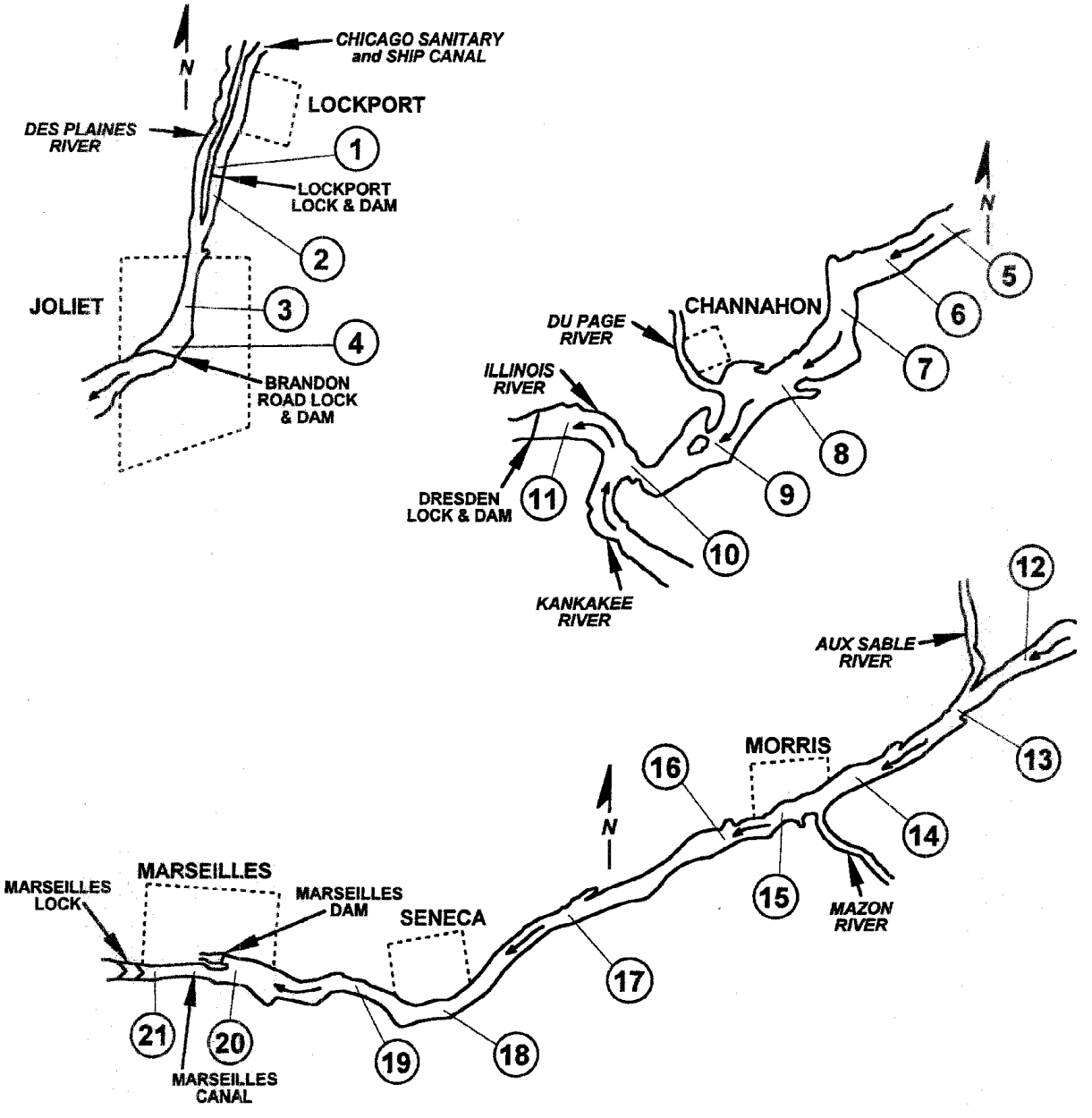
Monitoring Stations

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

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 THE ILLINOIS WATERWAY FROM OTTAWA TO PEORIA SHOWING SAMPLING STATIONS 22 TO 49

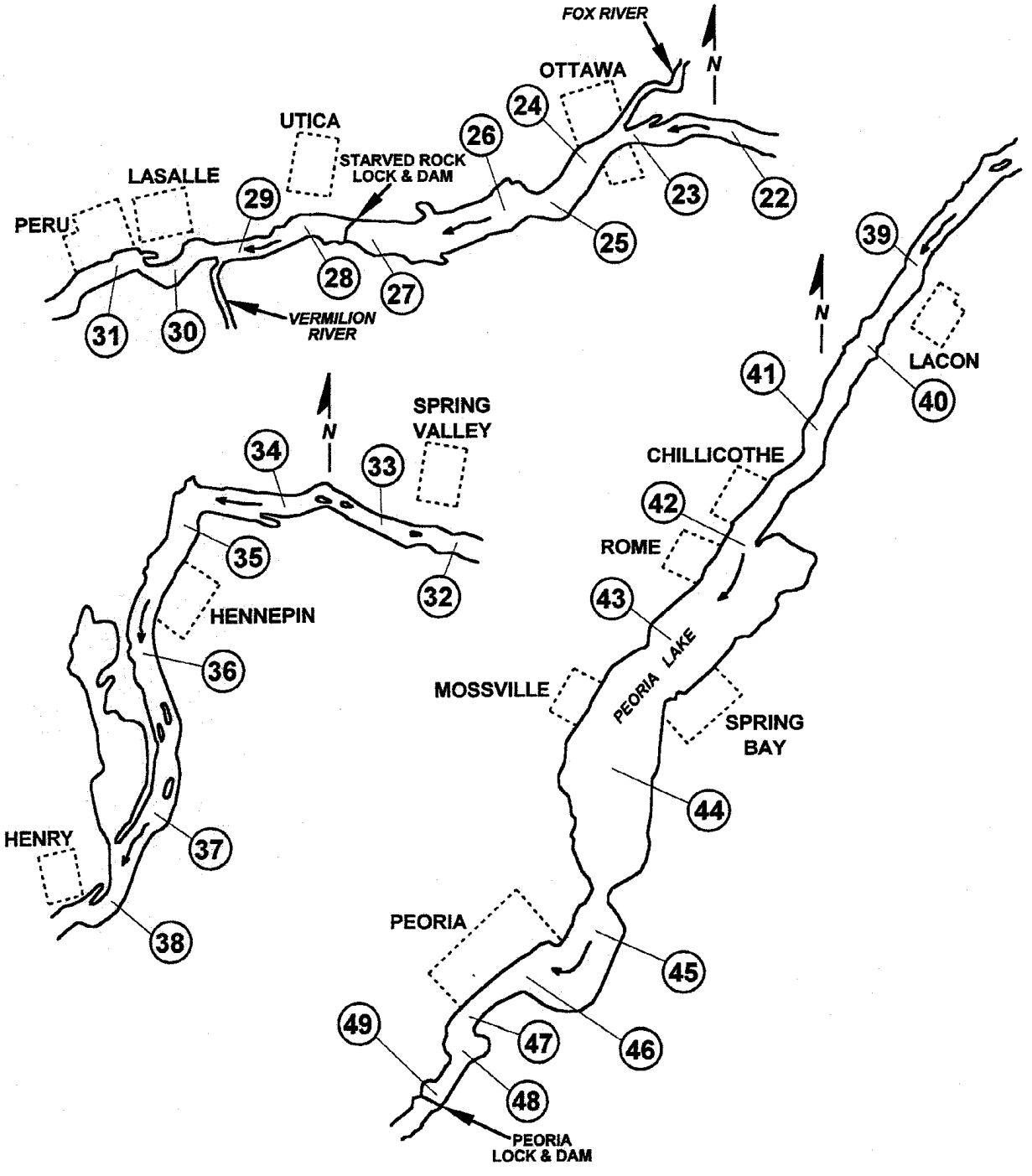


TABLE 2: MONITORING STATIONS ALONG THE ILLINOIS WATERWAY FROM LOCKPORT LOCK TO PEORIA LOCK

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
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

TABLE 2 (Continued): MONITORING STATIONS ALONG THE ILLINOIS WATERWAY FROM LOCKPORT LOCK TO PEORIA LOCK

Station Number	Waterway	Waterway Mile-Point Location	Navigational Pool
38	Illinois River	196.9	Peoria
39	Illinois River	190.0	Peoria
40	Illinois River	186.4	Peoria
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 5–9, May 12–16, August 4–8, August 11–15, October 6–10, and October 13–17 in 2003. 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 the Environmental Monitoring and Research Division (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 FC, 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 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:

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

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 a. Water samples for chlorophyll analysis were collected at 22 selected monitoring stations (2, 3, 5, 7, 10, 11, 15, 18, 20, 22, 25, 27, 28, 31, 34, 36, 38, 41, 42, 44, 45, and 48) 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,

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.

insulated chests. In the laboratory, the water samples were analyzed for chlorophyll *a*, *b*, and *c* using methods described in Standard Methods.

Sediment. *Chemical Constituents.* Sediment samples were collected during the 2003 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 6–10, 2003, 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.

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 gases, 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 geomorphological 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 the values were generally less than the MDL of 0.00006 mg/L. The mean dissolved mercury values were between 0.00007 and 0.00011 mg/L at Stations 13, 21, 24, 32, 34, and 39. The water quality data for selected parameters are summarized by navigational pool in Table 5.

Lockport Pool. *Dissolved Oxygen.* Dissolved oxygen ranged from 3.6 (October) to 6.2 mg/L (May) in the Lockport Pool. The mean DO concentration during May, August, and October of 2003 was 4.9 mg/L.

Ammonia Nitrogen. Ammonia nitrogen ranged from 0.22 (May) to 1.65 mg/L (August) at Station 1 during 2003. The mean ammonia nitrogen concentration during May, August, and October was 0.60 mg/L.

Un-ionized Ammonia. The maximum calculated un-ionized ammonia value during the three sampling periods of 2003 was 0.007 mg/L in October, while the minimum calculated un-ionized ammonia concentration was <0.001 mg/L at Station 1 in May. 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 0.94 (August) to 2.25 mg/L (October) at Station 1 during 2003. The mean TKN concentration during May, August, and October was 1.49 mg/L.

Nitrite plus Nitrate Nitrogen. The maximum NO_2+NO_3-N concentration recorded during the three sampling periods of 2003 was 6.74 mg/L on October 6, while the minimum NO_2+NO_3-N value was 3.49 mg/L at Station 1 on October 17. The mean concentration of NO_2+NO_3-N for the three monitoring periods was 4.69 mg/L.

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 2003

Navigational Pool	Constituents[a]	Range	Average
LOCKPORT	Water Temperature (°C)[b]	14.9 – 28.1	21.4
	TSS	10 – 23	15
	Turbidity (NTU)[b]	11 – 24	19
	Conductivity (µS/cm)[b]	709 – 997	831
	BOD_5	<2 – 6	5
	Dissolved Oxygen (DO)[b]	3.6 – 6.2	4.9
	pH (units)[b]	6.3 – 7.2	6.8
	NH_4-N	0.22 – 1.65	0.60
	Un-ionized Ammonia	<0.001 – 0.007	0.004
	TKN	0.94 – 2.25	1.49
	NO_2+NO_3-N	3.49 – 6.74	4.69
	TN	5.06 – 8.38	6.18
	TP	0.46 – 2.19	0.97
	Chlorophyll *a* (µg/L)	No Data	No Data
	Total Cyanide	0.003 – 0.005	0.003
	Phenols	0.010 – 0.020	0.012
	FC (cfu/100 ml)[c]	100 – 1800	277
BRANDON ROAD	Water Temperature (°C)[b]	14.6 – 28.4	20.5
	TSS	9 – 59	27
	Turbidity (NTU)[b]	11 – 43	25
	Conductivity (µS/cm)[b]	690 – 1087	857
	BOD_5	<2 – 7	4
	Dissolved Oxygen (DO)[b]	4.3 – 8.4	5.9
	pH (units)[b]	6.6 – 7.3	7.0
	NH_4-N	0.20 – 1.32	0.45
	Un-ionized Ammonia	<0.001 – 0.006	0.003
	TKN	0.79 – 1.98	1.35
	NO_2+NO_3-N	3.10 – 6.86	4.33
	TN	4.24 – 8.60	5.69
	TP	0.40 – 2.37	1.00
	Chlorophyll *a* (µg/L)	3.5 – 24.8	9.8
	Total Cyanide	<0.002 – 0.005	0.003
	Phenols	<0.003 – 0.013	0.008
	FC (cfu/100 ml)[c]	40 – 1800	336

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 2003

Navigational Pool	Constituents[a]	Range	Average
DRESDEN ISLAND	Water Temperature (°C)[b]	15.0 – 31.0	21.8
	TSS	10 – 91	30
	Turbidity (NTU)[b]	16 – 160	38
	Conductivity (µS/cm)[b]	677 – 1079	882
	BOD_5	<2 – 10	4
	Dissolved Oxygen (DO)[b]	5.7 – 10.0	7.8
	pH (units)[b]	6.7 – 8.1	7.4
	NH_4-N	0.17 – 0.63	0.32
	Un-ionized Ammonia	<0.001 – 0.016	0.004
	TKN	0.58 – 2.91	1.27
	NO_2+NO_3-N	3.04 – 6.31	4.22
	TN	4.29 – 7.74	5.49
	TP	0.30 – 1.69	0.90
	Chlorophyll *a* (µg/L)	4.2 – 40.4	15.6
	Total Cyanide	<0.002 – 0.003	0.003
	Phenols	<0.003 – 0.014	0.008
	FC (cfu/100 ml)[c]	20 – 1500	216
MARSEILLES	Water Temperature (°C)[b]	15.7 – 29.5	20.5
	TSS	16 – 86	39
	Turbidity (NTU)[b]	16 – 99	42
	Conductivity (µS/cm)[b]	681 – 897	788
	BOD_5	<2 – 7	4
	Dissolved Oxygen (DO)[b]	5.6 – 13.5	8.8
	pH (units)[b]	7.3 – 8.5	7.8
	NH_4-N	0.03 – 0.30	0.16
	Un-ionized Ammonia	0.001 – 0.012	0.005
	TKN	0.44 – 1.86	0.99
	NO_2+NO_3-N	3.01 – 8.59	4.31
	TN	3.74 – 9.70	5.30
	TP	0.25 – 1.87	0.62
	Chlorophyll *a* (µg/L)	1.3 – 57.1	25.5
	Total Cyanide	<0.002 – 0.003	0.002
	Phenols	<0.003 – 0.011	0.006
	FC (cfu/100 ml)[c]	<10 – 430	47

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 2003

Navigational Pool	Constituents[a]	Range	Average
STARVED ROCK	Water Temperature (°C)[b]	15.9 – 28.1	20.3
	TSS	19 – 447	53
	Turbidity (NTU)[b]	20 – 300	54
	Conductivity (µS/cm)[b]	704 – 960	805
	BOD_5	<2 – 11	5
	Dissolved Oxygen (DO)[b]	7.4 – 15.8	9.7
	pH (units)[b]	7.0 – 9.0	8.0
	NH_4-N	0.02 – 0.34	0.12
	Un-ionized Ammonia	<0.001 – 0.035	0.006
	TKN	0.44 – 3.23	1.21
	NO_2+NO_3-N	2.17 – 7.54	3.89
	TN	3.43 – 10.77	5.10
	TP	0.27 – 1.46	0.61
	Chlorophyll *a* (µg/L)	12.8 – 105.5	50.1
	Total Cyanide	<0.002 – 0.002	0.002
	Phenols	<0.003 – 0.011	0.006
	FC (cfu/100 ml)[c]	<10 – 250	38
UPPER PEORIA	Water Temperature (°C)[b]	15.7 – 27.6	20.2
	TSS	22 – 95	47
	Turbidity (NTU)[b]	15 –1570	98
	Conductivity (µS/cm)[b]	681 – 923	784
	BOD_5	<2 – 11	5
	Dissolved Oxygen (DO)[b]	6.2 – 18.8	9.9
	pH (units)[b]	7.3 – 9.2	8.1
	NH_4-N	0.03 – 0.74	0.18
	Un-ionized Ammonia	0.001 – 0.099	0.015
	TKN	0.99 – 2.05	1.39
	NO_2+NO_3-N	1.36 – 7.55	3.62
	TN	3.08 – 8.89	5.01
	TP	0.26 – 1.29	0.53
	Chlorophyll *a* (µg/L)	15.7 – 137.6	57.3
	Total Cyanide	<0.002 – 0.003	0.002
	Phenols	<0.003 – 0.010	0.005
	FC (cfu/100 ml)[c]	<10 – 240	27

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 2003

Navigational Pool	Constituents[a]	Range	Average
LOWER PEORIA	Water Temperature (°C)[b]	16.4 – 27.5	20.4
	TSS	40 – 383	86
	Turbidity (NTU)[b]	32 – 169	95
	Conductivity (µS/cm)[b]	670 – 919	790
	BOD_5	<2 – 8	4
	Dissolved Oxygen (DO)[b]	5.3 – 13.6	8.1
	pH (units)[b]	7.5 – 9.2	8.2
	NH_4-N	0.04 – 0.51	0.20
	Un-ionized Ammonia	0.002 – 0.048	0.016
	TKN	0.93 – 2.37	1.42
	NO_2+NO_3-N	0.86 – 6.76	2.98
	TN	2.10 – 7.97	4.40
	TP	0.33 – 1.47	0.59
	Chlorophyll *a* (µg/L)	15.4 – 101.1	52.0
	Total Cyanide	<0.002 – 0.003	0.002
	Phenols	<0.003 – 0.014	0.005
	FC (cfu/100 ml)[c]	<10 – 200	20

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

Total Nitrogen. Total nitrogen ranged from 5.06 (August) to 8.38 mg/L (October) during 2003. The mean TN concentration during May, August, and October was 6.18 mg/L.

Total Phosphorus. The maximum TP concentration during the three sampling periods of 2003 was 2.19 mg/L in October, while the minimum value was 0.46 mg/L at Station 1 in May. The mean concentration of TP for the three monitoring periods was 0.97 mg/L.

Fecal Coliform. Fecal coliform levels at Station 1 ranged from 100 (May) to 1800 cfu/100 ml (August) during 2003. The FC geometric mean during May, August, and October was 277 cfu/100 ml.

Brandon Road Pool. *Dissolved Oxygen.* Dissolved oxygen ranged from 4.3 (August) to 8.4 mg/L (May) during 2003. The mean DO concentration during May, August, and October was 5.9 mg/L.

Ammonia Nitrogen. Ammonia nitrogen ranged from 0.20 (May) to 1.32 mg/L (October) during 2003. The mean NH_4-N concentration during May, August, and October was 0.45 mg/L.

Un-ionized Ammonia. The maximum calculated un-ionized ammonia value during the three sampling periods of 2003 was 0.006 mg/L in October, while the minimum calculated concentration was <0.001 mg/L several times throughout the year. 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 0.79 (August) to 1.98 mg/L (October) during 2003. The mean TKN concentration during May, August, and October was 1.35 mg/L.

Nitrite plus Nitrate Nitrogen. The maximum NO_2+NO_3-N recorded during the three sampling periods of 2003 was 6.86 mg/L in October, while the minimum NO_2+NO_3-N value was 3.10 mg/L in August. The mean concentration of NO_2+NO_3-N for the three monitoring periods was 4.33 mg/L.

Total Nitrogen. Total nitrogen ranged from 4.24 (August) to 8.60 mg/L (October) during 2003. The mean TN concentration during May, August, and October was 5.69 mg/L.

Total Phosphorus. The maximum TP concentration recorded during the three sampling periods of 2003 was 2.37 mg/L in October, while the minimum TP value was 0.40 mg/L in May. The mean TP concentration for the three monitoring periods was 1.00 mg/L.

Chlorophyll a. Chlorophyll *a* ranged from 3.5 (October) to 24.8 µg/L (August) during 2003. The mean chlorophyll *a* concentration during May, August, and October was 9.8 µg/L.

Fecal Coliform. Fecal coliform levels ranged from 40 (May) to 1800 cfu/100 ml (May) during 2003. The FC geometric mean during May, August, and October was 336 cfu/100 ml.

Dresden Island Pool. *Dissolved Oxygen.* Dissolved oxygen ranged from 5.7 (August) to 10.0 mg/L (May) during 2003. The mean DO concentration during May, August, and October was 7.8 mg/L.

Ammonia Nitrogen. Ammonia nitrogen ranged from 0.17 (October) to 0.63 mg/L (August) during 2003. The mean NH_4-N

concentration during May, August, and October was 0.32 mg/L.

Un-ionized Ammonia. The maximum calculated un-ionized ammonia value during the three sampling periods of 2003 was 0.016 mg/L in August, while the minimum calculated concentration was <0.001 mg/L in May. 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 0.58 (October) to 2.91 mg/L (October) during 2003. The mean TKN concentration during May, August, and October was 1.27 mg/L.

Nitrite plus Nitrate Nitrogen. The maximum NO_2+NO_3-N recorded during the three sampling periods of 2003 was 6.31 mg/L in October, while the minimum NO_2+NO_3-N value was 3.04 mg/L in August. The mean concentration of NO_2+NO_3-N for the three monitoring periods was 4.22 mg/L.

Total Nitrogen. Total nitrogen ranged from 4.29 (August) to 7.74 mg/L (October) during 2003. The mean TN concentration during May, August, and October was 5.49 mg/L.

Total Phosphorus. The maximum TP concentration recorded during the three sampling periods of 2003 was 1.69 mg/L in October, while the minimum TP value was 0.30 mg/L in May. The mean TP concentration for the three monitoring periods was 0.90 mg/L.

Chlorophyll a. Chlorophyll *a* ranged from 4.2 (October) to 40.4 µg/L (August) during 2003. The mean chlorophyll *a* concentration during May, August, and October was 15.6 µg/L.

Fecal Coliform. Fecal coliform levels ranged from 20 (October) to 1500 cfu/100 ml (August) during 2003. The FC geometric mean during May, August, and October was 216 cfu/100 ml.

Marseilles Pool. *Dissolved Oxygen.* Dissolved oxygen ranged from 5.6 (August) to 13.5 mg/L (October) during 2003. The mean DO concentration during May, August, and October was 8.8 mg/L.

Ammonia Nitrogen. Ammonia nitrogen ranged from 0.03 (May) to 0.30 mg/L (several dates) during 2003. The mean NH_4-N concentration during May, August, and October was 0.16 mg/L.

Un-ionized Ammonia. The maximum calculated un-ionized ammonia value during the three sampling periods of 2003 was 0.012 mg/L in August, while the minimum calculated concentration was 0.001 mg/L in May. The mean calculated un-ionized ammonia for the three monitoring periods was 0.005 mg/L.

Total Kjeldahl Nitrogen. Total Kjeldahl nitrogen ranged from 0.44 (August) to 1.86 mg/L (May) during 2003. The mean TKN concentration during May, August, and October was 0.99 mg/L.

Nitrite plus Nitrate Nitrogen. The maximum NO_2+NO_3-N recorded during the three sampling periods of 2003 was 8.59 mg/L in May, while the minimum NO_2+NO_3-N value was 3.01 mg/L in October. The mean concentration of NO_2+NO_3-N for the three monitoring periods was 4.31 mg/L.

Total Nitrogen. Total nitrogen ranged from 3.74 (August) to 9.70 mg/L (May) during 2003. The mean TN concentration during May, August, and October was 5.30 mg/L.

Total Phosphorus. The maximum TP concentration recorded during the three sampling periods of 2003 was 1.87 mg/L in October, while the minimum TP value was 0.25 mg/L on several dates. The mean TP concentration for the three monitoring periods was 0.62 mg/L.

Chlorophyll a. Chlorophyll *a* ranged from 1.3 (August) to 57.1 µg/L (October) during 2003. The mean chlorophyll *a* concentration during May, August, and October was 25.5 µg/L.

Fecal Coliform. Fecal coliform levels ranged from <10 (several dates) to 430 cfu/100 ml (May) during 2003. The FC geometric mean during May, August, and October was 47 cfu/100 ml.

Starved Rock Pool. *Dissolved Oxygen.* Dissolved oxygen ranged from 7.4 (August) to 15.8 mg/L (October) during 2003. The mean DO concentration during May, August, and October was 9.7 mg/L.

Ammonia Nitrogen. Ammonia nitrogen ranged from 0.02 (several dates) to 0.34 mg/L (May) during 2003. The mean NH_4-N concentration during May, August, and October was 0.12 mg/L.

Un-ionized Ammonia. The maximum calculated un-ionized ammonia value during the three sampling periods of 2003 was 0.035 mg/L in October, while the minimum calculated concentration was <0.001 mg/L in May. 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 0.44 (August) to 3.23 mg/L (May) during 2003. The mean TKN concentration during May, August, and October was 1.21 mg/L.

Nitrite plus Nitrate Nitrogen. The maximum NO_2+NO_3-N recorded during the three sampling periods of 2003 was 7.54 mg/L in May, while the minimum NO_2+NO_3-N value was 2.17 mg/L in October. The mean concentration of NO_2+NO_3-N for the three monitoring periods was 3.89 mg/L.

Total Nitrogen. Total nitrogen ranged from 3.43 (October) to 10.77 mg/L (May) during 2003. The mean TN concentration during May, August, and October was 5.10 mg/L.

Total Phosphorus. The maximum TP concentration recorded during the three sampling periods of 2003 was 1.46 mg/L in May, while the minimum TP value was 0.27 mg/L also during May. The mean TP concentration for the three monitoring periods was 0.61 mg/L.

Chlorophyll a. Chlorophyll *a* ranged from 12.8 (May) to 105.5 µg/L (August) during 2003. The mean chlorophyll *a* concentration during May, August, and October was 50.1 µg/L.

Fecal Coliform. Fecal coliform levels ranged from <10 (several dates) to 250 cfu/100 ml (May) during 2003. The FC geometric mean during May, August, and October was 38 cfu/100 ml.

Upper Peoria Pool. *Dissolved Oxygen.* Dissolved oxygen ranged from 6.2 (August) to 18.8 mg/L (October) during 2003. The mean DO concentration during May, August, and October was 9.9 mg/L.

Ammonia Nitrogen. Ammonia nitrogen ranged from 0.03 (October) to 0.74 mg/L (August) during 2003. The mean NH_4-N

concentration during May, August, and October was 0.18 mg/L.

Un-ionized Ammonia. The maximum calculated un-ionized ammonia value during the three sampling periods of 2003 was 0.099 mg/L in August, while the minimum calculated concentration was 0.001 mg/L on several dates. The mean calculated un-ionized ammonia value for the three monitoring periods was 0.015 mg/L.

Total Kjeldahl Nitrogen. Total Kjeldahl nitrogen ranged from 0.99 (August) to 2.05 mg/L (October) during 2003. The mean TKN concentration during May, August, and October was 1.39 mg/L.

Nitrite plus Nitrate Nitrogen. The maximum NO_2+NO_3-N recorded during the three sampling periods of 2003 was 7.55 mg/L in May, while the minimum NO_2+NO_3-N value was 1.36 mg/L in October. The mean concentration of NO_2+NO_3-N for the three monitoring periods was 3.62 mg/L.

Total Nitrogen. Total nitrogen ranged from 3.08 (October) to 8.89 mg/L (May) during 2003. The mean TN concentration during May, August, and October was 5.01 mg/L.

Total Phosphorus. The maximum TP concentration recorded during the three sampling periods of 2003 was 1.29 mg/L in October, while the minimum TP value was 0.26 mg/L in May. The mean TP concentration for the three monitoring periods was 0.53 mg/L.

Chlorophyll a. Chlorophyll *a* ranged from 15.7 (May) to 137.6 µg/L (October) during 2003. The mean chlorophyll *a* concentration during May, August, and October was 57.3 µg/L.

Fecal Coliform. Fecal coliform levels ranged from <10 (several dates) to 240 cfu/100 ml (August) during 2003. The FC geometric mean during May, August, and October was 27 cfu/100 ml.

Lower Peoria Pool. *Dissolved Oxygen.* Dissolved oxygen ranged from 5.3 (several dates) to 13.6 mg/L (October) during 2003. The mean DO concentration during May, August, and October was 8.1 mg/L.

Ammonia Nitrogen. Ammonia nitrogen ranged from 0.04 (October) to 0.51 mg/L (May) during 2003. The mean NH_4-N concentration during May, August, and October was 0.20 mg/L.

Un-ionized Ammonia. The maximum calculated un-ionized ammonia value during the three sampling periods of 2003 was 0.048 mg/L in October, while the minimum calculated concentration was 0.002 mg/L on several dates. The mean calculated un-ionized ammonia value for the three monitoring periods was 0.016 mg/L.

Total Kjeldahl Nitrogen. Total Kjeldahl nitrogen ranged from 0.93 (May) to 2.37 mg/L (August) during 2003. The mean TKN concentration during May, August, and October was 1.42 mg/L.

Nitrite plus Nitrate Nitrogen. The maximum NO_2+NO_3-N recorded during the three sampling periods of 2003 was 6.76 mg/L in May, while the minimum NO_2+NO_3-N value was 0.86 mg/L in October. The mean concentration of NO_2+NO_3-N for the three monitoring periods was 2.98 mg/L.

Total Nitrogen. Total nitrogen ranged from 2.10 (October) to 7.97 mg/L (May) during 2003. The mean TN concentration during May, August, and October was 4.40 mg/L.

Total Phosphorus. The maximum TP concentration recorded during the three sampling periods of 2003 was 1.47 mg/L in August, while the minimum TP value was 0.33 mg/L in May. The mean TP concentration for the three monitoring periods was 0.59 mg/L.

Chlorophyll a. Chlorophyll *a* ranged from 15.4 (May) to 101.1 µg/L (October) during 2003. The mean chlorophyll *a* concentration during May, August, and October was 52.0 µg/L.

Fecal Coliform. Fecal coliform levels ranged from <10 (several dates) to 200 cfu/100 ml (October) during 2003. The FC geometric mean during May, August, and October was 20 cfu/100 ml.

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. There was a sharp increase near Station 21 downstream of Starved Rock Lock in 2003. A peak of similar magnitude was also present in 2002 at the same station.

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 re-aeration resulting from water passing over the Brandon Road Dam. The mean DO concentration along the Illinois Waterway was above 8.0 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 remains consistent throughout the Peoria Pool.

Total Nitrogen. Mean total nitrogen concentrations along the Illinois Waterway are quite variable. As shown in Figure 6, there is a general decrease from the Lockport Pool to the lower Peoria Pool.

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).

Waterway Use Designations

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).

Water Quality Violations. *pH.* During October monitoring, several stations in the upper and lower portions of the Peoria Pool exceeded the General Use waterway standard of 9.0 for pH.

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, 2003

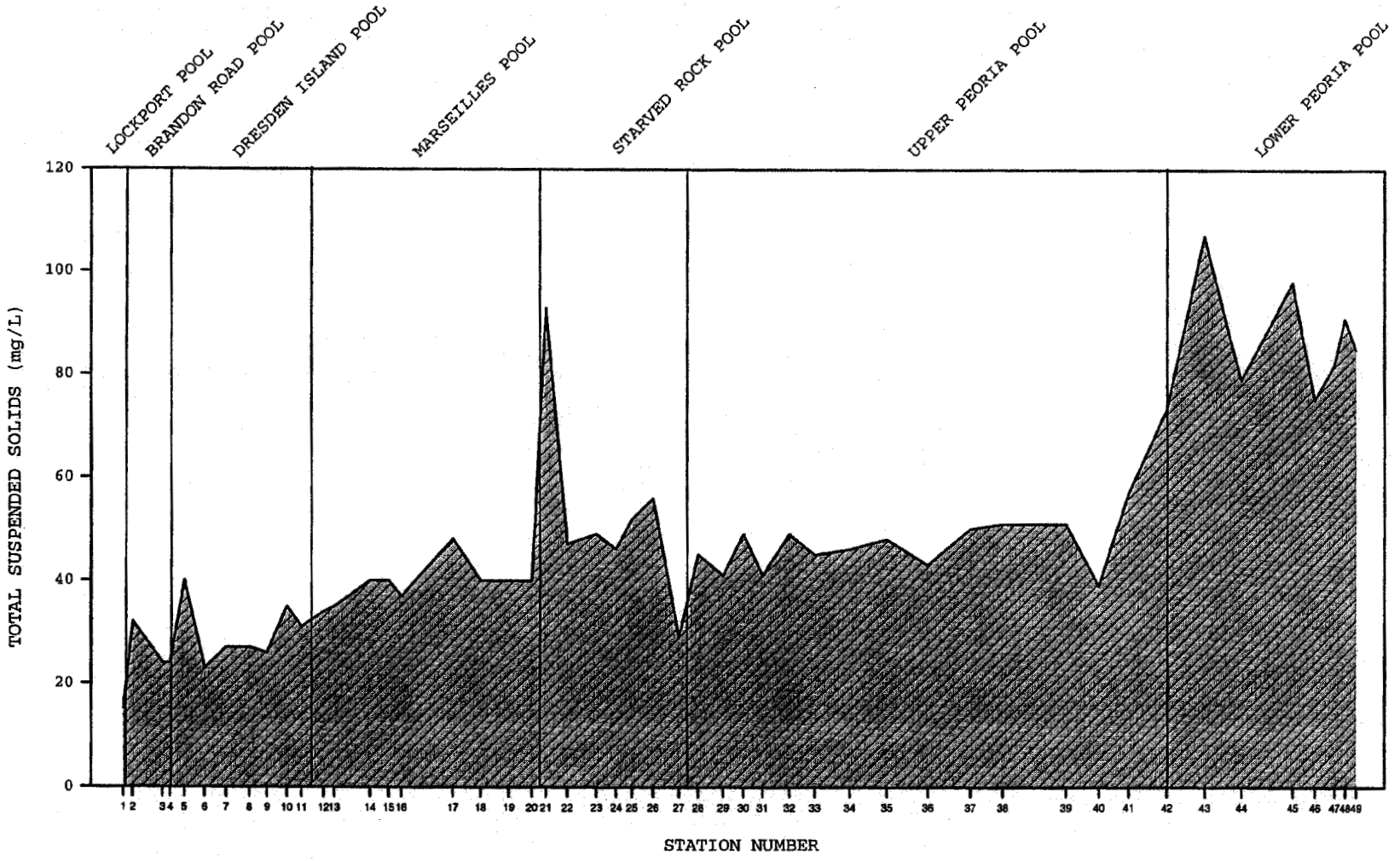


FIGURE 4: MEAN DISSOLVED OXYGEN CONCENTRATION AT 49 STATIONS ALONG THE ILLINOIS WATERWAY FROM THE LOCKPORT LOCK TO THE PEORIA LOCK DURING MAY, AUGUST, AND OCTOBER, 2003

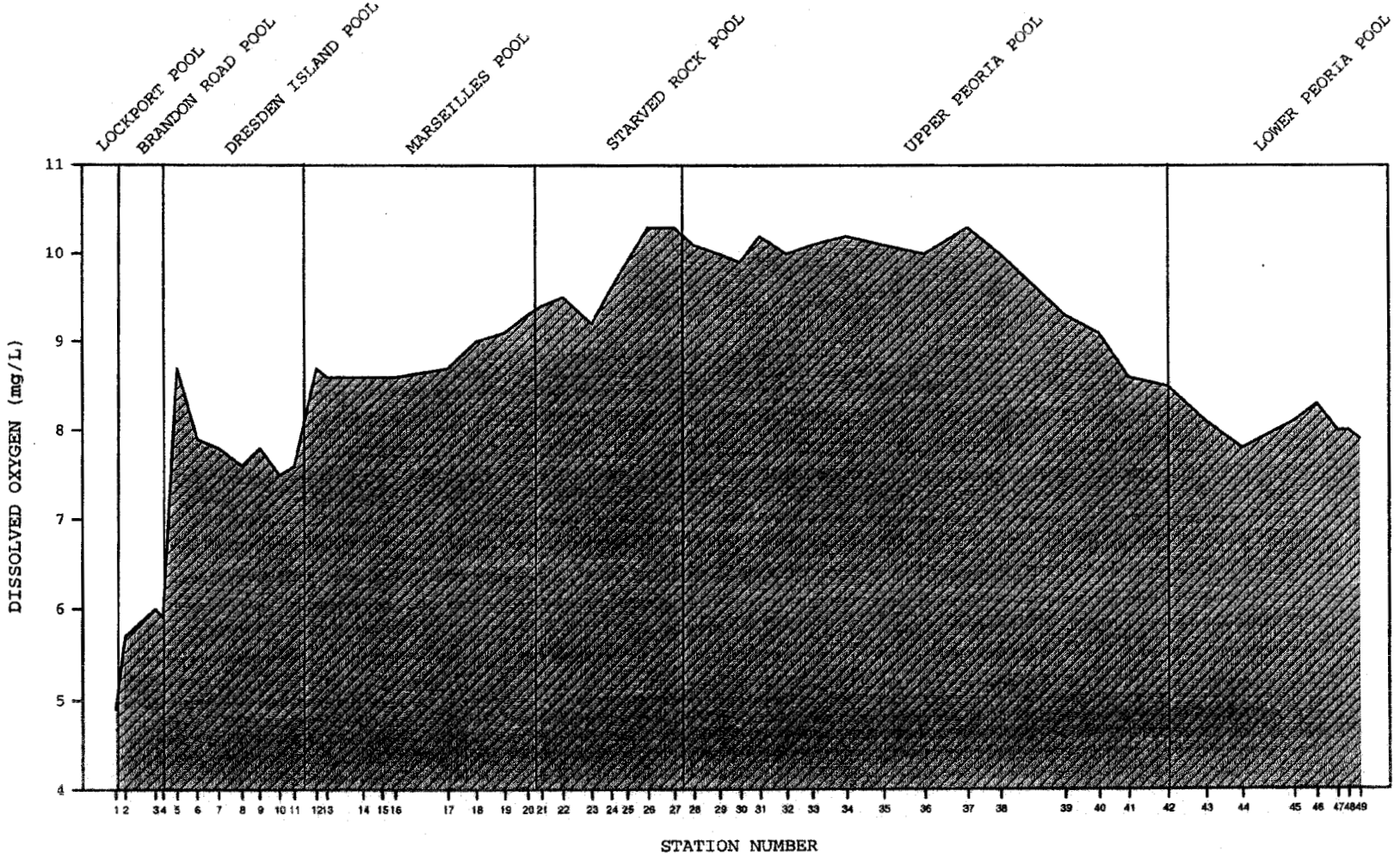


FIGURE 5: MEAN AMMONIA NITROGEN CONCENTRATION AT 49 STATIONS ALONG THE ILLINOIS WATERWAY FROM THE LOCKPORT LOCK TO THE PEORIA LOCK DURING MAY, AUGUST, AND OCTOBER, 2003

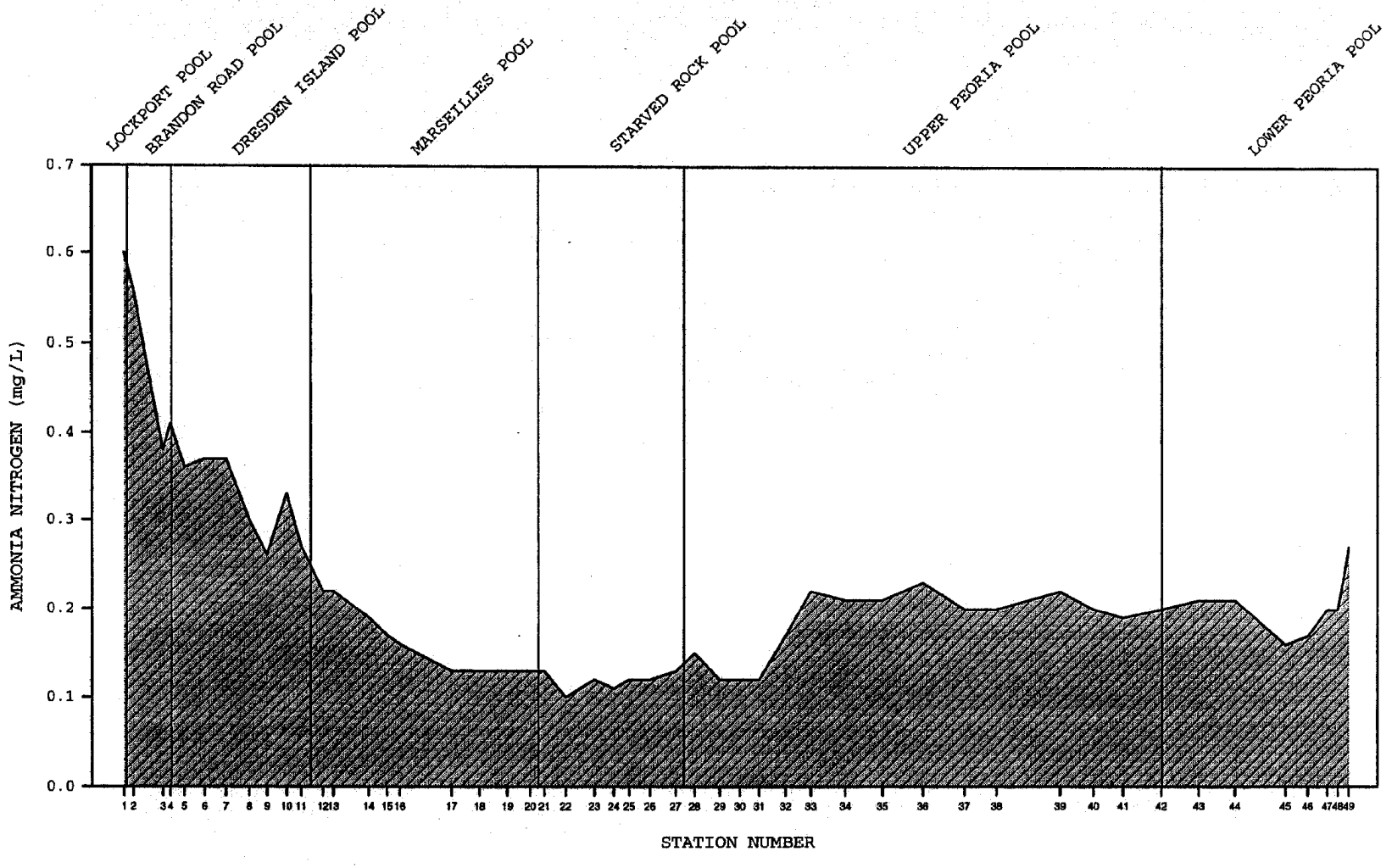


FIGURE 6: MEAN TOTAL NITROGEN CONCENTRATION AT 49 STATIONS ALONG THE ILLINOIS WATERWAY FROM THE LOCKPORT LOCK TO THE PEORIA LOCK DURING MAY, AUGUST, AND OCTOBER, 2003

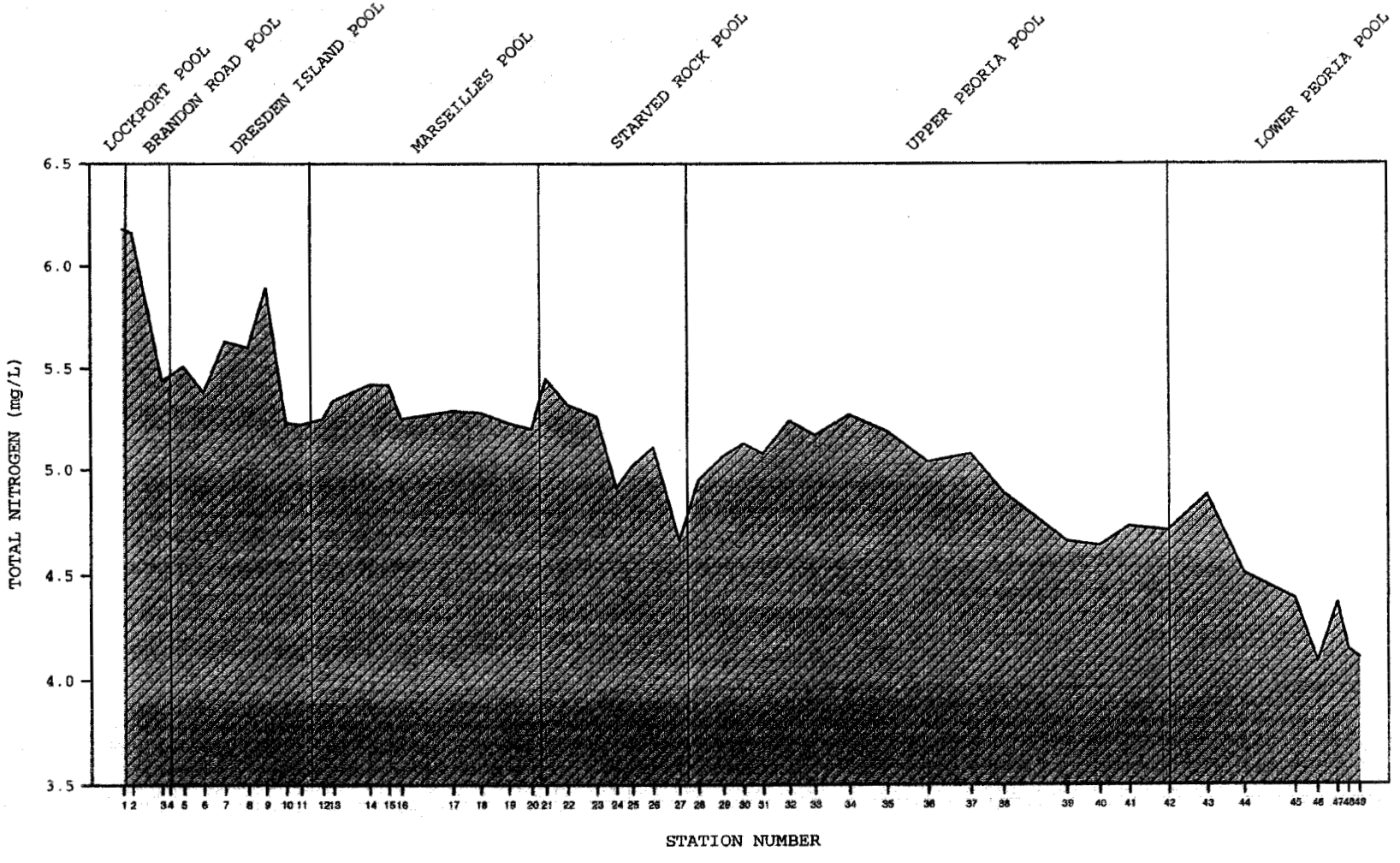


FIGURE 7: MEAN TOTAL PHOSPHORUS CONCENTRATION AT 49 STATIONS ALONG THE ILLINOIS WATERWAY FROM THE LOCKPORT LOCK TO THE PEORIA LOCK DURING MAY, AUGUST, AND OCTOBER, 2003

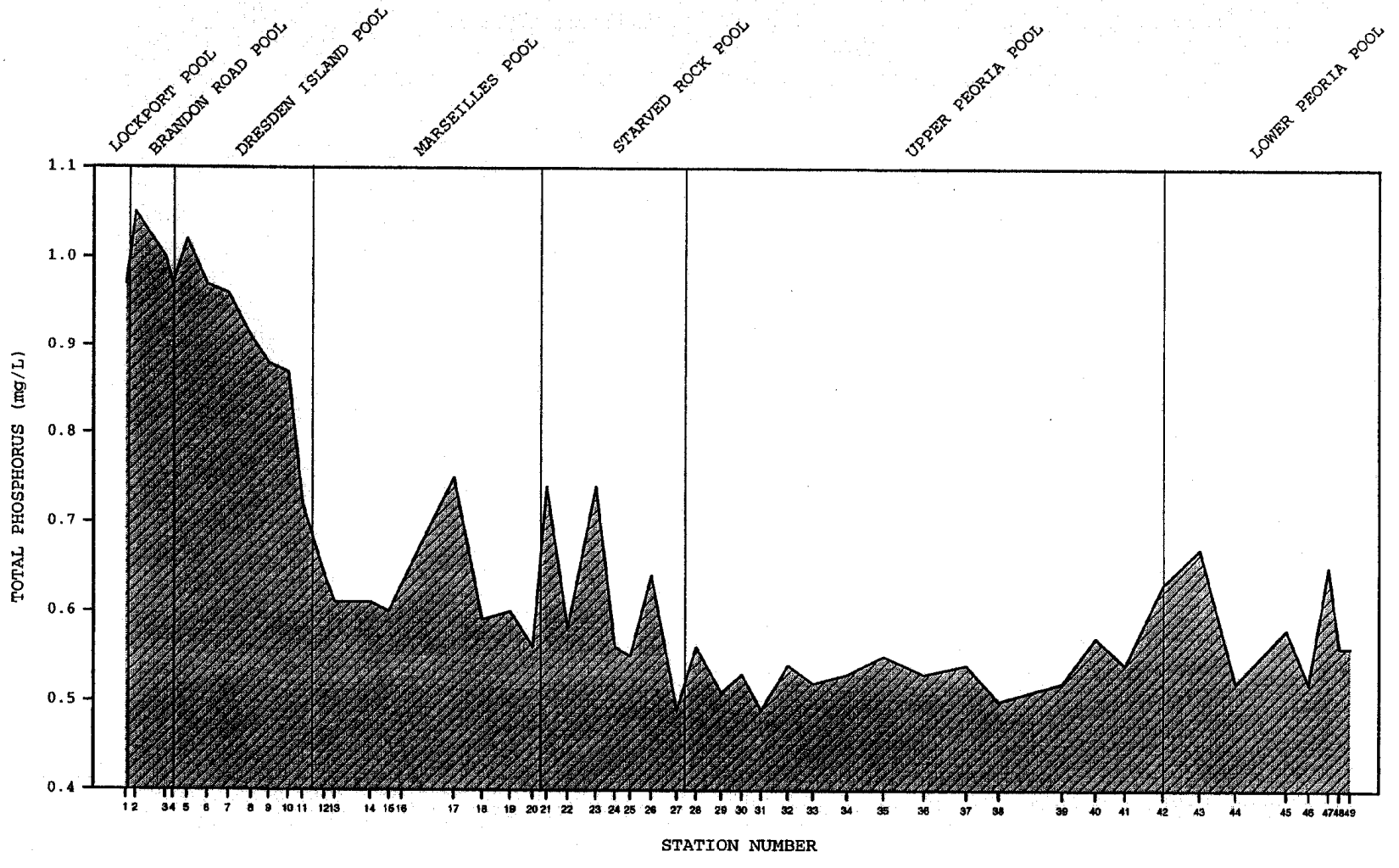
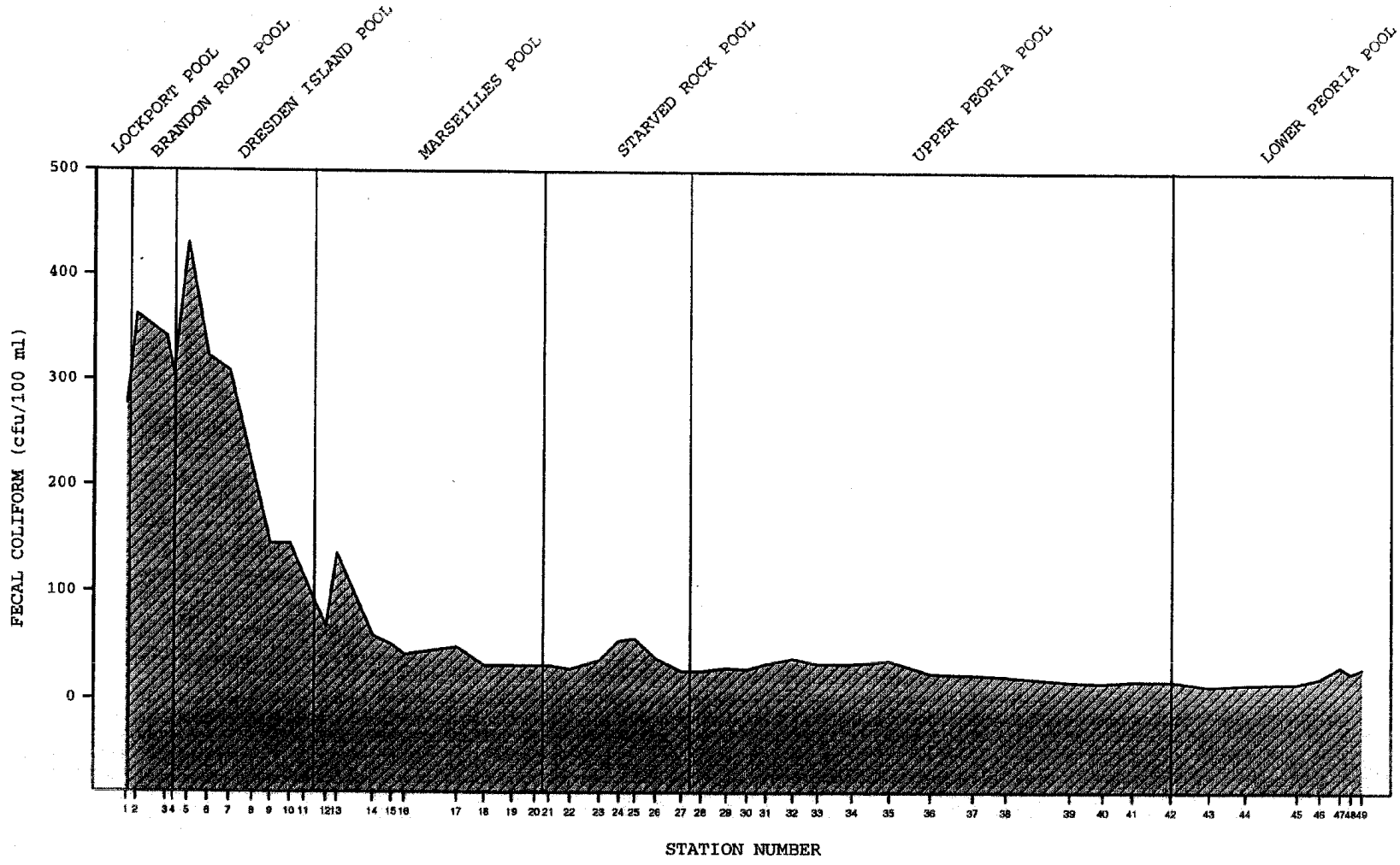


FIGURE 8: GEOMETRIC MEAN FECAL COLIFORM AT 49 STATIONS ALONG THE ILLINOIS WATERWAY FROM THE LOCKPORT LOCK TO THE PEORIA LOCK DURING MAY, AUGUST, AND OCTOBER, 2003



Dissolved Oxygen. In the Lockport Pool, the DO standard for Secondary Contact waters was not achieved on October 17. Water quality monitors measured 3.6 mg/L while the standard is 4.0 mg/L.

Fecal Coliform. During spring monitoring (May), FC was measured above 400 cfu/100 ml at Stations 9–13. The highest FC value measured during this period was 1,200 cfu/100 ml at Station 10 in the Dresden Island Pool. Station 9 (Dresden Island Pool) also exceeded the General Use water quality standard for FC in August with a value of 700 cfu/100 ml.

Total Iron. Total iron concentrations exceeded the General Use water quality standard of 1.000 mg/L at all but two stations in May, and in most stations throughout the Starved Rock and Peoria Pools during August of 2003. Stations 9 and 11 in the Dresden Island Pool were also above 1.000 mg/L in August. During October monitoring, several stations from Dresden Island through the lower Peoria Pool exceeded the standard for total iron.

Total Lead. Stations 1, 2, 3, 5, and 6 in the Lockport, Brandon Road, and Dresden Island Pools exceeded the Secondary Contact water quality standard of 0.100 mg/L for total lead in May.

Total Manganese. During May, several stations from the Marseilles to the Peoria Pool exceeded the General Use water quality standard of 1.000 mg/L for total manganese.

Total Mercury. The Water Quality Standard for the Protection of Human Health for total mercury is 0.012 µg/L. All but four stations in the sampling area exceeded this standard in October of 2003. The standard was also exceeded at Station 9 during May and Station 22 in August. The total mercury values for the remaining stations and dates were <MDL of 0.06 µg/L, so it is not known whether they were in violation of the Human Health Standard.

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 eight 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 2003 were 37.3 and 11, respectively. Nutrient levels measured in sediment included NH_4-N (100 mg/kg), TKN (1,614 mg/kg), and TP (2,476 mg/kg). Total cyanide and phenols concentrations in sediment were 0.819 and 0.061 mg/kg, respectively.

Trace Metals. During October of 2003, total arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, silver, and zinc concentrations measured in sediment at Station 1 were 2, 9.3, 137, 166, 29,517, 181, 493, 0.6304, 42, 7.4, and 812 mg/kg, respectively.

Brandon Road Pool. *General Chemistry.* The percent TS and TVS in sediment of Station 2 during October of 2003 were 33.6 and 12, respectively. Nutrient levels

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 2003

Station Number	Navigational Pool	Constituents (Expressed on a dry weight basis)						
		Total Solids (%)	Total Volatile Solids (% of Total)	Ammonia Nitrogen (mg/kg)	Total Kjeldahl Nitrogen (mg/kg)	Total Phos-phorus (mg/kg)	Total Cyanide (mg/kg)	Phenols (mg/kg)
1	Lockport	37.3	11	100	1614	2476	0.819	0.061
2	Brandon Road	33.6	12	46	1286	1650	1.413	0.057
5	Dresden Island	64.8	5	7	498	595	0.267	0.045
8	Dresden Island	69.7	5	7	295	373	0.284	0.029
12	Marseilles	85.8	1	1	7	8	0.041	0.028
18	Marseilles	79.4	1	2	30	25	0.043	0.024
23	Starved Rock	81.5	1	1	5	5	0.025	0.020
28	Peoria	75.7	1	2	29	20	0.019	0.032
32	Peoria	81.5	2	1	11	14	0.024	0.043
35	Peoria	71.7	2	6	172	138	0.049	0.043
38	Peoria	56.5	6	18	417	333	0.082	0.047
41	Peoria	43.7	7	16	899	449	0.111	0.027
44	Peoria	48.8	8	20	474	245	0.630	0.043
48	Peoria	71.8	2	9	369	165	0.150	0.023

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, 2003

Station Number	Navigational Pool	Arsenic	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Silver	Zinc
		(mg/kg dry weight)										
1	Lockport	2	9.3	137	166	29,517	181	493	0.6304	42	7.4	812
2	Brandon Road	1	23.6	234	233	28,917	258	465	1.7754	83	3.5	1,124
5	Dresden Island	<1	1.8	37	92	15,471	78	333	0.1183	23	<0.1	206
8	Dresden Island	<1	1.5	30	20	12,926	34	290	0.1948	30	<0.1	201
12	Marseilles	<1	0.3	5	1	5,700	8	109	0.0157	5	0.2	33
18	Marseilles	<1	0.1	5	<1	4,066	7	145	0.0263	5	<0.1	29
23	Starved Rock	<1	0.6	6	1	4,702	8	119	0.0135	7	<0.1	27
28	Peoria	<1	0.2	7	<1	4,531	11	125	0.0169	6	<0.1	25
32	Peoria	<1	0.1	19	2	5,580	6	157	0.0094	13	<0.1	158
35	Peoria	<1	0.7	11	7	7,712	16	190	0.0988	9	<0.1	75
38	Peoria	<1	0.4	22	14	31,702	21	437	0.0541	21	<0.1	100
41	Peoria	<1	2.3	40	31	19,123	31	548	0.1544	24	<0.1	178
44	Peoria	<1	1.6	41	36	27,299	45	671	0.4476	31	<0.1	229
48	Peoria	<1	0.9	19	12	12,974	23	364	0.1129	14	<0.1	88

measured in sediment included NH_4-N (46 mg/kg), TKN (1,286 mg/kg), and TP (1,650 mg/kg). Total cyanide and phenols concentrations in sediment were 1.413 and 0.057 mg/kg, respectively.

Trace Metals. During October of 2003, total arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, silver, and zinc concentrations measured in sediment at Station 2 were 1, 23.6, 234, 233, 28,917, 258, 465, 1.7754, 83, 3.5, and 1,124 mg/kg, respectively.

Dresden Island Pool. *General Chemistry.* Total solids in sediments at Stations 5 and 8 were 64.8 and 69.7, respectively, while TVS was 5 percent during October of 2003. Ammonia nitrogen, TKN, and TP in sediment measured 7, 498, and 595 mg/kg, respectively, at Station 5, and 7, 295, and 373 mg/kg, respectively, at Station 8. The total cyanide concentration in sediment ranged from 0.267 mg/kg at Station 5 to 0.284 mg/kg at Station 8. The concentration of phenols ranged from 0.029 mg/kg at Station 8 to 0.045 mg/kg at Station 5.

Trace Metals. During October of 2003, total arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, silver, and zinc concentrations measured in sediment were <1, 1.8, 37, 92, 15,471, 78, 333, 0.1183, 23, <0.1, and 206 mg/kg at Station 5, and <1, 1.5, 30, 20, 12,926, 34, 290, 0.1948, 30, <0.1, and 201 mg/kg, respectively, at Station 8.

Marseilles Pool. *General Chemistry.* Total solids in sediments at Stations 12 and 18 measured 85.8 and 79.4 percent, respectively, during October of 2003, while TVS measured 1 percent at both stations. Ammonia nitrogen, TKN, and TP in sediment measured 1, 7, and 8 mg/kg, respectively, at Station 12, and 2, 30, and 25 mg/kg, respectively, at Station 18. The total cyanide concentration in sediment ranged from 0.041 mg/kg at Station 12 to 0.043 mg/kg at Station 18. Values for phenols ranged from 0.024 at Station 18 to 0.028 mg/kg at Station 12.

Trace Metals. During October of 2003, total arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, silver, and zinc concentrations measured in sediment were <1, 0.3, 5, 1, 5,700, 8, 109, 0.0157, 5, 0.2, and 33 mg/kg at Station 12, and <1, 0.1, 5, <1, 4,066, 7, 145, 0.0263, 5, <0.1, and 29 mg/kg, respectively, at Station 18.

Starved Rock Pool. *General Chemistry.* The percent TS and TVS in sediments at Station 23 measured 81.5 and 3, respectively. Nutrient levels measured in sediment included NH_4-N (1 mg/kg), TKN (5 mg/kg), and TP (5 mg/kg). Total cyanide and phenols concentrations were 0.025 and 0.020 mg/kg, respectively.

Trace Metals. During October of 2003, total arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, silver, and zinc concentrations measured in sediment at Station 23 were <1, 0.6, 6, 1, 4,702, 8, 119, 0.0135, 7, <0.1, and 27 mg/kg, respectively.

Upper Peoria Pool. *General Chemistry.* Total solids and TVS in sediments at Stations 28, 32, 35, 38, and 41 ranged from 43.7–81.5 and 1–7 percent, respectively, during October of 2003. Ammonia nitrogen, TKN, and TP in sediment ranged from 1–18, 11–899, and 14–449 mg/kg, respectively. The total cyanide concentration in sediment ranged from 0.019 mg/kg to 0.111 mg/kg. The phenols values ranged from 0.027–0.047 mg/kg.

Trace Metals. During October of 2003, total arsenic, cadmium, chromium, copper,

iron, lead, manganese, mercury, nickel, silver, and zinc concentrations measured in sediment ranged from <1 (all stations), 0.1–2.3, 7–40, <1–31, 4,531–31,702, 6–45, 125–548, 0.0094–0.1544, 6–24, <0.1 (all stations), and 25–178 mg/kg, respectively.

Lower Peoria Pool. *General Chemistry.* Total solids in sediments at Stations 44 and 48 measured 48.8 and 71.8 percent, respectively, during October of 2003, while TVS measured 8 and 2 percent, respectively. Ammonia nitrogen, TKN, and TP in sediment measured 20, 474, and 245 mg/kg, respectively, at Station 44 and 9, 369, and 165 mg/kg, respectively, at Station 48. The total cyanide concentration in sediment ranged from 0.150 mg/kg at Station 48 to 0.630 mg/kg at Station 44. The phenols values ranged from 0.023 mg/kg at Station 48 to 0.043 mg/kg at Station 44.

Trace Metals. During October of 2003, total arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, silver, and zinc concentrations measured in sediment were <1, 1.6, 41, 36, 27, 299, 45, 671, 0.4476, 31, <0.1, and 229 mg/kg, respectively, at Station 44, and <1, 0.9, 19, 12, 12,974, 23, 364, 0.1129, 14, <0.1, and 88 mg/kg, respectively, at Station 48.

APPENDIX I

WATER QUALITY AT STATION 1 IN THE CHICAGO SANITARY AND SHIP CANAL MAY, AUGUST, AND OCTOBER 2003

TABLE AI-1: WATER QUALITY AT STATION 1 IN THE CHICAGO SANITARY AND SHIP CANAL MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	14.9[b]	28.1[b]	21.4[b]
Total Suspended Solids	10	23	15
Turbidity (NTU)	11[b]	24[b]	19[b]
Conductivity (µS/cm)	709[b]	997[b]	831[b]
Five-Day Biochemical Oxygen Demand	3	6	5
Dissolved Oxygen	3.6[b]	6.2[b]	4.9[b]
pH (units)	6.3[b]	7.2[b]	6.8[b]
Ammonia Nitrogen	0.22	0.007	0.004
Un-ionized Ammonia	0.001	0.007	0.004
Total Kjeldahl Nitrogen	0.94	2.25	1.49
Nitrite plus Nitrate Nitrogen	3.49	6.74	4.69
Total Nitrogen	5.06	8.38	6.18
Total Phosphorus	0.46	2.19	0.97
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	0.003	0.005	0.003
Phenols	0.010	0.020	0.012
Total Arsenic	<0.003	<0.003	0.003
Dissolved Arsenic	<0.002	0.003	0.002
Total Cadmium	<0.0004	0.0048	0.0017
Dissolved Cadmium	<0.0003	0.0010	0.0004
Total Chromium	<0.004	0.123	0.029
Dissolved Chromium	<0.0007	0.0030	0.0018
Total Copper	0.008	0.294	0.084
Dissolved Copper	<0.002	0.002	0.002
Total Iron	0.346	16.076	3.649
Dissolved Iron	<0.004	0.090	0.045
Total Lead	0.003	0.180	0.047
Dissolved Lead	<0.0009	0.0138	0.0044
Total Manganese	0.0241	0.5217	0.1685
Dissolved Manganese	0.0114	0.0293	0.0216
Total Mercury	<0.00008	<0.00018	0.00008
Total Nickel	0.004	0.078	0.027
Dissolved Nickel	<0.002	0.005	0.003
Total Silver	<0.0008	0.0015	0.0009
Dissolved Silver	<0.0003	0.0015	0.0005
Total Zinc	0.038	0.719	0.203
Dissolved Zinc	0.014	0.035	0.021
Fecal Coliform (cfu/100 ml)	100	1800	277[c]

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

APPENDIX II

WATER QUALITY AT STATIONS 2–4 DURING MAY, AUGUST, AND OCTOBER 2003

TABLE AII-1: WATER QUALITY AT STATION 2 IN THE CHICAGO SANITARY AND SHIP CANAL MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.0[b]	28.4[b]	21.3[b]
Total Suspended Solids	17	59	32
Turbidity (NTU)	17[b]	42[b]	28[b]
Conductivity (µS/cm)	690[b]	1,011[b]	832[b]
Five-Day Biochemical Oxygen Demand	<2	7	4
Dissolved Oxygen	4.3[b]	7.0[b]	5.7[b]
pH (units)	6.6[b]	7.2[b]	6.9[b]
Ammonia Nitrogen	0.23	1.32	0.56
Un-ionized Ammonia	<0.001	0.006	0.003
Total Kjeldahl Nitrogen	0.79	1.98	1.48
Nitrite plus Nitrate Nitrogen	3.76	6.86	4.67
Total Nitrogen	4.69	8.60	6.16
Total Phosphorus	0.46	2.37	1.05
Chlorophyll a (µg/L)	3.5	24.8	8.5
Total Cyanide	0.002	0.004	0.003
Phenols	0.004	0.013	0.008
Total Arsenic	<0.003	<0.003	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0048	0.0014
Dissolved Cadmium	<0.0003	0.0010	0.0005
Total Chromium	<0.004	0.123	0.033
Dissolved Chromium	<0.0007	0.0030	0.0017
Total Copper	0.011	0.294	0.085
Dissolved Copper	<0.002	0.008	0.003
Total Iron	0.579	16.076	4.578
Dissolved Iron	<0.004	0.060	0.036
Total Lead	0.006	0.180	0.054
Dissolved Lead	<0.0009	0.0138	0.0042
Total Manganese	0.0283	0.5217	0.1814
Dissolved Manganese	0.0093	0.0286	0.0215
Total Mercury	<0.00006	0.00017	0.00008
Total Nickel	<0.002	0.077	0.027
Dissolved Nickel	<0.002	0.005	0.003
Total Silver	<0.0008	0.0017	0.0010
Dissolved Silver	<0.0003	0.0008	0.0004
Total Zinc	0.046	0.719	0.234
Dissolved Zinc	0.008	0.078	0.026
Fecal Coliform (cfu/100 ml)	80	1800	362[c]

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

TABLE AII-2: WATER QUALITY AT STATION 3 IN THE DES PLAINES RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	14.6[b]	28.1[b]	20.1[b]
Total Suspended Solids	12	49	24
Turbidity (NTU)	12[b]	36[b]	24[b]
Conductivity (µS/cm)	702[b]	1,087[b]	871[b]
Five-Day Biochemical Oxygen Demand	<2	7	4
Dissolved Oxygen	4.6[b]	8.3[b]	6.0[b]
pH (units)	6.7[b]	7.3[b]	7.1[b]
Ammonia Nitrogen	0.20	0.59	0.38
Un-ionized Ammonia	<0.001	0.004	0.002
Total Kjeldahl Nitrogen	0.90	1.85	1.28
Nitrite plus Nitrate Nitrogen	3.31	6.34	4.16
Total Nitrogen	4.40	7.57	5.44
Total Phosphorus	0.44	2.02	1.00
Chlorophyll a (µg/L)	4.3	20.9	10.9
Total Cyanide	0.003	0.003	0.003
Phenols	0.004	0.013	0.009
Total Arsenic	<0.003	0.003	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0033	0.0012
Dissolved Cadmium	<0.0003	<0.0003	0.0003
Total Chromium	<0.004	0.095	0.027
Dissolved Chromium	<0.0007	0.0026	0.0016
Total Copper	0.011	0.253	0.081
Dissolved Copper	<0.002	0.005	0.003
Total Iron	0.332	11.622	3.601
Dissolved Iron	0.007	0.043	0.026
Total Lead	0.009	0.157	0.049
Dissolved Lead	<0.0009	0.0069	0.0030
Total Manganese	0.0249	0.5083	0.1869
Dissolved Manganese	0.0079	0.0287	0.0194
Total Mercury	<0.00006	0.00015	0.00008
Total Nickel	0.006	0.045	0.019
Dissolved Nickel	0.002	0.005	0.003
Total Silver	<0.0008	0.0027	0.0011
Dissolved Silver	<0.0003	0.0011	0.0004
Total Zinc	0.044	0.717	0.213
Dissolved Zinc	0.011	0.032	0.017
Fecal Coliform (cfu/100 ml)	110	900	341[c]

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

TABLE AII-3 WATER QUALITY AT STATION 4 IN THE DES PLAINES RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	14.6[b]	28.3[b]	20.1[b]
Total Suspended Solids	9	50	24
Turbidity (NTU)	11[b]	43[b]	23[b]
Conductivity (µS/cm)	691[b]	1,080[b]	867[b]
Five-Day Biochemical Oxygen Demand	<2	6	2
Dissolved Oxygen	4.5[b]	8.4[b]	5.9[b]
pH (units)	6.8[b]	7.3[b]	7.1[b]
Ammonia Nitrogen	0.25	0.65	0.41
Un-ionized Ammonia	<0.001	0.005	0.003
Total Kjeldahl Nitrogen	0.89	1.88	1.29
Nitrite plus Nitrate Nitrogen	3.10	6.26	4.17
Total Nitrogen	4.24	7.60	5.46
Total Phosphorus	0.40	1.92	0.97
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	0.002	0.005	0.003
Phenols	0.008	0.013	0.011
Total Arsenic	<0.003	0.003	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0007	0.0005
Dissolved Cadmium	<0.0003	0.0003	0.0003
Total Chromium	<0.004	0.036	0.015
Dissolved Chromium	<0.0007	0.0025	0.0015
Total Copper	0.005	0.185	0.062
Dissolved Copper	<0.002	0.004	0.002
Total Iron	0.266	5.133	2.046
Dissolved Iron	<0.004	0.171	0.053
Total Lead	0.003	0.078	0.031
Dissolved Lead	<0.0009	0.0048	0.0021
Total Manganese	0.0238	0.4494	0.1626
Dissolved Manganese	0.0085	0.0312	0.0215
Total Mercury	<0.00006	0.00011	0.00007
Total Nickel	0.004	0.035	0.015
Dissolved Nickel	<0.002	0.005	0.003
Total Silver	<0.0008	0.0017	0.0010
Dissolved Silver	<0.0003	0.0012	0.0006
Total Zinc	0.055	0.306	0.138
Dissolved Zinc	0.007	0.033	0.017
Fecal Coliform (cfu/100 ml)	40	800	307[c]

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

APPENDIX III

WATER QUALITY AT STATIONS 5–11 DURING MAY, AUGUST, AND OCTOBER 2003

TABLE AIII-1: WATER QUALITY AT STATION 5 IN THE DES PLAINES RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.0[b]	27.6[b]	20.6[b]
Total Suspended Solids	15	91	40
Turbidity (NTU)	21[b]	160[b]	51[b]
Conductivity (µS/cm)	690[b]	1,070[b]	887[b]
Five-Day Biochemical Oxygen Demand	<2	10	4
Dissolved Oxygen	7.4[b]	10.0[b]	8.7[b]
pH (units)	6.7[b]	7.9[b]	7.3[b]
Ammonia Nitrogen	0.23	0.57	0.36
Un-ionized Ammonia	<0.001	0.014	0.005
Total Kjeldahl Nitrogen	0.92	1.87	1.39
Nitrite plus Nitrate Nitrogen	3.04	6.31	4.12
Total Nitrogen	4.29	7.74	5.51
Total Phosphorus	0.42	1.68	1.02
Chlorophyll a (µg/L)	4.2	38.6	14.2
Total Cyanide	0.002	0.003	0.003
Phenols	0.006	0.013	0.009
Total Arsenic	<0.003	0.003	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0029	0.0009
Dissolved Cadmium	<0.0003	0.0003	0.0003
Total Chromium	<0.004	0.079	0.022
Dissolved Chromium	<0.0007	0.0031	0.0015
Total Copper	0.008	0.240	0.083
Dissolved Copper	<0.002	0.007	0.003
Total Iron	0.434	18.077	4.382
Dissolved Iron	0.010	0.169	0.047
Total Lead	0.005	0.125	0.042
Dissolved Lead	<0.0009	0.0085	0.0028
Total Manganese	0.0251	0.7372	0.2297
Dissolved Manganese	0.0102	0.0337	0.0212
Total Mercury	<0.00006	0.00007	0.00006
Total Nickel	<0.002	0.058	0.019
Dissolved Nickel	<0.002	0.005	0.003
Total Silver	<0.0008	0.0022	0.0011
Dissolved Silver	<0.0003	0.0013	0.0008
Total Zinc	0.037	0.613	0.197
Dissolved Zinc	0.007	0.034	0.017
Fecal Coliform (cfu/100 ml)	130	1500	430[c]

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

TABLE AIII-2: WATER QUALITY AT STATION 6 IN THE DES PLAINES RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.7[b]	31.0[b]	23.6[b]
Total Suspended Solids	15	43	23
Turbidity (NTU)	21[b]	71[b]	33[b]
Conductivity (µS/cm)	687[b]	1,057[b]	874[b]
Five-Day Biochemical Oxygen Demand	<2	7	4
Dissolved Oxygen	6.5[b]	9.9[b]	7.9[b]
pH (units)	6.8[b]	7.6[b]	7.3[b]
Ammonia Nitrogen	0.25	0.63	0.37
Un-ionized Ammonia	0.001	0.010	0.005
Total Kjeldahl Nitrogen	1.10	1.66	1.28
Nitrite plus Nitrate Nitrogen	3.04	5.96	4.09
Total Nitrogen	4.68	7.09	5.38
Total Phosphorus	0.41	1.69	0.97
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	0.002	0.003	0.003
Phenols	0.004	0.013	0.009
Total Arsenic	<0.003	<0.003	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0054	0.0013
Dissolved Cadmium	<0.0003	0.0003	0.0003
Total Chromium	<0.004	0.045	0.017
Dissolved Chromium	<0.0007	0.0021	0.0013
Total Copper	0.011	0.174	0.067
Dissolved Copper	<0.002	0.004	0.003
Total Iron	0.461	6.040	2.472
Dissolved Iron	0.010	0.056	0.026
Total Lead	0.004	0.101	0.034
Dissolved Lead	<0.0009	0.0063	0.0026
Total Manganese	0.0295	0.4825	0.1802
Dissolved Manganese	0.0086	0.0304	0.0194
Total Mercury	<0.00006	<0.00006	0.00006
Total Nickel	<0.002	0.046	0.017
Dissolved Nickel	<0.002	0.005	0.003
Total Silver	<0.0008	0.0020	0.0010
Dissolved Silver	<0.0003	0.0015	0.0006
Total Zinc	0.042	0.355	0.153
Dissolved Zinc	0.008	0.035	0.018
Fecal Coliform (cfu/100 ml)	130	1100	323[c]

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

TABLE AIII-3: WATER QUALITY AT STATION 7 IN THE DES PLAINES RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.9[b]	30.8[b]	22.5[b]
Total Suspended Solids	15	56	27
Turbidity (NTU)	21[b]	87[b]	38[b]
Conductivity (µS/cm)	724[b]	1,079[b]	890[b]
Five-Day Biochemical Oxygen Demand	<2	7	4
Dissolved Oxygen	6.5[b]	9.7[b]	7.8[b]
pH (units)	6.9[b]	7.6[b]	7.3[b]
Ammonia Nitrogen	0.23	0.60	0.37
Un-ionized Ammonia	0.001	0.011	0.004
Total Kjeldahl Nitrogen	0.80	1.89	1.26
Nitrite plus Nitrate Nitrogen	3.68	6.28	4.38
Total Nitrogen	5.04	7.08	5.63
Total Phosphorus	0.41	1.47	0.96
Chlorophyll a (µg/L)	4.6	15.1	11.2
Total Cyanide	0.002	0.003	0.003
Phenols	0.004	0.013	0.009
Total Arsenic	<0.003	<0.003	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0022	0.0007
Dissolved Cadmium	<0.0003	0.0004	0.0003
Total Chromium	<0.004	0.048	0.018
Dissolved Chromium	<0.0007	0.0020	0.0015
Total Copper	0.007	0.218	0.075
Dissolved Copper	<0.002	0.003	0.003
Total Iron	0.455	6.870	2.794
Dissolved Iron	0.005	0.045	0.024
Total Lead	0.004	0.100	0.035
Dissolved Lead	<0.0009	0.0056	0.0023
Total Manganese	0.0306	0.5203	0.1868
Dissolved Manganese	0.0070	0.0313	0.0203
Total Mercury	<0.00006	0.00011	0.00007
Total Nickel	<0.002	0.042	0.017
Dissolved Nickel	<0.002	0.006	0.003
Total Silver	<0.0008	0.0009	0.0008
Dissolved Silver	<0.0003	0.0010	0.0004
Total Zinc	0.034	0.372	0.161
Dissolved Zinc	0.008	0.035	0.016
Fecal Coliform (cfu/100 ml)	110	1200	309[c]

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

TABLE AIII-4: WATER QUALITY AT STATION 8 IN THE DES PLAINES RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.8[b]	30.7[b]	22.2[b]
Total Suspended Solids	13	59	27
Turbidity (NTU)	19[b]	61[b]	32[b]
Conductivity (µS/cm)	741[b]	1,056[b]	898[b]
Five-Day Biochemical Oxygen Demand	<2	6	4
Dissolved Oxygen	6.6[b]	9.5[b]	7.6[b]
pH (units)	6.9[b]	7.6[b]	7.3[b]
Ammonia Nitrogen	0.19	0.36	0.30
Un-ionized Ammonia	0.001	0.007	0.003
Total Kjeldahl Nitrogen	0.89	1.60	1.24
Nitrite plus Nitrate Nitrogen	3.74	5.67	4.36
Total Nitrogen	5.10	6.67	5.60
Total Phosphorus	0.43	1.38	0.91
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	0.002	0.003	0.003
Phenols	0.003	0.012	0.008
Total Arsenic	<0.003	<0.003	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0017	0.0006
Dissolved Cadmium	<0.0003	0.0004	0.0003
Total Chromium	<0.004	0.045	0.020
Dissolved Chromium	<0.0007	0.0019	0.0013
Total Copper	0.005	0.176	0.064
Dissolved Copper	<0.002	0.003	0.002
Total Iron	0.418	5.960	2.315
Dissolved Iron	<0.004	0.041	0.020
Total Lead	0.003	0.100	0.036
Dissolved Lead	<0.0009	0.0027	0.0016
Total Manganese	0.0256	0.4795	0.1784
Dissolved Manganese	0.0035	0.0307	0.0175
Total Mercury	<0.00006	0.00013	0.00007
Total Nickel	<0.002	0.041	0.016
Dissolved Nickel	<0.002	0.006	0.003
Total Silver	<0.0008	0.0018	0.0011
Dissolved Silver	<0.0003	0.0011	0.0006
Total Zinc	0.036	0.412	0.159
Dissolved Zinc	0.008	0.036	0.018
Fecal Coliform (cfu/100 ml)	40	1200	215[c]

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

TABLE AIII-5: WATER QUALITY AT STATION 9 IN THE DES PLAINES RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.1[b]	29.8[b]	21.7[b]
Total Suspended Solids	10	49	26
Turbidity (NTU)	16[b]	55[b]	32[b]
Conductivity (µS/cm)	760[b]	1042[b]	906[b]
Five-Day Biochemical Oxygen Demand	<2	7	4
Dissolved Oxygen	6.7[b]	9.4[b]	7.8[b]
pH (units)	7.0[b]	7.7[b]	7.4[b]
Ammonia Nitrogen	0.17	0.33	0.26
Un-ionized Ammonia	0.001	0.006	0.003
Total Kjeldahl Nitrogen	0.97	2.91	1.57
Nitrite plus Nitrate Nitrogen	3.70	5.85	4.32
Total Nitrogen	4.87	7.08	5.89
Total Phosphorus	0.41	1.45	0.88
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	0.002	0.003	0.003
Phenols	0.003	0.014	0.008
Total Arsenic	<0.003	<0.003	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0007	0.0005
Dissolved Cadmium	<0.0003	0.0005	0.0003
Total Chromium	<0.004	0.043	0.017
Dissolved Chromium	<0.0007	0.0031	0.0018
Total Copper	0.008	0.192	0.062
Dissolved Copper	<0.002	0.004	0.003
Total Iron	0.459	6.106	2.403
Dissolved Iron	<0.004	0.047	0.026
Total Lead	0.002	0.097	0.037
Dissolved Lead	<0.0009	0.0062	0.0028
Total Manganese	0.0251	0.4562	0.1711
Dissolved Manganese	0.0030	0.0315	0.0174
Total Mercury	<0.00006	0.00011	0.00007
Total Nickel	<0.002	0.036	0.015
Dissolved Nickel	<0.002	0.006	0.003
Total Silver	<0.0008	<0.0008	0.0008
Dissolved Silver	<0.0003	0.0009	0.0004
Total Zinc	0.043	0.313	0.141
Dissolved Zinc	0.007	0.033	0.017
Fecal Coliform (cfu/100 ml)	30	800	145

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

TABLE AIII-6: WATER QUALITY AT STATION 10 IN THE DES PLAINES RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.8[b]	29.6[b]	21.3[b]
Total Suspended Solids	16	56	35
Turbidity (NTU)	16[b]	78[b]	43[b]
Conductivity (µS/cm)	688[b]	1,038[b]	884[b]
Five-Day Biochemical Oxygen Demand	<2	6	4
Dissolved Oxygen	6.1[b]	8.7[b]	7.5[b]
pH (units)	7.1[b]	7.7[b]	7.4[b]
Ammonia Nitrogen	0.22	0.47	0.33
Un-ionized Ammonia	0.001	0.016	0.006
Total Kjeldahl Nitrogen	0.80	1.82	1.12
Nitrite plus Nitrate Nitrogen	3.13	5.91	4.11
Total Nitrogen	4.30	6.74	5.23
Total Phosphorus	0.37	1.48	0.87
Chlorophyll a (µg/L)	14.0	40.4	20.0
Total Cyanide	0.002	0.003	0.002
Phenols	0.003	0.011	0.008
Total Arsenic	<0.003	<0.003	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0025	0.0010
Dissolved Cadmium	<0.0003	0.0006	0.0004
Total Chromium	<0.004	0.069	0.022
Dissolved Chromium	<0.0007	0.0017	0.0012
Total Copper	0.011	0.175	0.058
Dissolved Copper	<0.002	0.004	0.002
Total Iron	0.356	13.455	3.881
Dissolved Iron	0.006	0.042	0.024
Total Lead	0.003	0.103	0.036
Dissolved Lead	<0.0009	0.0035	0.0020
Total Manganese	0.0256	0.6052	0.2071
Dissolved Manganese	0.0011	0.0308	0.0164
Total Mercury	<0.00006	0.00029	0.00010
Total Nickel	<0.002	0.041	0.014
Dissolved Nickel	<0.002	0.006	0.003
Total Silver	<0.0008	0.0036	0.0016
Dissolved Silver	<0.0003	0.0024	0.0008
Total Zinc	0.033	0.454	0.163
Dissolved Zinc	0.006	0.019	0.011
Fecal Coliform (cfu/100 ml)	30	1200	145[c]

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

TABLE AIII-7: WATER QUALITY AT STATION 11 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.0[b]	29.1[b]	20.5[b]
Total Suspended Solids	12	48	31
Turbidity (NTU)	16[b]	67[b]	36[b]
Conductivity (µS/cm)	677[b]	944[b]	836[b]
Five-Day Biochemical Oxygen Demand	<2	7	5
Dissolved Oxygen	5.7[b]	8.8[b]	7.6[b]
pH (units)	7.4[b]	8.1[b]	7.6[b]
Ammonia Nitrogen	0.20	0.31	0.27
Un-ionized Ammonia	0.002	0.008	0.005
Total Kjeldahl Nitrogen	0.58	1.61	1.05
Nitrite plus Nitrate Nitrogen	3.21	5.75	4.17
Total Nitrogen	4.38	6.69	5.22
Total Phosphorus	0.30	1.25	0.72
Chlorophyll a (µg/L)	11.5	33.8	16.8
Total Cyanide	0.002	0.003	0.002
Phenols	0.005	0.010	0.008
Total Arsenic	<0.003	<0.003	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0025	0.0008
Dissolved Cadmium	<0.0003	0.0005	0.0003
Total Chromium	<0.004	0.053	0.020
Dissolved Chromium	<0.0007	0.0026	0.0015
Total Copper	0.007	0.188	0.056
Dissolved Copper	<0.002	0.002	0.002
Total Iron	0.369	12.654	4.162
Dissolved Iron	0.008	0.038	0.022
Total Lead	0.005	0.085	0.033
Dissolved Lead	<0.0009	0.0087	0.0031
Total Manganese	0.0251	0.6776	0.2284
Dissolved Manganese	0.0025	0.0251	0.0146
Total Mercury	<0.00006	0.00009	0.00007
Total Nickel	<0.002	0.034	0.013
Dissolved Nickel	<0.002	0.006	0.003
Total Silver	<0.0008	0.0008	0.0008
Dissolved Silver	<0.0003	0.0009	0.0004
Total Zinc	0.021	0.313	0.134
Dissolved Zinc	0.003	0.018	0.009
Fecal Coliform (cfu/100 ml)	20	590	113[c]

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

APPENDIX IV

WATER QUALITY AT STATIONS 12–20 DURING MAY, AUGUST, AND OCTOBER 2003

TABLE AIV-1: WATER QUALITY AT STATION 12 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.7[b]	29.5[b]	20.7[b]
Total Suspended Solids	19	60	34
Turbidity (NTU)	24[b]	77[b]	43[b]
Conductivity (µS/cm)	681[b]	897[b]	786[b]
Five-Day Biochemical Oxygen Demand	<2	7	5
Dissolved Oxygen	5.8[b]	10.1[b]	8.7[b]
pH (units)	7.5[b]	8.1[b]	7.7[b]
Ammonia Nitrogen	0.016	0.30	0.22
Un-ionized Ammonia	0.002	0.011	0.007
Total Kjeldahl Nitrogen	0.62	1.73	0.95
Nitrite plus Nitrate Nitrogen	3.30	7.45	4.30
Total Nitrogen	3.92	8.49	5.25
Total Phosphorus	0.25	1.35	0.64
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	0.002	0.002	0.002
Phenols	<0.003	0.011	0.005
Total Arsenic	<0.003	<0.003	<0.003
Dissolved Arsenic	<0.002	<0.002	<0.002
Total Cadmium	0.0009	<0.0004	<0.0004
Dissolved Cadmium	<0.0003	0.0004	<0.0003
Total Chromium	<0.004	0.004	<0.004
Dissolved Chromium	0.0017	0.0011	<0.0007
Total Copper	0.006	0.013	0.006
Dissolved Copper	0.003	<0.002	<0.002
Total Iron	0.573	0.691	0.556
Dissolved Iron	0.011	0.018	0.011
Total Lead	0.009	0.006	0.005
Dissolved Lead	0.0028	0.0026	<0.0009
Total Manganese	0.0386	0.0379	0.0379
Dissolved Manganese	0.0034	0.0085	0.0027
Total Mercury	0.00009	<0.00006	<0.00006
Total Nickel	0.004	0.005	<0.002
Dissolved Nickel	0.002	0.004	<0.002
Total Silver	<0.0008	<0.0008	<0.0008
Dissolved Silver	<0.0003	<0.0003	<0.0003
Total Zinc	0.021	0.039	0.021
Dissolved Zinc	0.006	0.021	0.002
Fecal Coliform (cfu/100 ml)	<10	430	67[c]

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

TABLE AIV-2: WATER QUALITY AT STATION 13 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.7[b]	29.2[b]	20.6[b]
Total Suspended Solids	20	53	35
Turbidity (NTU)	22[b]	75[b]	41[b]
Conductivity (µS/cm)	687[b]	885[b]	786[b]
Five-Day Biochemical Oxygen Demand	3	6	4
Dissolved Oxygen	5.6[b]	10.0[b]	8.6[b]
pH (units)	7.5[b]	8.1[b]	7.8[b]
Ammonia Nitrogen	0.15	0.26	0.22
Un-ionized Ammonia	0.002	0.012	0.006
Total Kjeldahl Nitrogen	0.50	1.61	0.98
Nitrite plus Nitrate Nitrogen	3.18	7.93	4.36
Total Nitrogen	3.89	9.18	5.34
Total Phosphorus	0.26	1.16	0.61
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	0.002	0.002	0.002
Phenols	0.004	0.009	0.006
Total Arsenic	<0.003	0.012	0.005
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0031	0.0009
Dissolved Cadmium	<0.0003	<0.0003	0.0003
Total Chromium	<0.004	0.058	0.021
Dissolved Chromium	<0.0007	0.0026	0.0014
Total Copper	0.009	0.135	0.047
Dissolved Copper	<0.002	0.005	0.003
Total Iron	0.516	20.828	5.552
Dissolved Iron	0.005	0.034	0.015
Total Lead	0.004	0.103	0.038
Dissolved Lead	<0.0009	0.0060	0.0025
Total Manganese	0.0371	1.0239	0.3134
Dissolved Manganese	0.0018	0.0187	0.0083
Total Mercury	<0.00006	0.00009	0.00007
Total Nickel	<0.002	0.037	0.014
Dissolved Nickel	<0.002	0.004	0.002
Total Silver	<0.0008	<0.0008	0.0008
Dissolved Silver	<0.0003	0.0010	0.0005
Total Zinc	0.031	0.350	0.133
Dissolved Zinc	0.002	0.011	0.005
Fecal Coliform (cfu/100 ml)	20	410	136

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

TABLE AIV-3: WATER QUALITY AT STATION 14 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.8[b]	28.9[b]	20.6[b]
Total Suspended Solids	16	64	40
Turbidity (NTU)	20[b]	75[b]	42[b]
Conductivity (µS/cm)	689[b]	882[b]	788[b]
Five-Day Biochemical Oxygen Demand	3	6	4
Dissolved Oxygen	5.8[b]	10.1[b]	8.6[b]
pH (units)	7.5[b]	8.1[b]	7.7[b]
Ammonia Nitrogen	0.16	0.24	0.19
Un-ionized Ammonia	0.002	0.009	0.005
Total Kjeldahl Nitrogen	0.71	1.65	1.08
Nitrite plus Nitrate Nitrogen	3.24	7.89	4.34
Total Nitrogen	4.17	9.05	5.42
Total Phosphorus	0.28	1.16	0.61
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	<0.003	0.004	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0034	0.0013
Dissolved Cadmium	<0.0003	0.0006	0.0004
Total Chromium	<0.004	0.065	0.021
Dissolved Chromium	<0.0007	0.0030	0.0016
Total Copper	0.007	0.157	0.055
Dissolved Copper	<0.002	0.005	0.003
Total Iron	0.431	21.909	6.054
Dissolved Iron	0.005	0.036	0.016
Total Lead	0.004	0.116	0.039
Dissolved Lead	<0.0009	0.0098	0.0033
Total Manganese	0.0310	1.1096	0.3372
Dissolved Manganese	0.0011	0.0153	0.0066
Total Mercury	<0.00006	0.00029	0.00010
Total Nickel	<0.002	0.030	0.013
Dissolved Nickel	<0.002	0.004	0.002
Total Silver	<0.0008	0.0162	0.0034
Dissolved Silver	<0.0003	0.0011	0.0005
Total Zinc	0.028	0.403	0.152
Dissolved Zinc	0.002	0.011	0.005
Fecal Coliform (cfu/100 ml)	10	280	59[c]

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

TABLE AIV-4: WATER QUALITY AT STATION 15 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.8[b]	28.7[b]	20.5[b]
Total Suspended Solids	17	81	40
Turbidity (NTU)	26[b]	99[b]	46[b]
Conductivity (µS/cm)	692[b]	891[b]	783[b]
Five-Day Biochemical Oxygen Demand	3	6	4
Dissolved Oxygen	5.8[b]	10.1[b]	8.6[b]
pH (units)	7.5[b]	8.2[b]	7.8[b]
Ammonia Nitrogen	0.14	0.22	0.17
Un-ionized Ammonia	0.002	0.009	0.005
Total Kjeldahl Nitrogen	0.62	1.62	0.96
Nitrite plus Nitrate Nitrogen	3.22	8.59	4.46
Total Nitrogen	4.00	9.70	5.42
Total Phosphorus	0.28	1.10	0.60
Chlorophyll a (µg/L)	1.3	24.0	15.4
Total Cyanide	0.002	0.002	0.002
Phenols	0.005	0.009	0.007
Total Arsenic	<0.003	<0.003	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0013	0.0007
Dissolved Cadmium	<0.0003	0.0005	0.0003
Total Chromium	<0.004	0.064	0.022
Dissolved Chromium	0.0011	0.0027	0.0016
Total Copper	0.010	0.158	0.059
Dissolved Copper	<0.002	0.002	0.002
Total Iron	0.465	26.515	6.702
Dissolved Iron	0.005	0.186	0.047
Total Lead	0.005	0.123	0.041
Dissolved Lead	<0.0009	0.0091	0.0030
Total Manganese	0.0332	1.3761	0.3788
Dissolved Manganese	0.0011	0.0148	0.0058
Total Mercury	<0.00006	0.00034	0.00011
Total Nickel	<0.002	0.031	0.016
Dissolved Nickel	<0.002	0.004	0.002
Total Silver	<0.0008	<0.0008	0.0008
Dissolved Silver	<0.0003	0.0009	0.0004
Total Zinc	0.020	0.404	0.161
Dissolved Zinc	0.002	0.011	0.006
Fecal Coliform (cfu/100 ml)	<10	220	51[c]

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

TABLE AIV-5: WATER QUALITY AT STATION 16 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.8[b]	28.6[b]	20.5[b]
Total Suspended Solids	16	63	37
Turbidity (NTU)	24[b]	90[b]	40[b]
Conductivity (µS/cm)	693[b]	897[b]	783[b]
Five-Day Biochemical Oxygen Demand	3	7	5
Dissolved Oxygen	5.7[b]	10.1[b]	8.6[b]
pH (units)	7.5[b]	8.2[b]	7.8[b]
Ammonia Nitrogen	0.14	0.20	0.16
Un-ionized Ammonia	0.002	0.007	0.004
Total Kjeldahl Nitrogen	0.44	1.34	0.86
Nitrite plus Nitrate Nitrogen	3.34	8.26	4.39
Total Nitrogen	3.88	9.31	5.25
Total Phosphorus	0.25	1.38	0.63
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	<0.003	<0.003	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0015	0.0008
Dissolved Cadmium	<0.0003	0.0006	0.0004
Total Chromium	<0.004	0.056	0.020
Dissolved Chromium	<0.0007	0.0025	0.0013
Total Copper	0.007	0.197	0.056
Dissolved Copper	<0.002	0.005	0.003
Total Iron	0.424	22.585	5.931
Dissolved Iron	0.005	0.036	0.017
Total Lead	0.007	0.108	0.038
Dissolved Lead	<0.0009	0.0056	0.0024
Total Manganese	0.0318	1.1032	0.3293
Dissolved Manganese	0.0011	0.0136	0.0050
Total Mercury	<0.00006	0.00027	0.00010
Total Nickel	<0.002	0.028	0.012
Dissolved Nickel	<0.002	0.004	0.002
Total Silver	<0.0008	0.0018	0.0012
Dissolved Silver	<0.0003	0.0009	0.0005
Total Zinc	0.021	0.348	0.130
Dissolved Zinc	0.002	0.019	0.007
Fecal Coliform (cfu/100 ml)	<10	260	42[c]

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

TABLE AIV-6: WATER QUALITY AT STATION 17 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.2[b]	28.9[b]	20.6[b]
Total Suspended Solids	22	78	48
Turbidity (NTU)	24[b]	79[b]	46[b]
Conductivity (µS/cm)	707[b]	873[b]	786[b]
Five-Day Biochemical Oxygen Demand	3	6	5
Dissolved Oxygen	5.9[b]	10.6[b]	8.7[b]
pH (units)	7.6[b]	8.2[b]	7.8[b]
Ammonia Nitrogen	0.08	0.17	0.13
Un-ionized Ammonia	0.002	0.008	0.004
Total Kjeldahl Nitrogen	0.51	1.49	0.97
Nitrite plus Nitrate Nitrogen	3.31	7.46	4.32
Total Nitrogen	3.82	8.79	5.29
Total Phosphorus	0.32	1.87	0.75
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	0.002	0.002	0.003
Phenols	0.010	0.003	0.010
Total Arsenic	<0.003	<0.003	<0.003
Dissolved Arsenic	<0.002	<0.002	<0.002
Total Cadmium	0.0004	<0.0004	0.0009
Dissolved Cadmium	0.0006	<0.0003	0.0006
Total Chromium	0.006	<0.004	0.058
Dissolved Chromium	0.0011	<0.0007	0.0025
Total Copper	0.016	0.005	0.134
Dissolved Copper	<0.002	<0.002	0.002
Total Iron	1.325	0.554	24.114
Dissolved Iron	0.014	0.005	0.033
Total Lead	0.008	0.005	0.098
Dissolved Lead	0.0024	<0.0009	0.0048
Total Manganese	0.0639	0.0383	1.1265
Dissolved Manganese	0.0019	0.0007	0.0118
Total Mercury	<0.00006	<0.00006	0.00030
Total Nickel	0.006	<0.002	0.030
Dissolved Nickel	0.004	<0.002	0.004
Total Silver	<0.0008	<0.0008	0.0013
Dissolved Silver	0.0003	<0.0003	0.0009
Total Zinc	0.047	0.020	0.332
Dissolved Zinc	0.012	<0.002	0.012
Fecal Coliform (cfu/100 ml)	<10	160	49[c]

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

TABLE AIV-7: WATER QUALITY AT STATION 18 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.4[b]	28.6[b]	20.5[b]
Total Suspended Solids	17	76	40
Turbidity (NTU)	16[b]	68[b]	37[b]
Conductivity (µS/cm)	710[b]	864[b]	786[b]
Five-Day Biochemical Oxygen Demand	<2	6	4
Dissolved Oxygen	6.4[b]	12.0[b]	9.0[b]
pH (units)	7.3[b]	8.3[b]	7.8[b]
Ammonia Nitrogen	0.03	0.24	0.13
Un-ionized Ammonia	<0.001	0.010	0.005
Total Kjeldahl Nitrogen	0.45	1.55	1.02
Nitrite plus Nitrate Nitrogen	3.29	7.16	4.26
Total Nitrogen	3.74	8.52	5.28
Total Phosphorus	0.33	1.00	0.59
Chlorophyll a (µg/L)	18.2	53.9	27.6
Total Cyanide	0.002	0.002	0.002
Phenols	0.003	0.010	0.006
Total Arsenic	<0.003	<0.003	0.003
Dissolved Arsenic	<0.002	0.003	0.002
Total Cadmium	<0.0004	0.0038	0.0014
Dissolved Cadmium	<0.0003	0.0005	0.0003
Total Chromium	<0.004	0.060	0.021
Dissolved Chromium	<0.0007	0.0022	0.0013
Total Copper	0.004	0.192	0.067
Dissolved Copper	<0.002	0.004	0.002
Total Iron	0.383	20.161	5.473
Dissolved Iron	0.005	0.032	0.016
Total Lead	0.005	0.098	0.037
Dissolved Lead	<0.0009	0.0058	0.0027
Total Manganese	0.0317	1.1473	0.3541
Dissolved Manganese	0.0009	0.0103	0.0033
Total Mercury	<0.00006	0.00033	0.00011
Total Nickel	<0.002	0.028	0.012
Dissolved Nickel	<0.002	0.004	0.003
Total Silver	<0.0008	0.0017	0.0010
Dissolved Silver	<0.0003	0.0028	0.0009
Total Zinc	0.019	0.343	0.136
Dissolved Zinc	0.002	0.015	0.007
Fecal Coliform (cfu/100 ml)	<10	110	32[c]

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

TABLE AIV-8: WATER QUALITY AT STATION 19 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.2[b]	28.2[b]	20.3[b]
Total Suspended Solids	17	70	40
Turbidity (NTU)	17[b]	88[b]	40[b]
Conductivity (µS/cm)	712[b]	872[b]	790[b]
Five-Day Biochemical Oxygen Demand	3	6	4
Dissolved Oxygen	7.1[b]	12.4[b]	9.1[b]
pH (units)	7.4[b]	8.4[b]	7.8[b]
Ammonia Nitrogen	0.09	0.20	0.13
Un-ionized Ammonia	0.002	0.009	0.004
Total Kjeldahl Nitrogen	0.58	1.58	1.01
Nitrite plus Nitrate Nitrogen	3.16	7.11	4.22
Total Nitrogen	3.83	8.41	5.23
Total Phosphorus	0.33	1.03	0.60
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	<0.003	<0.003	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0033	0.0013
Dissolved Cadmium	<0.0003	0.0004	0.0003
Total Chromium	<0.004	0.061	0.022
Dissolved Chromium	<0.0007	0.0018	0.0013
Total Copper	0.010	0.178	0.064
Dissolved Copper	<0.002	0.002	0.002
Total Iron	0.457	17.155	5.395
Dissolved Iron	0.009	0.037	0.017
Total Lead	0.006	0.131	0.045
Dissolved Lead	<0.0009	0.0040	0.0022
Total Manganese	0.0319	1.0218	0.3495
Dissolved Manganese	0.0009	0.0112	0.0035
Total Mercury	<0.00006	0.00042	0.00012
Total Nickel	<0.002	0.030	0.012
Dissolved Nickel	<0.002	0.004	0.003
Total Silver	<0.0008	0.0023	0.0011
Dissolved Silver	<0.0003	0.0012	0.0005
Total Zinc	0.021	0.412	0.162
Dissolved Zinc	<0.002	0.013	0.006
Fecal Coliform (cfu/100 ml)	<10	80	32[c]

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

TABLE AIV-9: WATER QUALITY AT STATION 20 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.2[b]	28.1[b]	20.5[b]
Total Suspended Solids	16	86	40
Turbidity (NTU)	22[b]	88[b]	42[b]
Conductivity (µS/cm)	716[b]	884[b]	801[b]
Five-Day Biochemical Oxygen Demand	<2	6	5
Dissolved Oxygen	7.3[b]	13.5[b]	9.3[b]
pH (units)	7.4[b]	8.5[b]	7.9[b]
Ammonia Nitrogen	0.05	0.21	0.13
Un-ionized Ammonia	0.001	0.006	0.004
Total Kjeldahl Nitrogen	0.83	1.86	1.05
Nitrite plus Nitrate Nitrogen	3.01	7.06	4.16
Total Nitrogen	3.92	7.90	5.20
Total Phosphorus	0.40	0.79	0.56
Chlorophyll a (µg/L)	14.0	57.1	33.5
Total Cyanide	0.002	0.002	0.002
Phenols	0.004	0.011	0.007
Total Arsenic	<0.003	<0.003	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0039	0.0015
Dissolved Cadmium	<0.0003	0.0005	0.0003
Total Chromium	<0.004	0.069	0.025
Dissolved Chromium	<0.0007	0.0017	0.0012
Total Copper	0.009	0.187	0.070
Dissolved Copper	<0.002	0.002	0.002
Total Iron	0.425	23.435	6.663
Dissolved Iron	<0.004	0.037	0.012
Total Lead	0.005	0.128	0.045
Dissolved Lead	<0.0009	0.0045	0.0025
Total Manganese	0.0299	1.1891	0.3759
Dissolved Manganese	0.0010	0.0108	0.0035
Total Mercury	<0.00006	0.00006	0.00006
Total Nickel	<0.002	0.035	0.014
Dissolved Nickel	<0.002	0.004	0.002
Total Silver	<0.0008	0.0012	0.0009
Dissolved Silver	<0.0003	0.0010	0.0005
Total Zinc	0.017	0.442	0.161
Dissolved Zinc	0.002	0.012	0.005
Fecal Coliform (cfu/100 ml)	<10	100	32[c]

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

APPENDIX V

WATER QUALITY AT STATION 21–27 DURING MAY, AUGUST, AND OCTOBER 2003

TABLE AV-1: WATER QUALITY AT STATION 21 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.2[b]	28.1[b]	20.5[b]
Total Suspended Solids	19	447	93
Turbidity (NTU)	20[b]	300[b]	70[b]
Conductivity (µS/cm)	704[b]	960[b]	809[b]
Five-Day Biochemical Oxygen Demand	3	11	5
Dissolved Oxygen	7.6[b]	12.8[b]	9.4[b]
pH (units)	7.4[b]	8.5[b]	7.9[b]
Ammonia Nitrogen	0.05	0.34	0.13
Un-ionized Ammonia	0.001	0.007	0.004
Total Kjeldahl Nitrogen	0.44	3.23	1.36
Nitrite plus Nitrate Nitrogen	2.82	7.54	4.08
Total Nitrogen	3.43	10.77	5.45
Total Phosphorus	0.38	1.46	0.74
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	0.002	0.002	0.002
Phenols	0.003	0.008	0.005
Total Arsenic	<0.003	<0.003	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0112	0.0023
Dissolved Cadmium	<0.0003	0.0003	0.0003
Total Chromium	<0.004	0.219	0.045
Dissolved Chromium	<0.0007	0.0017	0.0013
Total Copper	0.008	0.356	0.094
Dissolved Copper	<0.002	0.004	0.003
Total Iron	0.488	89.333	16.290
Dissolved Iron	<0.004	0.029	0.014
Total Lead	0.003	0.331	0.067
Dissolved Lead	<0.0009	0.0063	0.0027
Total Manganese	0.0325	4.7771	0.9231
Dissolved Manganese	0.0005	0.0173	0.0062
Total Mercury	<0.00006	0.00018	0.00008
Total Nickel	<0.002	0.119	0.027
Dissolved Nickel	<0.002	0.004	0.003
Total Silver	<0.0008	0.0035	0.0013
Dissolved Silver	<0.0003	0.0014	0.0006
Total Zinc	0.019	1.321	0.286
Dissolved Zinc	<0.002	0.021	0.007
Fecal Coliform (cfu/100 ml)	<10	250	32[c]

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

TABLE AV-2: WATER QUALITY AT STATION 22 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.5[b]	27.9[b]	20.5[b]
Total Suspended Solids	26	86	47
Turbidity (NTU)	31[b]	105[b]	49[b]
Conductivity (µS/cm)	713[b]	902[b]	799[b]
Five-Day Biochemical Oxygen Demand	4	6	5
Dissolved Oxygen	7.8[b]	12.8[b]	9.5[b]
pH (units)	7.1[b]	8.5[b]	7.9[b]
Ammonia Nitrogen	0.02	0.23	0.10
Un-ionized Ammonia	<0.001	0.011	0.004
Total Kjeldahl Nitrogen	0.89	1.78	1.18
Nitrite plus Nitrate Nitrogen	2.87	7.19	4.14
Total Nitrogen	3.83	8.63	5.32
Total Phosphorus	0.40	0.85	0.58
Chlorophyll a (µg/L)	12.8	53.8	33.0
Total Cyanide	0.002	0.002	0.002
Phenols	0.003	0.008	0.006
Total Arsenic	<0.003	0.003	0.003
Dissolved Arsenic	<0.002	0.003	0.002
Total Cadmium	<0.0004	0.0025	0.0011
Dissolved Cadmium	<0.0003	0.0003	0.0003
Total Chromium	<0.004	0.064	0.023
Dissolved Chromium	<0.0007	0.0017	0.0013
Total Copper	0.008	0.168	0.060
Dissolved Copper	<0.002	0.003	0.002
Total Iron	0.648	20.013	6.373
Dissolved Iron	0.005	0.032	0.014
Total Lead	<0.002	0.114	0.041
Dissolved Lead	<0.0009	0.0033	0.0019
Total Manganese	0.0453	1.2121	0.3878
Dissolved Manganese	0.0009	0.0138	0.0035
Total Mercury	<0.00006	0.00029	0.00010
Total Nickel	<0.002	0.036	0.015
Dissolved Nickel	<0.002	0.004	0.002
Total Silver	<0.0008	0.0016	0.0009
Dissolved Silver	<0.0003	0.0012	0.0005
Total Zinc	0.023	0.397	0.155
Dissolved Zinc	0.002	0.019	0.008
Fecal Coliform (cfu/100 ml)	<10	100	29[c]

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

TABLE AV-3: WATER QUALITY AT STATION 23 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.1[b]	27.8[b]	20.3[b]
Total Suspended Solids	25	94	49
Turbidity (NTU)	21[b]	107[b]	51[b]
Conductivity (µS/cm)	716[b]	925[b]	799[b]
Five-Day Biochemical Oxygen Demand	3	7	5
Dissolved Oxygen	7.4[b]	11.7[b]	9.2[b]
pH (units)	7.2[b]	8.3[b]	7.9[b]
Ammonia Nitrogen	0.04	0.23	0.12
Un-ionized Ammonia	0.001	0.008	0.004
Total Kjeldahl Nitrogen	0.62	1.89	1.12
Nitrite plus Nitrate Nitrogen	2.80	7.33	4.15
Total Nitrogen	3.73	8.62	5.26
Total Phosphorus	0.37	1.29	0.74
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	0.002	0.002	0.002
Phenols	0.003	0.008	0.006
Total Arsenic	<0.003	<0.003	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0035	0.0014
Dissolved Cadmium	<0.0003	0.0004	0.0003
Total Chromium	<0.004	0.072	0.026
Dissolved Chromium	<0.0007	0.0018	0.0014
Total Copper	0.004	0.190	0.063
Dissolved Copper	<0.002	0.004	0.002
Total Iron	0.508	31.027	8.193
Dissolved Iron	<0.004	0.033	0.012
Total Lead	<0.002	0.131	0.046
Dissolved Lead	<0.0009	0.0054	0.0025
Total Manganese	0.0483	1.3721	0.4130
Dissolved Manganese	0.0006	0.0127	0.0030
Total Mercury	<0.00006	0.00014	0.00008
Total Nickel	<0.002	0.043	0.016
Dissolved Nickel	<0.002	0.003	0.002
Total Silver	<0.0008	0.0025	0.0011
Dissolved Silver	<0.0003	0.0014	0.0005
Total Zinc	0.026	0.441	0.166
Dissolved Zinc	<0.002	0.010	0.005
Fecal Coliform (cfu/100 ml)	10	140	37[c]

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

TABLE AV-4: WATER QUALITY AT STATION 24 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.9[b]	27.5[b]	20.0[b]
Total Suspended Solids	20	98	46
Turbidity (NTU)	20[b]	91[b]	41[b]
Conductivity (µS/cm)	721[b]	933[b]	814[b]
Five-Day Biochemical Oxygen Demand	<2	7	5
Dissolved Oxygen	7.5[b]	13.4[b]	9.6[b]
pH (units)	7.0[b]	8.6[b]	8.0[b]
Ammonia Nitrogen	0.06	0.26	0.11
Un-ionized Ammonia	0.001	0.009	0.005
Total Kjeldahl Nitrogen	0.70	1.37	1.11
Nitrite plus Nitrate Nitrogen	2.56	6.69	3.80
Total Nitrogen	3.57	8.06	4.91
Total Phosphorus	0.36	0.88	0.56
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	0.002	0.002	0.002
Phenols	0.003	0.010	0.006
Total Arsenic	<0.003	0.005	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0028	0.0012
Dissolved Cadmium	<0.0003	0.0004	0.0003
Total Chromium	<0.004	0.069	0.024
Dissolved Chromium	<0.0007	0.0017	0.0014
Total Copper	0.002	0.245	0.075
Dissolved Copper	<0.002	0.003	0.002
Total Iron	0.492	24.440	7.363
Dissolved Iron	<0.004	0.036	0.014
Total Lead	<0.002	0.132	0.043
Dissolved Lead	<0.0009	0.0048	0.0023
Total Manganese	0.0383	1.2950	0.4001
Dissolved Manganese	0.0005	0.0150	0.0035
Total Mercury	<0.00006	0.00013	0.00007
Total Nickel	<0.002	0.037	0.015
Dissolved Nickel	<0.002	0.004	0.002
Total Silver	<0.0008	0.0036	0.0014
Dissolved Silver	<0.0003	0.0013	0.0005
Total Zinc	0.019	0.435	0.169
Dissolved Zinc	<0.002	0.015	0.006
Fecal Coliform (cfu/100 ml)	10	200	55[c]

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

TABLE AV-5: WATER QUALITY AT STATION 25 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.2[b]	27.4[b]	20.1[b]
Total Suspended Solids	22	99	52
Turbidity (NTU)	20[b]	109[b]	46[b]
Conductivity (µS/cm)	719[b]	941[b]	811[b]
Five-Day Biochemical Oxygen Demand	3	7	5
Dissolved Oxygen	8.0[b]	14.4[b]	9.9[b]
pH (units)	7.2[b]	8.8[b]	8.1[b]
Ammonia Nitrogen	0.02	0.27	0.12
Un-ionized Ammonia	0.001	0.013	0.007
Total Kjeldahl Nitrogen	0.80	1.80	1.23
Nitrite plus Nitrate Nitrogen	2.17	7.04	3.79
Total Nitrogen	3.60	8.39	5.02
Total Phosphorus	0.38	0.73	0.55
Chlorophyll a (µg/L)	21.6	101.6	57.3
Total Cyanide	0.002	0.002	0.002
Phenols	0.003	0.010	0.006
Total Arsenic	<0.003	<0.003	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0044	0.0013
Dissolved Cadmium	<0.0003	<0.0003	0.0003
Total Chromium	<0.004	0.095	0.028
Dissolved Chromium	<0.0007	0.0019	0.0013
Total Copper	0.008	0.202	0.070
Dissolved Copper	<0.002	0.003	0.002
Total Iron	0.501	24.482	8.185
Dissolved Iron	<0.004	0.037	0.015
Total Lead	<0.002	0.156	0.048
Dissolved Lead	<0.0009	0.0040	0.0021
Total Manganese	0.0405	1.4160	0.4740
Dissolved Manganese	0.0005	0.0190	0.0040
Total Mercury	<0.00006	0.00019	0.00008
Total Nickel	<0.002	0.048	0.016
Dissolved Nickel	<0.002	0.003	0.002
Total Silver	<0.0008	0.0011	0.0009
Dissolved Silver	<0.0003	0.0012	0.0006
Total Zinc	0.021	0.562	0.181
Dissolved Zinc	<0.002	0.015	0.005
Fecal Coliform (cfu/100 ml)	20	120	57[c]

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

TABLE AV-6: WATER QUALITY AT STATION 26 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.4[b]	27.3[b]	20.2[b]
Total Suspended Solids	22	132	56
Turbidity (NTU)	23[b]	245[b]	77[b]
Conductivity (µS/cm)	723[b]	945[b]	811[b]
Five-Day Biochemical Oxygen Demand	4	6	5
Dissolved Oxygen	8.1[b]	15.8[b]	10.3[b]
pH (units)	7.2[b]	8.9[b]	8.1[b]
Ammonia Nitrogen	0.03	0.28	0.12
Un-ionized Ammonia	0.001	0.014	0.006
Total Kjeldahl Nitrogen	0.75	2.46	1.31
Nitrite plus Nitrate Nitrogen	2.54	7.15	3.80
Total Nitrogen	3.54	8.43	5.11
Total Phosphorus	0.29	1.19	0.64
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	<0.003	<0.003	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0064	0.0015
Dissolved Cadmium	<0.0003	0.0003	0.0003
Total Chromium	<0.004	0.139	0.034
Dissolved Chromium	<0.0007	0.0018	0.0013
Total Copper	0.007	0.238	0.072
Dissolved Copper	<0.002	0.003	0.002
Total Iron	0.299	38.112	10.215
Dissolved Iron	<0.004	0.035	0.015
Total Lead	0.002	0.210	0.054
Dissolved Lead	<0.0009	0.0040	0.0019
Total Manganese	0.0346	1.6714	0.4690
Dissolved Manganese	0.0007	0.0173	0.0038
Total Mercury	<0.00006	<0.00006	0.00006
Total Nickel	<0.002	0.065	0.018
Dissolved Nickel	<0.002	0.003	0.002
Total Silver	<0.0008	0.0010	0.0008
Dissolved Silver	<0.0003	0.0010	0.0005
Total Zinc	0.016	0.744	0.199
Dissolved Zinc	<0.002	0.007	0.004
Fecal Coliform (cfu/100 ml)	<10	200	39[c]

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

TABLE AV-7: WATER QUALITY AT STATION 27 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.0[b]	27.7[b]	20.3[b]
Total Suspended Solids	24	37	29
Turbidity (NTU)	25[b]	82[b]	40[b]
Conductivity (µS/cm)	722[b]	868[b]	793[b]
Five-Day Biochemical Oxygen Demand	3	8	5
Dissolved Oxygen	7.7[b]	14.2[b]	10.3[b]
pH (units)	7.6[b]	9.0[b]	8.2[b]
Ammonia Nitrogen	0.03	0.24	0.13
Un-ionized Ammonia	0.002	0.035	0.012
Total Kjeldahl Nitrogen	0.97	1.31	1.18
Nitrite plus Nitrate Nitrogen	2.67	5.58	3.48
Total Nitrogen	3.74	6.83	4.66
Total Phosphorus	0.27	0.78	0.49
Chlorophyll a (µg/L)	28.5	105.5	59.9
Total Cyanide	0.002	0.002	0.002
Phenols	0.003	0.011	0.006
Total Arsenic	<0.003	0.005	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0035	0.0012
Dissolved Cadmium	<0.0003	0.0003	0.0003
Total Chromium	<0.004	0.049	0.016
Dissolved Chromium	0.0008	0.0020	0.0015
Total Copper	<0.002	0.179	0.060
Dissolved Copper	<0.002	0.005	0.003
Total Iron	<0.005	18.610	4.744
Dissolved Iron	0.004	0.023	0.011
Total Lead	<0.002	0.114	0.031
Dissolved Lead	<0.0009	0.0031	0.0019
Total Manganese	<0.0002	0.9284	0.2784
Dissolved Manganese	0.0007	0.0070	0.0023
Total Mercury	<0.00006	<0.00006	0.00006
Total Nickel	<0.002	0.037	0.012
Dissolved Nickel	<0.002	0.003	0.002
Total Silver	<0.0008	0.0024	0.0011
Dissolved Silver	<0.0003	0.0012	0.0005
Total Zinc	0.002	0.311	0.109
Dissolved Zinc	<0.002	0.013	0.005
Fecal Coliform (cfu/100 ml)	10	80	27[c]

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

APPENDIX VI

WATER QUALITY AT STATIONS 28–41 DURING MAY, AUGUST, AND OCTOBER 2003

TABLE AVI-1: WATER QUALITY AT STATION 28 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.0[b]	27.2[b]	20.1[b]
Total Suspended Solids	26	69	45
Turbidity (NTU)	29[b]	143[b]	59[b]
Conductivity (µS/cm)	714[b]	870[b]	782[b]
Five-Day Biochemical Oxygen Demand	3	7	5
Dissolved Oxygen	7.6[b]	14.2[b]	10.1[b]
pH (units)	7.5[b]	8.9[b]	8.1[b]
Ammonia Nitrogen	0.06	0.38	0.15
Un-ionized Ammonia	0.002	0.018	0.008
Total Kjeldahl Nitrogen	1.11	1.54	1.25
Nitrite plus Nitrate Nitrogen	2.50	6.72	3.70
Total Nitrogen	3.61	7.97	4.95
Total Phosphorus	0.44	0.78	0.56
Chlorophyll a (µg/L)	21.6	98.3	58.4
Total Cyanides	0.002	0.002	0.002
Phenols	0.003	0.010	0.007
Total Arsenic	<0.003	0.004	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0033	0.0013
Dissolved Cadmium	<0.0003	0.0004	0.0003
Total Chromium	<0.004	0.077	0.026
Dissolved Chromium	0.0008	0.0022	0.0015
Total Copper	0.007	0.143	0.055
Dissolved Copper	<0.002	0.004	0.003
Total Iron	0.551	35.532	9.456
Dissolved Iron	0.005	0.016	0.009
Total Lead	0.004	0.126	0.041
Dissolved Lead	<0.0009	0.0040	0.0022
Total Manganese	0.0351	1.4781	0.4468
Dissolved Manganese	0.0006	0.0158	0.0059
Total Mercury	<0.00006	0.00042	0.00012
Total Nickel	<0.002	0.051	0.016
Dissolved Nickel	<0.002	0.003	0.002
Total Silver	<0.0008	<0.0008	0.0008
Dissolved Silver	<0.0003	0.0010	0.0004
Total Zinc	0.019	0.391	0.150
Dissolved Zinc	<0.002	0.023	0.007
Fecal Coliform (cfu/100 ml)	<10	100	27[c]

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

TABLE AVI-2: WATER QUALITY AT STATION 29 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.9[b]	26.7[b]	19.9[b]
Total Suspended Solids	31	64	41
Turbidity (NTU)	28[b]	133[b]	54[b]
Conductivity (µS/cm)	717[b]	872[b]	782[b]
Five-Day Biochemical Oxygen Demand	5	8	6
Dissolved Oxygen	8.0[b]	14.0[b]	10.0[b]
pH (units)	7.5[b]	8.8[b]	8.1[b]
Ammonia Nitrogen	0.06	0.20	0.12
Un-ionized Ammonia	0.001	0.015	0.008
Total Kjeldahl Nitrogen	1.01	1.53	1.34
Nitrite plus Nitrate Nitrogen	2.36	6.74	3.74
Total Nitrogen	3.66	8.18	5.07
Total Phosphorus	0.41	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	0.010	0.006
Total Arsenic	<0.003	0.006	0.004
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0023	0.0008
Dissolved Cadmium	<0.0003	<0.0003	0.0003
Total Chromium	<0.004	0.076	0.025
Dissolved Chromium	0.0009	0.0019	0.0015
Total Copper	0.007	0.169	0.060
Dissolved Copper	<0.002	0.002	0.002
Total Iron	0.527	36.310	9.486
Dissolved Iron	0.004	0.026	0.011
Total Lead	0.004	0.120	0.043
Dissolved Lead	<0.0009	0.0032	0.0018
Total Manganese	0.0411	1.4143	0.4285
Dissolved Manganese	0.0006	0.0078	0.0026
Total Mercury	<0.00006	0.00042	0.00012
Total Nickel	<0.002	0.064	0.019
Dissolved Nickel	<0.002	0.003	0.002
Total Silver	<0.0008	0.0015	0.0009
Dissolved Silver	<0.0003	0.0010	0.0005
Total Zinc	0.018	0.426	0.158
Dissolved Zinc	<0.002	0.009	0.004
Fecal Coliform (cfu/100 ml)	<10	70	30[c]

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

TABLE AVI-3: WATER QUALITY AT STATION 30 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.7[b]	26.8[b]	19.9[b]
Total Suspended Solids	26	95	49
Turbidity (NTU)	34[b]	1,570[b]	311[b]
Conductivity (µS/cm)	712[b]	863[b]	781[b]
Five-Day Biochemical Oxygen Demand	4	7	5
Dissolved Oxygen	8.0[b]	13.4[b]	9.9[b]
pH (units)	7.4[b]	8.9[b]	8.1[b]
Ammonia Nitrogen	0.04	0.18	0.12
Un-ionized Ammonia	0.001	0.016	0.008
Total Kjeldahl Nitrogen	1.10	1.70	1.34
Nitrite plus Nitrate Nitrogen	2.23	7.02	3.79
Total Nitrogen	3.62	8.43	5.13
Total Phosphorus	0.41	0.73	0.53
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	<0.003	<0.003	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0027	0.0009
Dissolved Cadmium	<0.0003	0.0003	0.0003
Total Chromium	<0.004	0.071	0.024
Dissolved Chromium	0.0009	0.0020	0.0014
Total Copper	0.009	0.161	0.058
Dissolved Copper	<0.002	0.002	0.002
Total Iron	0.604	34.005	8.807
Dissolved Iron	<0.004	0.026	0.011
Total Lead	0.002	0.123	0.044
Dissolved Lead	<0.0009	0.0039	0.0022
Total Manganese	0.0451	1.3860	0.4281
Dissolved Manganese	0.0008	0.0061	0.0026
Total Mercury	<0.00006	0.00036	0.00011
Total Nickel	<0.002	0.052	0.017
Dissolved Nickel	<0.002	0.003	0.002
Total Silver	<0.0008	0.0023	0.0011
Dissolved Silver	<0.0003	0.0010	0.0005
Total Zinc	0.024	0.401	0.157
Dissolved Zinc	<0.002	0.006	0.003
Fecal Coliform (cfu/100 ml)	<10	100	29[c]

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

TABLE AVI-4: WATER QUALITY AT STATION 31 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.2[b]	27.0[b]	20.0[b]
Total Suspended Solids	27	54	41
Turbidity (NTU)	33[b]	137[b]	54[b]
Conductivity (µS/cm)	703[b]	873[b]	782[b]
Five-Day Biochemical Oxygen Demand	5	11	7
Dissolved Oxygen	8.1[b]	15.1[b]	10.2[b]
pH (units)	7.4[b]	9.0[b]	8.1[b]
Ammonia Nitrogen	0.05	0.18	0.12
Un-ionized Ammonia	0.001	0.017	0.007
Total Kjeldahl Nitrogen	1.04	1.47	1.27
Nitrite plus Nitrate Nitrogen	2.20	7.44	3.82
Total Nitrogen	3.45	8.88	5.08
Total Phosphorus	0.36	0.66	0.49
Chlorophyll a (µg/L)	16.4	107.3	60.7
Total Cyanide	0.002	0.002	0.002
Phenols	0.004	0.008	0.006
Total Arsenic	<0.003	<0.003	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0037	0.0013
Dissolved Cadmium	<0.0003	0.0004	0.0003
Total Chromium	<0.004	0.069	0.023
Dissolved Chromium	0.0008	0.0022	0.0013
Total Copper	0.009	0.164	0.059
Dissolved Copper	<0.002	0.002	0.002
Total Iron	0.329	33.786	8.857
Dissolved Iron	<0.004	0.030	0.011
Total Lead	0.005	0.109	0.041
Dissolved Lead	<0.0009	0.0051	0.0019
Total Manganese	0.0352	1.2947	0.4077
Dissolved Manganese	0.0006	0.0052	0.0026
Total Mercury	<0.00006	0.00033	0.00011
Total Nickel	<0.002	0.048	0.017
Dissolved Nickel	<0.002	0.003	0.002
Total Silver	<0.0008	0.0029	0.0012
Dissolved Silver	<0.0003	0.0010	0.0004
Total Zinc	0.018	0.383	0.150
Dissolved Zinc	<0.002	0.006	0.003
Fecal Coliform (cfu/100 ml)	10	240	34[c]

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

TABLE AVI-5: WATER QUALITY AT STATION 32 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.1[b]	27.1[b]	20.0[b]
Total Suspended Solids	31	78	49
Turbidity (NTU)	33[b]	145[b]	64[b]
Conductivity (µS/cm)	698[b]	870[b]	780[b]
Five-Day Biochemical Oxygen Demand	4	7	6
Dissolved Oxygen	8.2[b]	14.3[b]	10.0[b]
pH (units)	7.4[b]	8.9[b]	8.1[b]
Ammonia Nitrogen	0.04	0.44	0.17
Un-ionized Ammonia	0.001	0.050	0.013
Total Kjeldahl Nitrogen	1.17	1.68	1.38
Nitrite plus Nitrate Nitrogen	2.18	7.55	3.86
Total Nitrogen	3.67	8.77	5.24
Total Phosphorus	0.38	0.77	0.54
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	0.002	0.002	0.002
Phenols	0.003	0.007	0.005
Total Arsenic	<0.003	<0.003	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0050	0.0015
Dissolved Cadmium	<0.0003	0.0004	0.0003
Total Chromium	<0.004	0.072	0.025
Dissolved Chromium	0.0008	0.0019	0.0013
Total Copper	0.007	0.199	0.062
Dissolved Copper	<0.002	0.002	0.002
Total Iron	0.719	30.339	9.292
Dissolved Iron	<0.004	0.016	0.008
Total Lead	0.004	0.119	0.043
Dissolved Lead	<0.0009	0.0043	0.0020
Total Manganese	0.0460	1.2552	0.4411
Dissolved Manganese	0.0007	0.0031	0.0016
Total Mercury	<0.00006	0.00035	0.00011
Total Nickel	<0.002	0.044	0.017
Dissolved Nickel	<0.002	0.003	0.002
Total Silver	<0.0008	<0.0008	0.0008
Dissolved Silver	<0.0003	0.0010	0.0004
Total Zinc	0.028	0.464	0.169
Dissolved Zinc	<0.002	0.108	0.021
Fecal Coliform (cfu/100 ml)	10	190	39[c]

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

TABLE AVI-6: WATER QUALITY AT STATION 33 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	15.9[b]	27.1[b]	20.1[b]
Total Suspended Solids	33	70	45
Turbidity (NTU)	37[b]	147[b]	67[b]
Conductivity (µS/cm)	698[b]	881[b]	784[b]
Five-Day Biochemical Oxygen Demand	4	9	6
Dissolved Oxygen	8.2[b]	14.1[b]	10.1[b]
pH (units)	7.4[b]	8.8[b]	8.1[b]
Ammonia Nitrogen	0.04	0.68	0.22
Un-ionized Ammonia	0.001	0.085	0.020
Total Kjeldahl Nitrogen	1.16	1.51	1.33
Nitrite plus Nitrate Nitrogen	2.15	7.41	3.84
Total Nitrogen	3.66	8.65	5.17
Total Phosphorus	0.39	0.75	0.52
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	<0.003	<0.003	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0032	0.0011
Dissolved Cadmium	<0.0003	0.0004	0.0003
Total Chromium	<0.004	0.067	0.022
Dissolved Chromium	0.0008	0.0020	0.0014
Total Copper	0.002	0.166	0.054
Dissolved Copper	<0.002	0.004	0.002
Total Iron	0.679	32.852	8.747
Dissolved Iron	<0.004	0.020	0.011
Total Lead	0.002	0.115	0.039
Dissolved Lead	<0.0009	0.0036	0.0019
Total Manganese	0.0507	1.4125	0.4221
Dissolved Manganese	0.0007	0.0026	0.0014
Total Mercury	<0.00006	0.00032	0.00010
Total Nickel	<0.002	0.043	0.016
Dissolved Nickel	<0.002	0.003	0.002
Total Silver	<0.0008	0.0021	0.0010
Dissolved Silver	<0.0003	0.0011	0.0005
Total Zinc	0.027	0.390	0.148
Dissolved Zinc	0.002	0.007	0.004
Fecal Coliform (cfu/100 ml)	10	150	34[c]

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

TABLE AVI-7: WATER QUALITY AT STATION 34 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.3[b]	27.1[b]	20.1[b]
Total Suspended Solids	24	78	46
Turbidity (NTU)	15[b]	1560[b]	310[b]
Conductivity (µS/cm)	700[b]	898[b]	789[b]
Five-Day Biochemical Oxygen Demand	<2	9	5
Dissolved Oxygen	8.2[b]	14.9[b]	10.2[b]
pH (units)	7.4[b]	8.9[b]	8.1[b]
Ammonia Nitrogen	0.05	0.63	0.21
Un-ionized Ammonia	0.001	0.068	0.017
Total Kjeldahl Nitrogen	1.08	1.73	1.44
Nitrite plus Nitrate Nitrogen	2.05	7.52	3.83
Total Nitrogen	3.62	8.78	5.27
Total Phosphorus	0.39	0.73	0.53
Chlorophyll a (µg/L)	15.7	114.8	58.2
Total Cyanide	0.002	0.003	0.002
Phenols	0.003	0.009	0.005
Total Arsenic	<0.003	<0.003	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0022	0.0007
Dissolved Cadmium	<0.0003	0.0003	0.0003
Total Chromium	<0.004	0.054	0.014
Dissolved Chromium	0.0009	0.0050	0.0021
Total Copper	0.006	0.148	0.042
Dissolved Copper	<0.002	0.015	0.004
Total Iron	0.483	17.811	3.590
Dissolved Iron	<0.004	2.119	0.360
Total Lead	0.003	0.102	0.028
Dissolved Lead	<0.0009	0.0090	0.0029
Total Manganese	0.0278	0.9621	0.2006
Dissolved Manganese	0.0009	0.1157	0.0206
Total Mercury	<0.00006	0.00027	0.00010
Total Nickel	<0.002	0.040	0.010
Dissolved Nickel	<0.002	0.007	0.003
Total Silver	<0.0008	0.0012	0.0009
Dissolved Silver	<0.0003	0.0009	0.0004
Total Zinc	0.021	0.347	0.092
Dissolved Zinc	<0.002	0.055	0.014
Fecal Coliform (cfu/100 ml)	20	50	34[c]

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

TABLE AVI-8: WATER QUALITY AT STATION 35 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.9[b]	27.2[b]	20.4[b]
Total Suspended Solids	31	76	48
Turbidity (NTU)	24[b]	183[b]	67[b]
Conductivity (µS/cm)	701[b]	908[b]	792[b]
Five-Day Biochemical Oxygen Demand	4	7	5
Dissolved Oxygen	7.9[b]	15.7[b]	10.1[b]
pH (units)	7.3[b]	9.0[b]	8.1[b]
Ammonia Nitrogen	0.03	0.64	0.21
Un-ionized Ammonia	0.001	0.067	0.016
Total Kjeldahl Nitrogen	0.99	1.73	1.43
Nitrite plus Nitrate Nitrogen	1.97	7.26	3.77
Total Nitrogen	3.67	8.89	5.19
Total Phosphorus	0.42	0.76	0.55
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	0.002	0.003	0.003
Phenols	0.005	0.009	0.007
Total Arsenic	<0.003	0.003	0.003
Dissolved Arsenic	<0.002	0.003	0.002
Total Cadmium	<0.0004	0.0037	0.0013
Dissolved Cadmium	<0.0003	0.0003	0.0003
Total Chromium	<0.004	0.081	0.026
Dissolved Chromium	<0.0007	0.0018	0.0012
Total Copper	0.008	0.185	0.061
Dissolved Copper	<0.002	0.002	0.002
Total Iron	0.473	38.514	10.195
Dissolved Iron	<0.004	0.024	0.011
Total Lead	0.003	0.151	0.047
Dissolved Lead	<0.0009	0.0036	0.0017
Total Manganese	0.0522	1.6554	0.4890
Dissolved Manganese	0.0010	0.0046	0.0021
Total Mercury	<0.00006	0.00028	0.00010
Total Nickel	<0.002	0.050	0.017
Dissolved Nickel	<0.002	0.003	0.002
Total Silver	<0.0008	0.0036	0.0013
Dissolved Silver	<0.0003	0.0013	0.0005
Total Zinc	0.024	0.511	0.170
Dissolved Zinc	<0.002	0.007	0.003
Fecal Coliform (cfu/100 ml)	<10	100	37[c]

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

TABLE AVI-9: WATER QUALITY AT STATION 36 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.9[b]	27.0[b]	20.4[b]
Total Suspended Solids	34	60	43
Turbidity (NTU)	20[b]	114[b]	51[b]
Conductivity (µS/cm)	695[b]	918[b]	791[b]
Five-Day Biochemical Oxygen Demand	5	6	6
Dissolved Oxygen	7.7[b]	15.9[b]	10.0[b]
pH (units)	7.4[b]	9.0[b]	8.1[b]
Ammonia Nitrogen	0.04	0.74	0.23
Un-ionized Ammonia	0.001	0.099	0.023
Total Kjeldahl Nitrogen	1.14	1.76	1.39
Nitrite plus Nitrate Nitrogen	1.90	7.30	3.65
Total Nitrogen	3.33	8.71	5.04
Total Phosphorus	0.40	0.74	0.53
Chlorophyll a (µg/L)	18.8	119.2	58.0
Total Cyanide	0.002	0.002	0.002
Phenols	0.003	0.008	0.005
Total Arsenic	<0.003	<0.003	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0034	0.0014
Dissolved Cadmium	<0.0003	<0.0003	0.0003
Total Chromium	<0.004	0.064	0.022
Dissolved Chromium	0.0009	0.0014	0.0012
Total Copper	0.008	0.191	0.060
Dissolved Copper	<0.002	0.003	0.002
Total Iron	0.722	33.029	9.122
Dissolved Iron	<0.004	0.019	0.012
Total Lead	0.005	0.128	0.042
Dissolved Lead	<0.0009	0.0032	0.0018
Total Manganese	0.0482	1.3134	0.4201
Dissolved Manganese	0.0006	0.0030	0.0016
Total Mercury	<0.00006	<0.00006	0.00006
Total Nickel	<0.002	0.045	0.018
Dissolved Nickel	<0.002	0.003	0.002
Total Silver	<0.0008	<0.0008	0.0008
Dissolved Silver	<0.0003	0.0009	0.0005
Total Zinc	0.020	0.414	0.152
Dissolved Zinc	<0.002	0.014	0.005
Fecal Coliform (cfu/100 ml)	<10	110	25[c]

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

TABLE AVI-10: WATER QUALITY AT STATION 37 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.9[b]	27.2[b]	20.6[b]
Total Suspended Solids	22	85	50
Turbidity (NTU)	27[b]	147[b]	55[b]
Conductivity (µS/cm)	695[b]	923[b]	788[b]
Five-Day Biochemical Oxygen Demand	4	6	5
Dissolved Oxygen	7.7[b]	18.8[b]	10.3[b]
pH (units)	7.4[b]	9.2[b]	8.2[b]
Ammonia Nitrogen	0.06	0.50	0.20
Un-ionized Ammonia	0.001	0.052	0.018
Total Kjeldahl Nitrogen	1.03	2.00	1.49
Nitrite plus Nitrate Nitrogen	1.87	7.17	3.59
Total Nitrogen	3.87	8.76	5.08
Total Phosphorus	0.40	0.76	0.54
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	0.002	0.003	0.002
Phenols	0.004	0.007	0.006
Total Arsenic	<0.003	0.004	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0025	0.0010
Dissolved Cadmium	<0.0003	0.0003	0.0003
Total Chromium	<0.004	0.085	0.023
Dissolved Chromium	<0.0007	0.0021	0.0014
Total Copper	0.002	0.188	0.064
Dissolved Copper	<0.002	0.002	0.002
Total Iron	0.493	48.201	10.456
Dissolved Iron	<0.004	0.035	0.017
Total Lead	0.003	0.159	0.044
Dissolved Lead	<0.0009	0.0030	0.0021
Total Manganese	0.0488	1.8752	0.4704
Dissolved Manganese	0.0009	0.0038	0.0019
Total Mercury	<0.00006	<0.00006	0.00006
Total Nickel	<0.002	0.063	0.019
Dissolved Nickel	<0.002	0.003	0.002
Total Silver	<0.0008	0.0010	0.0008
Dissolved Silver	<0.0003	0.0008	0.0004
Total Zinc	0.021	0.476	0.145
Dissolved Zinc	<0.002	0.007	0.003
Fecal Coliform (cfu/100 ml)	<10	210	24[c]

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

TABLE AVI-11: WATER QUALITY AT STATION 38 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.6[b]	27.1[b]	20.6[b]
Total Suspended Solids	41	60	51
Turbidity (NTU)	33[b]	142[b]	73[b]
Conductivity (µS/cm)	694[b]	923[b]	786[b]
Five-Day Biochemical Oxygen Demand	5	7	6
Dissolved Oxygen	7.6[b]	18.0[b]	10.0[b]
pH (units)	7.4[b]	9.2[b]	8.2[b]
Ammonia Nitrogen	0.08	0.49	0.20
Un-ionized Ammonia	0.001	0.050	0.020
Total Kjeldahl Nitrogen	1.13	1.85	1.42
Nitrite plus Nitrate Nitrogen	1.80	6.71	3.47
Total Nitrogen	3.65	7.84	4.89
Total Phosphorus	0.39	0.69	0.50
Chlorophyll a (µg/L)	22.6	137.6	59.1
Total Cyanide	0.002	0.003	0.002
Phenols	0.003	0.008	0.006
Total Arsenic	<0.003	<0.003	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0017	0.0007
Dissolved Cadmium	<0.0003	<0.0003	0.0003
Total Chromium	<0.004	0.070	0.021
Dissolved Chromium	<0.0007	0.0017	0.0011
Total Copper	<0.002	0.145	0.051
Dissolved Copper	<0.002	0.005	0.003
Total Iron	1.066	38.354	9.249
Dissolved Iron	0.005	0.031	0.014
Total Lead	0.005	0.134	0.040
Dissolved Lead	<0.0009	0.0042	0.0021
Total Manganese	0.0565	1.5343	0.4307
Dissolved Manganese	0.0014	0.0068	0.0040
Total Mercury	<0.00006	<0.00006	0.00006
Total Nickel	<0.002	0.050	0.017
Dissolved Nickel	<0.002	0.003	0.002
Total Silver	<0.0008	0.0008	0.0008
Dissolved Silver	<0.0003	0.0010	0.0006
Total Zinc	0.024	0.414	0.140
Dissolved Zinc	<0.002	0.011	0.004
Fecal Coliform (cfu/100 ml)	<10	70	22[c]

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

TABLE AVI-12: WATER QUALITY AT STATION 39 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.2[b]	27.6[b]	20.4[b]
Total Suspended Solids	32	66	51
Turbidity (NTU)	50[b]	139[b]	74[b]
Conductivity (µS/cm)	685[b]	920[b]	781[b]
Five-Day Biochemical Oxygen Demand	3	6	5
Dissolved Oxygen	7.7[b]	15.1[b]	9.3[b]
pH (units)	7.4[b]	9.1[b]	8.2[b]
Ammonia Nitrogen	0.05	0.50	0.22
Un-ionized Ammonia	0.001	0.062	0.021
Total Kjeldahl Nitrogen	1.25	2.05	1.56
Nitrite plus Nitrate Nitrogen	1.36	6.85	3.10
Total Nitrogen	3.08	8.23	4.66
Total Phosphorus	0.41	0.62	0.52
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	0.002	0.003	0.003
Phenols	0.003	0.008	0.006
Total Arsenic	<0.003	<0.003	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0031	0.0012
Dissolved Cadmium	<0.0003	0.0005	0.0003
Total Chromium	<0.004	0.084	0.025
Dissolved Chromium	0.0008	0.0016	0.0013
Total Copper	0.003	0.150	0.052
Dissolved Copper	<0.002	0.004	0.002
Total Iron	0.799	48.821	12.191
Dissolved Iron	<0.004	0.099	0.027
Total Lead	0.003	0.137	0.042
Dissolved Lead	<0.0009	0.0043	0.0025
Total Manganese	0.0657	1.7962	0.5149
Dissolved Manganese	0.0029	0.0062	0.0042
Total Mercury	<0.00006	0.00013	0.00007
Total Nickel	<0.002	0.061	0.021
Dissolved Nickel	<0.002	0.003	0.002
Total Silver	<0.0008	0.0016	0.0010
Dissolved Silver	<0.0003	0.0008	0.0005
Total Zinc	0.032	0.496	0.167
Dissolved Zinc	<0.002	0.009	0.003
Fecal Coliform (cfu/100 ml)	<10	140	17[c]

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

TABLE AVI-13: WATER QUALITY AT STATION 40 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.2[b]	27.2[b]	20.0[b]
Total Suspended Solids	26	52	39
Turbidity (NTU)	43[b]	101[b]	59[b]
Conductivity (µS/cm)	683[b]	921[b]	783[b]
Five-Day Biochemical Oxygen Demand	3	6	5
Dissolved Oxygen	6.6[b]	15.6[b]	9.1[b]
pH (units)	7.4[b]	9.1[b]	8.2[b]
Ammonia Nitrogen	0.04	0.46	0.20
Un-ionized Ammonia	0.001	0.077	0.020
Total Kjeldahl Nitrogen	1.00	1.64	1.33
Nitrite plus Nitrate Nitrogen	1.58	6.73	3.29
Total Nitrogen	3.22	7.73	4.62
Total Phosphorus	0.26	1.29	0.57
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	0.002	0.003	0.002
Phenols	0.005	0.008	0.007
Total Arsenic	<0.003	<0.003	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0017	0.0007
Dissolved Cadmium	<0.0003	<0.0003	0.0003
Total Chromium	<0.004	0.042	0.015
Dissolved Chromium	0.0005	0.0018	0.0011
Total Copper	0.002	0.184	0.056
Dissolved Copper	<0.002	0.003	0.002
Total Iron	1.072	20.875	6.080
Dissolved Iron	<0.004	0.018	0.010
Total Lead	0.005	0.083	0.025
Dissolved Lead	<0.0009	0.0044	0.0022
Total Manganese	0.0614	0.6561	0.2722
Dissolved Manganese	0.0028	0.0103	0.0050
Total Mercury	<0.00006	0.00009	0.00007
Total Nickel	<0.002	0.032	0.013
Dissolved Nickel	<0.002	0.003	0.002
Total Silver	<0.0008	0.0033	0.0012
Dissolved Silver	<0.0003	0.0010	0.0005
Total Zinc	0.027	0.267	0.104
Dissolved Zinc	<0.002	0.017	0.005
Fecal Coliform (cfu/100 ml)	<10	60	16[c]

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

TABLE AVI-14: WATER QUALITY AT STATION 41 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.4[b]	27.2[b]	20.1[b]
Total Suspended Solids	42	91	57
Turbidity (NTU)	45[b]	173[b]	74[b]
Conductivity (µS/cm)	681[b]	915[b]	780[b]
Five-Day Biochemical Oxygen Demand	3	7	5
Dissolved Oxygen	6.2[b]	14.0[b]	8.6[b]
pH (units)	7.4[b]	9.0[b]	8.1[b]
Ammonia Nitrogen	0.08	0.33	0.19
Un-ionized Ammonia	0.001	0.040	0.016
Total Kjeldahl Nitrogen	1.25	1.89	1.50
Nitrite plus Nitrate Nitrogen	1.56	6.66	3.24
Total Nitrogen	3.45	8.05	4.73
Total Phosphorus	0.44	0.62	0.54
Chlorophyll a (µg/L)	20.9	112.8	49.4
Total Cyanide	0.002	0.002	0.002
Phenols	0.003	0.008	0.006
Total Arsenic	<0.003	<0.003	0.003
Dissolved Arsenic	<0.002	0.002	0.002
Total Cadmium	<0.0004	0.0048	0.0012
Dissolved Cadmium	<0.0003	0.0004	0.0003
Total Chromium	<0.004	0.060	0.023
Dissolved Chromium	0.0007	0.0017	0.0012
Total Copper	0.003	0.183	0.060
Dissolved Copper	<0.002	0.003	0.002
Total Iron	0.988	31.404	9.956
Dissolved Iron	0.004	0.016	0.010
Total Lead	0.006	0.112	0.041
Dissolved Lead	<0.0009	0.0033	0.0019
Total Manganese	0.0709	1.1916	0.4444
Dissolved Manganese	0.0013	0.0045	0.0031
Total Mercury	<0.00006	0.00010	0.00007
Total Nickel	<0.002	0.045	0.018
Dissolved Nickel	<0.002	0.003	0.002
Total Silver	<0.0008	<0.0008	0.0008
Dissolved Silver	<0.0003	0.0013	0.0006
Total Zinc	0.027	0.438	0.168
Dissolved Zinc	<0.002	0.007	0.003
Fecal Coliform (cfu/100 ml)	<10	50	18[c]

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

APPENDIX VII

WATER QUALITY AT STATIONS 42–49 DURING MAY, AUGUST, AND OCTOBER 2003

TABLE AVII-1: WATER QUALITY AT STATION 42 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.6[b]	27.2[b]	20.3[b]
Total Suspended Solids	44	119	73
Turbidity (NTU)	56[b]	121[b]	74[b]
Conductivity (µS/cm)	675[b]	910[b]	779[b]
Five-Day Biochemical Oxygen Demand	4	8	6
Dissolved Oxygen	5.9[b]	13.6[b]	8.5[b]
pH (units)	7.5[b]	9.0[b]	8.2[b]
Ammonia Nitrogen	0.04	0.50	0.20
Un-ionized Ammonia	0.002	0.046	0.017
Total Kjeldahl Nitrogen	1.28	1.91	1.49
Nitrite plus Nitrate Nitrogen	1.66	6.54	3.22
Total Nitrogen	3.26	7.97	4.71
Total Phosphorus	0.43	1.11	0.63
Chlorophyll a (µg/L)	25.9	101.1	50.0
Total Cyanide	0.002	0.002	0.002
Phenols	0.004	0.011	0.006
Total Arsenic	<0.003	<0.003	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0047	0.0016
Dissolved Cadmium	<0.0003	0.0006	0.0004
Total Chromium	<0.004	0.079	0.026
Dissolved Chromium	<0.0007	0.0021	0.0014
Total Copper	0.004	0.197	0.065
Dissolved Copper	<0.002	0.011	0.004
Total Iron	1.141	42.973	12.332
Dissolved Iron	<0.004	0.033	0.011
Total Lead	<0.002	0.128	0.044
Dissolved Lead	<0.0009	0.0035	0.0019
Total Manganese	0.0800	1.4931	0.5144
Dissolved Manganese	0.0010	0.0025	0.0019
Total Mercury	<0.00006	0.00010	0.00007
Total Nickel	0.004	0.058	0.021
Dissolved Nickel	<0.002	0.003	0.002
Total Silver	<0.0008	0.0020	0.0010
Dissolved Silver	<0.0003	0.0012	0.0005
Total Zinc	0.027	0.511	0.179
Dissolved Zinc	<0.002	0.009	0.003
Fecal Coliform (cfu/100 ml)	<10	60	18[c]

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

TABLE AVII-2: WATER QUALITY AT STATION 43 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.6[b]	27.4[b]	20.3[b]
Total Suspended Solids	40	383	107
Turbidity (NTU)	32[b]	90[b]	63[b]
Conductivity (µS/cm)	689[b]	914[b]	786[b]
Five-Day Biochemical Oxygen Demand	4	7	5
Dissolved Oxygen	5.4[b]	12.1[b]	8.1[b]
pH (units)	7.6[b]	9.0[b]	8.2[b]
Ammonia Nitrogen	0.14	0.37	0.21
Un-ionized Ammonia	0.002	0.036	0.017
Total Kjeldahl Nitrogen	1.01	1.93	1.46
Nitrite plus Nitrate Nitrogen	2.08	6.76	3.42
Total Nitrogen	3.62	7.77	4.88
Total Phosphorus	0.38	1.47	0.67
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	0.002	0.002	0.002
Phenols	0.003	0.009	0.005
Total Arsenic	<0.003	0.006	0.004
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0022	0.0010
Dissolved Cadmium	<0.0003	0.0004	0.0003
Total Chromium	<0.004	0.064	0.020
Dissolved Chromium	0.0005	0.0017	0.0011
Total Copper	0.007	0.240	0.069
Dissolved Copper	<0.002	0.005	0.003
Total Iron	0.875	26.788	8.673
Dissolved Iron	<0.004	0.021	0.012
Total Lead	0.002	0.118	0.036
Dissolved Lead	<0.0009	0.0027	0.0016
Total Manganese	0.0705	1.3825	0.3961
Dissolved Manganese	0.0009	0.0089	0.0038
Total Mercury	<0.00006	0.00007	0.00006
Total Nickel	0.005	0.054	0.019
Dissolved Nickel	<0.002	0.004	0.003
Total Silver	<0.0008	0.0284	0.0057
Dissolved Silver	<0.0003	0.0009	0.0005
Total Zinc	0.020	0.461	0.150
Dissolved Zinc	<0.002	0.005	0.003
Fecal Coliform (cfu/100 ml)	<10	40	13[c]

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

TABLE AVII-3: WATER QUALITY AT STATION 44 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.7[b]	26.9[b]	19.8[b]
Total Suspended Solids	47	132	79
Turbidity (NTU)	76[b]	169[b]	109[b]
Conductivity (µS/cm)	684[b]	919[b]	784[b]
Five-Day Biochemical Oxygen Demand	3	5	3
Dissolved Oxygen	5.6[b]	11.2[b]	7.8[b]
pH (units)	7.6[b]	9.0[b]	8.2[b]
Ammonia Nitrogen	0.07	0.51	0.21
Un-ionized Ammonia	0.002	0.021	0.012
Total Kjeldahl Nitrogen	0.93	1.72	1.31
Nitrite plus Nitrate Nitrogen	1.53	6.64	3.20
Total Nitrogen	3.25	7.57	4.51
Total Phosphorus	0.33	0.74	0.52
Chlorophyll a (µg/L)	15.5	90.0	49.2
Total Cyanide	0.002	0.003	0.003
Phenols	0.003	0.014	0.008
Total Arsenic	<0.003	0.005	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0023	0.0008
Dissolved Cadmium	<0.0003	0.0006	0.0004
Total Chromium	<0.004	0.041	0.016
Dissolved Chromium	0.0008	0.0016	0.0013
Total Copper	0.011	0.140	0.053
Dissolved Copper	<0.002	0.004	0.002
Total Iron	1.310	17.039	7.035
Dissolved Iron	<0.004	0.325	0.061
Total Lead	0.005	0.087	0.029
Dissolved Lead	<0.0009	0.0027	0.0017
Total Manganese	0.0752	0.8560	0.3069
Dissolved Manganese	0.0013	0.0148	0.0084
Total Mercury	<0.00006	0.00009	0.00007
Total Nickel	0.005	0.044	0.018
Dissolved Nickel	<0.002	0.004	0.003
Total Silver	<0.0008	0.0028	0.0013
Dissolved Silver	<0.0003	0.0015	0.0006
Total Zinc	0.024	0.415	0.143
Dissolved Zinc	<0.002	0.010	0.004
Fecal Coliform (cfu/100 ml)	<10	40	15[c]

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

TABLE AVII-4: WATER QUALITY AT STATION 45 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.4[b]	26.9[b]	20.1[b]
Total Suspended Solids	56	227	98
Turbidity (NTU)	79[b]	131[b]	101[b]
Conductivity (µS/cm)	677[b]	914[b]	787[b]
Five-Day Biochemical Oxygen Demand	3	6	4
Dissolved Oxygen	5.4[b]	12.0[b]	8.1[b]
pH (units)	7.6[b]	9.1[b]	8.3[b]
Ammonia Nitrogen	0.09	0.30	0.16
Un-ionized Ammonia	0.002	0.034	0.014
Total Kjeldahl Nitrogen	1.08	1.69	1.35
Nitrite plus Nitrate Nitrogen	1.48	6.39	3.04
Total Nitrogen	2.78	7.50	4.39
Total Phosphorus	0.36	0.75	0.58
Chlorophyll a (µg/L)	32.7	99.1	60.8
Total Cyanide	0.002	0.002	0.002
Phenols	0.004	0.008	0.006
Total Arsenic	<0.003	0.004	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0012	0.0006
Dissolved Cadmium	<0.0003	0.0004	0.0003
Total Chromium	<0.004	0.041	0.017
Dissolved Chromium	0.0007	0.0027	0.0014
Total Copper	0.007	0.173	0.056
Dissolved Copper	<0.002	0.003	0.002
Total Iron	1.182	20.940	7.704
Dissolved Iron	<0.004	0.021	0.008
Total Lead	<0.002	0.083	0.031
Dissolved Lead	<0.0009	0.0033	0.0015
Total Manganese	<0.0002	0.8398	0.3015
Dissolved Manganese	0.0008	0.0049	0.0035
Total Mercury	<0.00006	<0.00006	0.00006
Total Nickel	<0.002	0.042	0.019
Dissolved Nickel	<0.002	0.004	0.003
Total Silver	<0.0008	<0.0008	0.0008
Dissolved Silver	<0.0003	0.0016	0.0006
Total Zinc	0.032	0.422	0.143
Dissolved Zinc	<0.002	0.011	0.004
Fecal Coliform (cfu/100 ml)	<10	70	16[c]

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

TABLE AVII-5: WATER QUALITY AT STATION 46 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.8[b]	27.5[b]	20.3[b]
Total Suspended Solids	53	108	75
Turbidity (NTU)	71[b]	115[b]	93[b]
Conductivity (µS/cm)	672[b]	913[b]	790[b]
Five-Day Biochemical Oxygen Demand	<2	6	4
Dissolved Oxygen	5.4[b]	12.5[b]	8.3[b]
pH (units)	7.8[b]	9.2[b]	8.3[b]
Ammonia Nitrogen	0.08	0.38	0.17
Un-ionized Ammonia	0.004	0.044	0.016
Total Kjeldahl Nitrogen	1.11	1.64	1.34
Nitrite plus Nitrate Nitrogen	0.86	5.92	2.74
Total Nitrogen	2.10	7.03	4.09
Total Phosphorus	0.43	0.57	0.52
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	0.002	0.002	0.002
Phenols	0.003	0.008	0.005
Total Arsenic	<0.003	<0.003	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0013	0.0007
Dissolved Cadmium	<0.0003	0.0004	0.0003
Total Chromium	<0.004	0.045	0.011
Dissolved Chromium	0.0009	0.0016	0.0012
Total Copper	0.008	0.175	0.051
Dissolved Copper	<0.002	0.005	0.003
Total Iron	0.458	22.378	5.075
Dissolved Iron	<0.004	0.014	0.008
Total Lead	<0.002	0.077	0.018
Dissolved Lead	<0.0009	0.0032	0.0018
Total Manganese	0.0117	0.7456	0.2034
Dissolved Manganese	0.0012	0.0057	0.0037
Total Mercury	<0.00006	<0.00006	0.00006
Total Nickel	0.005	0.056	0.015
Dissolved Nickel	<0.002	0.003	0.002
Total Silver	<0.0008	0.0018	0.0010
Dissolved Silver	<0.0003	0.0009	0.0004
Total Zinc	0.024	0.334	0.091
Dissolved Zinc	<0.002	0.008	0.004
Fecal Coliform (cfu/100 ml)	<10	120	21[c]

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

TABLE AVII-6: WATER QUALITY AT STATION 47 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.9[b]	27.3[b]	20.8[b]
Total Suspended Solids	44	128	82
Turbidity (NTU)	69[b]	142[b]	104[b]
Conductivity (µS/cm)	673[b]	911[b]	793[b]
Five-Day Biochemical Oxygen Demand	3	6	4
Dissolved Oxygen	5.4[b]	11.7[b]	8.0[b]
pH (units)	7.8[b]	9.1[b]	8.3[b]
Ammonia Nitrogen	0.08	0.45	0.20
Un-ionized Ammonia	0.004	0.036	0.016
Total Kjeldahl Nitrogen	1.26	2.37	1.60
Nitrite plus Nitrate Nitrogen	1.03	5.89	2.77
Total Nitrogen	2.29	7.15	4.37
Total Phosphorus	0.50	0.98	0.65
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	0.002	0.002	0.002
Phenols	0.003	0.007	0.005
Total Arsenic	<0.003	0.004	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0010	0.0006
Dissolved Cadmium	<0.0003	<0.0003	0.0003
Total Chromium	<0.004	0.056	0.021
Dissolved Chromium	0.0010	0.0016	0.0012
Total Copper	0.007	0.166	0.064
Dissolved Copper	<0.002	0.003	0.002
Total Iron	1.527	27.657	10.771
Dissolved Iron	0.004	0.067	0.017
Total Lead	0.007	0.106	0.038
Dissolved Lead	<0.0009	0.0039	0.0020
Total Manganese	0.0854	1.2344	0.4469
Dissolved Manganese	0.0009	0.0052	0.0033
Total Mercury	<0.00006	<0.00006	0.00006
Total Nickel	0.006	0.062	0.024
Dissolved Nickel	<0.002	0.004	0.003
Total Silver	<0.0008	<0.0008	0.0008
Dissolved Silver	<0.0003	0.0008	0.0004
Total Zinc	0.034	0.395	0.155
Dissolved Zinc	<0.002	0.007	0.003
Fecal Coliform (cfu/100 ml)	<10	90	32[c]

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

TABLE AVII-7: WATER QUALITY AT STATION 48 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.5[b]	27.5[b]	20.7[b]
Total Suspended Solids	64	160	91
Turbidity (NTU)	76[b]	166[b]	111[b]
Conductivity (µS/cm)	670[b]	918[b]	799[b]
Five-Day Biochemical Oxygen Demand	<2	5	4
Dissolved Oxygen	5.3[b]	11.6[b]	8.0[b]
pH (units)	7.9[b]	9.1[b]	8.3[b]
Ammonia Nitrogen	0.10	0.36	0.20
Un-ionized Ammonia	0.003	0.031	0.018
Total Kjeldahl Nitrogen	1.24	1.60	1.43
Nitrite plus Nitrate Nitrogen	1.11	5.64	2.72
Total Nitrogen	2.52	6.88	4.15
Total Phosphorus	0.42	0.64	0.56
Chlorophyll a (µg/L)	23.9	88.1	55.6
Total Cyanide	0.002	0.002	0.002
Phenols	0.003	0.006	0.005
Total Arsenic	<0.003	0.004	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0033	0.0010
Dissolved Cadmium	<0.0003	<0.0003	0.0003
Total Chromium	<0.004	0.052	0.020
Dissolved Chromium	0.0008	0.0016	0.0012
Total Copper	0.007	0.168	0.055
Dissolved Copper	<0.002	0.003	0.002
Total Iron	1.708	27.513	9.417
Dissolved Iron	<0.004	0.015	0.009
Total Lead	0.006	0.105	0.034
Dissolved Lead	<0.0009	0.0031	0.0015
Total Manganese	0.1084	1.0699	0.4176
Dissolved Manganese	0.0010	0.0036	0.0022
Total Mercury	<0.00006	<0.00006	0.00006
Total Nickel	0.006	0.055	0.022
Dissolved Nickel	<0.002	0.003	0.002
Total Silver	<0.0008	0.0015	0.0010
Dissolved Silver	<0.0003	0.0010	0.0005
Total Zinc	0.039	0.379	0.149
Dissolved Zinc	<0.002	0.008	0.003
Fecal Coliform (cfu/100 ml)	<10	200	26[c]

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

TABLE AVII-8: WATER QUALITY AT STATION 49 IN THE ILLINOIS RIVER
MAY, AUGUST, AND OCTOBER 2003

Constituents[a]	Minimum	Maximum	Mean
Water Temperature (°C)	16.8[b]	27.6[b]	20.7[b]
Total Suspended Solids	49	124	85
Turbidity (NTU)	72[b]	151[b]	106[b]
Conductivity (µS/cm)	673[b]	913[b]	802[b]
Five-Day Biochemical Oxygen Demand	3	7	5
Dissolved Oxygen	5.3[b]	11.8[b]	7.9[b]
pH (units)	7.8[b]	9.1[b]	8.3[b]
Ammonia Nitrogen	1.10	0.54	0.27
Un-ionized Ammonia	0.005	0.048	0.022
Total Kjeldahl Nitrogen	1.05	1.79	1.39
Nitrite plus Nitrate Nitrogen	1.05	5.54	2.71
Total Nitrogen	2.19	6.59	4.11
Total Phosphorus	0.46	0.69	0.56
Chlorophyll a (µg/L)	No Data	No Data	No Data
Total Cyanide	0.002	0.002	0.002
Phenols	0.003	0.006	0.004
Total Arsenic	<0.003	<0.003	0.003
Dissolved Arsenic	<0.002	<0.002	0.002
Total Cadmium	<0.0004	0.0030	0.0013
Dissolved Cadmium	<0.0003	<0.0003	0.0003
Total Chromium	<0.004	0.058	0.022
Dissolved Chromium	0.0008	0.0016	0.0012
Total Copper	0.009	0.232	0.076
Dissolved Copper	<0.002	0.004	0.003
Total Iron	1.608	27.784	10.689
Dissolved Iron	<0.004	0.011	0.006
Total Lead	0.005	0.100	0.038
Dissolved Lead	<0.0009	0.0037	0.0020
Total Manganese	0.1057	1.3473	0.4616
Dissolved Manganese	0.0010	0.0030	0.0020
Total Mercury	<0.00006	<0.00006	0.00006
Total Nickel	0.004	0.055	0.021
Dissolved Nickel	<0.002	0.004	0.003
Total Silver	<0.0008	0.0012	0.0009
Dissolved Silver	<0.0003	0.0006	0.0004
Total Zinc	0.042	0.393	0.160
Dissolved Zinc	<0.002	0.008	0.003
Fecal Coliform (cfu/100 ml)	<10	120	30[c]

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