

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:)
)
WATER QUALITY STANDARDS AND) R08-9
EFFLUENT LIMITATIONS FOR THE) (Rulemaking - Water)
CHICAGO AREA WATERWAY SYSTEM)
AND THE LOWER DES PLAINES RIVER:) Subdocket C
PROPOSED AMENDMENTS TO 35 Ill.)
Adm. Code Parts 301, 302, 303 and 304)

NOTICE OF FILING

To: ALL COUNSEL OF RECORD
(Service List Attached)

PLEASE TAKE NOTICE that on the 8th day of September, 2011, I, on behalf of the Metropolitan Water Reclamation District of Greater Chicago (the "District"), electronically filed the District's **Responses to Information Requests at May 16-18, June 27, and August 15-16, 2011 Hearings**, with the Office of the Clerk of the Illinois Pollution Control Board.

Dated: September 8, 2011

**METROPOLITAN WATER RECLAMATION
DISTRICT OF GREATER CHICAGO**

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PROOF OF SERVICE

The undersigned, a non-attorney, certifies, under penalties of perjury pursuant to 735 ILCS 5/1-109, that I caused a copy of the forgoing, the District's **Responses to Information Requests at May 16-18, June 27, and August 15-16, 2011 Hearings**, to be served via First Class Mail, postage paid, from One North Wacker Drive, Chicago, Illinois, on the 8th day of September, 2011, upon the attorneys of record on the attached Service List.

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**METROPOLITAN WATER RECLAMATION DISTRICT OF
GREATER CHICAGO'S RESPONSES TO INFORMATION
REQUESTS AT MAY 16-18, JUNE 27, AND AUGUST 15-16, 2011 HEARINGS**

The Metropolitan Water Reclamation District of Greater Chicago (the "District") hereby files its Responses to the Information Requests made by the Pollution Control Board (the "Board") and parties to this rulemaking at the hearings conducted on May 16-18, June 27, and August 15-16, 2011. At the hearings on those dates, the Board and several parties made requests that the District provide certain information. Attached hereto is a list of those requests, along with the District's itemized Responses to the information requests. For each numbered request, the Response is attached as an Item with the same number. The particular order of the requests in the list was developed strictly for organizational purposes, and is not meant to convey priority.

**METROPOLITAN WATER RECLAMATION
DISTRICT OF GREATER CHICAGO**

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<u>INFORMATION REQUEST</u>	<u>PAGE OF TRANSCRIPT OF REQUEST</u>
1. Impact of nutrient removal on dissolved oxygen levels	May 18, 2011 Hearing, at 17-18
2. Impacts of various sources on dissolved oxygen levels	May 18, 2011 Hearing, at 85-86
3. MWRD report on 2008 dissolved oxygen data	May 16, 2011 Hearing, at 37-38
4. Comparison of MWRD temperature data to current water quality standards	May 16, 2011 Hearing, at 160-61
5. Information on correlation of macroinvertebrate and sediment data in Habitat Evaluation Report	May 16, 2011 Hearing, at 152-53
6. Basis for Cuyahoga "fish passage" designation	May 17, 2011 Hearing (morning), at 111-112
7. Revised cyanide calculations excluding brook trout	May 17, 2011 Hearing (afternoon), at 91-92
8. Operating hours and procedures for existing aeration stations	May 18, 2011 Hearing, at 25
9. Locations of Lake Calumet Connecting Channel and various slips	June 27, 2011 Hearing, at 46-47
10. Drainage basins for specific rain gauges	June 27, 2011 Hearing, at 63
11. Temperature factors assessed in preparation of Habitat Evaluation Report	May 16, 2011 Hearing, at 78
12. Table from draft IDNR 2000 report on Illinois IBI	May 16, 2011 Hearing, at 133
13. Reports concerning electrofishing depth	August 15, 2011 Hearing

ITEM 1

EFFECT OF NUTRIENT REMOVAL ON BIOCHEMICAL OXYGEN DEMAND

During the May 18, 2011 hearing, Pollution Control Board staff asked the District to provide information regarding the effect of nutrient removal on effluent levels of biochemical oxygen demand (BOD). Based on its review of relevant information, the District believes that the effect of nutrient removal on effluent BOD levels will depend on what processes are needed for the required nutrient removal. If nutrient removal is accomplished with filtration, BOD levels will be reduced from the current levels. However, if nutrient removal is accomplished without filtration, BOD levels will not change. Table 1 contains information concerning BOD effluent levels from treatment plants accomplishing nutrient removal with and without filtration.

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TABLE 1: EFFLUENT BIOCHEMICAL OXYGEN DEMAND CONCENTRATIONS FROM TREATMENT PLANTS REMOVING TOTAL NITROGEN AND/OR TOTAL PHOSPHORUS

LOCATION/	PROCESS	EFFLUENT BOD	SOURCE
Nutrient Removal Plants (Without Filters)			
China	A2O - Phoredox TP _{eff} : 0.53 mg/L; TN _{eff} : 8.79 mg/L	Avg. 11.7 mg/L <i>Based on 12/2009 to 12/2010 data</i>	Zhang, (2011)
China	Oxidation Ditch – Carrousel TP _{eff} : 0.26 mg/L; TN _{eff} : NA ¹	Average 15.0 mg/L <i>Based on 12/2009 to 12/2010 data</i>	Zhang, (2011)
China	Oxidation Ditch – Carrousel TP _{eff} : 1.36 mg/L; TN _{eff} : NA ¹	Average 6.1 mg/L <i>Based on 12/2009 to 12/2010 data</i>	Zhang, (2011)
Connecticut	4-Stage Bardenpho TP _{eff} : NA ¹ ; TN _{eff} : 3.2 mg/L	Average 1.6 mg/L <i>Based on 2008 data</i>	Drainville, (2009)
Unknown	Reversed A2O TP _{eff} : 0.5 – 1.5 mg/L; TN _{eff} : 11 – 20 mg/L	8.0 – 19.0 mg/L	Hua, (2009)
Unknown	Reversed A2O TP _{eff} : 0.75 – 1.55 mg/L; TN _{eff} : 14 – 25 mg/L	7.5 – 23.0 mg/L	Hua, (2009)
Nutrient Removal Plants (with Filters)			
North Carolina	4-Stage Bardenpho w/denitrification filters TP _{eff} : NA ¹ ; TN _{eff} : 2.3 mg/L	Meets the following limits: 10 mg/L in winter; 5 mg/L in summer <i>Based on data 2006 data</i>	DiFiore, (2007)
Maryland	5-Stage Bardenpho w/filters TP _{eff} : 0.22 mg/L; TN _{eff} : 2.26 mg/L	Less than 5 mg/L <i>Based on 9/2007 to 5/2008 data</i>	Maillard, (2008)
Helsinki	Modified Ludzack Ettinger (MLE) w/denitrification filters and chemical P removal TP _{eff} : 0.24 mg/L; TN _{eff} : 3 - 10 mg/L	MLE only: 10 mg/L MLE w/denitrification filters: 6 mg/L	Kiiskinen, (2005)
Puerto Rico	Conventional Activated Sludge w/denitrification filters TP _{eff} : NA ¹ ; NO ₃ ⁻ _{eff} : 0.3 mg/L	Aeration tanks only: 8.2 mg/L After denitrification filters: 2.6 mg/L	Gutierrez, (2003)

¹ NA - Not applicable; treatment plant does not remove particular nutrient.

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ITEM 2

Information Request No. 2 – Impacts of Various Sources on Dissolved Oxygen Levels

A question was raised as to information regarding the contributions of oxygen demand from various sources, including CSOs, treatment facilities, and stagnant waters. Dr. Zenz indicated that specific information on those issues would be included in the final Integrated Strategy report. That report, which addresses options for compliance with the IEPA's proposed DO standards, will be submitted to the Board shortly, but it will not contain specific information regarding oxygen demand contributions from specific sources. The conclusions in that report will be based on a modeling study that was conducted by Dr. Steven Melching and other researchers at Marquette University. The report from that study, which was attached to Dr. Zenz's testimony that was filed on February 2, 2011, does contain information about various sources of oxygen demand. Also, information about contributions of CSOs to dissolved oxygen levels is presented in the attached article by the Marquette researchers and MWRD personnel, which was presented at the Water Environment Federation annual WEFTEC conference in 2007.

**EVALUATION OF ELIMINATING GRAVITY CSOs ON WATER QUALITY
OF THE CHICAGO AREA WATERWAYS (CAWs) USING
AN UNSTEADY FLOW WATER QUALITY MODEL**

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ABSTRACT

The water quality in the Chicago Area Waterways (CAWs) has been improved in the past two decades as a result of intercepting combined sewer overflows (CSOs) by the deep tunnels that have been built under the Tunnel and Reservoir Plan (TARP) and better performance at the water reclamation plants discharging to the waterways. However, the storage capacity of the deep tunnels, of which most has been in use, is limited to under 6.9 million cubic meters (245 million cubic feet) and is insufficient for 803 square kilometers (310 square miles) of combined sewer areas, and CSO discharges via gravity CSO outfalls to the CAWs still frequently occur until the storage reservoirs are complete in about another decade. A recent Use Attainability Analysis (UAA) study for the CAWs by the Illinois Environmental Protection Agency (IEPA) required an evaluation of treating the gravity CSOs in the system and its impact on the water quality of the CAWs. An unsteady flow water quality model developed for the CAWs was used for the evaluation of eliminating gravity CSOs on the water quality of the CAWs. Two scenarios, with and without the gravity CSOs in the model, were simulated. The simulated hourly dissolved oxygen (DO) concentrations at thirty seven selected locations throughout the CAWs were analyzed and compared. The simulation results indicated that eliminating gravity CSOs increased stream DO concentrations in the entire system with different improvements at different locations. The simulated DO concentration increase was the most significant in the Upper North Shore Channel, where the stream flow was dominated by gravity CSOs during a storm. CSOs from a fairly large storm could have prolonged impact on stream DO concentrations, which could last for weeks. Even if all gravity CSOs were eliminated, which means the complete capture of the gravity CSOs to the system, the target DO value of 4 mg/L could not be satisfied 100 percent of the time at some locations in the CAWs under the summer conditions in 2001 and 2002.

KEYWORDS

Combined Sewer Overflows (CSOs), water quality modeling, dissolved oxygen, Chicago Area Waterways.

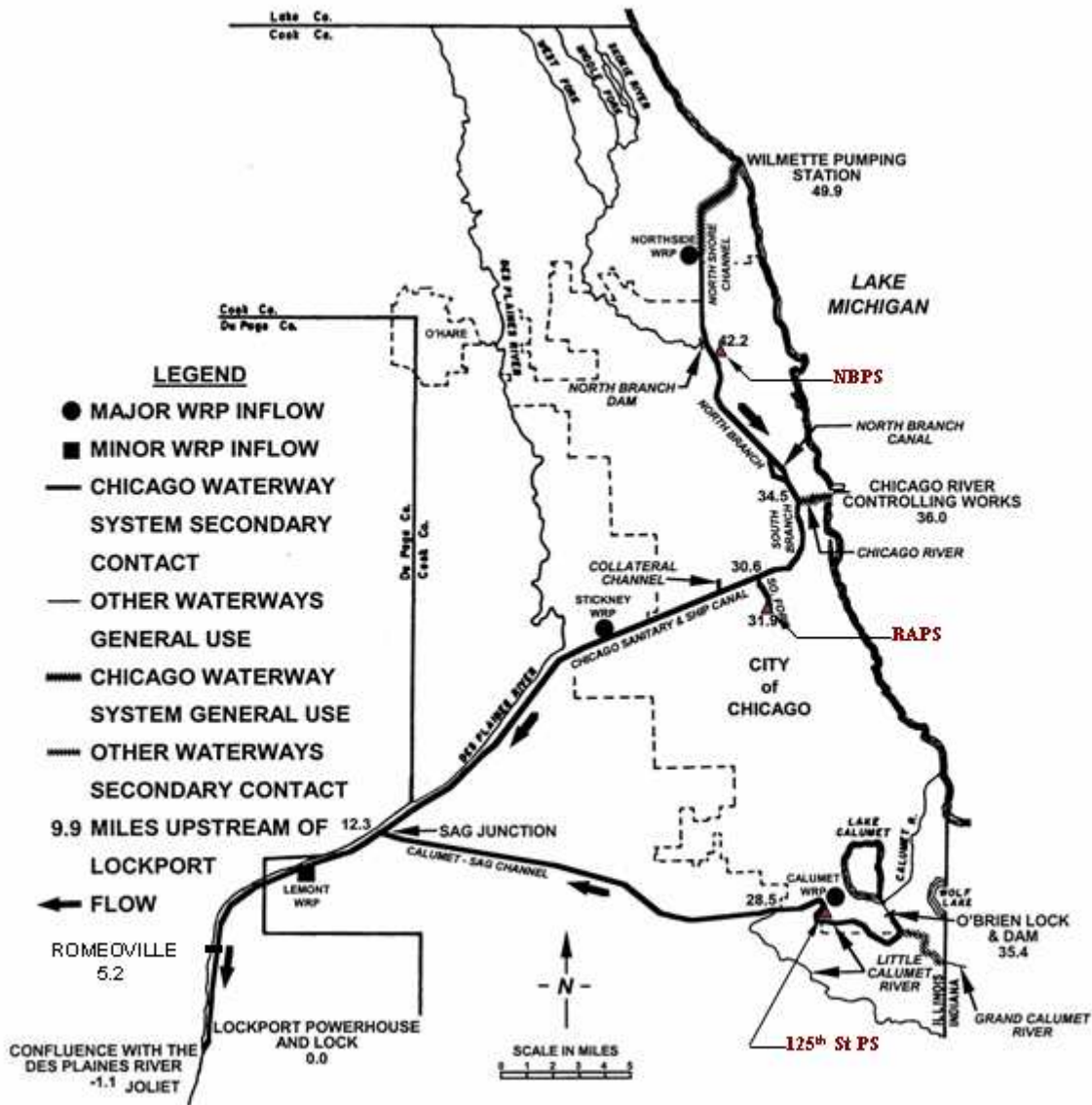
INTRODUCTION

The Chicago Area Waterways (CAWs) consist of two natural river systems, i.e. the Chicago and Calumet river systems that have been significantly altered for drainage and navigation purposes, and three man-made channels, i.e. the North Shore Channel (NSC), Chicago Sanitary and Ship Canal (CSSC) and Calumet-Sag Channel (CSC). The man-made channels were created to reverse the river flows and provide urban drainage for the Chicago area, taking pollutants away from Lake Michigan to protect the major drink water source for the region. As shown in Figure 1, the CAWs are a 78-mile branching network and most of its reaches are used for commercial and recreational navigation and urban drainage. The major point sources to the CAWs are the treated sewage from the three large water reclamation plants (WRPs) serving the region and pumped CSOs from three large pumping stations discharging only during a large storm, these are also the main flow contributors to the system.

The City of Chicago and several surrounding municipalities have combined sewer systems, which are located in the watershed of the CAWs. Combined sewer overflows (CSOs) are discharged into the CAWs during a large storm via approximately 240 gravity CSO outfalls and 3 large CSO pumping stations--North Branch Pumping Station (NBPS), Racine Avenue Pumping Station (RAPS), and 125th Street Pumping Station (125th St PS)--as shown in Figure 1. Since 1970s', the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC) has been implementing a Tunnel and Reservoir Plan (TARP) to capture the majority of CSOs by intercepting them through drop shafts into the deep tunnels and diverting them into large reservoirs for temporary storage. The stored CSO will eventually be treated in two of the MWRDGC's large WRPs, the Stickney and Calumet WRPs, before being discharged into the CAWs. Of 176 kilometers (109.4 miles) of planned deep tunnels, 124 kilometers (77.2 miles) are located in this watershed with a storage volume of 6.9 million cubic meters (245 million cubic feet or 1.8 billion gallons). Most of the deep tunnels have been built and are in service. The large CSO storage reservoirs are still under construction. Currently, CSO discharges to the waterways during a large storm after the deep tunnels are filled are still occurring, resulting in some degree of deterioration in water quality.

A recent Use Attainability Analysis (UAA) study conducted by the IEPA for the CAWs required the MWRDGC to evaluate alternatives that are potentially applicable to improve the water quality of the CAWs. On-site treatment of gravity CSOs is one of the alternatives proposed by the UAA study. However, the benefits of treating gravity CSOs need to be evaluated to justify the potential cost for constructing treatment facilities. The main benefits of CSO treatment are to increase DO concentrations and decrease pathogen densities, if disinfection is part of the treatment, in the waterways. The extents of such improvement have to be evaluated through a modeling study, given the complexity and scale of the system.

Figure 1 – The Chicago Area Waterways and location of some major point sources



A one-dimensional unsteady flow water quality model for the CAWs was developed by Marquette University at the request of the MWRDGC prior to the UAA study. The model uses the Duflow Modeling Studio, developed in the Netherlands (STOWA/MX. Systems, 2004), as the platform for simulations. The modeling software was chosen because of its successful application to several European river systems for both hydraulic and water quality, its unique features of scenario management for water quantity and water quality models, and its compatibility with Geographical Information Systems (GIS) and the Microsoft Windows operating system (Shrestha and Melching, 2003). The unsteady flow water quality model for the CAWs includes most of the waterways system with the Wilmette pumping station, the Chicago River Controlling Works (CRCW), the O'Brien Lock & Dam (O'Brien L&D) and the USGS

gauge station on the Little Calumet River South as the upstream boundaries and Romeoville on the CSSC as the downstream boundary, because USGS gauge stations were located at these locations and extensive hydraulic data were collected during the time periods that the model intended to simulate. Many tributaries to the CAWs were treated as inflow points to the system in the model. The model was calibrated using intensively measured water quality data collected in the summer and fall of 2001 and verified using the routine monitoring data in 2002 (Alp and Melching, 2006).

The calibrated and verified unsteady flow water quality model for the CAWs was used extensively for evaluating various alternatives proposed by the UAA study for improving the water quality of the CAWs. This study evaluated the impact of eliminating all gravity CSOs to the CAWs, which means complete capture of these CSOs, on the water quality of the CAWs, using the water quality model and scenario simulations. The approach and results of the study are presented in this paper.

APPROACH

The combined sewer systems in the City of Chicago and a few surrounding municipalities are located in the upstream areas of the CAWs, as shown in Figure 1. There are approximately 240 gravity CSO outfalls with various sizes in the watershed. Only on a very rare occasion, CSOs are discharged at all these locations. CSOs at many of these locations have been intercepted by the deep tunnels since the deep tunnels were gradually put into service starting in 1985. Uneven rain distribution over the entire watershed makes CSO discharges vary from location to location and event to event. Unlike the CSO discharged at the three large pumping stations, at which the discharge time and volume are recorded, in this watershed, the information on the location and quantity of CSO discharges at the gravity CSO outfalls were scarce. Therefore, it is difficult to mimic every gravity CSO discharge in the model. In order for the model to properly handle the CSOs, the gravity CSO outfalls were consolidated into 28 representative locations in the model, spreading over the entire combined sewer system. Table 1 summarizes the numbers of representative CSO discharge locations and the corresponding receiving stream reaches.

Table 1 – Distribution of CSO discharge locations in the model

Number of CSO Discharge Locations	Stream Receiving CSO Discharges
2	Upper North Shore Channel (upstream of Northside WRP) (UNSC)
2	Lower North Shore Channel (downstream of Northside WRP) (LNSC)
5	North Branch of Chicago River (NBCR)
1	Chicago River (CR)
2	South Branch of Chicago River (SBCR)
6	Chicago Sanitary and Ship Canal (CSSC)
3	Calumet-Sag Channel (CSC)
4	Little Calumet River North (LCRN)
3	Little Calumet River South (LCRS)

The total CSO discharge, which is the sum of all gravity CSO discharges in the model, was determined by matching the simulated and measured stages at the downstream boundary during the CSO periods (Shrestha and Melching, 2003). Assumptions were made that CSO discharges were uniformly distributed in time and space in the entire watershed during the CSO periods and the discharge time and hourly discharge rate were determined using the data collected at one of the three large CSO pumping stations. However, CSO discharge at each of these 28 locations was different and was calculated based on its portion of the total CSO drainage area and the total CSO discharge estimated from the hydraulic balance for the entire system. In the model, the gravity CSO discharges in 2001 varied hour by hour in each event, but in 2002 were constant throughout an event. Tables 2 and 3 list the gravity CSO duration and total discharges, which are the sums of 28 individual CSOs, in each CSO event for 2001 and 2002, respectively.

Table 2 – Duration and total discharges of the gravity CSOs in the 2001 model

Event Date	Duration hour	Mean flow m ³ /s (cfs)*	Peak flow m ³ /s (cfs)*
7/25/2001	10	61.6 (2,170)	116 (4,080)
8/2-3/2001	17	194 (6,850)	574 (20,300)
8/25/2001	9	190 (6,710)	586 (20,700)
8/30-31/2001	9	78.7 (2,780)	130 (4,590)
9/19/2001	9	117 (4,150)	258 (9,100)
9/20-21/2001	13	66.1 (2,330)	167 (5,910)
9/23/2001	8	102 (3,590)	184 (6,510)
10/5/2001	10	65.6 (2,320)	102 (3,610)
10/12/2001	7	102 (3,600)	177 (6,250)
10/13-14/2001	27	105 (3,730)	278 (9,810)
10/23/2001	5	65.4 (2,310)	101 (3,560)

* The unit for values in parentheses is cubic feet per second (cfs).

Table 3 – Duration and total discharges of the gravity CSOs in the 2002 model

Event Date	Duration hour	Mean flow m ³ /s (cfs)*	Peak flow m ³ /s (cfs)*
5/11/2002	5	114 (4,040)	114 (4,040)
5/12/2002	25	457 (16,100)	457 (16,100)
5/16/2002	8	46.9 (1,660)	46.9 (1,660)
6/11/2002	4	239 (8,430)	239 (8,430)
7/9/2002	4	82.1 (2,900)	82.1 (2,900)
8/22-23/2002	37	43.0 (1,520)	43.0 (1,520)

* The unit for the values in parentheses is cubic feet per second (cfs).

Several CSOs discharged at the three large CSO pumping stations were sampled in 2001 for measuring chemical constituents, which include BOD₅, Suspended Solids (SS), all nitrogen

species, soluble and total phosphorus and pH, in the pumped CSOs. The event mean concentrations (EMCs) were calculated and were used in the model. No measured concentration data were available in 2002. For the events that had no measured data, the average values of EMCs from historic data were used. Chemical constituents in the gravity CSOs were not measured during the study period. The data from the nearby CSO pumping station were used for the gravity CSOs in the model. For the gravity CSOs discharged to UNSC, LNSC, NBCR and CR, the NBPS data were used, for the gravity CSOs discharged to SBCR and CSSC, the RAPS data were used, and for the gravity CSOs discharged to CSC, LCRN and LCRS, the 125th St PS data were used. Using limited historical EMC data for gravity CSOs Neugebauer and Melching (2005) showed that this approach was statistically reasonable. The major chemical constituents in the gravity CSOs modeled in 2001 and 2002 are listed in Table 4. Detailed description on how concentrations of the chemical constituents in the modeled CSOs were derived can be found in the report by Alp and Melching (2006).

Table 4 – Major chemical constituents in the modeled gravity CSOs in 2001 and 2002

Event Date	NBPS			RAPS			125th St PS		
	BOD ₅	SS	NH ₄ -N	BOD ₅	SS	NH ₄ -N	BOD ₅	SS	NH ₄ -N
7/25/01	35.6	107	2.72	45.8	641	1.32	25.9	81.7	0.92
8/2-3/01	27.3	92.3	1.81	39.3	498	1.05	24.4	86.0	1.24
8/25/01	35.6	107	2.72	53.0	820	1.60	12.6	68.3	0.88
8/30-31/01	35.6	107	2.72	59.4	989	1.90	25.9	81.7	0.92
9/19/01	14.9	67.0	2.38	55.2	875	1.70	25.9	81.7	0.92
9/20-21/01	20.8	83.1	1.77	50.1	744	1.50	25.9	81.7	0.92
9/23/01	42.3	87.1	5.81	58.3	959	1.90	25.9	81.7	0.92
10/5/01	35.6	107	2.72	49.6	731	1.50	25.9	81.7	0.92
10/12/01	35.6	107	2.72	60.6	1022	2.00	8.40	41.4	0.32
10/13-14/01	30.2	52.2	1.83	33.2	376	0.80	8.40	41.4	0.32
10/23/01	35.6	86.1	1.92	50.9	763	1.50	25.9	81.7	0.92
All in 2002	35.4	102	2.86	52.1	500	2.86	25.7	75.9	1.04

Note: The unit for all the values in the table is mg/L.

The unsteady flow water quality model for the CAWs developed by Marquette University using the Duflow Modeling Studio software was used to evaluate the impact of the gravity CSOs on dissolved oxygen (DO) concentrations. The model was simulated with two different scenarios, Baseline and No Gravity CSOs. The first scenario, Baseline, is used to simulate the real condition using the calibrated (Year 2001) and verified (Year 2002) model. This Baseline scenario has all 28 gravity CSOs and other hydraulic conditions intact. The second scenario, No Gravity CSOs, is used to simulate the condition assuming that all 28 gravity CSOs into the CAWs would be eliminated. The second scenario also uses a modified downstream flow boundary condition, which was derived by subtracting the total gravity CSO flows in the model from the flow at Romeoville, Illinois, which is the downstream boundary of the model. In reality, the captured and stored CSO is eventually returned to the CWS after full secondary treatment at the Calumet and Stickney WRPs. However, since it is not yet known when the captured and stored CSO flows would be returned to the CAWs, this returned flow was not been accounted for in this modeling exercise.

For each scenario, model simulations were separately performed for two simulation periods from July 12 to November 9 of 2001, which had eleven CSO events, and from May 1 to September 23 of 2002, which had six CSO events. In every simulation, all hydraulic conditions, except for gravity CSOs and the downstream flow boundary, and all kinetic constants and chemical constituents, including oxygen loadings from the two instream aeration stations and four Sidestream Elevated Pool Aeration (SEPA) stations, remained unchanged. In the No Gravity CSOs scenario, all gravity CSO discharges were set as zero in the model.

RESULTS AND DISCUSSION

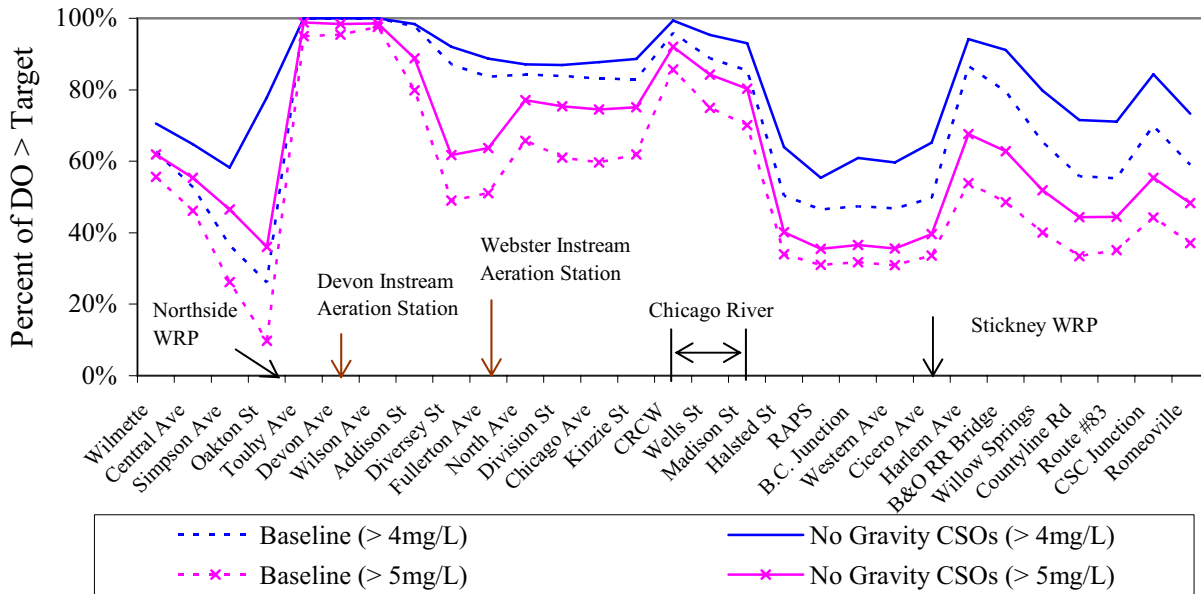
The hydraulic data were input into the model at a 15-minute interval for the upstream and downstream boundaries and gauged and ungauged tributaries, and a one-hour interval for the flows from the major point sources, such as WRP effluents and gravity and pumped CSOs. However, the measured chemical constituents input into the model at the boundaries and point sources had much larger time intervals varying from daily to monthly, except for DO concentrations, which were monitored hourly by the MWRDGC at thirty four locations throughout the CAWs. Alp and Melching (2006) discussed in detail the selection of chemical constituents for the model input in their report. The Duflow Modeling Studio allows users to define the time steps separately for computation and output. In the simulations, the computational time step for both flow and water quality was 15 minutes, and the output time step was one hour. After each simulation run, simulated hourly DO concentrations at 37 locations throughout the CWS were retrieved. The simulated hourly DO concentrations were used for evaluation in this study, although other chemical constituents can also be retrieved from model simulations.

To satisfy the requirements of the UAA study for the CAWs, the percentage of simulated hourly DO concentrations greater than 4, 5, and 6 mg/L, respectively, for a given simulation period was calculated at the selected locations. The percentage compliance of DO concentration with a target DO level in the waterways could be examined. Figures 2 and 3 present the comparison of the percentage of simulated hourly DO concentrations greater than 4 and 5 mg/L for the Chicago and Calumet river systems, respectively, between the two scenarios for the simulation period of July 12 to November 9, 2001, and Figures 4 and 5 for the simulation period of May 1 to September 23, 2002. The locations in the figures are arranged from upstream to downstream for both waterways systems.

As shown in these figures, the improvement of simulated hourly DO concentrations in the CAWs after eliminating gravity CSOs varied from location to location. At a location, the improvement of DO concentrations after eliminating the gravity CSOs is depicted in the figures as the difference between the dashed line and the corresponding solid line. For satisfying the target DO concentration of greater than 4 mg/L, the largest difference, hence the largest improvement, took place at Oakton Street, which is located on the UNSC upstream of the Northside WRP, under the summer conditions in 2001 and 2002. At this location, stream flow is relatively low during the dry weather periods and sediment oxygen demand causes low stream DO concentrations, as indicated by the solid lines (without gravity CSOs) in the figures. There are gravity CSO outfalls located upstream of this location and when CSOs occur during a storm, CSOs become the dominant flow and further reduce DO concentrations in the stream. In the model, two

representative gravity CSOs for the UNSC were located upstream of this location and the CSO discharges at these two locations accounted for 8.4 percent of the total gravity CSO discharges to the system. As expected, the elimination of these two gravity CSOs in the UNSC dramatically improved the simulated DO concentrations with respect to the percentage increase in the reach downstream of the gravity CSO discharge location and upstream of the Northside WRP.

Figure 2 - Comparison of percentage of the simulated hourly DO concentrations greater than 4 and 5 mg/L with and without gravity CSOs in the Chicago River system in the period of 7/12 to 11/9/2001



The percentage increase in DO due to the elimination of gravity CSOs became less significant at the effluent discharge point of the Northside WRP on the NSC. The effluent of the Northside WRP, which treats on average 10.5 m³/s (371 cfs) of wastewater during dry weather and a peak wet weather flow of 20.1 m³/s (696 cfs) and is located just upstream of Touhy Avenue, is the dominant flow in the LNSC during dry weather periods and even in some wet weather periods if the rainfall is relatively small. As evidenced in Figures 2 and 4, the effluent of Northside WRP with DO concentrations ranging from 5.5 to 7.5 mg/L in the summer of 2001 significantly raised stream DO concentrations, assuming complete mixing with stream flows at the discharge location in the model. Although the percentage increase in stream DO concentrations was relatively small in the LNSC, the elimination of upstream gravity CSOs still increased the simulated DO concentrations in this reach (data not shown).

Figure 3 - Comparison of percentage of the simulated hourly DO concentrations greater than 4 and 5 mg/L with and without gravity CSOs in the Calumet River system in the period of 7/12 to 11/9/2001

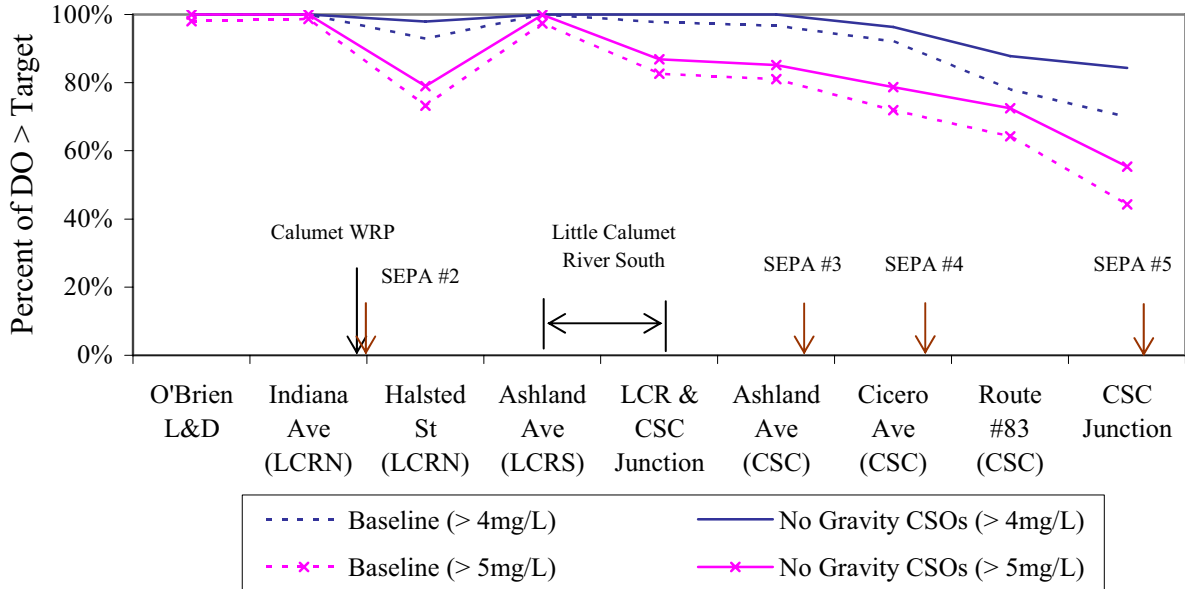


Figure 4 - Comparison of percentage of the simulated hourly DO concentrations greater than 4 and 5 mg/L with and without gravity CSOs in the Chicago River system in the period of 5/1 to 9/23/2002

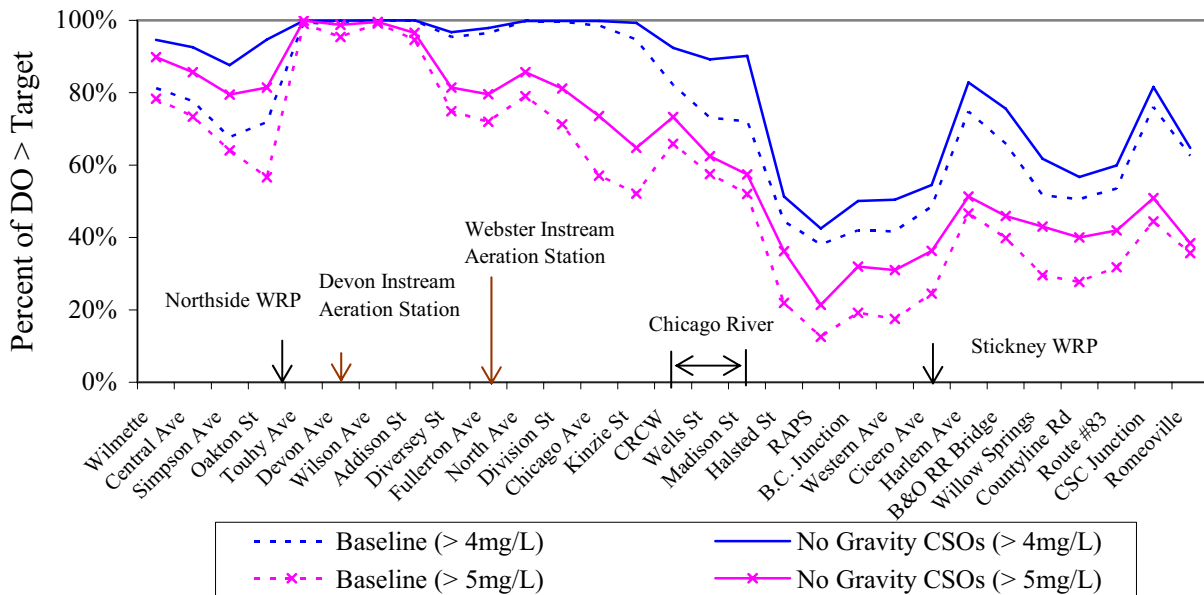
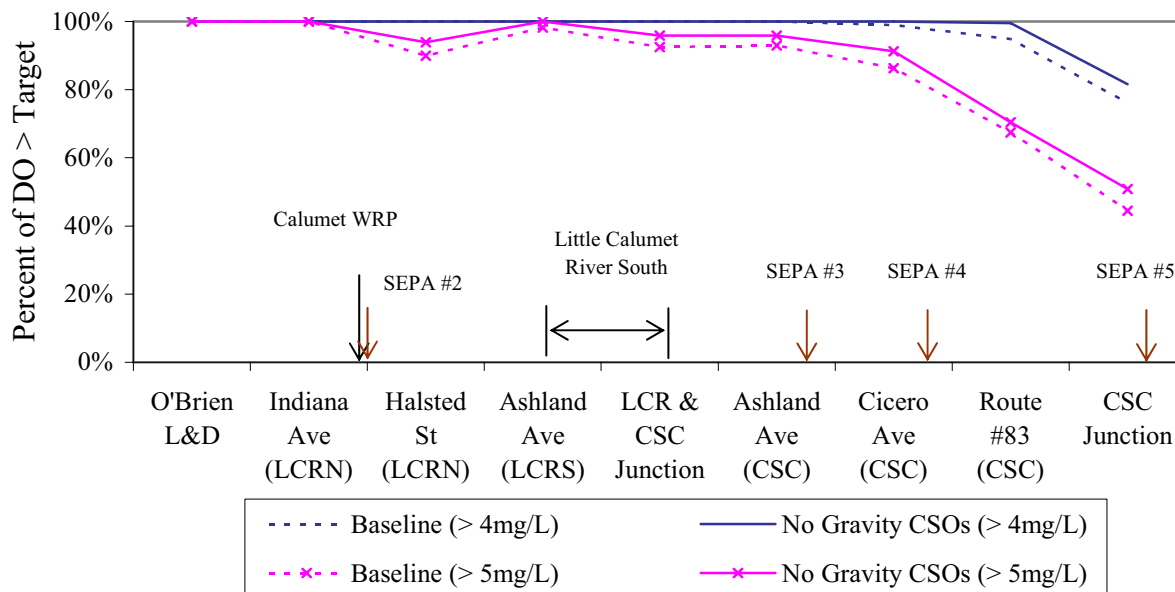


Figure 5 - Comparison of percentage of the simulated hourly DO concentrations greater than 4 and 5 mg/L with and without gravity CSOs in the Calumet River system in the period of 5/1 to 9/23/2002



There are two instream aeration stations in the Chicago River system. The Devon instream aeration station is located on the LNSC between Devon Avenue and Wilson Avenue and the Webster instream aeration station is located on the NBCR between Fullerton Avenue and North Avenue. These instream aeration stations have design capacities of adding 6,040 and 3,630 kilograms per day (13,300 and 8,000 lbs/d) of dissolved oxygen into the stream, respectively (Lanyon and Polls, 1996). The most efficient overall performance at the Devon instream aeration station occurred during the summer periods, which was observed and reported by Polls et al. (1982). The improvement of stream DO concentrations due to the elimination of gravity CSOs appeared to be less significant downstream of these aeration stations, as the DO concentrations were raised at these stations. It was found that the artificial reaeration of oxygen depleted waterways could be a cost effective way to improve the water quality of the waterways versus advanced treatment at an upstream water reclamation plant (Lanyon and Polls, 1996). Artificial reaeration was also proposed in the UAA study by the IEPA as an alternative for improving water quality of the CAWs.

Another stream section that had relatively low DO concentrations under the summer conditions in 2001 and 2002 was the southern end of the SBCR, the South Fork of the SBCR, and the northern end of the CSSC, as seen in Figures 2 and 4 from Halsted Street on the SBCR to Cicero Avenue on the CSSC. Completely eliminating 12 representative gravity CSOs upstream and 3 more representative gravity CSOs did not raise the simulated hourly DO concentrations to more than 65 percent compliance with the target DO value of 4 mg/L in either year. This implied that the lowered DO concentrations in this section were not just caused by the upstream gravity CSOs, but also by the pollutants from other upstream sources, sediment oxygen demand, and the

pumped CSOs, particularly from the RAPS, which was not eliminated in the simulations under the No Gravity CSOs scenario.

Similar to the phenomenon at the Northside WRP effluent discharge point, the stream DO concentrations were raised at the Stickney WRP effluent discharge point because of relatively high DO concentrations in the Stickney WRP effluent and relatively large flow discharge. The average effluent flow at the Stickney WRP is about 32 m³/s (1130 cfs) and the peak wet weather flow is 63 m³/s (2230 cfs). Under the Baseline condition, the simulated hourly DO concentrations were raised from less than 50 percent compliance with the target value of 4 mg/L upstream to 87 percent at this point in 2001 and 75 percent in 2002. After eliminating 16 representative gravity CSOs upstream, the percent compliance of simulated hourly DO concentrations with the target DO value of 4 mg/L was raised by another 8 percentage points in both years.

In the model, the most downstream representative gravity CSO outfall in the Chicago River system is located on the CSSC just upstream of the Baltimore and Ohio Railroad (B&O RR) Bridge. The simulated hourly DO concentrations downstream from this location to the downstream boundary, which is about 25 kilometers (16 miles) long, were improved as much as upstream (see Figure 2) after the elimination of gravity CSOs. This indicated that pollutants from gravity CSOs could be carried by the stream flow further downstream and could affect the DO concentrations at a location as far as 25 kilometers downstream.

The overall impact of eliminating gravity CSOs on the simulated hourly DO concentrations was less significant in the Calumet River system than in the Chicago River system under the summer conditions in 2001 and 2002, as can be inferred in Figures 2 through 5. This was likely due to the relatively high DO concentrations under the Baseline conditions in both years (percent simulated hourly DO > 4 mg/L was greater than 78 percent in 2001 and 94 percent in 2002), the operation of SEPA stations, dilution by the tributary flows, the relatively large resident volume of water in the CSC (the stream is wider and flow is less) and relatively diluted CSOs. The relatively high stream DO concentrations in the CSC helped to raise the DO concentrations in the CSSC at the junction of CSC and CSSC, as indicated at CSC Junction in Figures 2 and 4.

The impact of individual CSO events on simulated DO concentrations could be examined by plotting the simulated hourly DO concentrations from both scenarios against the simulation time. As CSOs occurred more frequently in the 2001 simulation period, the simulated hourly DO concentrations over the simulation period in 2001 at Oakton Street on the UNSC, at Cicero Avenue on the CSC, which is located downstream of all 10 representative gravity CSOs in the Calumet river system, and at Romeoville on the CSSC, which is the downstream boundary of the model, are presented in Figures 6, 7, and 8, respectively.

The simulation results presented in these figures supported the finding that the impact of gravity CSOs on stream DO concentrations varied from location to location. Almost every CSO event affected the simulated DO concentrations at Oakton Street on the UNSC, as the CSO discharge was the dominant flow in this reach. As shown in Figure 6, the effect from a large storm, such as the one taking place on August 2 to 3, 2001, on the simulated DO concentrations lasted for nearly three weeks. However, not every gravity CSO affected the simulated DO concentration at

Cicero Avenue on the CSC during the 2001 simulation period, as seen in Figure 7. The impact of gravity CSOs from large storms on water quality in the stream extended all the way to the downstream boundary, 25 kilometers (16 miles) away from the closest CSO outfall, possibly due to shorter traveling times at higher stream flows during large storms and more pollutants discharged into the system from the CSOs.

Figure 6 - Simulated hourly DO concentrations at Oakton Street on the UNSC during the 2001 simulation period

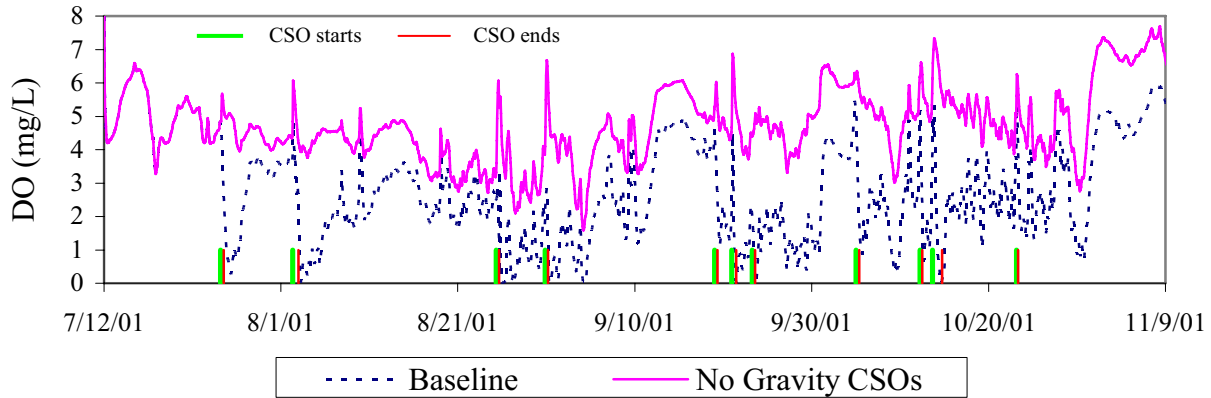


Figure 7 - Simulated hourly DO concentrations at Cicero Avenue on the CSC during the 2001 simulation period

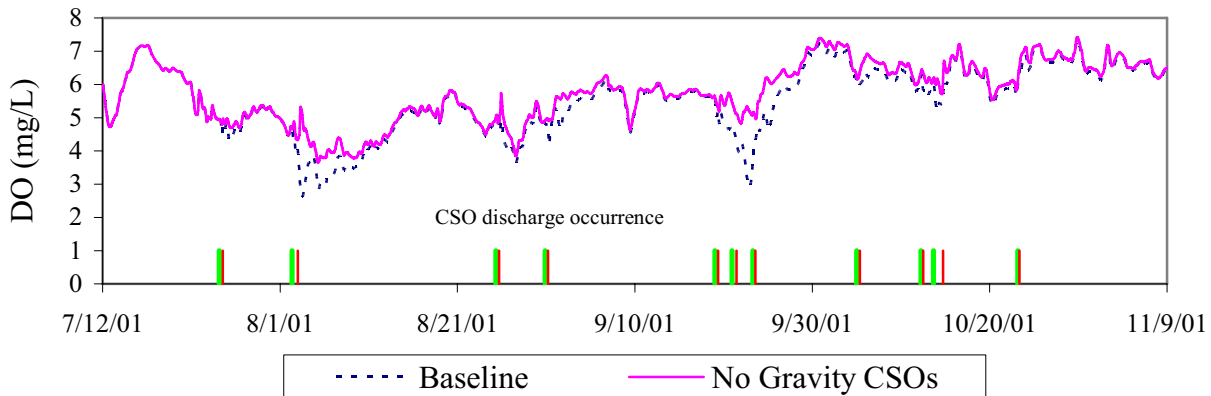
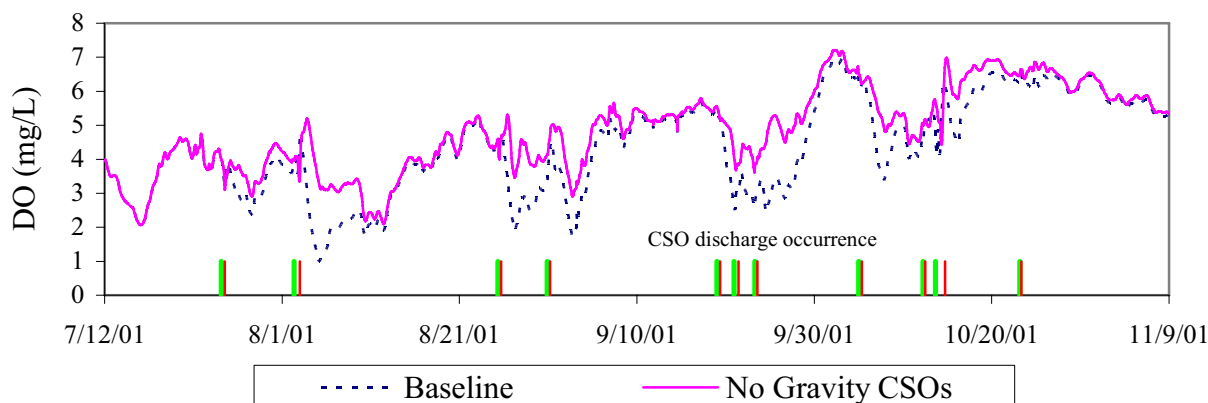


Figure 8 - Simulated hourly DO concentrations at Romeoville on the CSSC during the 2001 simulation period



CONCLUSIONS

The results obtained through the model simulations under two different scenarios revealed that eliminating gravity CSOs could increase stream DO concentrations in the entire CAWs at different degrees under the summer conditions in 2001 and 2002. The DO increase due to the elimination of gravity CSOs was most significant in the UNSC, in which the stream flow was dominated by gravity CSOs. The impact of eliminating gravity CSOs on stream DO concentrations was the least in the CSC, likely due to the relatively high DO concentrations under the Baseline conditions, the operation of SEPA stations, dilution by the tributary flows, the large resident volume of water in the CSC and relatively diluted CSOs. Gravity CSOs had a prolonged impact on stream DO concentrations in the CAWs after a large storm. Such impact could last up to a few weeks at some locations. Even if all gravity CSOs were eliminated, which means the complete capture of the gravity CSOs to the system, the target DO value of 4 mg/L could not be satisfied 100 percent of the time at some locations in the CAWs under the summer conditions in 2001 and 2002.

ACKNOWLEDGMENTS

The personnel of the Engineering Department of the MWRDGC, particularly Laura Serbanescu and Joseph Kratzer, are acknowledged for providing the watershed and TARP information for the study.

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ITEM 3



***MONITORING AND RESEARCH
DEPARTMENT***

REPORT NO. 09-50

***CONTINUOUS DISSOLVED OXYGEN MONITORING
IN THE DEEP-DRAFT CHICAGO WATERWAY SYSTEM
DURING 2008***

August 2009

Metropolitan Water Reclamation District of Greater Chicago
100 East Erie Street Chicago, Illinois 60611-2803 312-751-5600

**CONTINUOUS DISSOLVED OXYGEN MONITORING
IN THE DEEP-DRAFT CHICAGO WATERWAY SYSTEM
DURING 2008**

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ACKNOWLEDGMENT

Thanks are extended to staff from the Industrial Waste Division who deployed and retrieved the water quality monitors weekly during the study. Special thanks to Richard Schackart, Justin Vick, Colleen Joyce, Angel Whittington, and Panu Lansiri for downloading and servicing the monitors.

Thanks are also extended to Dr. Thomas Granato, Assistant Director of Monitoring and Research, Environmental Monitoring and Research Division, for his helpful review of the draft report.

We thank Robert Larson, Illinois State Water Survey, for designing the Access[®] database program, and Roger Smith, Senior Program Analyst, Information Technology Department for modifying the database program. Their help with the Access[®] program is greatly appreciated.

We thank Dr. Zainul Abedin, Biostatistician, for modifying the database program and for performing the calculations for the data summaries used in this report.

Particular thanks are due to Rhonda Griffith for reviewing, editing, and preparing the report for print.

DISCLAIMER

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

INTRODUCTION

The Chicago Area Waterway System (CAWS) consists of 78 miles of canals, which serve the Chicago area for two principal purposes, the drainage of urban storm water runoff and treated municipal wastewater effluent and the support of commercial navigation. Approximately 75 percent of the length is composed of man-made canals where no waterway existed previously, and the remainder is composed of natural streams that have been deepened, straightened and/or widened to such an extent that reversion to the natural state is not possible. The flow of water in the CAWS is artificially controlled by hydraulic structures. The CAWS has two river systems, the Calumet River System and the Chicago River System.

Over the years, increased pollutant loading from urbanization throughout the Chicago metropolitan area and low stream velocities in Chicago area deep-draft waterways have caused dissolved oxygen (DO) concentrations to fall below DO standards established by the Illinois Pollution Control Board (IPCB). More than 30 years ago, the Metropolitan Water Reclamation District of Greater Chicago (District) determined that applicable IPCB DO standards for Chicago area waterways could not be met exclusively by advanced wastewater treatment at its three major regional water reclamation plants (WRPs), Calumet, North Side, and Stickney, and by the capture and treatment of combined sewer overflows (CSOs). In order to increase the DO concentration in the Chicago and Calumet River Systems, the District designed and constructed artificial aeration systems (instream diffuser and sidestream elevated pool aeration [SEPA] stations) during the late 1970s and early 1990s, respectively.

From October 1994 through May 1996, the Monitoring and Research Department (M&R) conducted weekly DO surveys in the Chicago River System. Water samples were collected manually, chemically fixed in the field, and returned to the laboratory for titration. The results from these surveys showed that DO concentrations in selected waterway reaches were less than IPCB DO standards applicable to these reaches.

In 1998, M&R initiated a comprehensive field-monitoring program in order to locate and identify reaches in the Chicago River System where the DO concentration is less than the applicable IPCB DO standard. Initially, the program was to focus on the Chicago River System for a two-year period and has since been extended. Subsequently, the scope of the monitoring program was first expanded to include the Calumet River System, and then later the Chicago area wadeable streams. The resulting data have been used for the calibration and verification of a water quality model for the CAWS.

Data in this report are from 23 deep-draft continuous DO monitoring stations of the District's Continuous Dissolved Oxygen Monitoring (CDOM) Program. This report covers the monitoring results for the period January 2008 through December 2008 for the deep-draft waterways of the Chicago River System, Calumet River System, and Des Plaines River System.

MONITORING STATIONS

Locations and Descriptions

The CDOM Program and the Ambient Water Quality Monitoring (AWQM) Program supply the District with water quality data throughout the year for both the wadeable and deep-draft waterways within its jurisdiction. All stations for both programs are shown in Figure 1. Descriptions of the locations for the deep-draft monitoring stations are listed in Table 1.

Several monitoring stations once managed in past years were re-activated from April through November 2008 to gather data for a special project involving the SEPA stations along the Calumet-Sag Channel. These stations include Romeoville Road on the Chicago Sanitary and Ship Canal (CSSC), and Division Street, River Mile 311.7, and Southwest Highway on the Calumet-Sag Channel. The data collected are included in this report.

Designated Uses

The IPCB has assigned water uses for specific water bodies within the state of Illinois. All waters in Illinois are designated for General Use, except those selected as Secondary Contact and Indigenous Aquatic Life Waters (Secondary Contact).

In the Chicago and Calumet River Systems, General Use Waters include the North Shore Channel from Lake Michigan to the North Side WRP, and the Chicago and Calumet Rivers.

Secondary Contact Waters include the North Shore Channel from the North Side WRP to the North Branch of the Chicago River, the North Branch of the Chicago River from the North Shore Channel to the Chicago River, the South Branch of the Chicago River, Bubbly Creek, the CSSC, the Grand Calumet River, the deep-draft portion of the Little Calumet River, the Calumet-Sag Channel, and the Des Plaines River from its confluence with the CSSC to the Interstate Highway 55 bridge southwest of Joliet.

Water Quality Standards

The IPCB has established water quality standards for DO in both General Use and Secondary Contact Waters. In General Use Waters, the DO shall not be less than 6.0 mg/L during 16 hours of any 24-hour period, nor less than 5.0 mg/L at any time. In Secondary Contact Waters, the DO shall not be less than 4.0 mg/L at any time, except in the Calumet-Sag Channel where the DO shall not be less than 3.0 mg/L at any time. For this report, we have selected the 5.0 mg/L DO standard when calculating percent compliance for General Use Waters. On December 18, 2008 the USEPA approved new DO standards for General Use Waters in the state of Illinois. These new General Use DO standards will be used in the 2009 CDOM report.

MATERIALS AND METHODS

Water Quality Monitor

The continuous water quality monitors (monitor) used to collect DO data were manufactured by YSI Incorporated (YSI) of Yellow Springs, Ohio. DO was measured hourly using the YSI Model 6920 or Model 6600 monitor. In order to protect and safeguard the monitors from marine navigation and vandalism, the monitors were deployed in the field in stainless steel pipes. Two different installation designs were employed: (1) a 3-foot length of 8-inch diameter stainless steel pipe, secured to shore by means of a chain, was positioned on the bottom of the waterway and oriented downstream such that the water passed through the pipe, and (2) a fixed length of 8-inch diameter stainless steel pipe, with multiple 2-inch circular openings, was vertically mounted on the side of a bridge abutment.

Servicing the monitors followed a weekly schedule. Industrial Waste Division personnel retrieved each monitor from the field following seven days of continuous monitoring. Prior to retrieval, a water sample for winkler DO analysis was collected next to the protective housing. An additional monitor, that had been previously calibrated and serviced in the laboratory, was then deployed to replace the retrieved monitor. The retrieved monitors were returned to the laboratory for data downloading, exterior cleaning, servicing, and calibration of the DO sensors. The monitors were temporarily stored in holding tanks containing tap water for subsequent deployment during the following week.

Data Management and Review

Hourly DO data were directly exported electronically from individual monitors to a specially designed Access[®] database for data processing and storage. Following data downloading, the weekly DO data were carefully reviewed for accuracy.

The review process included the following:

1. Comparing a grab sample DO concentration measured in the field with a DO concentration recorded by a retrieved monitor (DO rejection criteria = difference greater than 2.0 mg/L).
2. Comparing the last hourly DO concentration measured by a retrieved monitor with the first hourly DO concentration recorded by a deployed monitor (DO rejection criteria = difference greater than 2.0 mg/L).
3. Comparing a DO concentration measured in a laboratory holding tank and a DO concentration recorded by a retrieved monitor (DO rejection criteria = difference greater than 1.0 mg/L).

Criterion 3 would entail rejection of all hourly readings; criteria 1 and 2 may or may not reject all readings.

After careful review of the DO data, weekly summary statistics (mean, minimum, maximum, and percent observations above DO standard) and individual line drawings for each monitoring station showing hourly DO concentrations were prepared.

Verification of Representative Data

During the spring, summer, and fall of 2008, cross-sectional DO surveys were conducted in the CAWS and Des Plaines River System to determine if a fixed continuous monitoring location represented the DO concentration across the waterway. Verification was achieved by comparing the DO concentrations measured in grab samples at multiple fixed locations and depths across the waterway with the fixed monitor measurements. The results from the cross-sectional surveys showed that the differences across the waterway were generally minimal (coefficient of variation < 10%) and equivalent (< 2 mg/L difference) to the DO concentration measured by the monitor at the fixed locations.

RESULTS

The annual minimum, maximum, and mean DO concentrations measured at all 23 stations during 2008 are shown in Table 2.

The number and percent of measured DO concentrations rejected and removed from the Access[®] database following review during 2008 are summarized in Table 3.

The number and percent of DO concentrations above the applicable IPCB DO standard for each waterway during 2008 are presented in Table 4. The DO data shown in Table 4 do not include the DO concentrations rejected during the data review.

Table 5 shows the percent distribution of DO concentrations from <1.0 mg/L to >5.0 mg/L at the 23 monitoring stations during 2008. The current national one-day minimum DO criterion for adult life stages of fish is 3.0 mg/L (Chapman, 1986).

Individual line drawings showing hourly DO concentrations at each monitoring station are indicated in Figures 2 through 24.

Weekly DO summary statistics during 2008 are presented for each monitoring station in Appendix A, Tables A-1 through A-23.

Summary statistics for dissolved oxygen measurements made during cross-sectional surveys are shown in Appendix Table A-24.

DO Fluctuations

DO concentrations fluctuate seasonally and daily in the aquatic environment. Cold water holds more DO than warm water, a trend that can typically be seen in annual DO graphs where the colder months have higher mean DO concentrations than the warmer months. Daily fluctuations in DO can be caused by photosynthesis during daylight hours causing a surplus of DO, and, conversely, respiration by aquatic plants and algae during the night, resulting in a deficiency of DO. Other deficiencies of DO can occur when oxygen demanding materials are introduced into a waterway or by thermal discharges. Oxygen demanding materials enter a waterway most often through wastewater treatment effluents, CSOs, and stormwater run-off. Wastewater treatment effluents and CSOs contain organic materials that are decomposed by microorganisms which consume DO in the process. Stormwater run-off also can flush organic materials into the waterway. This is most evident during heavy rain storms that result in CSO events containing untreated waste and stormwater. The District web site (www.mwr.org) has information regarding CSO events which can be found in the Services and Facilities Section under the title "Combined Sewer Overflows."

TABLE 1: DEEP-DRAFT CONTINUOUS DISSOLVED OXYGEN
MONITORING STATIONS

Monitoring Station	Waterway	Description of Monitoring Station
<u>Chicago River System</u>		
Main Street	North Shore Channel	3.5 miles below Wilmette Pumping Station, 0.8 mile above North Side WRP outfall, water quality monitor under Main Street bridge, center of channel, 6 inches above bottom.
Foster Avenue	North Shore Channel	3.2 miles below North Side WRP outfall, 1.5 miles below Devon Aeration Station, 0.1 mile above junction with North Branch Chicago River, water quality monitor on northwest side Foster Avenue bridge, 3 feet below water surface.
Addison Street	North Branch Chicago River	5.2 miles below North Side WRP outfall, water quality monitor on northwest side Addison Street bridge, 3 feet below water surface.
Fullerton Avenue	North Branch Chicago River	7.2 miles below North Side WRP outfall, 0.4 mile above Webster Aeration Station, water quality monitor on northwest side Fullerton Avenue bridge, 3 feet below water surface.
Kinzie Street	North Branch Chicago River	9.9 miles below North Side WRP outfall, 3.1 miles below Webster Aeration Station, 0.2 mile above junction with Chicago River, water quality monitor on northeast side Kinzie Street bridge, 3 feet below water surface.

TABLE 1 (Continued): DEEP-DRAFT CONTINUOUS DISSOLVED OXYGEN MONITORING STATIONS

Monitoring Station	Waterway	Description of Monitoring Station
<u>Chicago River System (Continued)</u>		
Clark Street	Chicago River	1.2 miles below Chicago River Controlling Works, 0.4 mile above junction with South Branch Chicago River, water quality monitor on northeast side Clark Street bridge, 3 feet below water surface.
Loomis Street	South Branch Chicago River	3.6 miles below junction with Chicago River, water quality monitor on northeast side Loomis Street bridge, 3 feet below water surface.
36 th Street	Bubbly Creek	0.2 mile below Racine Avenue Pumping Station, 1.2 miles above junction with South Branch of the Chicago River, water quality monitor attached to concrete wall on west side of river, 3 feet below water surface.
Interstate Highway 55	Bubbly Creek	1.0 mile below Racine Avenue Pumping Station, 0.4 mile above junction with South Branch of the Chicago River, water quality monitor on northeast side I-55 bridge, 3 feet below water surface.
Cicero Avenue	Chicago Sanitary and Ship Canal	1.5 miles above Stickney WRP out-fall, 1.1 miles below Crawford Generating Station cooling water discharge, water quality monitor on northeast side Cicero Avenue bridge, 3 feet below water surface.

TABLE 1 (Continued): DEEP-DRAFT CONTINUOUS DISSOLVED OXYGEN MONITORING STATIONS

Monitoring Station	Waterway	Description of Monitoring Station
<u>Chicago River System (Continued)</u>		
B&O Central Railroad	Chicago Sanitary and Ship Canal	3.6 miles below Stickney WRP outfall, water quality monitor in center of canal, east side B&O Central RR bridge, 3 feet below water surface.
Route 83	Chicago Sanitary and Ship Canal	1.2 miles above junction with Calumet-Sag Channel, 1.1 miles above Canal Junction SEPA Station, water quality monitor 0.6 mile above Route 83 bridge, center of canal, 6 inches above bottom.
Romeoville Road	Chicago Sanitary and Ship Canal	7.1 miles below junction with Calumet-Sag Channel, 5.1 miles above Lockport Lock; water quality monitor on southeast side of Romeoville Road bridge, 3 feet below water surface.
Lockport Powerhouse	Chicago Sanitary and Ship Canal	0.1 mile above Lockport Powerhouse, 1.1 miles above junction with Des Plaines River, water quality monitor on north side of canal, in forebay area on fender wall, 3 feet below water surface.
<u>Des Plaines River System</u>		
Jefferson Street	Des Plaines River	3.0 miles below Lockport Lock, 2.1 miles below junction with Chicago Sanitary and Ship Canal, water quality monitor on southeast side Jefferson Street bridge, 3 feet below water surface.

TABLE 1 (Continued): DEEP-DRAFT CONTINUOUS DISSOLVED OXYGEN MONITORING STATIONS

Monitoring Station	Waterway	Description of Monitoring Station
<u>Calumet River System</u>		
C&W Indiana Railroad	Little Calumet River	5.2 miles below SEPA 1, 1.5 miles above SEPA 2, 3.6 miles below Thomas J. O'Brien Lock and Dam, 1.3 miles above Calumet WRP out-fall, water quality monitor attached to northeast side C&W Indiana RR bridge, 3 feet below water surface.
Halsted Street	Little Calumet River	7.7 miles below SEPA 1, 1.0 mile below SEPA 2, 1.2 miles below Calumet WRP, 0.5 mile above junction with Calumet-Sag Channel, water quality monitor attached to southeast side Halsted Street bridge, 3 feet below water surface.
Division Street	Calumet-Sag Channel	1.0 mile below junction with Little Calumet River; 0.4 miles above SEPA 3, water quality monitor attached to southwest side of Division Street bridge, 3 feet below water surface.
Cicero Avenue	Calumet-Sag Channel	3.1 miles below SEPA 3, 3.3 miles above SEPA 4, water quality monitor attached to northwest side Cicero Avenue bridge, 3 feet below water surface.
River Mile 311.7	Calumet-Sag Channel	6.4 miles below SEPA 3, 0.1 mile above SEPA 4, water quality monitor attached to concrete wall upstream of SEPA 4 intake structure, 3 feet below water surface.

TABLE 1 (Continued): DEEP-DRAFT CONTINUOUS DISSOLVED OXYGEN MONITORING STATIONS

Monitoring Station	Waterway	Description of Monitoring Station
<u>Calumet River System (Continued)</u>		
Southwest Highway	Calumet-Sag Channel	0.8 mile below SEPA 4; 7.0 miles above Canal Junction SEPA Station; monitor attached to southeast side of Southwest Highway bridge, three feet below water surface.
104 th Avenue	Calumet-Sag Channel	4.6 miles below SEPA 4, 3.2 miles above Canal Junction SEPA Station, water quality monitor in center of channel, 6 inches above bottom.
Route 83	Calumet-Sag Channel	0.4 mile above junction with Chicago Sanitary and Ship Canal, 0.3 mile above Canal Junction SEPA Station, water quality monitor on southwest side Illinois Central-Gulf RR bridge, 3 feet below water surface.

TABLE 2: MINIMUM, MAXIMUM, AND MEAN HOURLY DISSOLVED OXYGEN CONCENTRATIONS¹

Monitoring Station	Waterway	DO Concentration (mg/L)		
		Minimum	Maximum	Mean
<u>Chicago River System</u>				
Main Street	North Shore Channel	0.1	26.4	8.3
Foster Avenue	North Shore Channel	0.5	10.8	7.8
Addison Street	North Branch Chicago River	0.2	12.8	8.1
Fullerton Avenue	North Branch Chicago River	0.8	12.2	7.6
Kinzie Street	North Branch Chicago River	1.8	13.0	7.2
Clark Street	Chicago River	1.1	13.2	8.7
Loomis Street	South Branch Chicago River	2.2	13.0	7.6
36 th Street	Bubbly Creek	0.0	23.6	4.3
Interstate Highway 55	Bubbly Creek	0.0	16.3	5.7
Cicero Avenue	Chicago Sanitary and Ship Canal	0.0	10.9	6.2
B&O Central Railroad	Chicago Sanitary and Ship Canal	2.3	10.7	7.2
Route 83	Chicago Sanitary and Ship Canal	0.5	9.9	6.6
Romeoville Road	Chicago Sanitary and Ship Canal	1.2	8.8	5.1
Lockport Powerhouse	Chicago Sanitary and Ship Canal	1.9	13.1	6.5
<u>Des Plaines River System</u>				
Jefferson Street	Des Plaines River	2.8	12.9	7.9
<u>Calumet River System</u>				
C&W Indiana Railroad	Little Calumet River	0.3	17.0	9.5
Halsted Street	Little Calumet River	0.0	17.8	7.0
Division Street	Calumet-Sag Channel	0.6	11.8	5.6
Cicero Avenue	Calumet-Sag Channel	1.6	12.6	7.3
River Mile 311.7	Calumet-Sag Channel	1.3	14.5	6.5
Southwest Highway	Calumet-Sag Channel	2.1	12.5	6.3
104 th Avenue	Calumet-Sag Channel	4.7	11.0	7.8
Route 83	Calumet-Sag Channel	2.4	13.2	7.5

¹Dissolved oxygen was measured hourly using a YSI Model 6920 or Model 6600 continuous water quality monitor.

TABLE 3: NUMBER AND PERCENT OF DISSOLVED OXYGEN VALUES NOT MEETING ACCEPTANCE CRITERIA¹

Monitoring Station	Waterway	Number of DO Values Rejected	Percent of DO Values Rejected
<u>Chicago River System</u>			
Main Street	North Shore Channel	626	7
Foster Avenue	North Shore Channel	173	2
Addison Street	North Branch Chicago River	14	<1
Fullerton Avenue	North Branch Chicago River	554	6
Kinzie Street	North Branch Chicago River	3	<1
Clark Street	Chicago River	339	4
Loomis Street	South Branch Chicago River	389	4
36 th Street	Bubbly Creek	176	2
Interstate Highway 55	Bubbly Creek	1,122	13
Cicero Avenue	Chicago Sanitary and Ship Canal	1,000	11
B&O Central Railroad	Chicago Sanitary and Ship Canal	173	2
Route 83	Chicago Sanitary and Ship Canal	3,799	43
Romeoville Road	Chicago Sanitary and Ship Canal	646	13
Lockport Powerhouse	Chicago Sanitary and Ship Canal	840	10
<u>Des Plaines River System</u>			
Jefferson Street	Des Plaines River	172	2
<u>Calumet River System</u>			
C&W Indiana Railroad	Little Calumet River	674	8
Halsted Street	Little Calumet River	340	4
Division Street	Calumet-Sag Channel	168	3
Cicero Avenue	Calumet-Sag Channel	180	2
River Mile 311.7	Calumet-Sag Channel	0	0
Southwest Highway	Calumet-Sag Channel	0	0
104 th Avenue	Calumet-Sag Channel	4,052	46
Route 83	Calumet-Sag Channel	339	4

¹Dissolved oxygen was measured hourly using a YSI Model 6920 or Model 6600 continuous water quality monitor. DO values were rejected based on quality control check and/or operational problems with monitor.

TABLE 4: NUMBER AND PERCENT OF DISSOLVED OXYGEN VALUES
MEASURED ABOVE THE ILLINOIS POLLUTION CONTROL BOARD'S
WATER QUALITY STANDARD¹

Monitoring Station	Waterway	IPCB DO Standard	Number of DO Values	Number Above Standard	Percent Above Standard
<u>Chicago River System</u>					
Main Street	North Shore Channel	5.0	8,158	6,957	85
Foster Avenue	North Shore Channel	4.0	8,611	8,605	>99
Addison Street	North Branch Chicago River	4.0	8,770	8,756	>99
Fullerton Avenue	North Branch Chicago River	4.0	8,230	8,202	>99
Kinzie Street	North Branch Chicago River	4.0	8,781	8,673	99
Clark Street	Chicago River	5.0	8,445	8,369	99
Loomis Street	South Branch Chicago River	4.0	8,395	8,307	99
36 th Street	Bubbly Creek	4.0	8,608	3,386	39
Interstate Highway 55	Bubbly Creek	4.0	7,662	5,963	78
Cicero Avenue	Chicago Sanitary and Ship Canal	4.0	7,784	7,144	92
B&O Central Railroad	Chicago Sanitary and Ship Canal	4.0	8,611	8,530	99
Route 83	Chicago Sanitary and Ship Canal	4.0	4,985	4,846	97
Romeoville Road	Chicago Sanitary and Ship Canal	4.0	4,394	3,835	87
Lockport Powerhouse	Chicago Sanitary and Ship Canal	4.0	7,944	7,329	92
<u>Des Plaines River System</u>					
Jefferson Street	Des Plaines River	4.0	8,612	8,550	99
<u>Calumet River System</u>					
C&W Indiana Railroad	Little Calumet River	4.0	8,110	7,614	94
Halsted Street	Little Calumet River	4.0	8,444	8,253	98
Division Street	Calumet-Sag Channel	3.0	4,703	4,601	98
Cicero Avenue	Calumet-Sag Channel	3.0	8,604	8,579	>99
River Mile 311.7	Calumet-Sag Channel	3.0	5,040	5,007	99
Southwest Highway	Calumet-Sag Channel	3.0	5,038	5,018	>99
104 th Avenue	Calumet-Sag Channel	3.0	4,732	4,732	100
Route 83	Calumet-Sag Channel	3.0	8,445	8,420	>99

¹Dissolved oxygen was measured hourly using a YSI Model 6920 or Model 6600 continuous water quality monitor.

TABLE 5: PERCENT OF DISSOLVED OXYGEN VALUES IN SELECTED RANGES

Monitoring Station	Waterway	Percent of DO Values in Range (mg/L)					
		0-<1	1-<2	2-<3	3-<4	4-<5	≥5
<u>Chicago River System</u>							
Main Street	North Shore Channel	3	1	2	5	5	85
Foster Avenue	North Shore Channel	<1	<1	<1	<1	<1	>99
Addison Street	North Branch Chicago River	<1	<1	<1	<1	<1	>99
Fullerton Avenue	North Branch Chicago River	<1	<1	<1	<1	4	96
Kinzie Street	North Branch Chicago River	0	<1	<1	1	8	90
Clark Street	Chicago River	0	<1	<1	<1	<1	99
Loomis Street	South Branch Chicago River	0	0	<1	1	3	96
36 th Street	Bubbly Creek	28	12	11	10	8	32
Interstate Highway 55	Bubbly Creek	5	3	5	9	16	62
Cicero Avenue	Chicago Sanitary and Ship Canal	<1	1	2	5	19	73
B&O Central Railroad	Chicago Sanitary and Ship Canal	0	0	<1	1	3	96
Route 83	Chicago Sanitary and Ship Canal	<1	<1	1	2	14	83
Romeoville Road	Chicago Sanitary and Ship Canal	0	<1	1	11	34	54
Lockport Powerhouse	Chicago Sanitary and Ship Canal	0	<1	1	6	18	74
<u>Des Plaines River System</u>							
Jefferson Street	Des Plaines River	0	0	<1	1	7	92
<u>Calumet River System</u>							
C&W Indiana Railroad	Little Calumet River	<1	1	2	3	3	90
Halsted Street	Little Calumet River	<1	<1	<1	2	4	93
Division Street	Calumet-Sag Channel	<1	<1	2	5	20	73
Cicero Avenue	Calumet-Sag Channel	0	<1	<1	1	7	92
River Mile 311.7	Calumet-Sag Channel	0	<1	<1	3	9	87
Southwest Highway	Calumet-Sag Channel	0	0	<1	4	11	84
104 th Avenue	Calumet-Sag Channel	0	0	0	0	<1	>99
Route 83	Calumet-Sag Channel	0	0	<1	2	7	90

FIGURE 1: CONTINUOUS DISSOLVED OXYGEN MONITORING AND AMBIENT WATER QUALITY MONITORING SAMPLE STATIONS

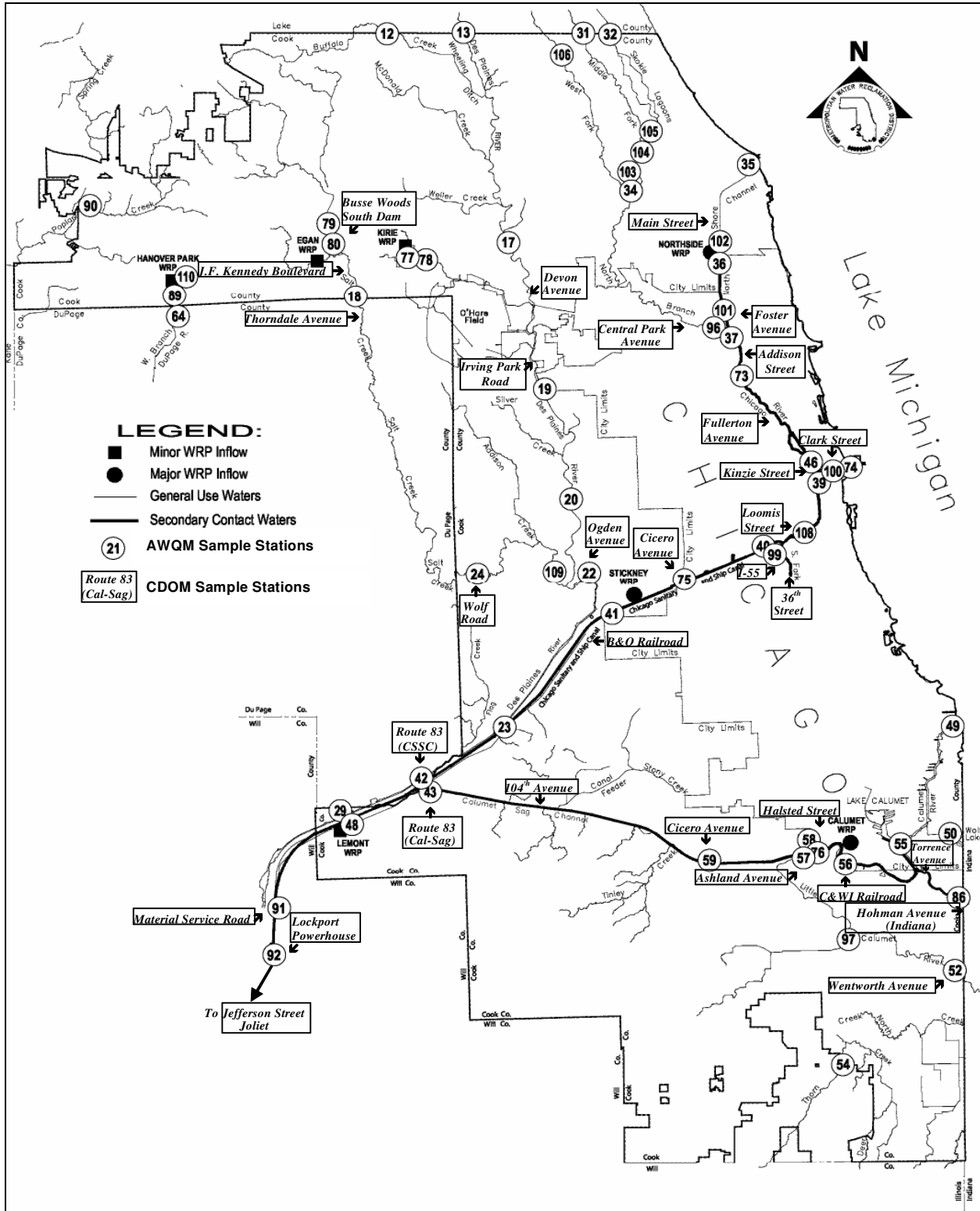


FIGURE 2: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT MAIN STREET ON THE NORTH SHORE CHANNEL FROM JANUARY 1, 2008 THROUGH DECEMBER 31, 2008

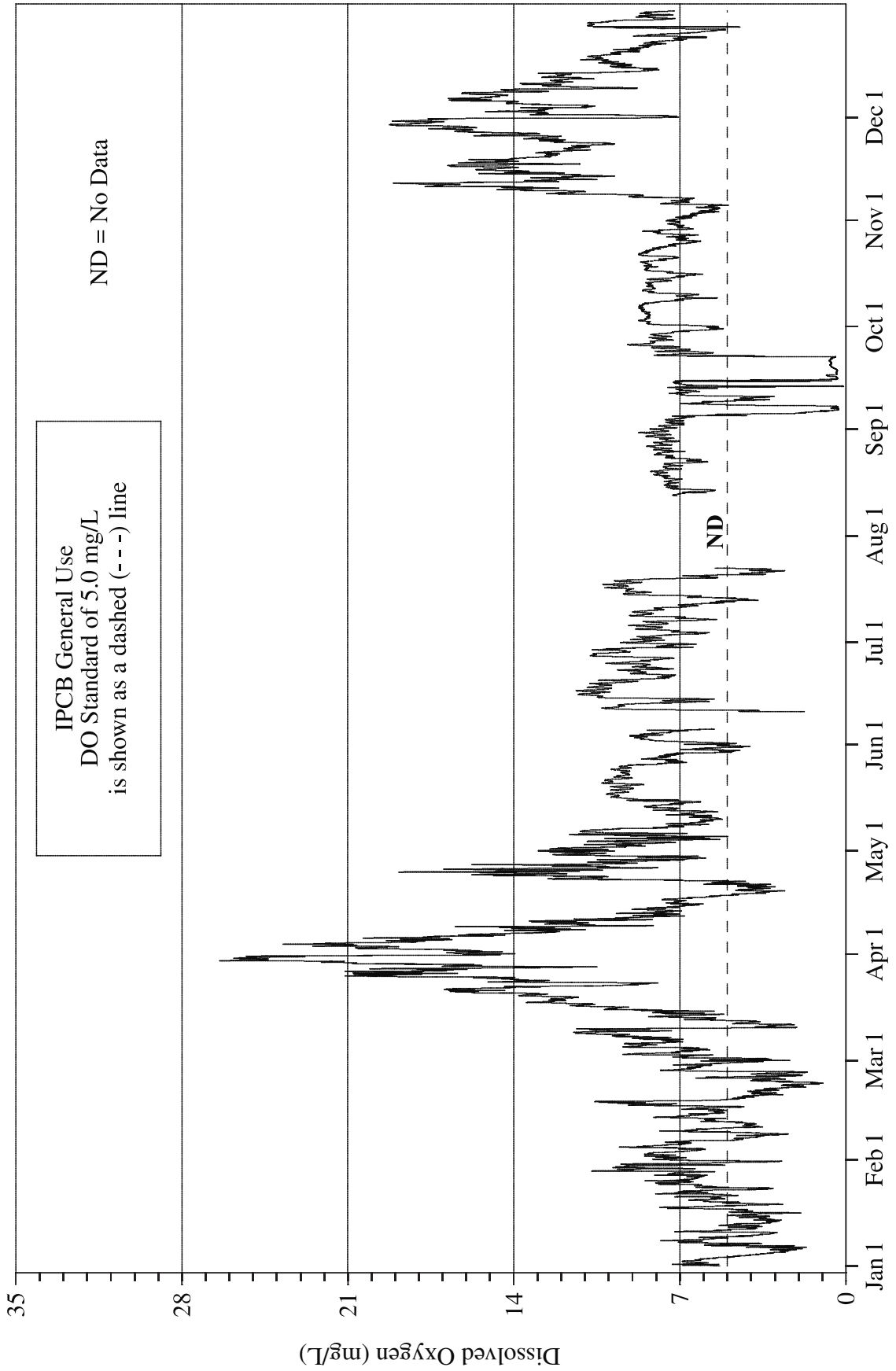


FIGURE 3: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT FOSTER AVENUE ON THE NORTH SHORE CHANNEL FROM JANUARY 1, 2008 THROUGH DECEMBER 31, 2008

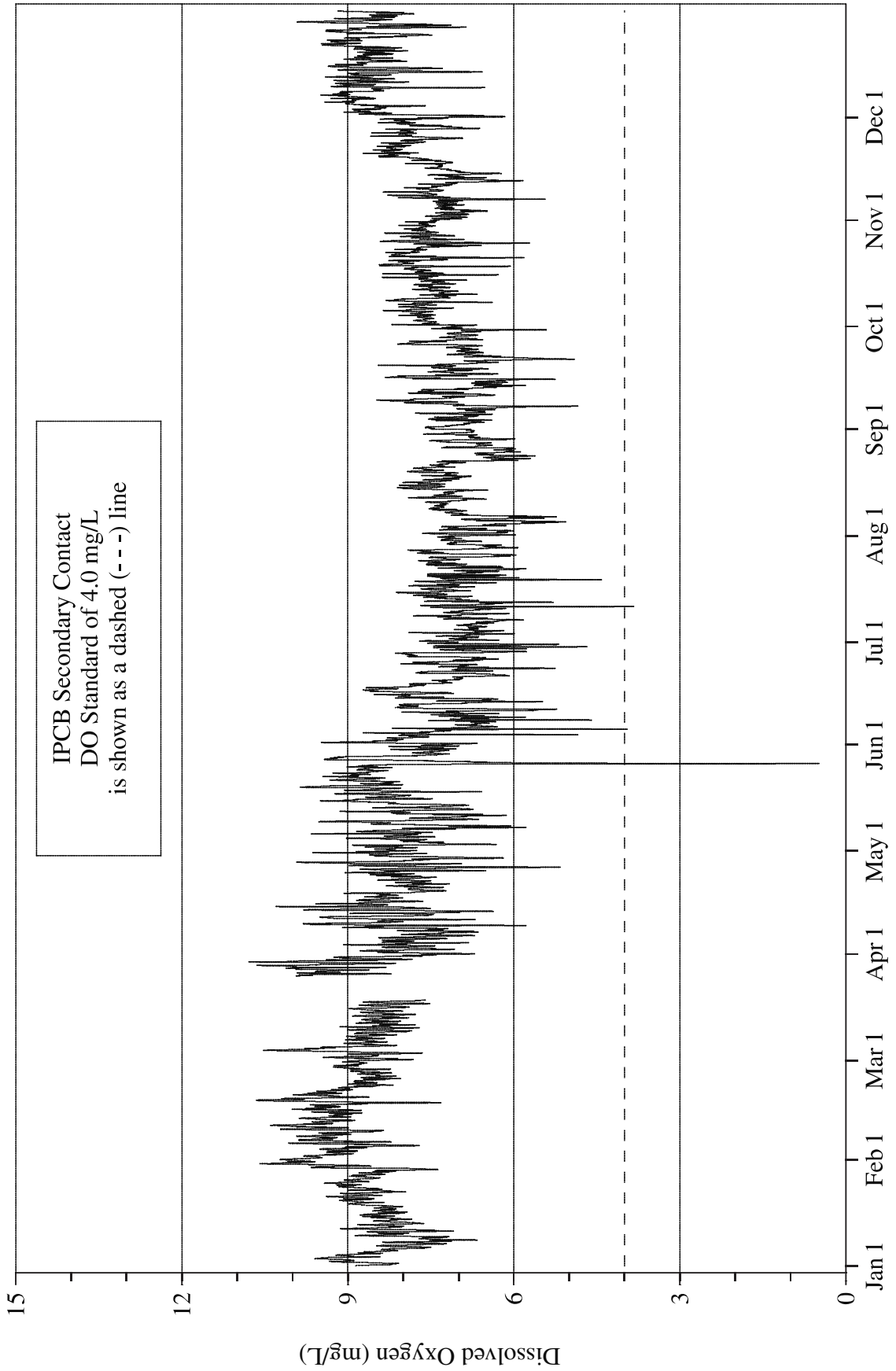


FIGURE 4: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT ADDISON STREET ON THE NORTH BRANCH CHICAGO RIVER FROM JANUARY 1, 2008 THROUGH DECEMBER 31, 2008

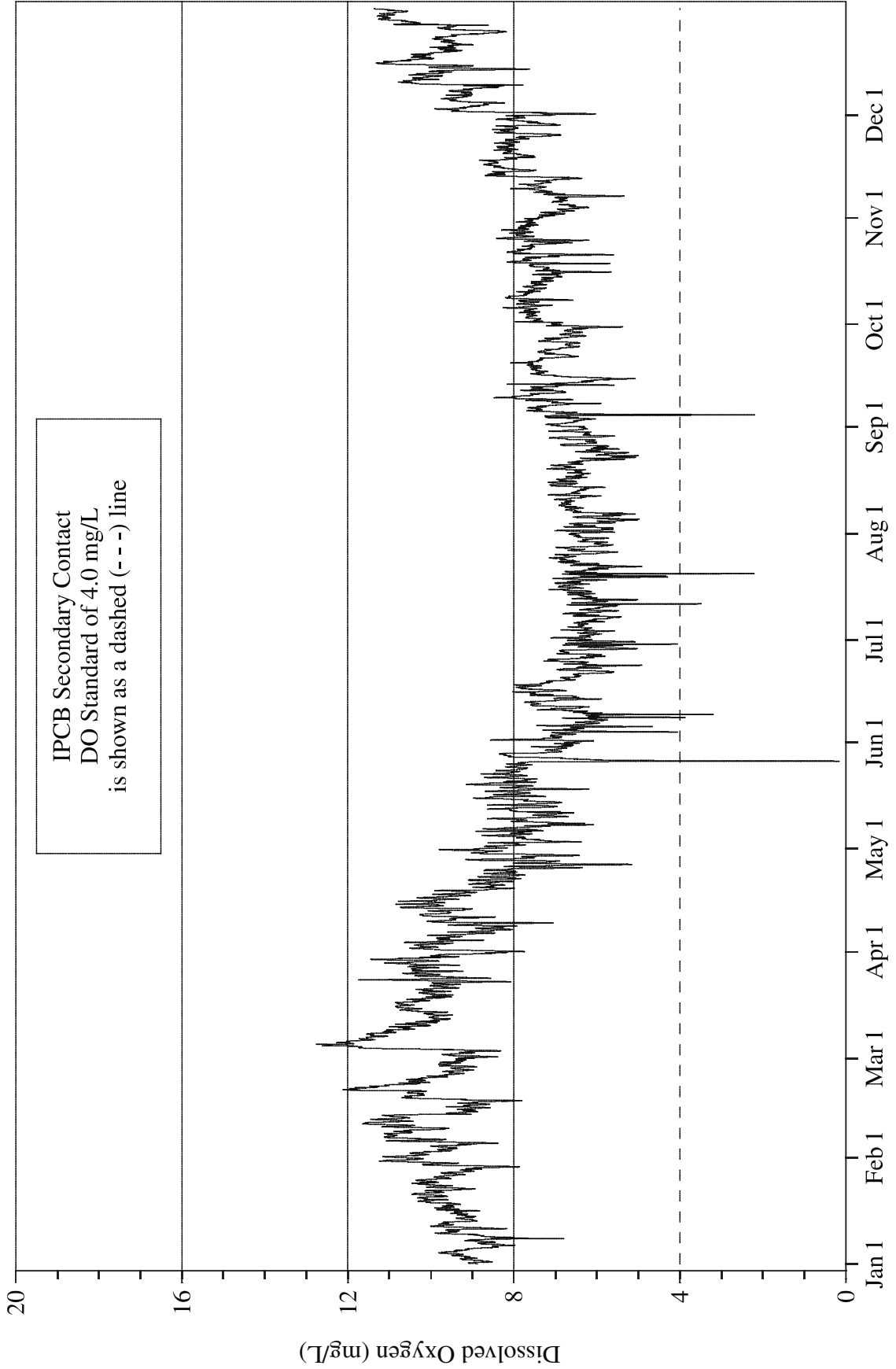


FIGURE 5: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT FULLERTON AVENUE ON THE NORTH BRANCH CHICAGO RIVER FROM JANUARY 1, 2008 THROUGH DECEMBER 31, 2008

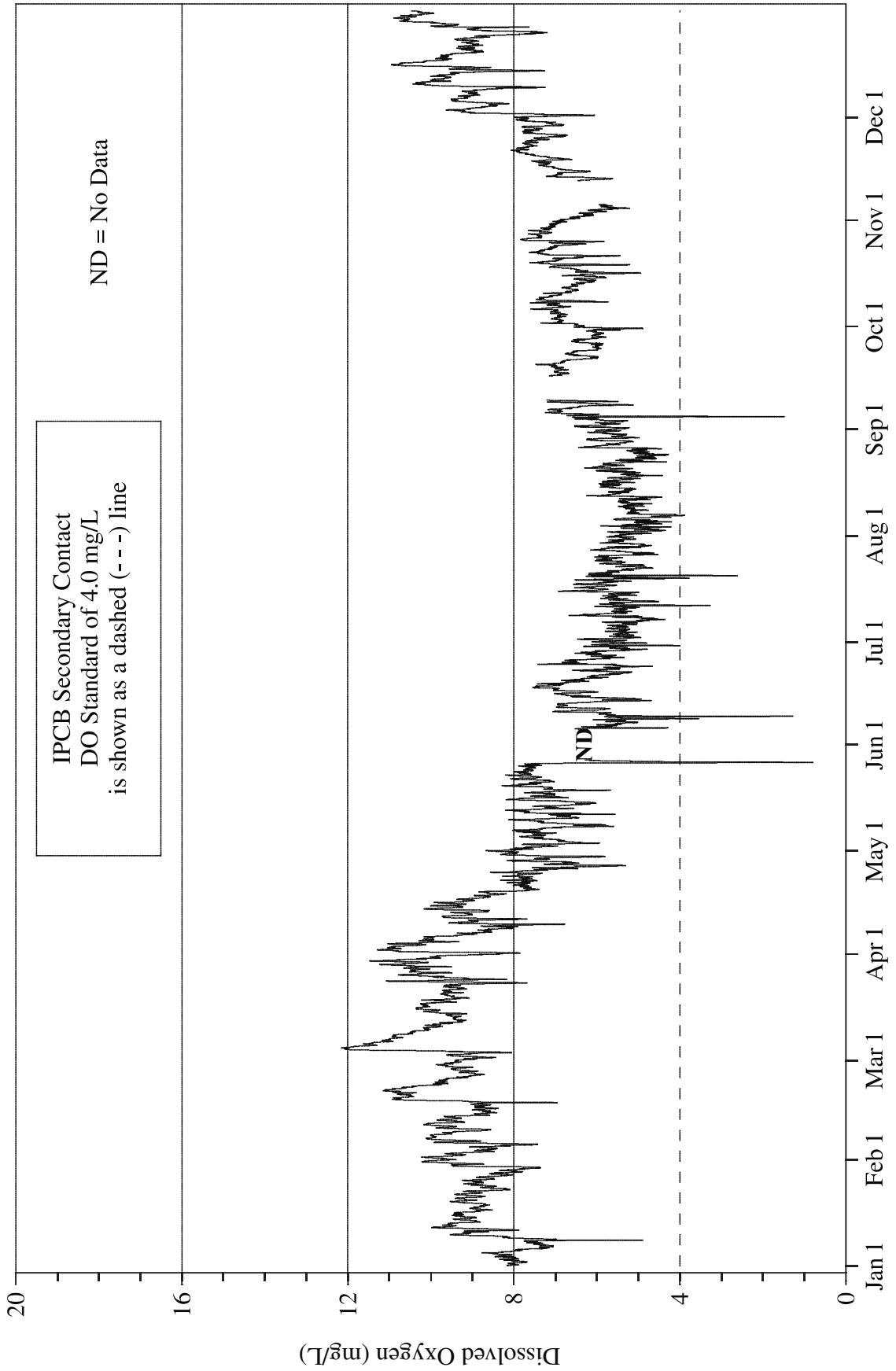


FIGURE 6: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT KINZIE STREET ON THE NORTH BRANCH CHICAGO RIVER FROM JANUARY 1, 2008 THROUGH DECEMBER 31, 2008

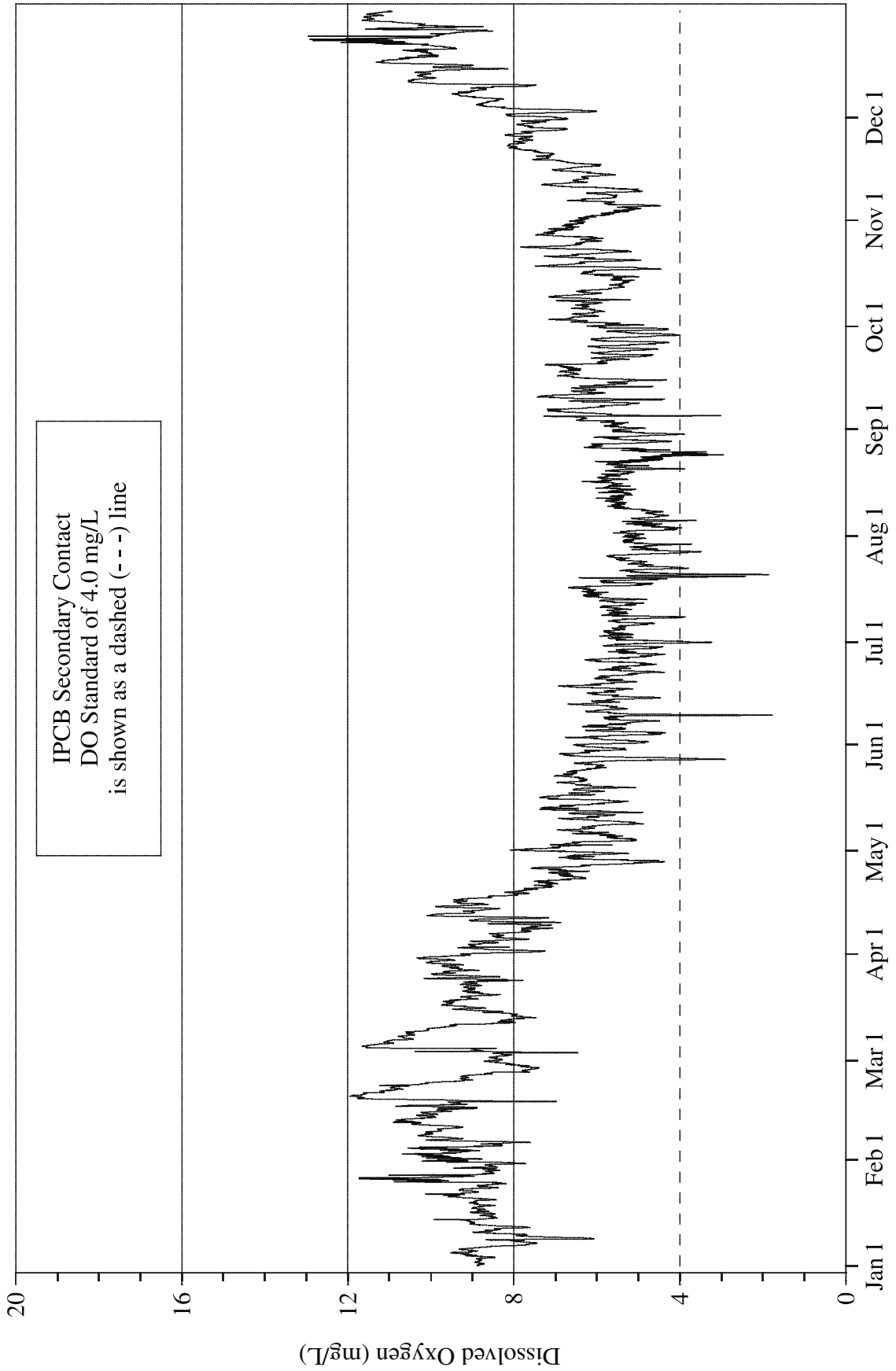


FIGURE 7: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT CLARK STREET ON THE CHICAGO RIVER FROM JANUARY 1, 2008 THROUGH DECEMBER 31, 2008

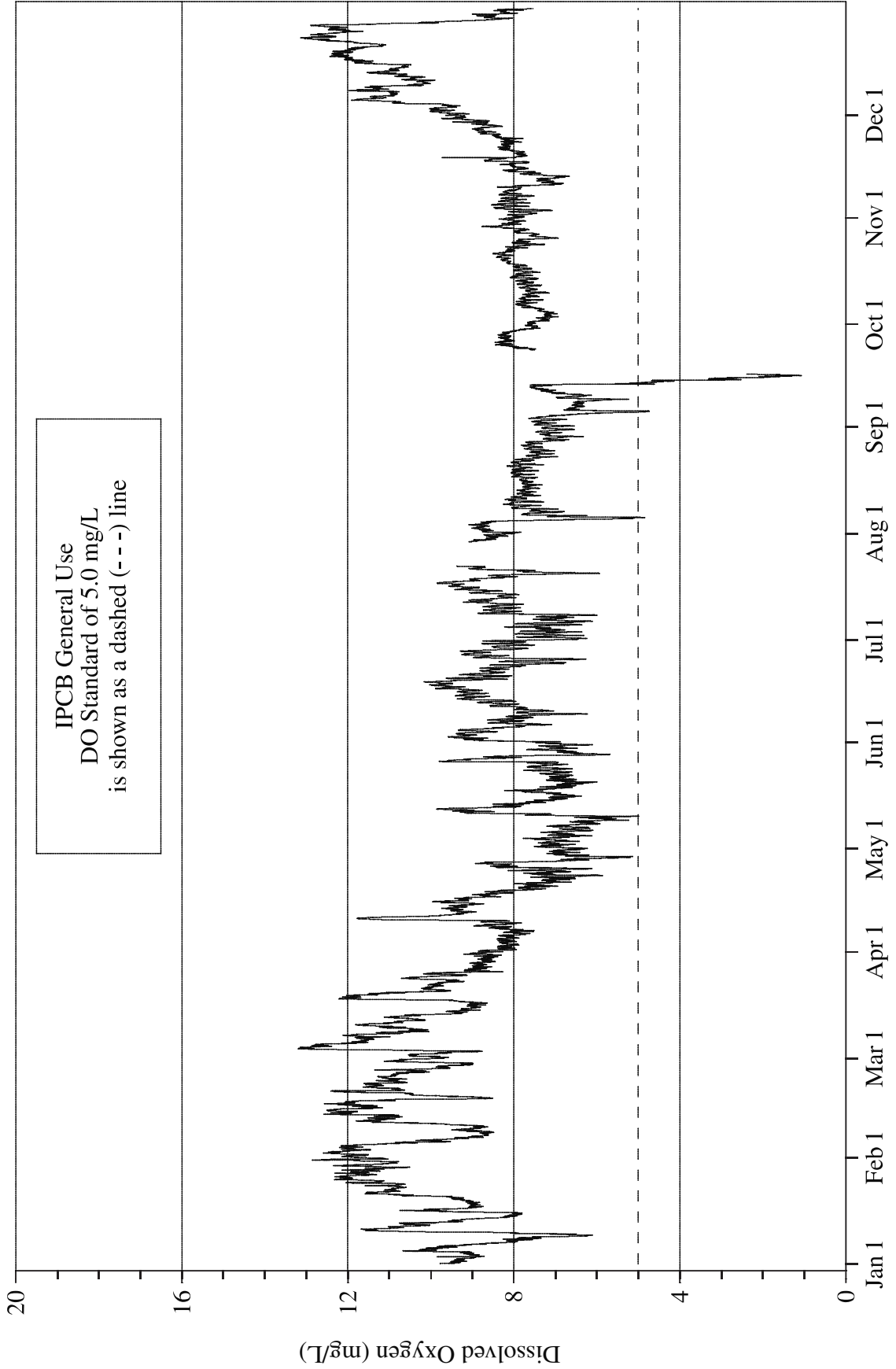


FIGURE 8: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT LOOMIS STREET ON THE SOUTH BRANCH CHICAGO RIVER FROM JANUARY 1, 2008 THROUGH DECEMBER 31, 2008

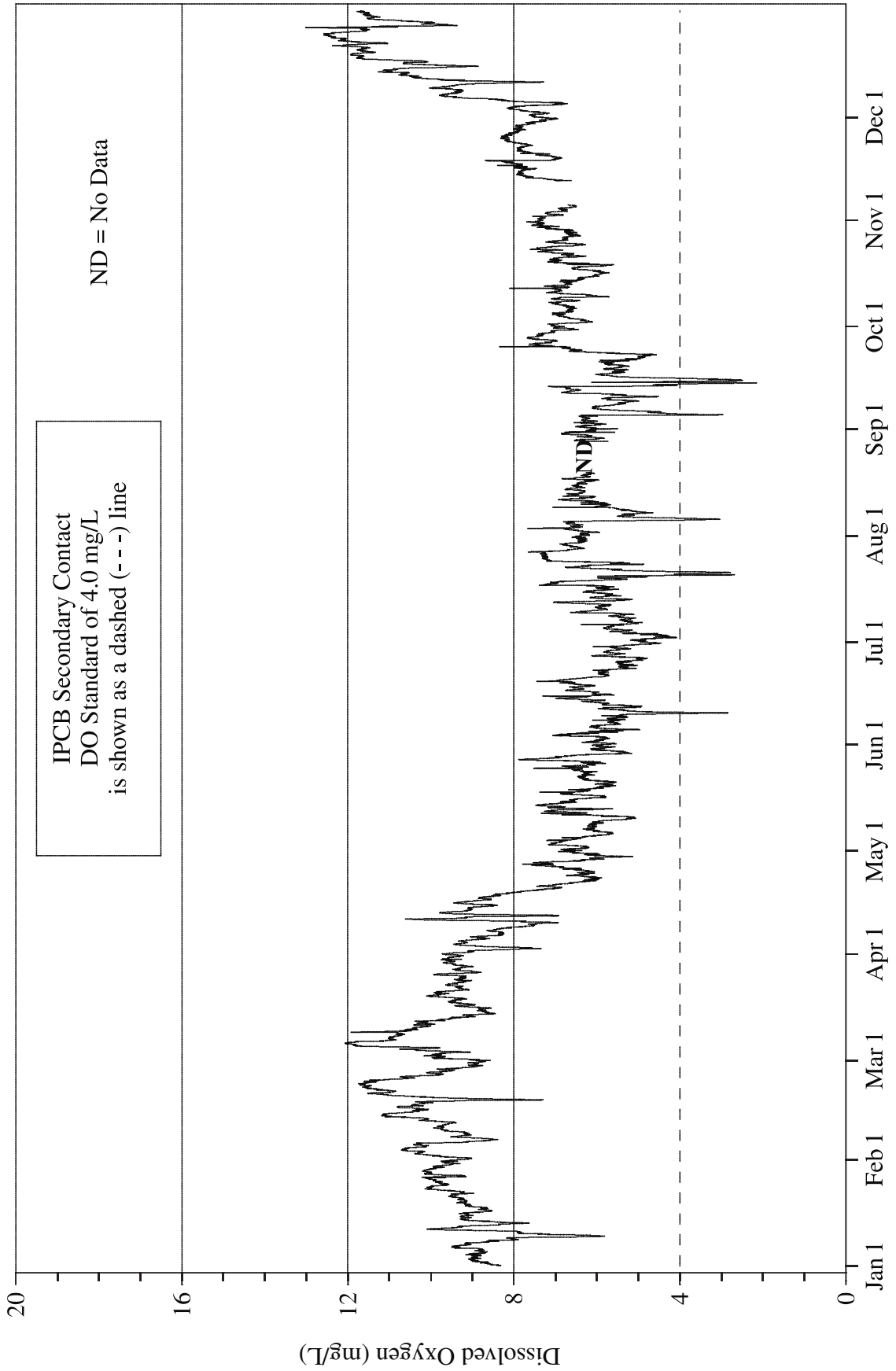
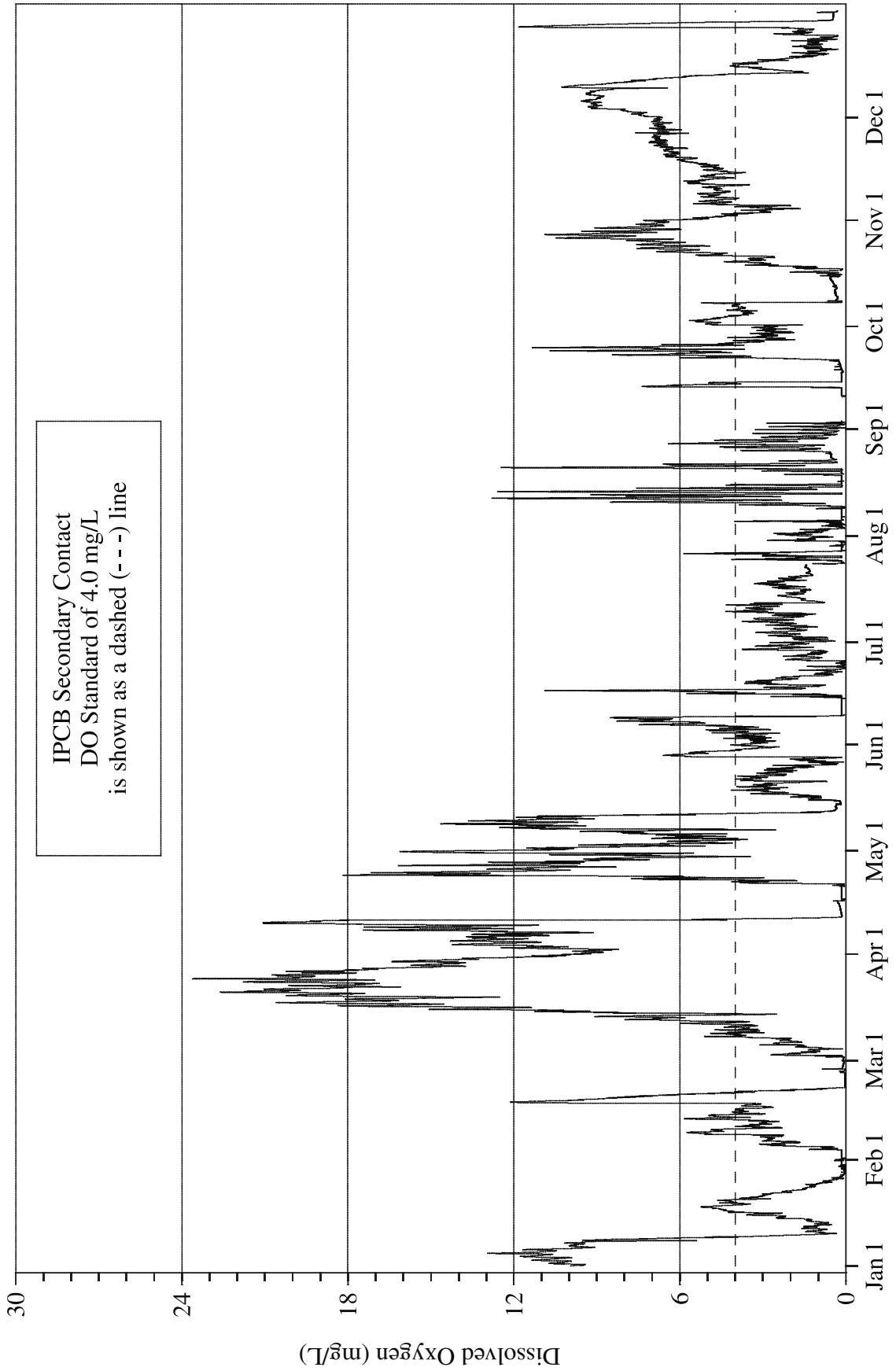


FIGURE 9: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT 36TH STREET ON BUBBLY CREEK FROM JANUARY 1, 2008 THROUGH DECEMBER 31, 2008



IPCB Secondary Contact
DO Standard of 4.0 mg/L
is shown as a dashed (- - -) line

FIGURE 10: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT INTERSTATE HIGHWAY 55 ON BUBBLY CREEK FROM JANUARY 1, 2008 THROUGH DECEMBER 31, 2008

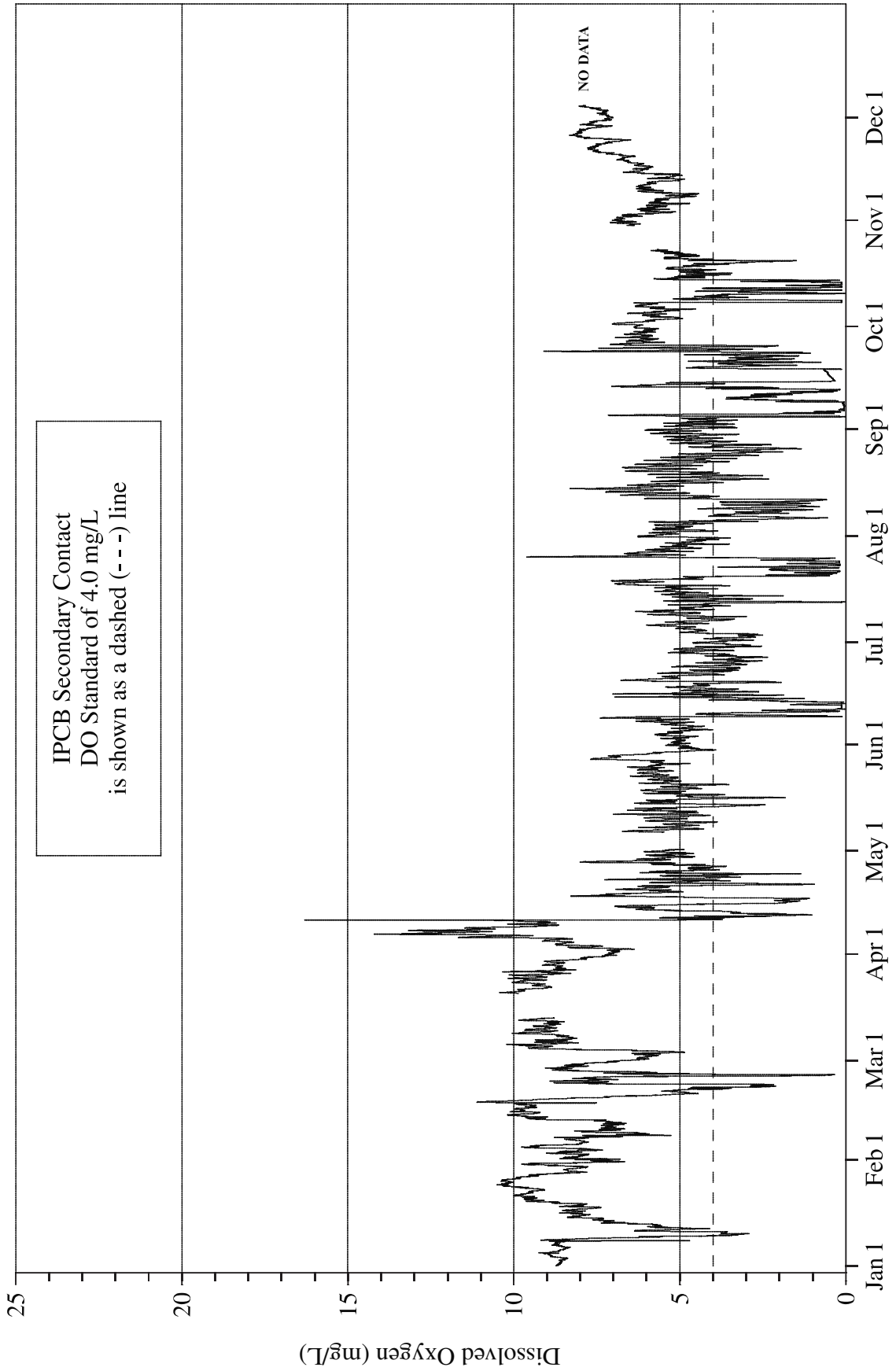
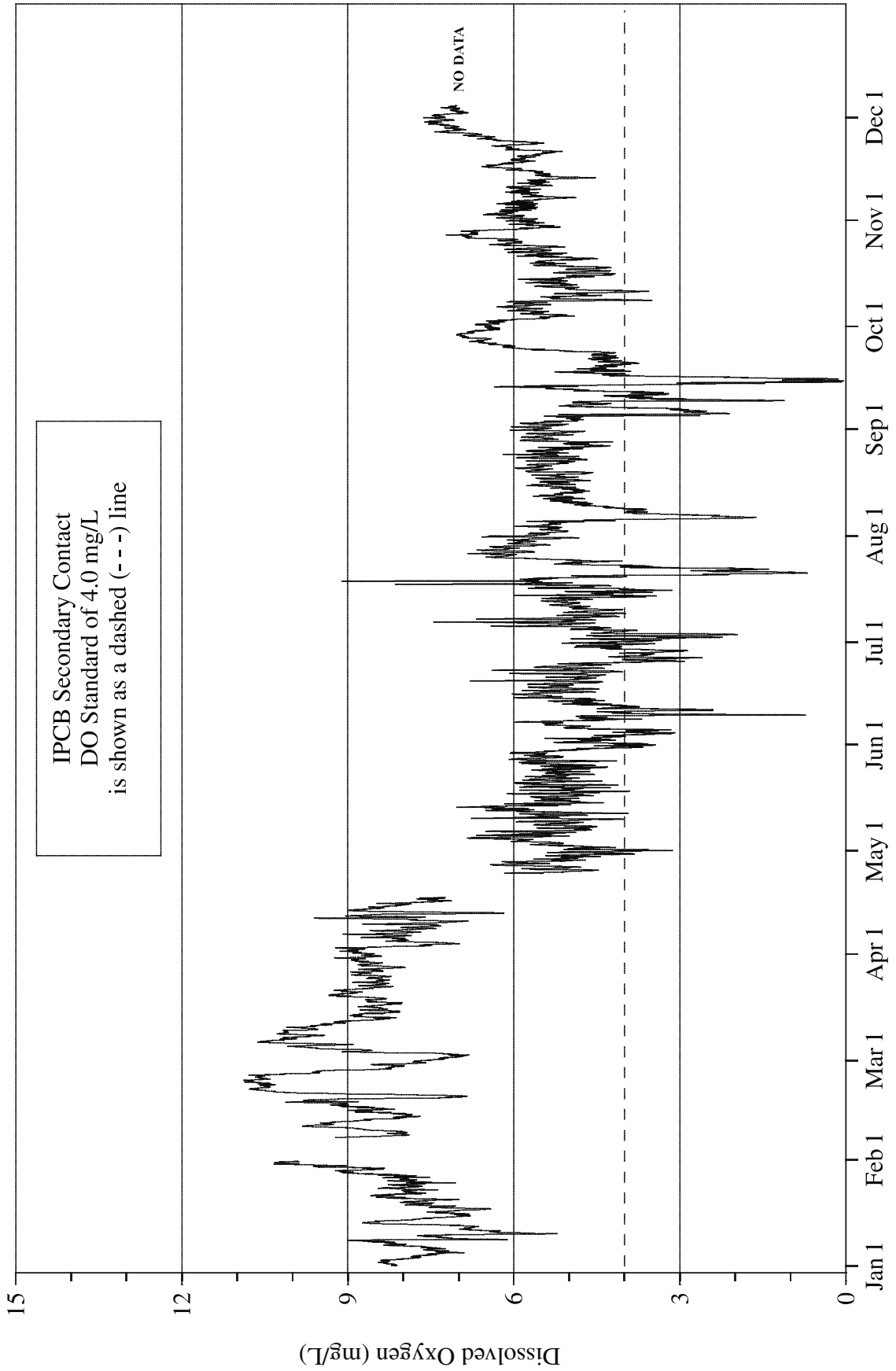


FIGURE 11: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT CICERO AVENUE ON THE CHICAGO SANITARY AND SHIP CANAL FROM JANUARY 1, 2008 THROUGH DECEMBER 31, 2008



IPCB Secondary Contact
DO Standard of 4.0 mg/L
is shown as a dashed (---) line

FIGURE 12: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT B&O CENTRAL RAILROAD ON THE CHICAGO SANITARY AND SHIP CANAL FROM JANUARY 1, 2008 THROUGH DECEMBER 31, 2008

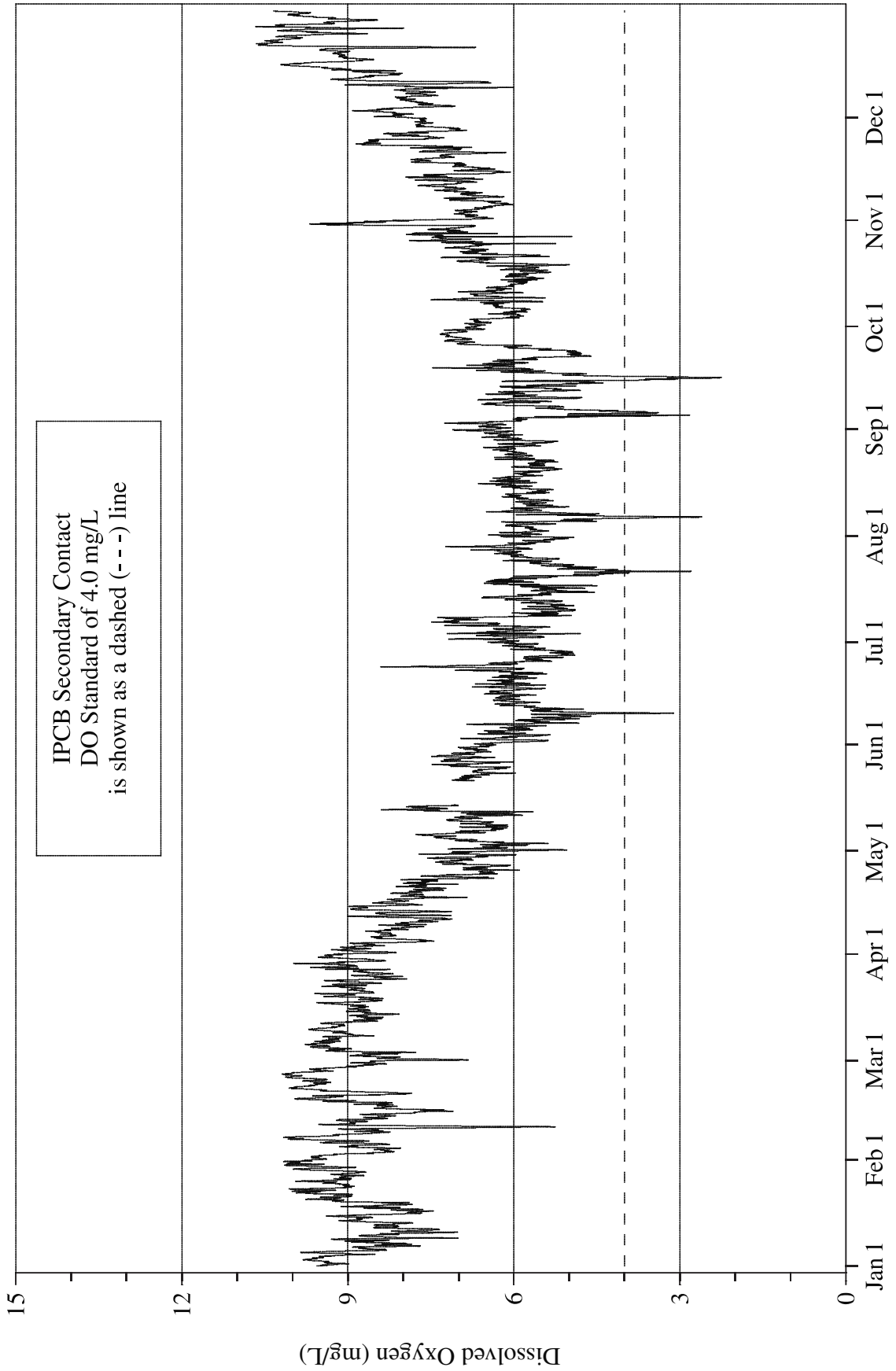


FIGURE 13: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT ROUTE 83 ON THE CHICAGO SANITARY AND SHIP CANAL FROM JANUARY 1, 2008 THROUGH DECEMBER 31, 2008

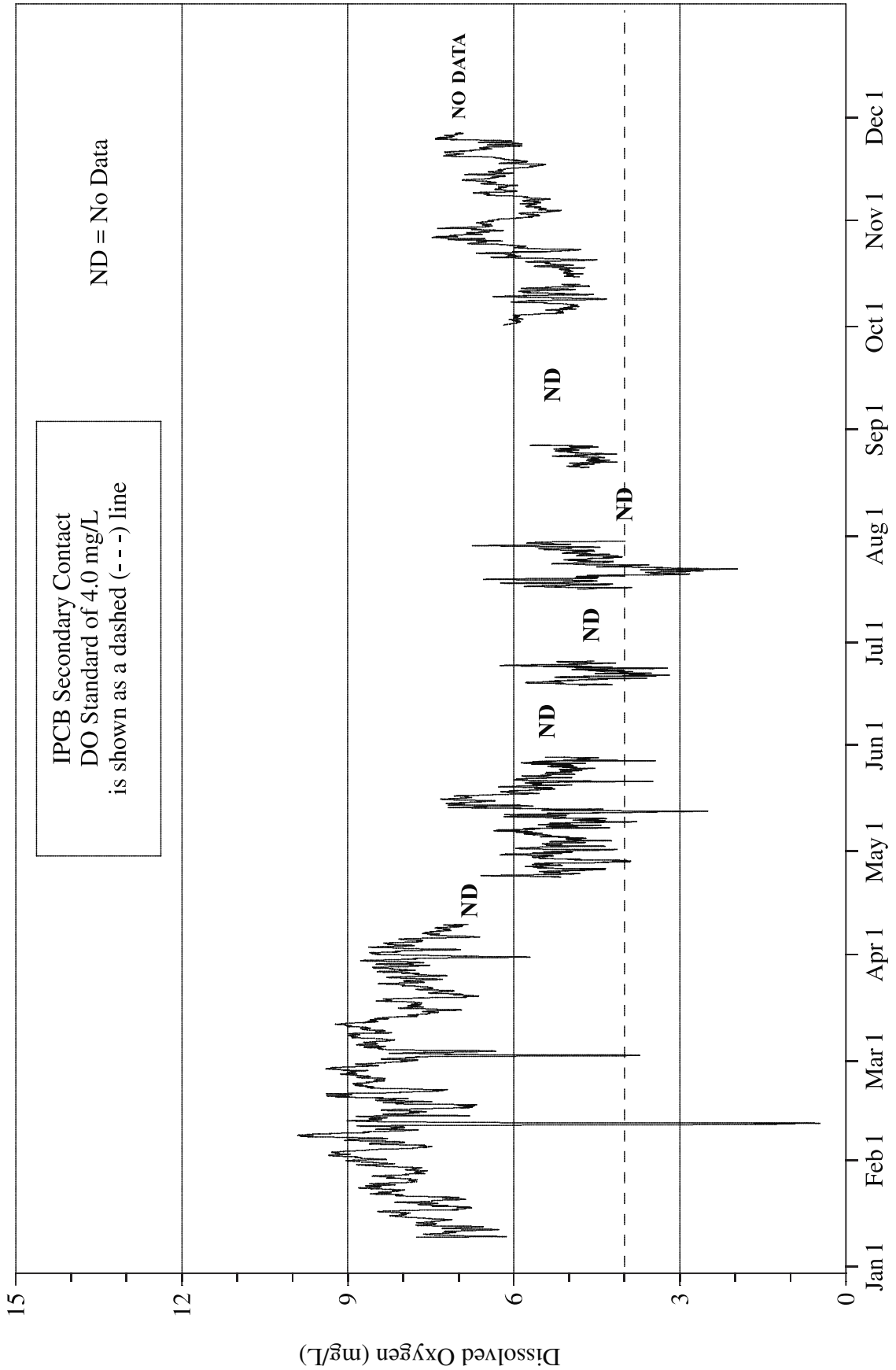


FIGURE 14: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT ROMEVILLE ROAD ON THE CHICAGO SANITARY AND SHIP CANAL FROM JANUARY 1, 2008 THROUGH DECEMBER 31, 2008

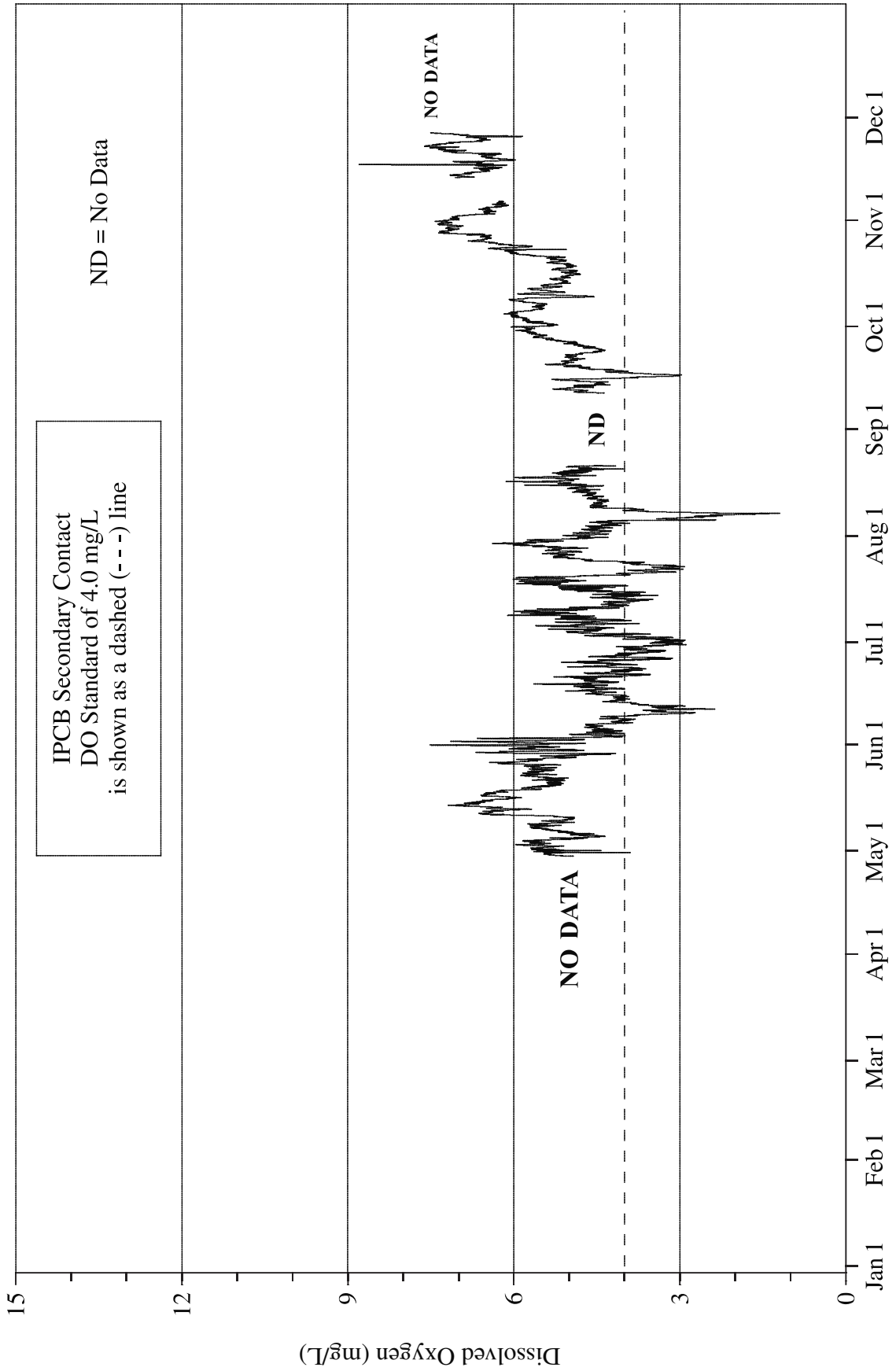


FIGURE 15: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT LOCKPORT POWERHOUSE ON THE CHICAGO SANITARY AND SHIP CANAL FROM JANUARY 1, 2008 THROUGH DECEMBER 31, 2008

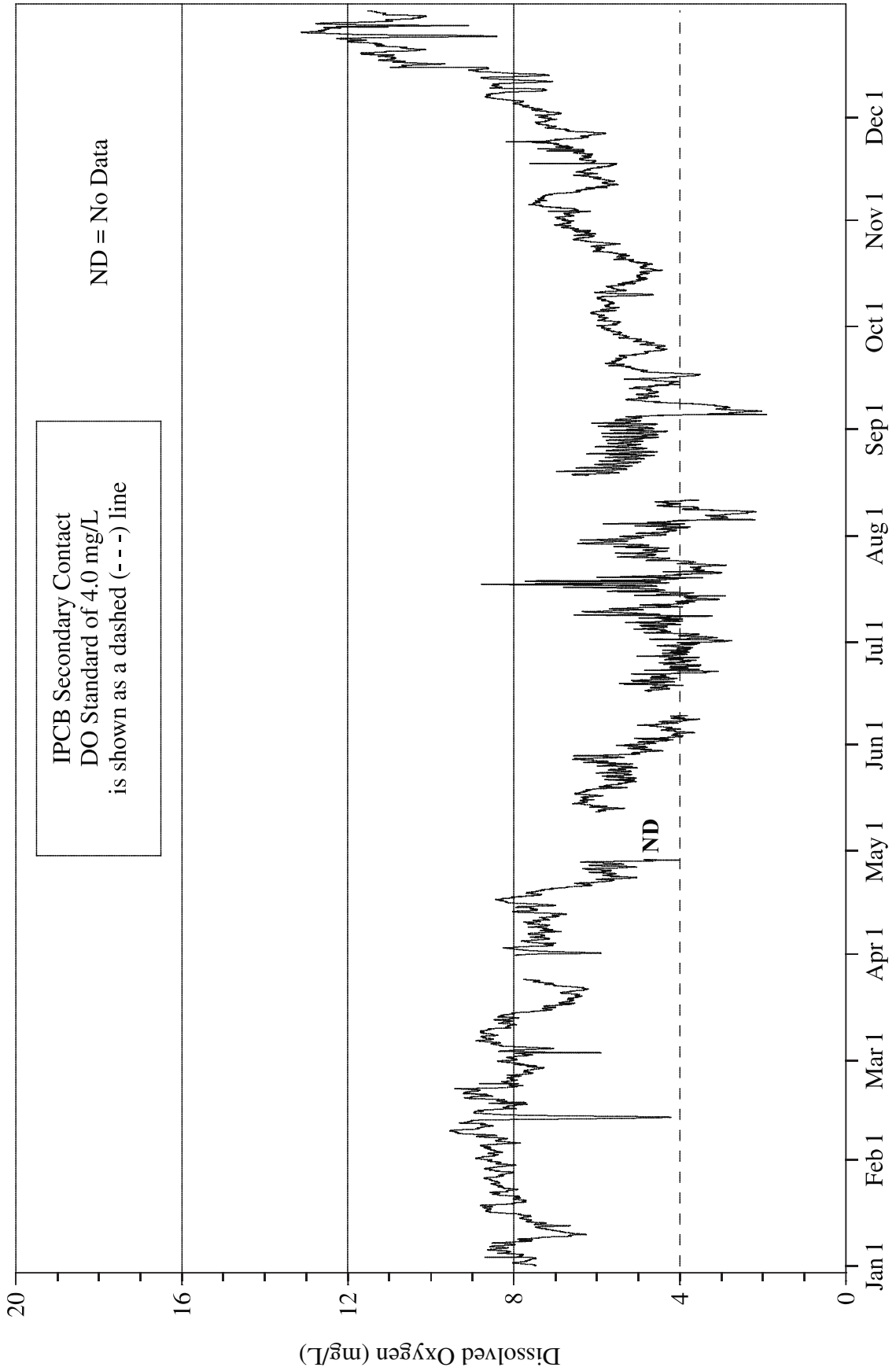
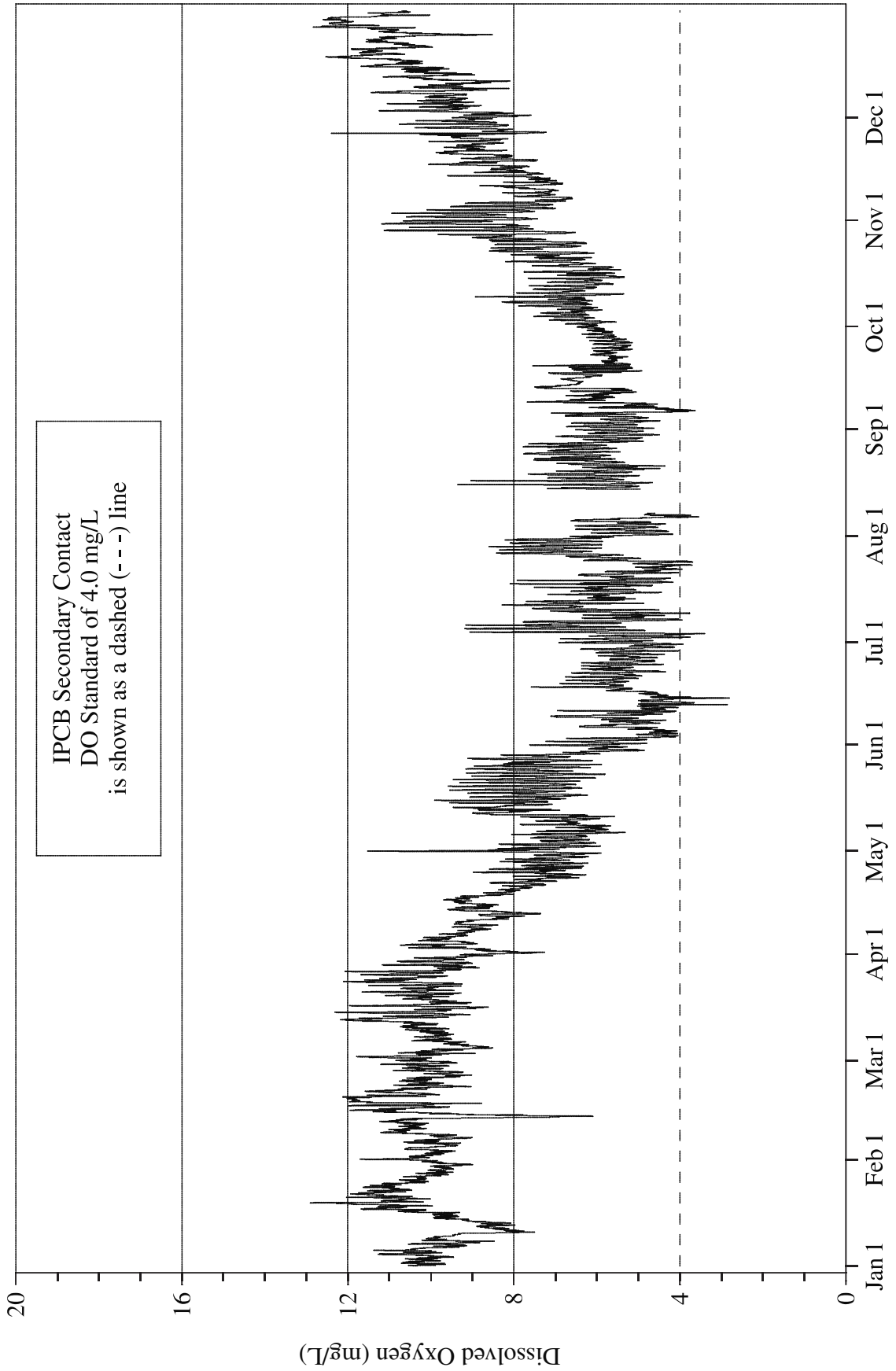


FIGURE 16: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT JEFFERSON STREET ON THE DES PLAINES RIVER FROM JANUARY 1, 2008 THROUGH DECEMBER 31, 2008



IPCB Secondary Contact
DO Standard of 4.0 mg/L
is shown as a dashed (- - -) line

FIGURE 17: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT C&W INDIANA RAILROAD ON THE LITTLE CALUMET RIVER FROM JANUARY 1, 2008 THROUGH DECEMBER 31, 2008

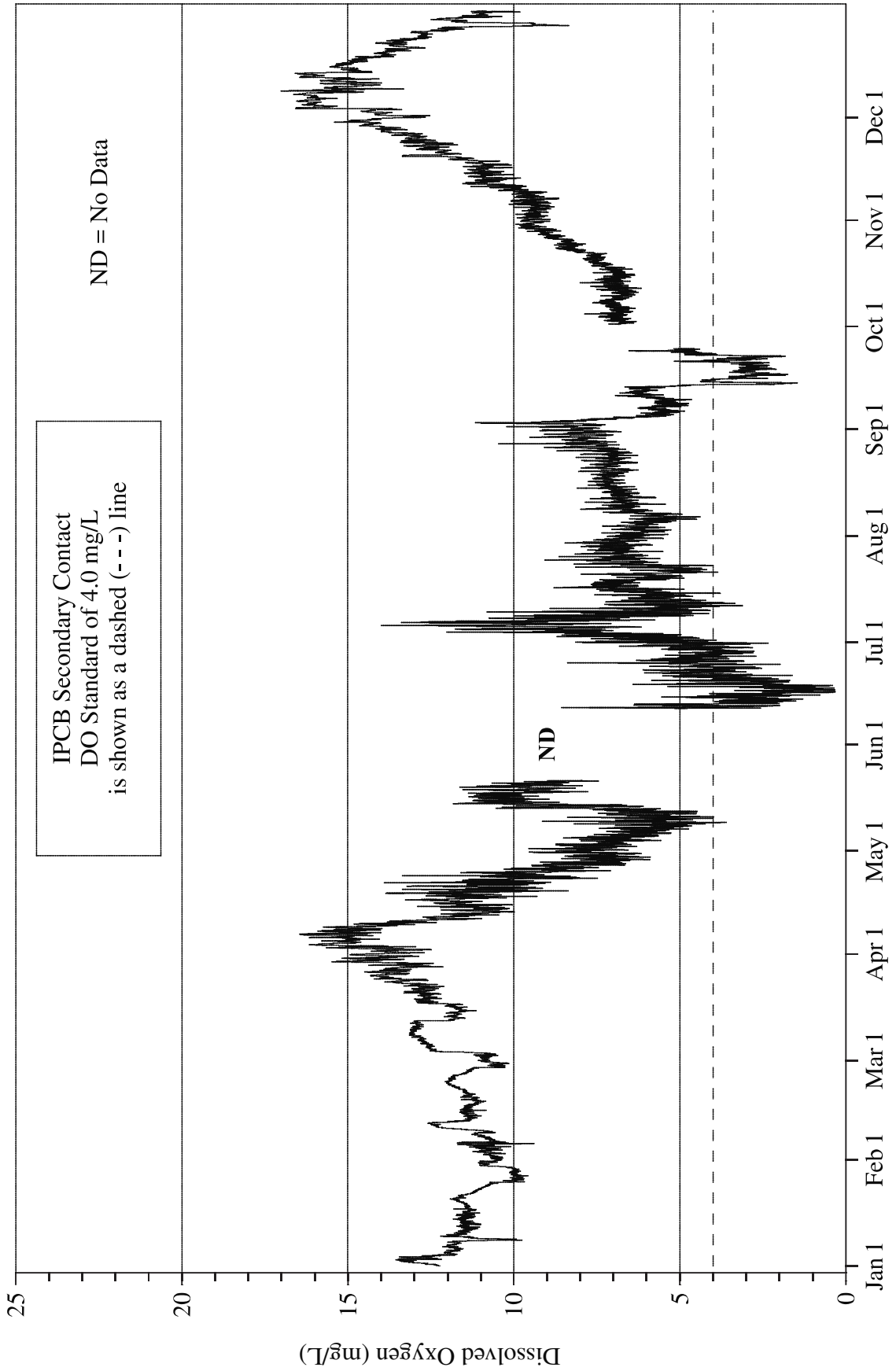


FIGURE 18: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT HALSTED STREET ON THE LITTLE CALUMET RIVER FROM JANUARY 1, 2008 THROUGH DECEMBER 31, 2008

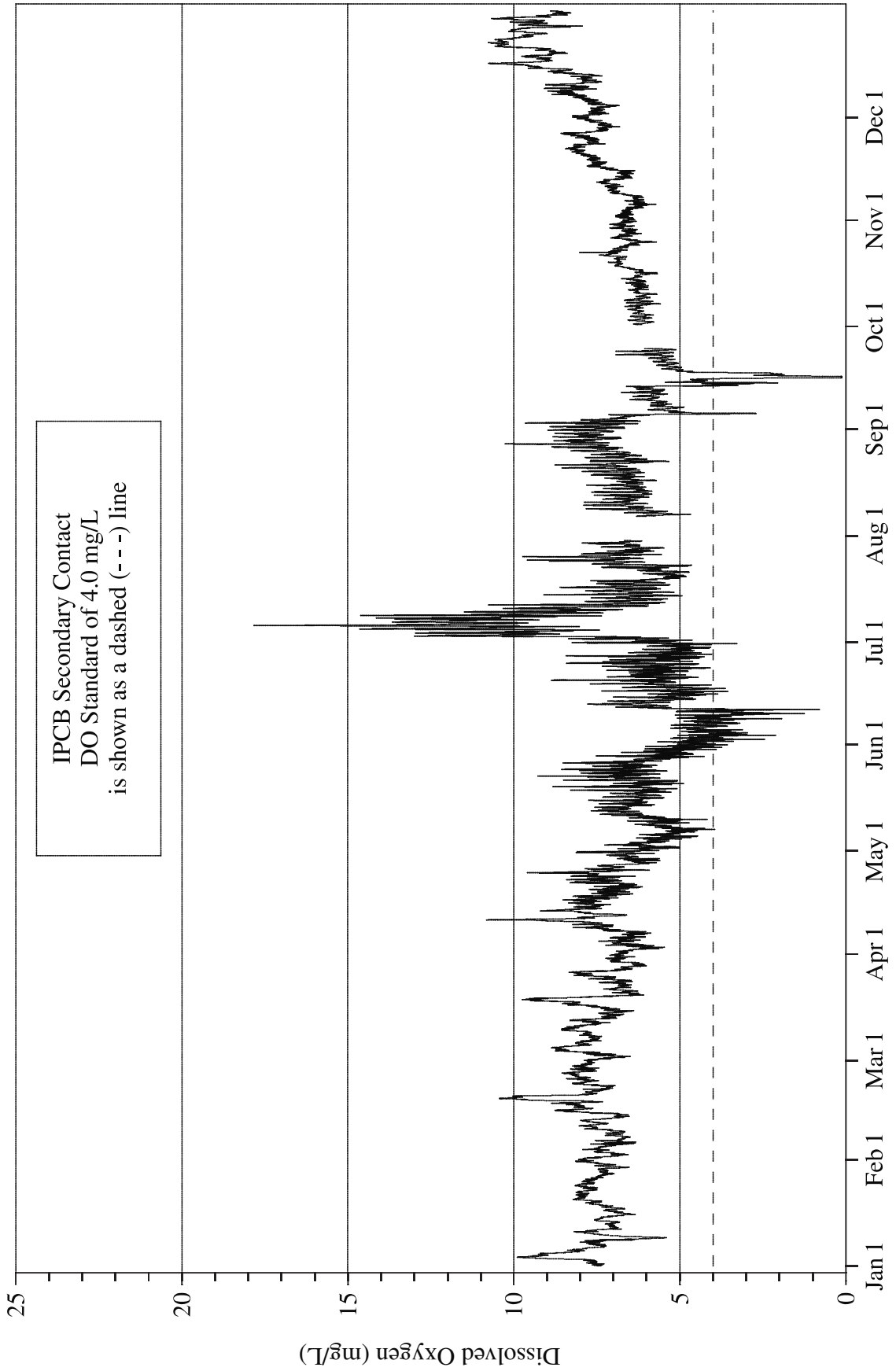


FIGURE 19: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT DIVISION STREET ON THE CALUMET-SAG CHANNEL FROM JANUARY 1, 2008 THROUGH DECEMBER 31, 2008

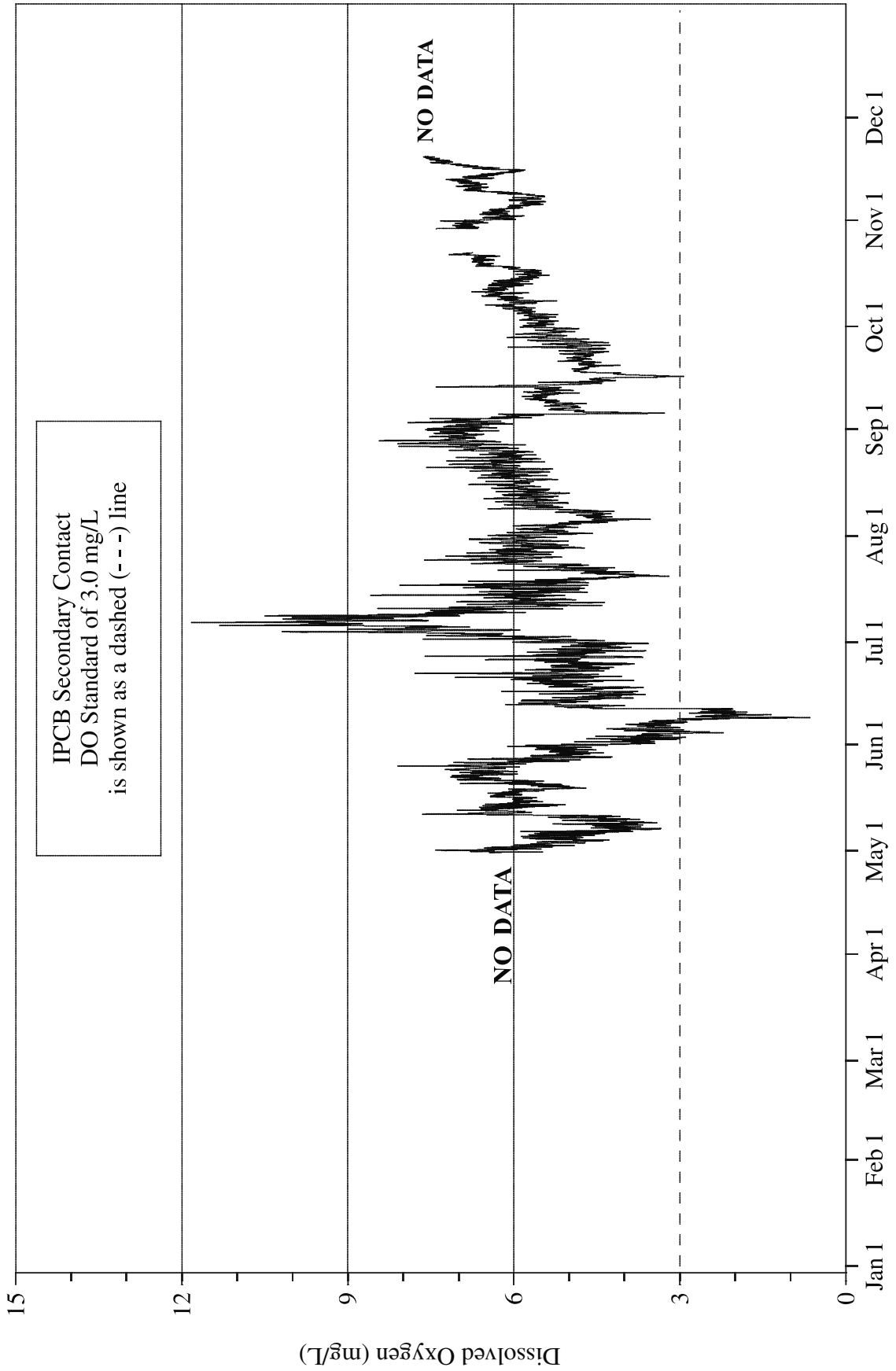
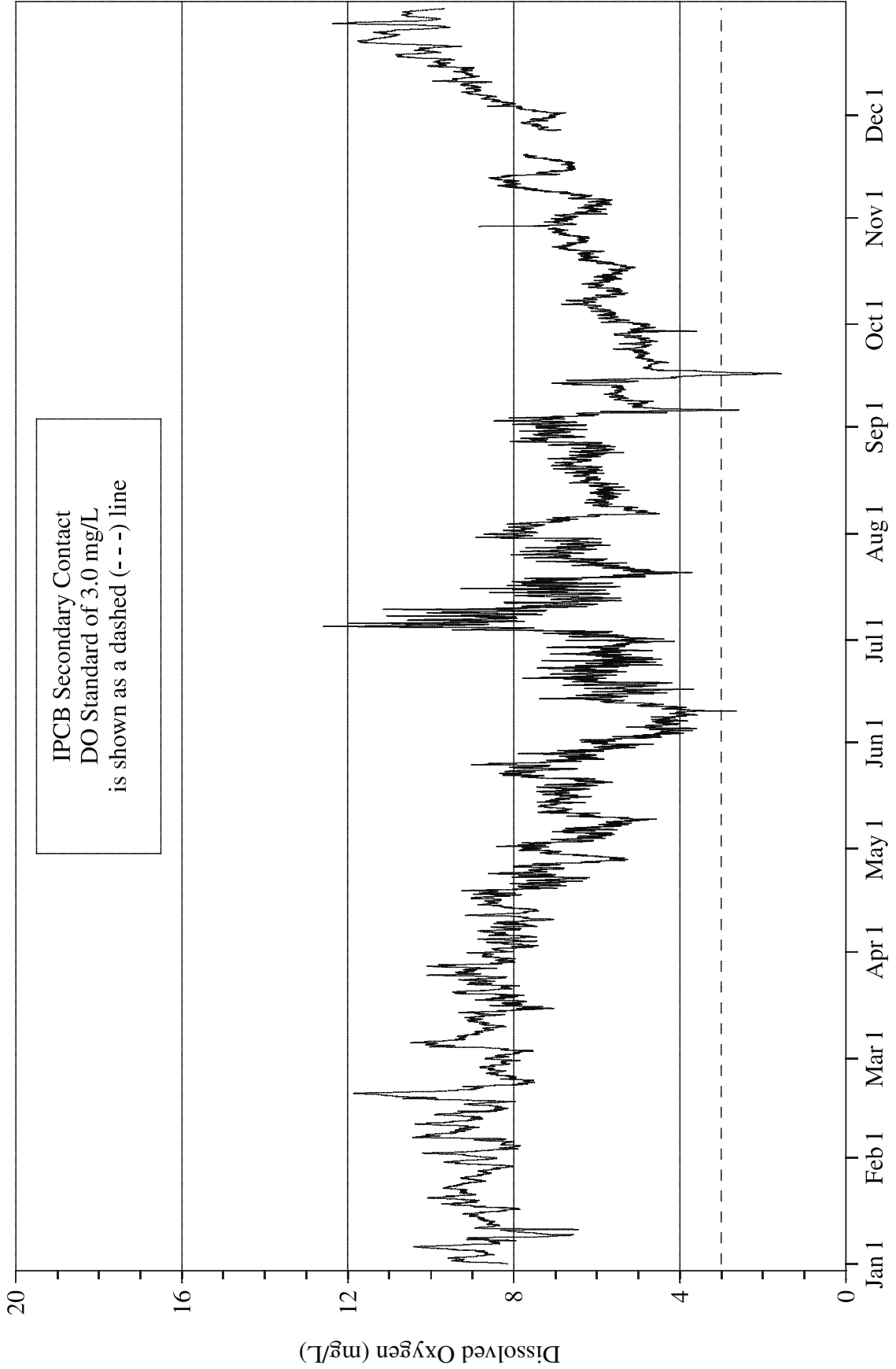


FIGURE 20: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT CICERO AVENUE ON THE CALUMET-SAG CHANNEL FROM JANUARY 1, 2008 THROUGH DECEMBER 31, 2008



IPCB Secondary Contact
DO Standard of 3.0 mg/L
is shown as a dashed (---) line

FIGURE 21: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT RIVER MILE 311.7 ON THE CALUMET-SAG CHANNEL FROM JANUARY 1, 2008 THROUGH DECEMBER 31, 2008

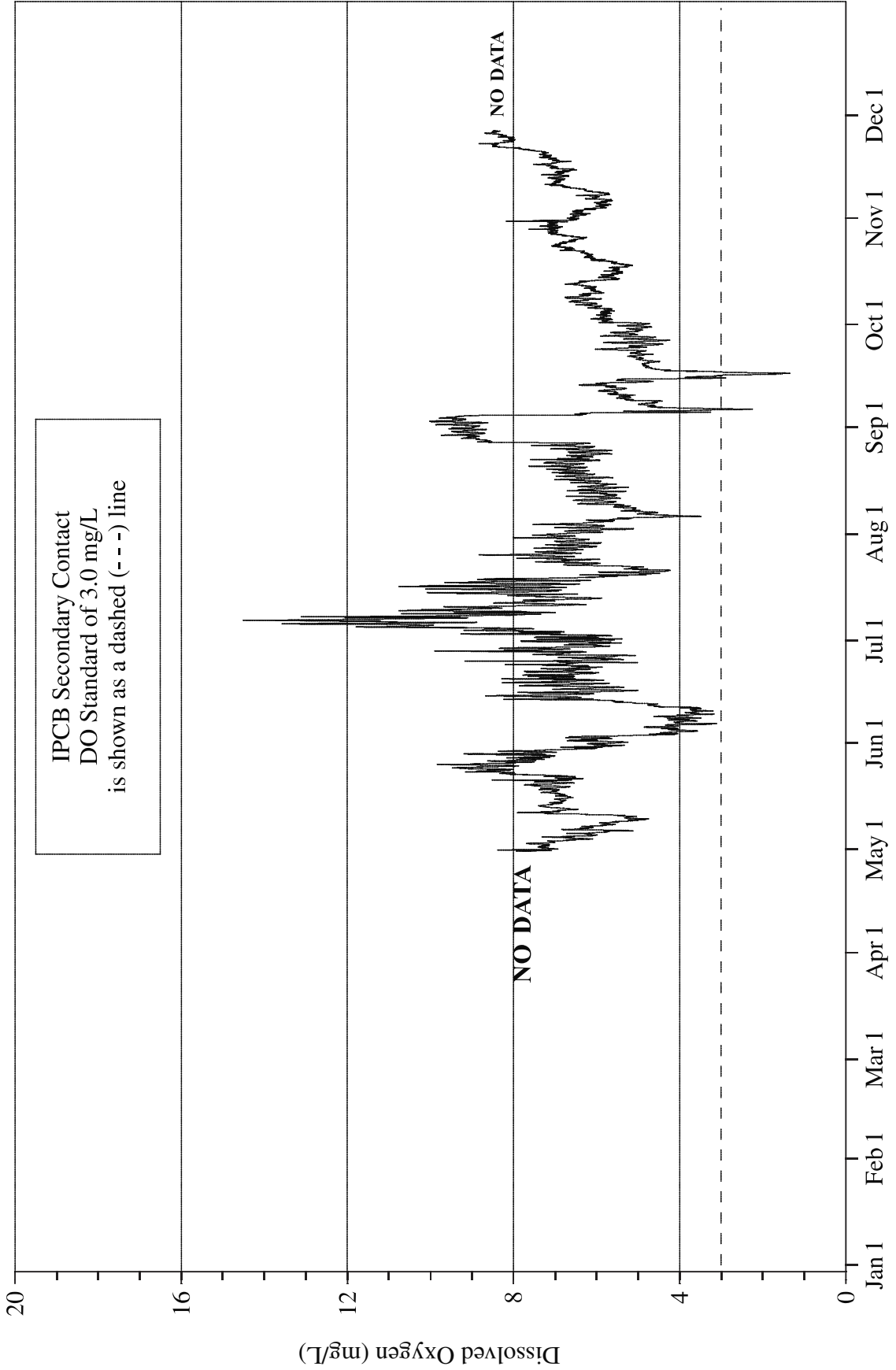


FIGURE 22: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT SOUTHWEST HIGHWAY ON THE CALUMET-SAG CHANNEL FROM JANUARY 1, 2008 THROUGH DECEMBER 31, 2008

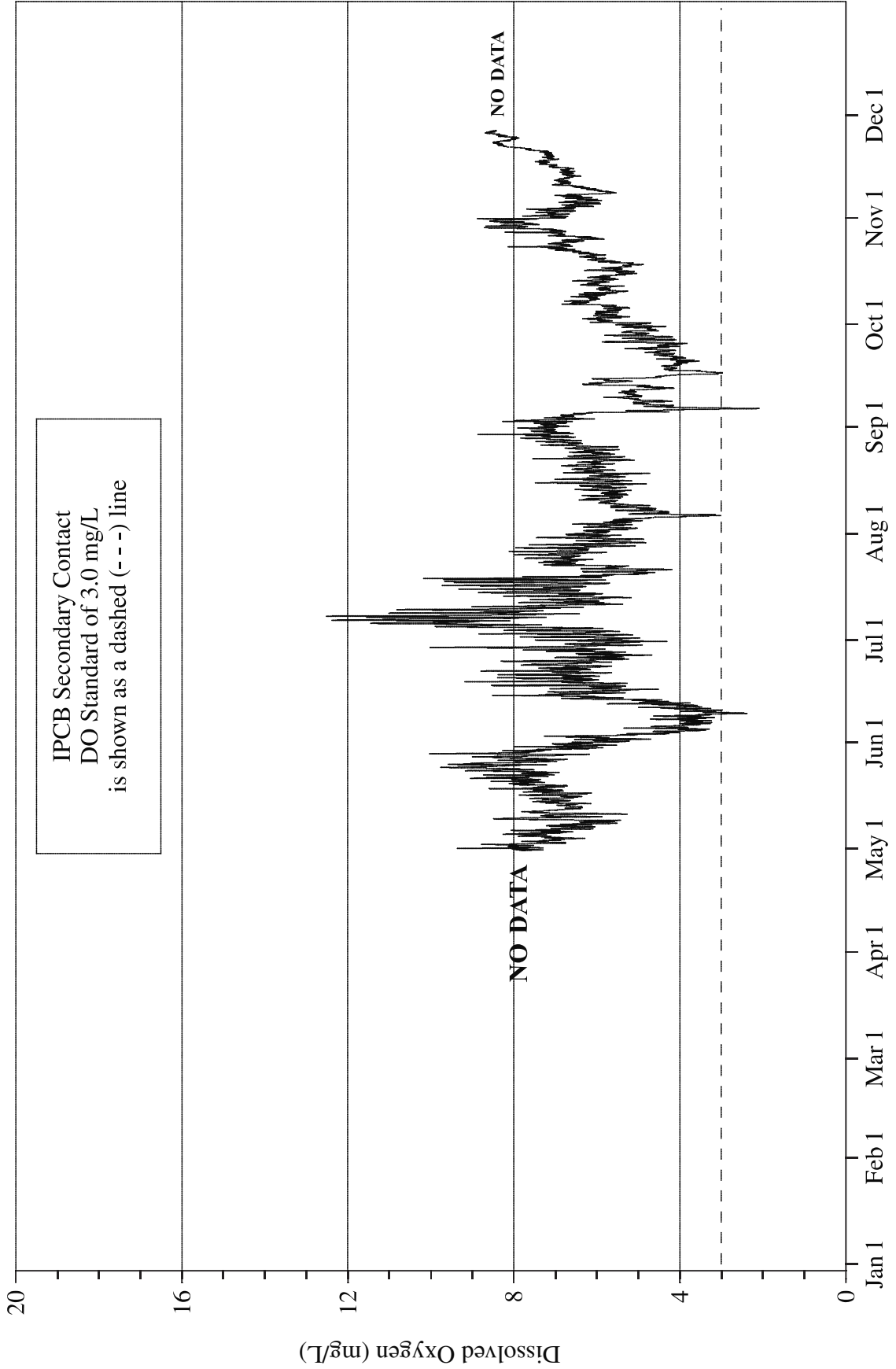
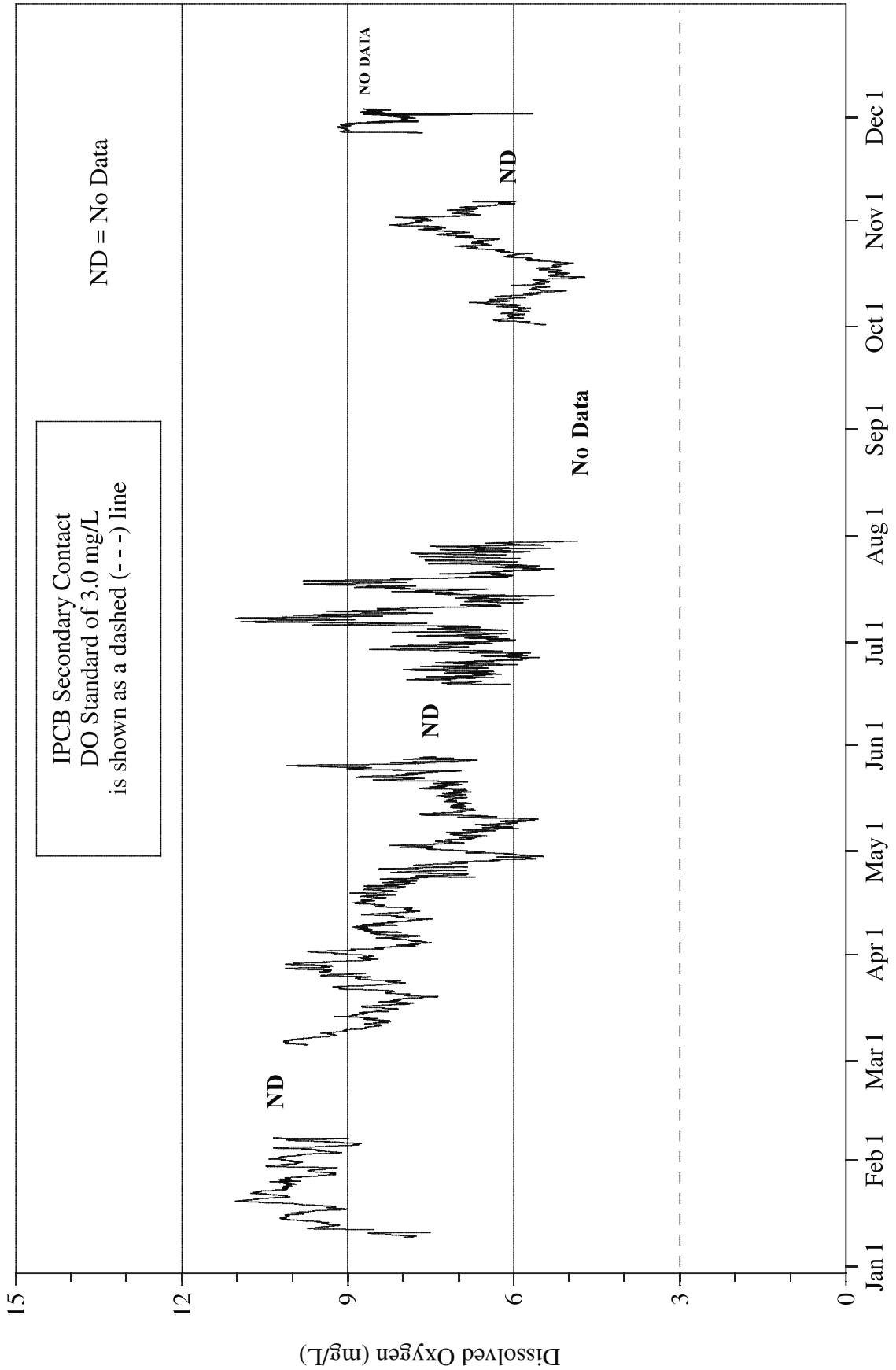


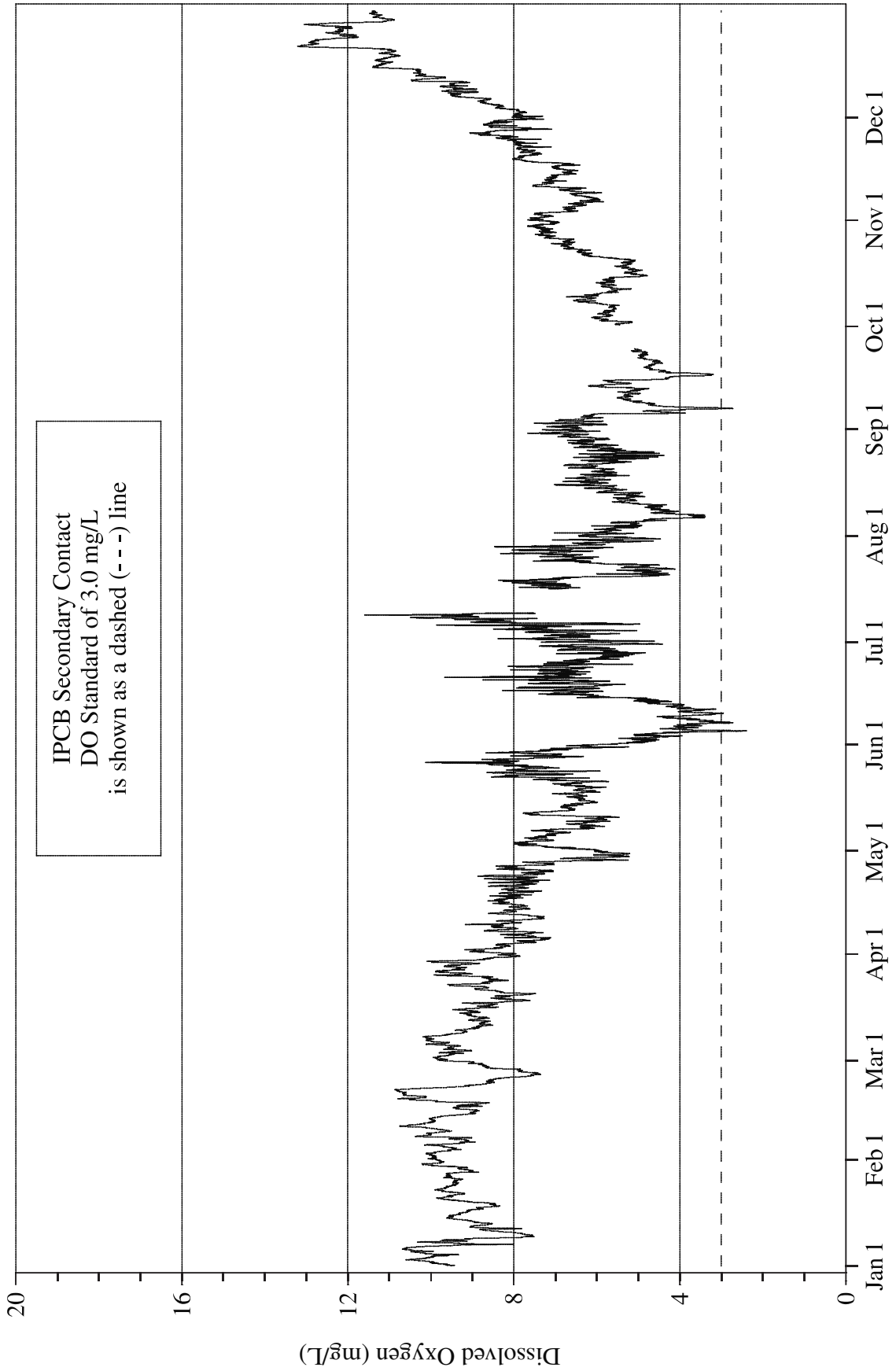
FIGURE 23: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT 104TH AVENUE ON THE CALUMET-SAG CHANNEL FROM JANUARY 1, 2008 THROUGH DECEMBER 31, 2008



IPCB Secondary Contact
DO Standard of 3.0 mg/L
is shown as a dashed (---) line

ND = No Data

FIGURE 24: DISSOLVED OXYGEN CONCENTRATION MEASURED HOURLY AT ROUTE 83 ON THE CALUMET-SAG CHANNEL FROM JANUARY 1, 2008 THROUGH DECEMBER 31, 2008



REFERENCES

Chapman, G., "Water Quality Criteria for Dissolved Oxygen," EPA 440/5-86-003, United States Environmental Protection Agency, Office of Water Regulations and Standards, Washington, D.C., 1986.

APPENDIX A

WEEKLY DO SUMMARY STATISTICS AT ALL DEEP-DRAFT
MONITORING STATIONS DURING 2008

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TABLE A-1: WEEKLY DO SUMMARY STATISTICS AT MAIN STREET
ON THE NORTH SHORE CHANNEL DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 5.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/08 - 01/06/08	144	1.7	7.3	4.4	42
01/07/08 - 01/13/08	168	2.8	7.8	4.8	39
01/14/08 - 01/20/08	168	1.9	7.8	4.6	36
01/21/08 - 01/27/08	168	3.1	8.5	6.2	85
01/28/08 - 02/03/08	168	2.7	10.7	7.4	92
02/04/08 - 02/10/08	168	2.4	9.5	5.5	54
02/11/08 - 02/17/08	168	3.8	10.6	6.2	80
02/18/08 - 02/24/08	168	1.0	9.0	3.5	11
02/25/08 - 03/02/08	168	1.6	9.4	5.3	59
03/03/08 - 03/09/08	168	5.7	11.5	8.3	100
03/10/08 - 03/16/08	167	2.1	11.6	6.5	69
03/17/08 - 03/23/08	168	7.9	16.9	12.8	100
03/24/08 - 03/30/08	168	10.5	26.4	18.5	100
03/31/08 - 04/06/08	168	13.8	25.3	18.3	100
04/07/08 - 04/13/08	168	6.8	16.5	10.5	100
04/14/08 - 04/20/08	168	2.6	8.9	5.7	57
04/21/08 - 04/27/08	168	3.2	18.8	10.5	90
04/28/08 - 05/04/08	168	5.3	13.0	9.3	100
05/05/08 - 05/11/08	168	5.0	11.6	7.6	99
05/12/08 - 05/18/08	168	5.4	10.1	8.3	100
05/19/08 - 05/25/08	168	8.5	10.3	9.5	100
05/26/08 - 06/01/08	168	4.0	9.2	6.5	80
06/02/08 - 06/08/08	86	5.6	9.1	8.0	100
06/09/08 - 06/15/08	131	1.7	11.3	8.5	91
06/16/08 - 06/22/08	168	7.2	11.4	9.4	100
06/23/08 - 06/29/08	168	6.4	10.8	8.9	100
06/30/08 - 07/06/08	168	5.8	9.5	7.9	100
07/07/08 - 07/13/08	168	3.7	9.1	6.8	88
07/14/08 - 07/20/08	168	3.4	10.2	8.1	93
07/21/08 - 07/27/08	37	2.6	5.5	3.7	8
07/28/08 - 08/10/08			NO DATA		
08/11/08 - 08/17/08	130	5.5	7.6	7.1	100
08/18/08 - 08/24/08	168	5.8	8.2	7.4	100
08/25/08 - 08/31/08	168	6.8	8.7	7.8	100

TABLE A-1 (Continued): WEEKLY DO SUMMARY STATISTICS AT
MAIN STREET ON THE NORTH SHORE CHANNEL DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 5.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
09/01/08 - 09/07/08	168	0.3	8.2	4.8	61
09/08/08 - 09/14/08	168	0.1	7.5	5.7	72
09/15/08 - 09/21/08	168	0.3	7.2	0.8	3
09/22/08 - 09/28/08	168	0.4	9.2	7.4	95
09/29/08 - 10/05/08	168	5.2	8.7	7.6	100
10/06/08 - 10/12/08	168	5.4	8.7	7.8	100
10/13/08 - 10/19/08	168	6.0	8.7	7.9	100
10/20/08 - 10/26/08	168	6.1	8.7	7.6	100
10/27/08 - 11/02/08	168	6.1	8.6	7.1	100
11/03/08 - 11/09/08	168	4.9	14.7	7.9	99
11/10/08 - 11/16/08	168	9.8	19.1	14.1	100
11/17/08 - 11/23/08	168	9.7	16.3	12.5	100
11/24/08 - 11/30/08	168	7.4	19.2	15.3	100
12/01/08 - 12/07/08	167	7.1	16.8	13.2	100
12/08/08 - 12/14/08	168	7.9	16.2	11.8	100
12/15/08 - 12/21/08	168	7.9	11.2	9.6	100
12/22/08 - 12/28/08	168	4.5	10.9	8.0	99
12/29/08 - 12/31/08	72	7.2	10.0	8.2	100

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TABLE A-2: WEEKLY DO SUMMARY STATISTICS AT FOSTER AVENUE
ON THE NORTH SHORE CHANNEL DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/08 - 01/06/08	144	7.5	9.6	8.6	100
01/07/08 - 01/13/08	168	6.7	9.1	8.0	100
01/14/08 - 01/20/08	168	7.8	9.1	8.5	100
01/21/08 - 01/27/08	168	8.0	9.4	8.8	100
01/28/08 - 02/03/08	167	7.4	10.6	9.2	100
02/04/08 - 02/10/08	167	7.7	10.4	9.2	100
02/11/08 - 02/17/08	168	7.3	10.3	9.2	100
02/18/08 - 02/24/08	168	8.0	10.6	9.1	100
02/25/08 - 03/02/08	168	7.7	9.4	8.7	100
03/03/08 - 03/09/08	168	7.7	10.5	8.8	100
03/10/08 - 03/16/08	167	7.7	9.1	8.4	100
03/17/08 - 03/23/08	36	7.5	8.8	8.1	100
03/24/08 - 03/30/08	132	7.8	10.8	9.4	100
03/31/08 - 04/06/08	168	6.7	9.3	7.8	100
04/07/08 - 04/13/08	168	5.8	9.8	8.1	100
04/14/08 - 04/20/08	168	7.2	10.3	8.2	100
04/21/08 - 04/27/08	168	5.2	9.9	7.9	100
04/28/08 - 05/04/08	168	6.2	9.6	7.9	100
05/05/08 - 05/11/08	168	5.8	9.7	7.7	100
05/12/08 - 05/18/08	168	6.6	9.5	8.1	100
05/19/08 - 05/25/08	168	8.0	9.9	8.7	100
05/26/08 - 06/01/08	168	0.5	9.5	7.6	98
06/02/08 - 06/08/08	168	4.0	8.7	7.1	99
06/09/08 - 06/15/08	168	5.2	8.5	7.2	100
06/16/08 - 06/22/08	168	6.1	8.7	7.4	100
06/23/08 - 06/29/08	168	4.7	8.1	6.9	100
06/30/08 - 07/06/08	168	5.2	7.9	6.8	100
07/07/08 - 07/13/08	168	3.8	7.8	6.7	99
07/14/08 - 07/20/08	168	4.4	8.1	7.2	100
07/21/08 - 07/27/08	168	5.8	7.9	7.0	100
07/28/08 - 08/03/08	167	5.9	7.6	6.8	100
08/04/08 - 08/10/08	168	5.1	7.6	6.7	100
08/11/08 - 08/17/08	168	6.5	8.1	7.3	100
08/18/08 - 08/24/08	168	5.6	7.9	7.0	100

TABLE A-2 (Continued): WEEKLY DO SUMMARY STATISTICS AT
FOSTER AVENUE ON THE NORTH SHORE CHANNEL DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
08/25/08 - 08/31/08	168	5.9	7.6	6.7	100
09/01/08 - 09/07/08	168	4.8	7.8	6.9	100
09/08/08 - 09/14/08	168	5.8	8.5	7.1	100
09/15/08 - 09/21/08	168	4.9	8.4	6.8	100
09/22/08 - 09/28/08	168	6.2	8.1	7.0	100
09/29/08 - 10/05/08	168	5.4	8.4	7.4	100
10/06/08 - 10/12/08	168	6.4	8.3	7.5	100
10/13/08 - 10/19/08	168	6.1	8.4	7.6	100
10/20/08 - 10/26/08	168	5.7	8.4	7.6	100
10/27/08 - 11/02/08	168	6.8	8.3	7.5	100
11/03/08 - 11/09/08	167	5.4	8.4	7.2	100
11/10/08 - 11/16/08	168	5.8	8.0	7.1	100
11/17/08 - 11/23/08	168	7.1	8.7	7.9	100
11/24/08 - 11/30/08	168	6.6	8.6	7.7	100
12/01/08 - 12/07/08	168	6.2	9.5	8.5	100
12/08/08 - 12/14/08	168	6.5	9.4	8.6	100
12/15/08 - 12/21/08	168	7.3	9.4	8.6	100
12/22/08 - 12/28/08	168	6.9	9.9	8.7	100
12/29/08 - 12/31/08	72	7.8	9.2	8.4	100

TABLE A-3: WEEKLY DO SUMMARY STATISTICS AT ADDISON STREET
ON THE NORTH BRANCH CHICAGO RIVER DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/08 - 01/06/08	144	8.0	9.8	9.0	100
01/07/08 - 01/13/08	168	6.8	10.0	9.1	100
01/14/08 - 01/20/08	168	8.8	10.3	9.6	100
01/21/08 - 01/27/08	168	8.9	10.5	9.8	100
01/28/08 - 02/03/08	168	7.9	11.2	9.8	100
02/04/08 - 02/10/08	168	8.4	11.6	10.3	100
02/11/08 - 02/17/08	168	7.8	11.6	9.7	100
02/18/08 - 02/24/08	168	9.5	12.1	10.6	100
02/25/08 - 03/02/08	168	8.4	9.8	9.3	100
03/03/08 - 03/09/08	168	8.3	12.8	11.3	100
03/10/08 - 03/16/08	167	9.5	11.0	10.2	100
03/17/08 - 03/23/08	168	8.1	11.7	9.9	100
03/24/08 - 03/30/08	168	8.6	11.4	10.1	100
03/31/08 - 04/06/08	168	7.7	10.6	9.5	100
04/07/08 - 04/13/08	168	7.0	10.7	9.2	100
04/14/08 - 04/20/08	168	8.0	10.8	9.4	100
04/21/08 - 04/27/08	168	5.2	9.1	7.9	100
04/28/08 - 05/04/08	168	6.4	9.8	8.0	100
05/05/08 - 05/11/08	168	6.1	8.9	7.5	100
05/12/08 - 05/18/08	168	6.2	9.0	7.8	100
05/19/08 - 05/25/08	168	7.4	9.1	8.0	100
05/26/08 - 06/01/08	168	0.2	8.6	6.9	97
06/02/08 - 06/08/08	168	3.9	7.4	6.4	99
06/09/08 - 06/15/08	168	3.2	8.0	6.9	99
06/16/08 - 06/22/08	168	5.6	8.0	6.9	100
06/23/08 - 06/29/08	168	4.1	7.3	6.3	100
06/30/08 - 07/06/08	168	5.1	7.1	6.2	100
07/07/08 - 07/13/08	168	3.5	6.8	6.0	99
07/14/08 - 07/20/08	168	2.2	7.2	6.3	99
07/21/08 - 07/27/08	168	4.9	7.1	6.4	100
07/28/08 - 08/03/08	168	5.6	7.0	6.2	100
08/04/08 - 08/10/08	168	5.0	7.0	6.3	100
08/11/08 - 08/17/08	168	5.8	7.2	6.6	100
08/18/08 - 08/24/08	168	5.0	7.2	6.2	100

TABLE A-3 (Continued): WEEKLY DO SUMMARY STATISTICS AT
ADDISON STREET ON THE NORTH BRANCH CHICAGO RIVER DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
08/25/08 - 08/31/08	168	5.5	7.2	6.3	100
09/01/08 - 09/07/08	168	2.2	7.7	6.8	98
09/08/08 - 09/14/08	168	5.4	8.5	7.1	100
09/15/08 - 09/21/08	168	5.1	8.1	7.2	100
09/22/08 - 09/28/08	167	6.3	7.4	6.8	100
09/29/08 - 10/05/08	168	5.4	8.3	7.2	100
10/06/08 - 10/12/08	168	6.6	8.2	7.6	100
10/13/08 - 10/19/08	168	5.7	8.2	7.2	100
10/20/08 - 10/26/08	168	5.6	8.4	7.5	100
10/27/08 - 11/02/08	168	6.6	8.3	7.5	100
11/03/08 - 11/09/08	156	5.3	8.1	6.9	100
11/10/08 - 11/16/08	168	6.4	8.7	7.8	100
11/17/08 - 11/23/08	168	7.5	8.8	8.1	100
11/24/08 - 11/30/08	168	6.9	8.5	7.8	100
12/01/08 - 12/07/08	168	6.0	9.9	8.9	100
12/08/08 - 12/14/08	168	7.6	10.8	9.6	100
12/15/08 - 12/21/08	168	9.0	11.3	10.0	100
12/22/08 - 12/28/08	168	8.2	11.3	9.7	100
12/29/08 - 12/31/08	72	10.6	11.4	11.0	100

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TABLE A-4: WEEKLY DO SUMMARY STATISTICS AT FULLERTON AVENUE
ON THE NORTH BRANCH CHICAGO RIVER DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/08 - 01/06/08	144	7.0	8.8	7.9	100
01/07/08 - 01/13/08	168	4.9	10.0	8.5	100
01/14/08 - 01/20/08	168	8.5	9.5	9.1	100
01/21/08 - 01/27/08	168	8.0	9.4	8.7	100
01/28/08 - 02/03/08	168	7.4	10.2	9.0	100
02/04/08 - 02/10/08	168	7.4	10.1	9.2	100
02/11/08 - 02/17/08	168	6.9	10.2	9.1	100
02/18/08 - 02/24/08	168	9.1	11.1	10.3	100
02/25/08 - 03/02/08	167	8.4	9.9	9.2	100
03/03/08 - 03/09/08	168	8.1	12.2	10.9	100
03/10/08 - 03/16/08	167	9.1	10.4	9.8	100
03/17/08 - 03/23/08	168	7.7	11.0	9.5	100
03/24/08 - 03/30/08	168	8.2	11.5	10.2	100
03/31/08 - 04/06/08	168	7.9	11.3	10.0	100
04/07/08 - 04/13/08	168	6.8	10.1	8.8	100
04/14/08 - 04/20/08	168	7.4	10.2	8.7	100
04/21/08 - 04/27/08	168	5.3	8.6	7.4	100
04/28/08 - 05/04/08	168	5.8	8.7	7.4	100
05/05/08 - 05/11/08	168	5.6	8.1	7.1	100
05/12/08 - 05/18/08	168	5.7	8.2	7.1	100
05/19/08 - 05/25/08	168	7.0	8.3	7.6	100
05/26/08 - 06/01/08	37	0.8	7.7	5.7	84
06/02/08 - 06/08/08	84	3.5	6.5	5.5	98
06/09/08 - 06/15/08	168	1.3	7.0	6.1	99
06/16/08 - 06/22/08	168	5.2	7.5	6.4	100
06/23/08 - 06/29/08	168	4.0	7.4	5.8	99
06/30/08 - 07/06/08	168	4.8	6.5	5.5	100
07/07/08 - 07/13/08	168	3.3	6.7	5.3	98
07/14/08 - 07/20/08	167	2.6	6.9	5.7	97
07/21/08 - 07/27/08	168	4.5	6.1	5.4	100
07/28/08 - 08/03/08	168	4.2	5.9	5.2	100
08/04/08 - 08/10/08	168	3.9	5.6	5.0	98
08/11/08 - 08/17/08	168	4.4	6.2	5.4	100
08/18/08 - 08/24/08	168	4.3	6.3	5.2	100

TABLE A-4 (Continued): WEEKLY DO SUMMARY STATISTICS AT FULLERTON AVENUE ON THE NORTH BRANCH CHICAGO RIVER DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values \geq 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
08/25/08 - 08/31/08	168	4.4	6.4	5.5	100
09/01/08 - 09/07/08	168	1.5	7.2	6.1	98
09/08/08 - 09/14/08	35	5.1	7.2	6.2	100
09/15/08 - 09/21/08	133	6.0	7.5	6.8	100
09/22/08 - 09/28/08	168	5.8	6.8	6.2	100
09/29/08 - 10/05/08	168	4.9	7.5	6.6	100
10/06/08 - 10/12/08	168	5.7	7.6	6.9	100
10/13/08 - 10/19/08	168	4.9	7.6	6.4	100
10/20/08 - 10/26/08	168	5.4	7.8	7.0	100
10/27/08 - 11/02/08	168	6.1	7.7	7.0	100
11/03/08 - 11/09/08	60	5.2	6.4	5.8	100
11/10/08 - 11/16/08	108	5.6	7.4	6.7	100
11/17/08 - 11/23/08	168	6.6	8.1	7.5	100
11/24/08 - 11/30/08	168	6.7	8.0	7.4	100
12/01/08 - 12/07/08	168	6.1	9.6	8.7	100
12/08/08 - 12/14/08	168	7.2	10.4	9.3	100
12/15/08 - 12/21/08	168	8.6	10.9	9.6	100
12/22/08 - 12/28/08	168	7.2	10.7	8.9	100
12/29/08 - 12/31/08	72	9.9	10.9	10.4	100

TABLE A-5: WEEKLY DO SUMMARY STATISTICS AT KINZIE STREET
ON THE NORTH BRANCH CHICAGO RIVER DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/08 - 01/06/08	144	7.8	9.5	8.9	100
01/07/08 - 01/13/08	168	6.1	9.1	8.1	100
01/14/08 - 01/20/08	168	8.4	9.9	8.8	100
01/21/08 - 01/27/08	168	8.2	11.7	9.3	100
01/28/08 - 02/03/08	168	7.7	10.7	9.1	100
02/04/08 - 02/10/08	168	7.6	10.5	9.5	100
02/11/08 - 02/17/08	168	7.0	10.9	9.9	100
02/18/08 - 02/24/08	168	7.9	11.9	10.6	100
02/25/08 - 03/02/08	168	7.4	9.3	8.2	100
03/03/08 - 03/09/08	168	6.5	11.6	10.3	100
03/10/08 - 03/16/08	167	7.5	10.1	8.7	100
03/17/08 - 03/23/08	168	8.3	9.7	9.1	100
03/24/08 - 03/30/08	168	7.8	10.3	9.5	100
03/31/08 - 04/06/08	168	7.2	10.2	8.6	100
04/07/08 - 04/13/08	168	6.9	10.1	8.3	100
04/14/08 - 04/20/08	168	7.1	9.9	8.5	100
04/21/08 - 04/27/08	168	4.4	7.6	6.6	100
04/28/08 - 05/04/08	168	4.5	8.1	6.3	100
05/05/08 - 05/11/08	168	4.9	6.9	6.0	100
05/12/08 - 05/18/08	168	4.9	7.4	6.4	100
05/19/08 - 05/25/08	166	5.1	7.0	6.3	100
05/26/08 - 06/01/08	168	2.9	6.9	5.7	93
06/02/08 - 06/08/08	168	4.3	6.8	5.5	100
06/09/08 - 06/15/08	168	1.8	6.7	5.5	95
06/16/08 - 06/22/08	168	4.4	6.9	5.6	100
06/23/08 - 06/29/08	168	4.4	6.3	5.2	100
06/30/08 - 07/06/08	168	3.2	5.9	5.2	93
07/07/08 - 07/13/08	168	3.9	6.0	5.4	98
07/14/08 - 07/20/08	168	1.9	6.7	5.4	91
07/21/08 - 07/27/08	168	3.5	5.7	4.9	88
07/28/08 - 08/03/08	168	3.7	5.6	4.9	98
08/04/08 - 08/10/08	168	3.6	5.8	4.9	96
08/11/08 - 08/17/08	168	5.1	6.3	5.6	100
08/18/08 - 08/24/08	168	2.9	6.0	5.0	91

TABLE A-5 (Continued): WEEKLY DO SUMMARY STATISTICS AT KINZIE STREET ON THE NORTH BRANCH CHICAGO RIVER DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values \geq 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
08/25/08 - 08/31/08	168	3.4	6.3	5.2	95
09/01/08 - 09/07/08	168	3.0	7.3	6.0	99
09/08/08 - 09/14/08	168	4.4	7.4	6.0	100
09/15/08 - 09/21/08	168	4.3	7.2	6.3	100
09/22/08 - 09/28/08	168	4.0	6.2	5.2	99
09/29/08 - 10/05/08	168	4.3	7.1	5.9	100
10/06/08 - 10/12/08	168	5.2	7.2	6.2	100
10/13/08 - 10/19/08	168	4.5	7.5	5.8	100
10/20/08 - 10/26/08	168	4.9	7.8	6.3	100
10/27/08 - 11/02/08	168	5.6	7.5	6.6	100
11/03/08 - 11/09/08	168	4.5	6.7	5.5	100
11/10/08 - 11/16/08	168	5.2	7.3	6.4	100
11/17/08 - 11/23/08	168	5.9	8.1	7.4	100
11/24/08 - 11/30/08	168	6.7	8.2	7.5	100
12/01/08 - 12/07/08	168	6.0	9.5	8.2	100
12/08/08 - 12/14/08	168	7.5	10.5	9.5	100
12/15/08 - 12/21/08	168	8.1	11.3	10.1	100
12/22/08 - 12/28/08	168	8.5	13.0	10.4	100
12/29/08 - 12/31/08	72	10.9	11.6	11.4	100

TABLE A-6: WEEKLY DO SUMMARY STATISTICS AT CLARK STREET
ON THE CHICAGO RIVER DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 5.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/08 - 01/06/08	144	8.4	10.7	9.4	100
01/07/08 - 01/13/08	168	6.1	11.7	9.1	100
01/14/08 - 01/20/08	168	7.8	10.7	9.0	100
01/21/08 - 01/27/08	168	10.4	12.3	11.4	100
01/28/08 - 02/03/08	168	10.5	12.9	11.7	100
02/04/08 - 02/10/08	168	8.5	12.2	9.6	100
02/11/08 - 02/17/08	168	10.3	12.6	11.6	100
02/18/08 - 02/24/08	168	8.5	12.4	10.8	100
02/25/08 - 03/02/08	168	8.8	11.3	10.1	100
03/03/08 - 03/09/08	168	8.8	13.2	11.6	100
03/10/08 - 03/16/08	167	8.7	11.8	10.0	100
03/17/08 - 03/23/08	168	8.6	12.2	10.3	100
03/24/08 - 03/30/08	168	8.3	10.7	9.1	100
03/31/08 - 04/06/08	168	7.5	9.2	8.2	100
04/07/08 - 04/13/08	168	7.5	11.8	9.2	100
04/14/08 - 04/20/08	168	6.9	9.9	8.5	100
04/21/08 - 04/27/08	168	5.9	8.9	7.3	100
04/28/08 - 05/04/08	168	5.1	7.8	6.8	100
05/05/08 - 05/11/08	168	5.0	9.3	6.7	99
05/12/08 - 05/18/08	168	6.4	9.9	7.7	100
05/19/08 - 05/25/08	168	6.0	7.8	6.9	100
05/26/08 - 06/01/08	168	5.7	9.8	7.6	100
06/02/08 - 06/08/08	168	7.1	9.6	8.5	100
06/09/08 - 06/15/08	168	6.2	9.4	8.3	100
06/16/08 - 06/22/08	168	8.0	10.2	9.1	100
06/23/08 - 06/29/08	168	6.3	9.3	8.2	100
06/30/08 - 07/06/08	168	6.1	8.7	7.3	100
07/07/08 - 07/13/08	168	6.0	9.2	8.1	100
07/14/08 - 07/20/08	168	5.9	9.8	8.6	100
07/21/08 - 07/27/08	34	7.5	9.4	8.6	100
07/28/08 - 08/03/08	133	7.8	9.1	8.6	100
08/04/08 - 08/10/08	168	4.8	8.8	7.5	99
08/11/08 - 08/17/08	168	7.3	8.1	7.7	100
08/18/08 - 08/24/08	168	6.9	8.2	7.7	100

TABLE A-6 (Continued): WEEKLY DO SUMMARY STATISTICS AT CLARK STREET ON THE CHICAGO RIVER DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values \geq 5.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
08/25/08 - 08/31/08	168	6.3	7.8	7.2	100
09/01/08 - 09/07/08	168	4.7	7.6	6.7	95
09/08/08 - 09/14/08	168	2.5	7.6	6.3	82
09/15/08 - 09/21/08	34	1.1	3.3	2.1	0
09/22/08 - 09/28/08	133	7.5	8.4	8.1	100
09/29/08 - 10/05/08	168	6.9	8.0	7.4	100
10/06/08 - 10/12/08	168	7.2	8.0	7.7	100
10/13/08 - 10/19/08	168	7.4	8.3	7.9	100
10/20/08 - 10/26/08	168	6.9	8.5	7.9	100
10/27/08 - 11/02/08	168	7.4	8.8	8.0	100
11/03/08 - 11/09/08	168	7.1	8.5	8.0	100
11/10/08 - 11/16/08	168	6.7	8.3	7.6	100
11/17/08 - 11/23/08	168	7.6	9.7	8.1	100
11/24/08 - 11/30/08	168	7.8	9.7	8.8	100
12/01/08 - 12/07/08	168	9.1	11.9	10.4	100
12/08/08 - 12/14/08	168	9.9	12.0	10.8	100
12/15/08 - 12/21/08	168	10.5	12.4	11.7	100
12/22/08 - 12/28/08	168	8.3	13.1	11.8	100
12/29/08 - 12/31/08	72	7.5	9.0	8.3	100

TABLE A-7: WEEKLY DO SUMMARY STATISTICS AT LOOMIS STREET
ON THE SOUTH BRANCH CHICAGO RIVER DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/08 - 01/06/08	144	8.3	9.5	8.9	100
01/07/08 - 01/13/08	168	5.8	10.1	8.3	100
01/14/08 - 01/20/08	168	8.5	9.5	9.1	100
01/21/08 - 01/27/08	168	9.0	10.2	9.7	100
01/28/08 - 02/03/08	168	9.0	10.7	9.9	100
02/04/08 - 02/10/08	167	8.4	10.7	9.6	100
02/11/08 - 02/17/08	168	9.4	11.2	10.3	100
02/18/08 - 02/24/08	167	7.3	11.7	10.8	100
02/25/08 - 03/02/08	168	8.6	10.7	9.5	100
03/03/08 - 03/09/08	168	9.1	12.1	10.8	100
03/10/08 - 03/16/08	167	8.5	10.6	9.5	100
03/17/08 - 03/23/08	168	8.9	10.1	9.5	100
03/24/08 - 03/30/08	168	8.8	9.9	9.4	100
03/31/08 - 04/06/08	168	7.3	9.7	8.9	100
04/07/08 - 04/13/08	168	6.9	10.6	8.5	100
04/14/08 - 04/20/08	168	6.9	9.4	8.3	100
04/21/08 - 04/27/08	167	5.9	7.8	6.6	100
04/28/08 - 05/04/08	168	5.1	7.2	6.5	100
05/05/08 - 05/11/08	168	5.1	7.3	5.9	100
05/12/08 - 05/18/08	168	5.6	7.5	6.6	100
05/19/08 - 05/25/08	167	5.5	7.5	6.2	100
05/26/08 - 06/01/08	168	5.2	7.9	6.2	100
06/02/08 - 06/08/08	168	5.0	7.1	5.9	100
06/09/08 - 06/15/08	168	2.8	7.3	5.6	95
06/16/08 - 06/22/08	168	5.6	7.4	6.3	100
06/23/08 - 06/29/08	168	4.8	6.1	5.4	100
06/30/08 - 07/06/08	168	4.1	6.4	5.1	100
07/07/08 - 07/13/08	168	5.1	7.0	5.8	100
07/14/08 - 07/20/08	168	2.7	7.4	5.8	92
07/21/08 - 07/27/08	168	2.8	7.6	6.3	93
07/28/08 - 08/03/08	168	5.9	7.7	6.5	100
08/04/08 - 08/10/08	168	3.0	7.0	5.5	92
08/11/08 - 08/17/08	168	6.0	6.9	6.4	100
08/18/08 - 08/24/08	34	6.1	6.4	6.2	100

TABLE A-7 (Continued): WEEKLY DO SUMMARY STATISTICS AT
LOOMIS STREET ON THE SOUTH BRANCH CHICAGO RIVER DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
08/25/08 - 08/31/08	86	5.6	6.8	6.3	100
09/01/08 - 09/07/08	168	3.0	6.5	5.8	95
09/08/08 - 09/14/08	168	2.2	7.2	5.5	93
09/15/08 - 09/21/08	168	2.5	6.0	5.2	88
09/22/08 - 09/28/08	168	4.6	8.3	6.7	100
09/29/08 - 10/05/08	168	6.1	7.3	6.8	100
10/06/08 - 10/12/08	168	5.7	8.1	6.8	100
10/13/08 - 10/19/08	168	5.6	7.2	6.3	100
10/20/08 - 10/26/08	168	6.3	7.6	6.9	100
10/27/08 - 11/02/08	168	6.4	7.7	7.1	100
11/03/08 - 11/09/08	58	6.5	7.2	6.8	100
11/10/08 - 11/16/08	110	6.6	8.4	7.7	100
11/17/08 - 11/23/08	168	6.8	8.7	7.7	100
11/24/08 - 11/30/08	168	6.9	8.3	7.8	100
12/01/08 - 12/07/08	168	6.7	9.8	8.1	100
12/08/08 - 12/14/08	168	7.3	11.3	9.8	100
12/15/08 - 12/21/08	168	8.9	12.4	11.1	100
12/22/08 - 12/28/08	168	9.4	13.0	11.5	100
12/29/08 - 12/31/08	72	10.6	11.8	11.4	100

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TABLE A-8: WEEKLY DO SUMMARY STATISTICS AT 36TH STREET
ON BUBBLY CREEK DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/08 - 01/06/08	144	9.1	12.9	10.6	100
01/07/08 - 01/13/08	168	0.3	10.2	3.7	35
01/14/08 - 01/20/08	168	1.2	5.2	3.5	46
01/21/08 - 01/27/08	168	0.0	3.4	1.3	0
01/28/08 - 02/03/08	168	0.0	1.3	0.1	0
02/04/08 - 02/10/08	168	0.3	5.7	3.0	24
02/11/08 - 02/17/08	168	2.4	12.1	4.3	33
02/18/08 - 02/24/08	168	0.0	11.0	3.2	36
02/25/08 - 03/02/08	168	0.0	2.7	0.3	0
03/03/08 - 03/09/08	168	0.1	5.1	2.5	12
03/10/08 - 03/16/08	167	2.5	18.3	7.6	76
03/17/08 - 03/23/08	168	12.5	22.6	18.4	100
03/24/08 - 03/30/08	168	11.8	23.6	17.0	100
03/31/08 - 04/06/08	167	8.2	14.3	11.3	100
04/07/08 - 04/13/08	168	0.1	21.1	8.9	60
04/14/08 - 04/20/08	168	0.0	0.5	0.1	0
04/21/08 - 04/27/08	168	0.0	18.2	9.1	77
04/28/08 - 05/04/08	168	3.4	16.1	8.2	98
05/05/08 - 05/11/08	168	2.5	14.6	9.1	98
05/12/08 - 05/18/08	168	0.2	4.1	1.2	1
05/19/08 - 05/25/08	168	0.7	4.0	2.6	0
05/26/08 - 06/01/08	167	0.0	6.6	3.1	28
06/02/08 - 06/08/08	168	2.4	8.5	4.6	47
06/09/08 - 06/15/08	168	0.0	8.3	0.5	2
06/16/08 - 06/22/08	168	0.1	10.9	2.4	14
06/23/08 - 06/29/08	168	0.0	3.7	1.2	0
06/30/08 - 07/06/08	168	0.4	3.7	1.9	0
07/07/08 - 07/13/08	168	0.8	4.3	2.4	1
07/14/08 - 07/20/08	168	1.2	3.3	2.0	0
07/21/08 - 07/27/08	166	0.0	5.8	1.4	5
07/28/08 - 08/03/08	168	0.0	2.8	0.7	0
08/04/08 - 08/10/08	168	0.0	8.5	0.9	7
08/11/08 - 08/17/08	168	0.0	12.8	3.2	35
08/18/08 - 08/24/08	168	0.0	12.5	1.7	16

TABLE A-8 (Continued): WEEKLY DO SUMMARY STATISTICS AT
36TH STREET ON BUBBLY CREEK DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
08/25/08 - 08/31/08	168	0.2	6.4	2.0	11
09/01/08 - 09/07/08	57	0.0	2.8	0.5	0
09/08/08 - 09/14/08	110	0.0	7.4	1.8	29
09/15/08 - 09/21/08	168	0.0	6.0	0.4	3
09/22/08 - 09/28/08	168	1.8	11.3	4.8	55
09/29/08 - 10/05/08	167	1.6	5.6	3.8	42
10/06/08 - 10/12/08	168	0.0	5.2	1.3	9
10/13/08 - 10/19/08	168	0.1	4.4	1.2	3
10/20/08 - 10/26/08	168	2.6	10.5	5.7	79
10/27/08 - 11/02/08	168	3.4	10.9	6.9	94
11/03/08 - 11/09/08	168	1.6	5.5	4.0	63
11/10/08 - 11/16/08	168	3.5	5.8	4.8	92
11/17/08 - 11/23/08	168	4.9	7.1	6.2	100
11/24/08 - 11/30/08	167	5.7	7.6	6.7	100
12/01/08 - 12/07/08	168	6.7	9.6	8.6	100
12/08/08 - 12/14/08	168	1.4	10.3	6.8	80
12/15/08 - 12/21/08	168	0.3	4.2	2.1	7
12/22/08 - 12/28/08	168	0.3	11.8	3.1	23
12/29/08 - 12/31/08	72	0.3	1.6	0.5	0

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TABLE A-9: WEEKLY DO SUMMARY STATISTICS AT INTERSTATE HIGHWAY 55
ON BUBBLY CREEK DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/08 - 01/06/08	144	8.3	9.2	8.7	100
01/07/08 - 01/13/08	168	2.9	9.2	6.2	82
01/14/08 - 01/20/08	168	7.0	9.7	8.3	100
01/21/08 - 01/27/08	168	8.5	10.5	9.7	100
01/28/08 - 02/03/08	168	6.7	9.8	8.1	100
02/04/08 - 02/10/08	167	5.3	9.8	7.7	100
02/11/08 - 02/17/08	168	6.6	11.1	9.1	100
02/18/08 - 02/24/08	168	2.1	10.3	6.2	85
02/25/08 - 03/02/08	168	0.3	9.0	6.6	93
03/03/08 - 03/09/08	168	4.9	10.2	8.5	100
03/10/08 - 03/16/08	81	8.5	9.8	9.0	100
03/17/08 - 03/23/08	86	8.9	10.4	9.5	100
03/24/08 - 03/30/08	168	7.7	10.3	8.9	100
03/31/08 - 04/06/08	168	6.4	14.2	8.5	100
04/07/08 - 04/13/08	168	1.0	16.3	7.4	71
04/14/08 - 04/20/08	168	1.1	8.3	4.9	74
04/21/08 - 04/27/08	168	0.9	8.0	4.6	73
04/28/08 - 05/04/08	82	4.5	6.9	5.5	100
05/05/08 - 05/11/08	134	3.9	7.0	5.3	99
05/12/08 - 05/18/08	168	1.8	6.6	4.9	79
05/19/08 - 05/25/08	168	3.5	6.6	5.5	98
05/26/08 - 06/01/08	168	3.9	7.7	5.6	98
06/02/08 - 06/08/08	168	4.0	7.4	5.2	100
06/09/08 - 06/15/08	168	0.0	7.0	2.1	19
06/16/08 - 06/22/08	168	1.9	6.8	4.5	72
06/23/08 - 06/29/08	168	2.4	5.3	3.8	33
06/30/08 - 07/06/08	168	2.5	6.0	4.2	60
07/07/08 - 07/13/08	168	0.0	6.3	4.3	73
07/14/08 - 07/20/08	168	0.3	7.1	4.7	77
07/21/08 - 07/27/08	168	0.2	9.6	2.9	35
07/28/08 - 08/03/08	168	3.5	6.3	5.0	93
08/04/08 - 08/10/08	167	0.5	5.9	3.0	20
08/11/08 - 08/17/08	168	0.6	8.3	5.0	79
08/18/08 - 08/24/08	168	2.5	6.7	4.8	85

TABLE A-9 (Continued): WEEKLY DO SUMMARY STATISTICS AT INTERSTATE HIGHWAY 55 ON BUBBLY CREEK DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values \geq 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
08/25/08 - 08/31/08	168	1.3	6.0	4.1	55
09/01/08 - 09/07/08	168	0.0	7.1	2.8	41
09/08/08 - 09/14/08	168	0.0	7.0	2.5	20
09/15/08 - 09/21/08	168	0.1	4.8	1.8	10
09/22/08 - 09/28/08	167	1.1	9.1	5.0	69
09/29/08 - 10/05/08	168	4.6	7.0	5.9	100
10/06/08 - 10/12/08	168	0.0	6.4	3.3	39
10/13/08 - 10/19/08	168	0.0	5.8	3.6	59
10/20/08 - 10/26/08	82	1.5	5.9	4.9	91
10/27/08 - 11/02/08	86	5.8	7.1	6.6	100
11/03/08 - 11/09/08	168	4.4	6.3	5.5	100
11/10/08 - 11/16/08	168	4.9	6.7	5.8	100
11/17/08 - 11/23/08	168	6.1	7.8	7.0	100
11/24/08 - 11/30/08	168	6.5	8.3	7.6	100
12/01/08 - 12/07/08	82	7.1	8.0	7.4	100
12/08/08 - 12/31/08			NO DATA		

TABLE A-10: WEEKLY DO SUMMARY STATISTICS AT CICERO AVENUE
ON THE CHICAGO SANITARY AND SHIP CANAL DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/08 - 01/06/08	144	6.9	8.4	7.8	100
01/07/08 - 01/13/08	168	5.2	9.0	7.4	100
01/14/08 - 01/20/08	168	6.4	8.5	7.4	100
01/21/08 - 01/27/08	168	7.1	8.9	8.0	100
01/28/08 - 02/03/08	84	8.3	10.3	9.3	100
02/04/08 - 02/10/08	86	7.9	9.8	8.6	100
02/11/08 - 02/17/08	168	7.7	10.1	8.7	100
02/18/08 - 02/24/08	168	6.8	10.9	9.8	100
02/25/08 - 03/02/08	168	6.8	10.8	8.4	100
03/03/08 - 03/09/08	168	7.4	10.6	9.7	100
03/10/08 - 03/16/08	167	8.1	10.1	8.9	100
03/17/08 - 03/23/08	168	8.0	9.3	8.7	100
03/24/08 - 03/30/08	168	8.0	9.2	8.6	100
03/31/08 - 04/06/08	168	7.0	9.2	8.3	100
04/07/08 - 04/13/08	168	6.2	9.6	7.9	100
04/14/08 - 04/20/08	82	7.1	8.7	7.9	100
04/21/08 - 04/27/08	87	4.5	6.4	5.5	100
04/28/08 - 05/04/08	168	3.1	6.8	5.1	93
05/05/08 - 05/11/08	168	3.9	6.8	5.3	99
05/12/08 - 05/18/08	168	3.9	7.0	5.4	99
05/19/08 - 05/25/08	168	4.1	6.0	5.2	100
05/26/08 - 06/01/08	168	3.4	6.1	5.0	86
06/02/08 - 06/08/08	168	3.1	6.0	4.5	76
06/09/08 - 06/15/08	168	0.7	6.0	4.4	74
06/16/08 - 06/22/08	167	4.0	6.8	5.0	100
06/23/08 - 06/29/08	168	2.6	5.6	4.0	50
06/30/08 - 07/06/08	168	2.0	7.4	4.3	65
07/07/08 - 07/13/08	168	4.0	6.7	4.9	98
07/14/08 - 07/20/08	168	0.9	9.1	4.7	78
07/21/08 - 07/27/08	168	0.7	6.8	4.6	68
07/28/08 - 08/03/08	168	4.8	6.6	5.6	100
08/04/08 - 08/10/08	168	1.6	5.8	4.1	55
08/11/08 - 08/17/08	168	4.6	5.8	5.1	100
08/18/08 - 08/24/08	168	4.6	6.2	5.3	100

TABLE A-10 (Continued): WEEKLY DO SUMMARY STATISTICS AT
CICERO AVENUE ON THE CHICAGO SANITARY AND SHIP CANAL DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
08/25/08 - 08/31/08	168	4.2	6.1	5.2	100
09/01/08 - 09/07/08	168	2.1	6.0	4.5	68
09/08/08 - 09/14/08	167	0.0	6.3	3.8	49
09/15/08 - 09/21/08	167	0.0	5.3	3.7	68
09/22/08 - 09/28/08	168	4.2	7.0	5.9	100
09/29/08 - 10/05/08	168	4.9	6.8	6.1	100
10/06/08 - 10/12/08	168	3.5	6.3	5.1	90
10/13/08 - 10/19/08	168	4.2	5.9	5.0	100
10/20/08 - 10/26/08	168	4.5	6.9	5.7	100
10/27/08 - 11/02/08	168	5.2	7.2	6.1	100
11/03/08 - 11/09/08	168	4.9	6.3	5.8	100
11/10/08 - 11/16/08	168	4.5	6.6	5.7	100
11/17/08 - 11/23/08	168	5.1	6.5	5.8	100
11/24/08 - 11/30/08	168	6.0	7.6	7.0	100
12/01/08 - 12/07/08	81	6.8	7.5	7.1	100
12/08/08 - 12/31/08			NO DATA		

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TABLE A-11: WEEKLY DO SUMMARY STATISTICS AT B&O CENTRAL RAILROAD ON THE CHICAGO SANITARY AND SHIP CANAL DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values \geq 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/08 - 01/06/08	144	7.7	9.8	9.1	100
01/07/08 - 01/13/08	168	7.0	9.3	8.2	100
01/14/08 - 01/20/08	168	7.5	9.8	8.6	100
01/21/08 - 01/27/08	168	8.7	10.1	9.3	100
01/28/08 - 02/03/08	168	8.2	10.2	9.3	100
02/04/08 - 02/10/08	168	5.3	10.2	8.7	100
02/11/08 - 02/17/08	168	7.1	9.5	8.4	100
02/18/08 - 02/24/08	168	7.8	10.1	9.4	100
02/25/08 - 03/02/08	168	6.8	10.2	9.0	100
03/03/08 - 03/09/08	168	7.8	9.8	9.2	100
03/10/08 - 03/16/08	167	8.1	9.7	8.9	100
03/17/08 - 03/23/08	168	8.4	9.6	8.9	100
03/24/08 - 03/30/08	167	7.9	10.0	8.8	100
03/31/08 - 04/06/08	168	7.4	9.5	8.6	100
04/07/08 - 04/13/08	168	7.1	9.0	8.0	100
04/14/08 - 04/20/08	168	6.8	9.0	8.0	100
04/21/08 - 04/27/08	168	5.9	8.0	7.0	100
04/28/08 - 05/04/08	168	5.0	7.7	6.6	100
05/05/08 - 05/11/08	167	5.8	7.8	6.7	100
05/12/08 - 05/18/08	58	5.7	8.4	7.3	100
05/19/08 - 05/25/08	110	6.0	7.2	6.7	100
05/26/08 - 06/01/08	168	5.5	7.5	6.7	100
06/02/08 - 06/08/08	168	4.8	7.0	5.9	100
06/09/08 - 06/15/08	168	3.1	6.5	5.6	95
06/16/08 - 06/22/08	168	5.4	7.1	6.1	100
06/23/08 - 06/29/08	168	4.9	8.4	5.8	100
06/30/08 - 07/06/08	168	4.8	7.5	6.2	100
07/07/08 - 07/13/08	168	4.9	7.4	5.7	100
07/14/08 - 07/20/08	168	4.1	6.5	5.5	100
07/21/08 - 07/27/08	168	2.8	6.8	5.4	94
07/28/08 - 08/03/08	168	4.9	7.2	5.8	100
08/04/08 - 08/10/08	168	2.6	6.5	5.3	92
08/11/08 - 08/17/08	168	5.3	6.6	5.9	100
08/18/08 - 08/24/08	168	5.1	6.3	5.7	100

TABLE A-11 (Continued): WEEKLY DO SUMMARY STATISTICS AT B&O CENTRAL RAILROAD ON THE CHICAGO SANITARY AND SHIP CANAL DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values \geq 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
08/25/08 - 08/31/08	168	5.2	7.1	6.1	100
09/01/08 - 09/07/08	168	2.8	7.2	5.4	88
09/08/08 - 09/14/08	168	4.4	6.6	5.7	100
09/15/08 - 09/21/08	168	2.3	7.5	5.4	83
09/22/08 - 09/28/08	168	4.6	7.3	6.2	100
09/29/08 - 10/05/08	168	5.7	7.3	6.4	100
10/06/08 - 10/12/08	168	5.4	7.5	6.3	100
10/13/08 - 10/19/08	167	5.0	7.0	5.9	100
10/20/08 - 10/26/08	168	5.2	7.9	6.7	100
10/27/08 - 11/02/08	168	5.0	9.7	7.4	100
11/03/08 - 11/09/08	168	6.0	7.4	6.7	100
11/10/08 - 11/16/08	168	6.1	7.9	7.0	100
11/17/08 - 11/23/08	168	6.1	8.9	7.5	100
11/24/08 - 11/30/08	167	6.9	8.6	7.7	100
12/01/08 - 12/07/08	168	7.1	8.9	7.9	100
12/08/08 - 12/14/08	168	6.0	9.3	8.1	100
12/15/08 - 12/21/08	168	6.7	10.5	9.2	100
12/22/08 - 12/28/08	168	8.0	10.7	9.9	100
12/29/08 - 12/31/08	72	8.5	10.3	9.6	100

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TABLE A-12: WEEKLY DO SUMMARY STATISTICS AT ROUTE 83
ON THE CHICAGO SANITARY AND SHIP CANAL DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/08 - 01/06/08			NO DATA		
01/07/08 - 01/13/08	110	6.1	7.8	7.2	100
01/14/08 - 01/20/08	168	6.8	8.5	7.6	100
01/21/08 - 01/27/08	168	7.0	8.8	8.2	100
01/28/08 - 02/03/08	168	7.6	9.3	8.5	100
02/04/08 - 02/10/08	168	7.5	9.9	8.5	100
02/11/08 - 02/17/08	168	0.5	9.0	7.3	92
02/18/08 - 02/24/08	168	7.2	9.4	8.5	100
02/25/08 - 03/02/08	168	3.7	9.4	8.3	98
03/03/08 - 03/09/08	168	6.3	9.0	8.4	100
03/10/08 - 03/16/08	167	6.9	9.2	8.2	100
03/17/08 - 03/23/08	168	6.6	8.5	7.6	100
03/24/08 - 03/30/08	168	6.6	8.8	8.0	100
03/31/08 - 04/06/08	168	5.7	8.6	7.7	100
04/07/08 - 04/13/08	66	6.8	7.6	7.3	100
04/14/08 - 04/20/08			NO DATA		
04/21/08 - 04/27/08	110	3.9	6.6	5.2	98
04/28/08 - 05/04/08	168	3.9	6.2	5.1	96
05/05/08 - 05/11/08	168	3.8	6.4	5.3	98
05/12/08 - 05/18/08	168	2.5	7.3	6.1	93
05/19/08 - 05/25/08	168	3.5	6.3	5.3	99
05/26/08 - 06/01/08	59	3.4	5.9	5.1	98
06/02/08 - 06/15/08			NO DATA		
06/16/08 - 06/22/08	110	3.2	5.8	4.5	77
06/23/08 - 06/29/08	58	3.2	6.2	4.9	93
06/30/08 - 07/13/08			NO DATA		
07/14/08 - 07/20/08	110	2.8	6.5	4.8	87
07/21/08 - 07/27/08	168	2.0	5.4	4.2	68
07/28/08 - 08/03/08	58	4.0	6.7	5.4	98
08/04/08 - 08/17/08			NO DATA		
08/18/08 - 08/24/08	100	4.1	5.3	4.7	100
08/25/08 - 08/31/08	58	4.5	5.7	5.0	100
09/01/08 - 09/28/08			NO DATA		
09/29/08 - 10/05/08	110	5.1	6.2	5.7	100

TABLE A-12 (Continued): WEEKLY DO SUMMARY STATISTICS AT
ROUTE 83 ON THE CHICAGO SANITARY AND SHIP CANAL DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
10/06/08 - 10/12/08	168	4.3	6.4	5.3	100
10/13/08 - 10/19/08	116	4.7	5.8	5.1	100
10/20/08 - 10/26/08	168	4.5	7.5	6.0	100
10/27/08 - 11/02/08	167	5.5	7.4	6.4	100
11/03/08 - 11/09/08	168	5.1	6.7	5.8	100
11/10/08 - 11/16/08	168	5.5	6.9	6.3	100
11/17/08 - 11/23/08	168	5.4	7.3	6.4	100
11/24/08 - 11/30/08	58	6.0	7.4	7.0	100
12/01/08 - 12/31/08			NO DATA		

TABLE A-13: WEEKLY DO SUMMARY STATISTICS AT ROMEOVILLE ROAD
ON THE CHICAGO SANITARY AND SHIP CANAL DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/08 - 04/27/08			NO DATA		
04/28/08 - 05/04/08	134	3.9	6.0	5.4	99
05/05/08 - 05/11/08	168	4.4	6.6	5.3	100
05/12/08 - 05/18/08	168	5.5	7.2	6.4	100
05/19/08 - 05/25/08	168	5.0	5.9	5.5	100
05/26/08 - 06/01/08	167	4.2	7.5	5.6	100
06/02/08 - 06/08/08	168	3.8	6.7	4.5	92
06/09/08 - 06/15/08	168	2.4	4.7	3.7	40
06/16/08 - 06/22/08	168	3.5	5.6	4.4	88
06/23/08 - 06/29/08	168	3.1	5.1	4.0	43
06/30/08 - 07/06/08	168	2.9	5.6	4.1	60
07/07/08 - 07/13/08	168	3.5	6.1	4.6	86
07/14/08 - 07/20/08	168	3.4	6.0	4.7	82
07/21/08 - 07/27/08	168	2.9	5.5	4.3	54
07/28/08 - 08/03/08	168	4.1	6.4	5.0	100
08/04/08 - 08/10/08	168	1.2	4.6	3.6	46
08/11/08 - 08/17/08	168	4.3	6.1	4.8	100
08/18/08 - 08/24/08	82	4.0	5.6	4.9	100
08/25/08 - 09/07/08			NO DATA		
09/08/08 - 09/14/08	85	4.3	5.3	4.7	100
09/15/08 - 09/21/08	168	3.0	5.4	4.5	77
09/22/08 - 09/28/08	168	4.4	5.7	5.0	100
09/29/08 - 10/05/08	168	5.2	6.2	5.8	100
10/06/08 - 10/12/08	168	4.6	6.1	5.5	100
10/13/08 - 10/19/08	168	4.8	5.5	5.1	100
10/20/08 - 10/26/08	168	5.0	6.8	6.0	100
10/27/08 - 11/02/08	168	6.3	7.4	7.0	100
11/03/08 - 11/09/08	84	6.1	6.6	6.4	100
11/10/08 - 11/16/08	86	6.1	7.1	6.7	100
11/17/08 - 11/23/08	168	6.0	8.8	6.9	100
11/24/08 - 11/30/08	60	5.8	7.5	6.7	100
12/01/08 - 12/31/08			NO DATA		

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TABLE A-14: WEEKLY DO SUMMARY STATISTICS AT LOCKPORT POWERHOUSE
ON THE CHICAGO SANITARY AND SHIP CANAL DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/08 - 01/06/08	144	7.5	8.7	8.0	100
01/07/08 - 01/13/08	168	6.3	8.5	7.3	100
01/14/08 - 01/20/08	168	7.6	8.8	8.1	100
01/21/08 - 01/27/08	168	7.9	8.7	8.3	100
01/28/08 - 02/03/08	168	8.0	8.9	8.5	100
02/04/08 - 02/10/08	168	7.8	9.5	8.7	100
02/11/08 - 02/17/08	168	4.2	9.3	8.0	100
02/18/08 - 02/24/08	168	7.8	9.4	8.5	100
02/25/08 - 03/02/08	168	7.3	8.4	7.8	100
03/03/08 - 03/09/08	168	5.9	8.9	8.3	100
03/10/08 - 03/16/08	167	7.0	8.6	7.9	100
03/17/08 - 03/23/08	168	6.2	7.5	6.7	100
03/24/08 - 03/30/08	13	7.4	7.8	7.5	100
03/31/08 - 04/06/08	156	5.9	8.3	7.4	100
04/07/08 - 04/13/08	168	6.7	8.0	7.3	100
04/14/08 - 04/20/08	168	6.1	8.4	7.5	100
04/21/08 - 04/27/08	168	5.0	6.5	5.8	100
04/28/08 - 05/04/08	11	4.0	5.3	4.6	91
05/05/08 - 05/11/08			NO DATA		
05/12/08 - 05/18/08	159	5.3	6.6	6.1	100
05/19/08 - 05/25/08	168	5.0	6.0	5.5	100
05/26/08 - 06/01/08	168	4.4	6.6	5.4	100
06/02/08 - 06/08/08	168	3.5	5.1	4.2	77
06/09/08 - 06/15/08	12	3.8	4.2	4.1	75
06/16/08 - 06/22/08	156	3.1	5.5	4.4	87
06/23/08 - 06/29/08	168	3.5	5.0	4.0	47
06/30/08 - 07/06/08	168	2.7	5.3	4.1	55
07/07/08 - 07/13/08	168	3.0	6.5	4.5	69
07/14/08 - 07/20/08	168	2.9	8.8	4.8	79
07/21/08 - 07/27/08	168	2.9	5.5	4.1	50
07/28/08 - 08/03/08	168	3.8	6.5	4.9	97
08/04/08 - 08/10/08	168	2.2	5.8	3.6	40
08/11/08 - 08/17/08	10	3.6	4.1	3.8	10
08/18/08 - 08/24/08	156	4.6	7.0	5.6	100

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TABLE A-14 (Continued): WEEKLY DO SUMMARY STATISTICS AT LOCKPORT POWERHOUSE ON THE CHICAGO SANITARY AND SHIP CANAL DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values \geq 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
08/25/08 - 08/31/08	168	4.3	6.0	5.1	100
09/01/08 - 09/07/08	168	1.9	6.1	4.2	60
09/08/08 - 09/14/08	168	3.2	5.3	4.6	92
09/15/08 - 09/21/08	168	3.5	5.8	4.9	89
09/22/08 - 09/28/08	168	4.3	5.6	4.9	100
09/29/08 - 10/05/08	168	5.4	6.1	5.8	100
10/06/08 - 10/12/08	168	4.6	6.0	5.6	100
10/13/08 - 10/19/08	168	4.4	5.5	4.9	100
10/20/08 - 10/26/08	168	5.1	6.6	5.8	100
10/27/08 - 11/02/08	168	6.0	7.0	6.6	100
11/03/08 - 11/09/08	168	6.2	7.6	7.0	100
11/10/08 - 11/16/08	168	5.5	6.6	6.0	100
11/17/08 - 11/23/08	168	5.5	8.2	6.5	100
11/24/08 - 11/30/08	168	5.8	7.5	6.8	100
12/01/08 - 12/07/08	168	6.9	8.7	7.8	100
12/08/08 - 12/14/08	168	7.1	9.1	8.1	100
12/15/08 - 12/21/08	168	8.6	11.7	10.7	100
12/22/08 - 12/28/08	168	8.4	13.1	11.7	100
12/29/08 - 12/31/08	72	10.1	11.5	10.8	100

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TABLE A-15: WEEKLY DO SUMMARY STATISTICS AT JEFFERSON STREET
ON THE DES PLAINES RIVER DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/08 - 01/06/08	144	9.1	11.4	10.2	100
01/07/08 - 01/13/08	168	7.5	10.5	9.0	100
01/14/08 - 01/20/08	168	9.1	12.9	10.5	100
01/21/08 - 01/27/08	168	9.6	11.9	10.7	100
01/28/08 - 02/03/08	167	9.0	11.7	9.9	100
02/04/08 - 02/10/08	168	9.0	11.2	10.1	100
02/11/08 - 02/17/08	168	6.1	12.0	10.2	100
02/18/08 - 02/24/08	168	9.0	12.1	10.7	100
02/25/08 - 03/02/08	168	8.9	11.8	10.1	100
03/03/08 - 03/09/08	168	8.5	10.8	9.7	100
03/10/08 - 03/16/08	167	8.6	12.3	10.4	100
03/17/08 - 03/23/08	168	9.0	12.1	10.1	100
03/24/08 - 03/30/08	168	8.8	12.1	10.1	100
03/31/08 - 04/06/08	168	7.3	10.7	9.3	100
04/07/08 - 04/13/08	168	7.4	9.6	8.8	100
04/14/08 - 04/20/08	168	7.3	9.7	8.6	100
04/21/08 - 04/27/08	168	6.2	9.0	7.4	100
04/28/08 - 05/04/08	168	5.9	11.5	7.2	100
05/05/08 - 05/11/08	168	5.3	9.0	6.7	100
05/12/08 - 05/18/08	168	6.2	9.9	7.9	100
05/19/08 - 05/25/08	167	5.8	9.6	7.6	100
05/26/08 - 06/01/08	168	4.8	9.1	6.7	100
06/02/08 - 06/08/08	168	4.0	6.8	5.1	100
06/09/08 - 06/15/08	168	2.8	7.1	4.8	91
06/16/08 - 06/22/08	168	4.3	7.6	5.6	100
06/23/08 - 06/29/08	168	4.0	6.4	5.2	100
06/30/08 - 07/06/08	168	3.4	9.2	6.0	92
07/07/08 - 07/13/08	168	3.8	8.3	5.9	98
07/14/08 - 07/20/08	168	4.2	8.1	5.7	100
07/21/08 - 07/27/08	168	3.7	8.4	5.4	92
07/28/08 - 08/03/08	168	4.2	8.6	6.2	100
08/04/08 - 08/10/08	84	3.5	6.6	5.0	93
08/11/08 - 08/17/08	85	4.7	9.3	6.1	100
08/18/08 - 08/24/08	168	4.4	7.8	6.1	100

TABLE A-15 (Continued): WEEKLY DO SUMMARY STATISTICS AT JEFFERSON STREET ON THE DES PLAINES RIVER DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values \geq 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
08/25/08 - 08/31/08	168	4.5	7.8	6.0	100
09/01/08 - 09/07/08	168	3.6	7.1	5.3	95
09/08/08 - 09/14/08	168	4.5	7.7	6.2	100
09/15/08 - 09/21/08	168	4.9	7.5	6.0	100
09/22/08 - 09/28/08	168	5.1	6.4	5.7	100
09/29/08 - 10/05/08	167	5.5	7.5	6.3	100
10/06/08 - 10/12/08	168	5.4	8.9	6.8	100
10/13/08 - 10/19/08	168	5.3	8.2	6.3	100
10/20/08 - 10/26/08	168	6.1	9.0	7.3	100
10/27/08 - 11/02/08	168	6.5	11.2	8.6	100
11/03/08 - 11/09/08	168	6.6	10.5	7.6	100
11/10/08 - 11/16/08	167	6.8	9.6	7.8	100
11/17/08 - 11/23/08	168	7.4	10.1	8.9	100
11/24/08 - 11/30/08	168	7.2	12.4	8.9	100
12/01/08 - 12/07/08	168	7.6	11.2	9.4	100
12/08/08 - 12/14/08	168	8.1	11.4	9.8	100
12/15/08 - 12/21/08	168	9.6	12.5	11.0	100
12/22/08 - 12/28/08	168	8.5	12.8	11.2	100
12/29/08 - 12/31/08	72	10.0	12.6	11.5	100

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TABLE A-16: WEEKLY DO SUMMARY STATISTICS AT C&W INDIANA RAILROAD
ON THE LITTLE CALUMET RIVER DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/08 - 01/06/08	144	11.5	13.5	12.4	100
01/07/08 - 01/13/08	168	9.8	12.2	11.4	100
01/14/08 - 01/20/08	168	11.0	11.9	11.5	100
01/21/08 - 01/27/08	168	9.6	11.7	10.7	100
01/28/08 - 02/03/08	168	9.8	11.2	10.5	100
02/04/08 - 02/10/08	168	9.4	12.4	11.1	100
02/11/08 - 02/17/08	168	10.8	12.6	11.5	100
02/18/08 - 02/24/08	168	10.9	12.1	11.6	100
02/25/08 - 03/02/08	168	10.2	11.9	11.0	100
03/03/08 - 03/09/08	168	10.9	13.1	12.7	100
03/10/08 - 03/16/08	167	11.1	13.1	12.2	100
03/17/08 - 03/23/08	168	11.5	13.9	12.7	100
03/24/08 - 03/30/08	168	12.1	15.5	13.8	100
03/31/08 - 04/06/08	168	12.5	16.4	14.6	100
04/07/08 - 04/13/08	168	10.0	15.9	13.0	100
04/14/08 - 04/20/08	168	8.4	13.9	11.3	100
04/21/08 - 04/27/08	168	6.6	13.9	9.4	100
04/28/08 - 05/04/08	168	5.6	9.5	7.4	100
05/05/08 - 05/11/08	168	3.6	9.1	5.9	98
05/12/08 - 05/18/08	168	4.5	11.8	9.0	100
05/19/08 - 05/25/08	62	7.5	11.6	9.2	100
05/26/08 - 06/08/08			NO DATA		
06/09/08 - 06/15/08	107	0.8	8.6	3.4	23
06/16/08 - 06/22/08	168	0.3	6.4	3.0	23
06/23/08 - 06/29/08	168	2.0	8.4	4.3	56
06/30/08 - 07/06/08	168	2.3	14.0	7.6	95
07/07/08 - 07/13/08	167	3.1	11.5	6.3	96
07/14/08 - 07/20/08	167	3.8	8.8	6.4	99
07/21/08 - 07/27/08	168	3.9	9.1	6.3	98
07/28/08 - 08/03/08	168	5.3	8.5	6.6	100
08/04/08 - 08/10/08	168	4.4	8.0	6.2	100
08/11/08 - 08/17/08	168	5.7	8.1	7.0	100
08/18/08 - 08/24/08	168	6.2	8.1	7.1	100
08/25/08 - 08/31/08	168	6.5	10.4	7.8	100

TABLE A-16 (Continued): WEEKLY DO SUMMARY STATISTICS AT
C&W INDIANA RAILROAD ON THE LITTLE CALUMET RIVER DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
09/01/08 - 09/07/08	168	4.8	11.2	6.9	100
09/08/08 - 09/14/08	168	1.5	6.9	5.3	89
09/15/08 - 09/21/08	168	1.8	5.2	3.1	10
09/22/08 - 09/28/08	61	1.8	6.5	4.3	72
09/29/08 - 10/05/08	107	6.3	7.9	6.9	100
10/06/08 - 10/12/08	168	6.2	7.7	6.9	100
10/13/08 - 10/19/08	168	6.4	8.0	7.1	100
10/20/08 - 10/26/08	168	7.2	9.1	8.1	100
10/27/08 - 11/02/08	168	8.5	9.9	9.3	100
11/03/08 - 11/09/08	168	8.6	10.4	9.5	100
11/10/08 - 11/16/08	168	9.6	11.5	10.7	100
11/17/08 - 11/23/08	168	10.1	13.4	12.0	100
11/24/08 - 11/30/08	168	12.4	15.4	13.7	100
12/01/08 - 12/07/08	168	12.5	16.6	15.3	100
12/08/08 - 12/14/08	168	13.3	17.0	15.3	100
12/15/08 - 12/21/08	168	12.7	15.5	14.3	100
12/22/08 - 12/28/08	168	8.3	14.1	12.2	100
12/29/08 - 12/31/08	72	9.8	12.5	11.3	100

TABLE A-17: WEEKLY DO SUMMARY STATISTICS AT HALSTED STREET
ON THE LITTLE CALUMET RIVER DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/08 - 01/06/08	144	7.2	9.9	8.2	100
01/07/08 - 01/13/08	168	5.4	8.2	7.1	100
01/14/08 - 01/20/08	168	6.3	8.2	7.3	100
01/21/08 - 01/27/08	168	7.0	8.1	7.7	100
01/28/08 - 02/03/08	168	6.5	8.1	7.3	100
02/04/08 - 02/10/08	168	6.3	8.0	7.1	100
02/11/08 - 02/17/08	168	6.5	8.9	7.7	100
02/18/08 - 02/24/08	168	7.0	10.4	8.1	100
02/25/08 - 03/02/08	168	6.5	8.5	7.7	100
03/03/08 - 03/09/08	168	7.4	8.9	8.0	100
03/10/08 - 03/16/08	167	6.4	8.5	7.5	100
03/17/08 - 03/23/08	168	6.1	9.7	7.4	100
03/24/08 - 03/30/08	168	6.0	8.3	7.0	100
03/31/08 - 04/06/08	168	5.5	7.4	6.6	100
04/07/08 - 04/13/08	167	5.9	10.8	7.7	100
04/14/08 - 04/20/08	168	6.1	8.5	7.4	100
04/21/08 - 04/27/08	168	5.7	9.6	7.2	100
04/28/08 - 05/04/08	168	4.7	8.1	6.2	100
05/05/08 - 05/11/08	168	4.0	7.4	5.5	99
05/12/08 - 05/18/08	168	5.3	8.3	6.5	100
05/19/08 - 05/25/08	168	4.9	9.3	6.6	100
05/26/08 - 06/01/08	168	3.4	8.5	5.5	96
06/02/08 - 06/08/08	168	1.9	5.3	4.1	60
06/09/08 - 06/15/08	168	0.8	7.8	4.9	72
06/16/08 - 06/22/08	168	3.6	8.9	5.6	98
06/23/08 - 06/29/08	168	4.0	8.4	5.6	100
06/30/08 - 07/06/08	168	3.3	17.8	9.3	99
07/07/08 - 07/13/08	168	5.4	14.6	8.6	100
07/14/08 - 07/20/08	168	4.8	9.1	6.3	100
07/21/08 - 07/27/08	168	4.6	9.7	6.5	100
07/28/08 - 08/03/08	60	5.5	7.9	6.6	100
08/04/08 - 08/10/08	107	4.7	7.9	6.3	100
08/11/08 - 08/17/08	168	5.7	7.8	6.6	100
08/18/08 - 08/24/08	168	5.3	8.8	6.8	100

TABLE A-17 (Continued): WEEKLY DO SUMMARY STATISTICS AT HALSTED STREET ON THE LITTLE CALUMET RIVER DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values \geq 4.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
08/25/08 - 08/31/08	168	6.5	10.3	7.7	100
09/01/08 - 09/07/08	167	2.7	9.7	6.4	96
09/08/08 - 09/14/08	168	2.0	6.8	5.5	90
09/15/08 - 09/21/08	168	0.0	5.9	4.3	74
09/22/08 - 09/28/08	60	5.1	6.9	5.7	100
09/29/08 - 10/05/08	108	5.8	6.6	6.2	100
10/06/08 - 10/12/08	168	5.6	6.7	6.2	100
10/13/08 - 10/19/08	168	5.7	7.2	6.4	100
10/20/08 - 10/26/08	168	5.7	8.0	6.8	100
10/27/08 - 11/02/08	168	6.2	7.1	6.6	100
11/03/08 - 11/09/08	168	5.7	7.1	6.5	100
11/10/08 - 11/16/08	168	6.4	7.8	7.0	100
11/17/08 - 11/23/08	168	7.2	8.4	7.8	100
11/24/08 - 11/30/08	168	6.8	8.6	7.6	100
12/01/08 - 12/07/08	168	6.8	8.8	7.7	100
12/08/08 - 12/14/08	168	7.3	9.1	8.2	100
12/15/08 - 12/21/08	168	8.3	10.8	9.3	100
12/22/08 - 12/28/08	168	7.9	10.8	9.8	100
12/29/08 - 12/31/08	72	8.3	10.7	9.2	100

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TABLE A-18: WEEKLY DO SUMMARY STATISTICS AT DIVISION STREET
ON THE CALUMET-SAG CHANNEL DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 3.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/08 - 04/27/08			NO DATA		
04/28/08 - 05/04/08	108	4.3	7.4	5.6	100
05/05/08 - 05/11/08	168	3.3	7.6	4.6	100
05/12/08 - 05/18/08	168	5.1	7.0	6.0	100
05/19/08 - 05/25/08	168	4.7	8.1	6.2	100
05/26/08 - 06/01/08	168	3.5	7.1	5.2	100
06/02/08 - 06/08/08	168	0.6	4.7	3.3	76
06/09/08 - 06/15/08	168	1.3	6.1	3.9	64
06/16/08 - 06/22/08	168	3.7	7.8	5.0	100
06/23/08 - 06/29/08	168	3.6	7.6	4.8	100
06/30/08 - 07/06/08	168	3.6	11.8	7.0	100
07/07/08 - 07/13/08	168	4.4	10.5	6.9	100
07/14/08 - 07/20/08	168	3.2	8.6	5.3	100
07/21/08 - 07/27/08	168	3.8	7.6	5.6	100
07/28/08 - 08/03/08	168	4.6	6.8	5.6	100
08/04/08 - 08/10/08	168	3.5	6.5	5.0	100
08/11/08 - 08/17/08	168	5.0	6.8	5.8	100
08/18/08 - 08/24/08	168	5.3	7.6	6.1	100
08/25/08 - 08/31/08	168	5.7	8.4	6.9	100
09/01/08 - 09/07/08	168	3.3	7.9	5.9	100
09/08/08 - 09/14/08	167	4.4	7.4	5.4	100
09/15/08 - 09/21/08	167	2.9	5.2	4.5	99
09/22/08 - 09/28/08	168	4.3	6.1	5.0	100
09/29/08 - 10/05/08	168	4.8	6.0	5.5	100
10/06/08 - 10/12/08	168	5.2	6.8	6.1	100
10/13/08 - 10/19/08	168	5.4	6.7	6.0	100
10/20/08 - 10/26/08	59	6.3	7.2	6.7	100
10/27/08 - 11/02/08	109	5.8	7.4	6.6	100
11/03/08 - 11/09/08	168	5.4	6.9	6.0	100
11/10/08 - 11/16/08	168	5.8	7.2	6.6	100
11/17/08 - 11/23/08	61	6.8	7.6	7.3	100
11/24/08 - 12/31/08			NO DATA		

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TABLE A-19: WEEKLY DO SUMMARY STATISTICS AT CICERO AVENUE
ON THE CALUMET-SAG CHANNEL DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 3.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/08 - 01/06/08	144	8.1	10.4	9.1	100
01/07/08 - 01/13/08	168	6.4	9.1	8.2	100
01/14/08 - 01/20/08	168	7.9	10.1	9.0	100
01/21/08 - 01/27/08	168	8.5	9.7	9.1	100
01/28/08 - 02/03/08	168	7.9	10.2	8.8	100
02/04/08 - 02/10/08	168	7.8	10.4	9.1	100
02/11/08 - 02/17/08	168	8.0	10.1	8.9	100
02/18/08 - 02/24/08	168	7.5	11.9	9.1	100
02/25/08 - 03/02/08	168	7.5	8.8	8.3	100
03/03/08 - 03/09/08	168	7.5	10.5	9.1	100
03/10/08 - 03/16/08	167	7.0	9.3	8.5	100
03/17/08 - 03/23/08	168	7.7	9.5	8.5	100
03/24/08 - 03/30/08	168	8.0	10.1	8.8	100
03/31/08 - 04/06/08	168	7.4	9.1	8.2	100
04/07/08 - 04/13/08	168	7.0	9.2	7.9	100
04/14/08 - 04/20/08	168	6.7	9.2	8.3	100
04/21/08 - 04/27/08	168	5.3	8.6	7.1	100
04/28/08 - 05/04/08	168	5.3	8.4	6.8	100
05/05/08 - 05/11/08	168	4.6	7.4	6.0	100
05/12/08 - 05/18/08	168	6.1	7.4	6.9	100
05/19/08 - 05/25/08	168	5.6	9.0	7.2	100
05/26/08 - 06/01/08	168	4.6	7.9	6.2	100
06/02/08 - 06/08/08	168	3.6	5.6	4.4	100
06/09/08 - 06/15/08	168	2.6	7.4	4.9	99
06/16/08 - 06/22/08	168	3.7	7.8	5.9	100
06/23/08 - 06/29/08	168	4.4	7.3	5.7	100
06/30/08 - 07/06/08	168	4.1	12.6	7.5	100
07/07/08 - 07/13/08	168	5.4	11.1	7.6	100
07/14/08 - 07/20/08	168	3.7	9.3	6.4	100
07/21/08 - 07/27/08	167	4.7	8.1	6.3	100
07/28/08 - 08/03/08	168	5.7	8.9	7.4	100
08/04/08 - 08/10/08	168	4.5	7.7	5.9	100
08/11/08 - 08/17/08	168	5.2	6.7	5.9	100
08/18/08 - 08/24/08	168	5.4	7.2	6.3	100

TABLE A-19 (Continued): WEEKLY DO SUMMARY STATISTICS AT
CICERO AVENUE ON THE CALUMET-SAG CHANNEL DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 3.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
08/25/08 - 08/31/08	168	5.6	8.1	6.8	100
09/01/08 - 09/07/08	168	2.6	8.5	6.0	98
09/08/08 - 09/14/08	168	4.6	7.1	5.6	100
09/15/08 - 09/21/08	168	1.6	5.1	4.2	89
09/22/08 - 09/28/08	168	3.6	5.6	5.0	100
09/29/08 - 10/05/08	168	4.4	6.2	5.5	100
10/06/08 - 10/12/08	168	5.3	6.8	6.0	100
10/13/08 - 10/19/08	168	5.1	6.4	5.7	100
10/20/08 - 10/26/08	168	5.8	7.1	6.4	100
10/27/08 - 11/02/08	157	5.8	8.8	6.8	100
11/03/08 - 11/09/08	168	5.6	8.1	6.5	100
11/10/08 - 11/16/08	168	6.5	8.6	7.5	100
11/17/08 - 11/23/08	60	6.5	7.8	7.2	100
11/24/08 - 11/30/08	109	6.9	7.8	7.4	100
12/01/08 - 12/07/08	168	6.8	9.2	8.2	100
12/08/08 - 12/14/08	168	8.5	10.0	9.1	100
12/15/08 - 12/21/08	168	9.3	11.4	10.1	100
12/22/08 - 12/28/08	168	9.5	12.4	10.9	100
12/29/08 - 12/31/08	72	9.7	10.7	10.3	100

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TABLE A-20: WEEKLY DO SUMMARY STATISTICS AT RIVER MILE 311.7
ON THE CALUMET-SAG CHANNEL DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 3.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/08 - 04/27/08			NO DATA		
04/28/08 - 05/04/08	109	6.1	8.4	7.0	100
05/05/08 - 05/11/08	168	4.7	7.9	5.9	100
05/12/08 - 05/18/08	168	6.4	7.4	6.9	100
05/19/08 - 05/25/08	168	6.3	9.8	7.7	100
05/26/08 - 06/01/08	168	5.2	9.2	7.0	100
06/02/08 - 06/08/08	168	3.1	6.7	4.4	100
06/09/08 - 06/15/08	168	3.2	8.7	5.2	100
06/16/08 - 06/22/08	168	5.0	8.3	6.6	100
06/23/08 - 06/29/08	168	5.0	9.9	6.6	100
06/30/08 - 07/06/08	168	5.4	14.5	8.5	100
07/07/08 - 07/13/08	168	5.9	13.1	8.4	100
07/14/08 - 07/20/08	168	4.5	10.8	7.3	100
07/21/08 - 07/27/08	168	4.2	8.8	6.4	100
07/28/08 - 08/03/08	168	5.1	8.0	6.5	100
08/04/08 - 08/10/08	168	3.5	6.6	5.3	100
08/11/08 - 08/17/08	168	5.2	7.0	6.0	100
08/18/08 - 08/24/08	168	5.6	7.6	6.5	100
08/25/08 - 08/31/08	168	5.6	9.7	8.1	100
09/01/08 - 09/07/08	168	2.3	10.0	6.9	95
09/08/08 - 09/14/08	168	4.4	6.4	5.4	100
09/15/08 - 09/21/08	168	1.3	5.3	4.1	85
09/22/08 - 09/28/08	168	4.2	6.0	5.1	100
09/29/08 - 10/05/08	168	4.7	6.2	5.5	100
10/06/08 - 10/12/08	168	5.8	6.8	6.2	100
10/13/08 - 10/19/08	168	5.1	6.5	5.7	100
10/20/08 - 10/26/08	168	6.0	7.1	6.5	100
10/27/08 - 11/02/08	168	6.2	8.2	6.8	100
11/03/08 - 11/09/08	168	5.6	6.8	6.0	100
11/10/08 - 11/16/08	168	6.5	7.5	6.9	100
11/17/08 - 11/23/08	168	6.6	8.8	7.6	100
11/24/08 - 11/30/08	59	8.0	8.7	8.3	100
12/01/08 - 12/31/08			NO DATA		

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TABLE A-21: WEEKLY DO SUMMARY STATISTICS AT SOUTHWEST HIGHWAY
ON THE CALUMET-SAG CHANNEL DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 3.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/08 - 04/27/08			NO DATA		
04/28/08 - 05/04/08	109	6.3	9.4	7.5	100
05/05/08 - 05/11/08	168	5.3	8.5	6.8	100
05/12/08 - 05/18/08	167	6.1	8.6	7.0	100
05/19/08 - 05/25/08	168	6.7	9.8	8.0	100
05/26/08 - 06/01/08	168	4.7	10.0	7.1	100
06/02/08 - 06/08/08	168	3.2	7.3	4.3	100
06/09/08 - 06/15/08	168	2.4	8.5	4.8	94
06/16/08 - 06/22/08	168	4.5	9.2	6.6	100
06/23/08 - 06/29/08	168	4.7	10.0	6.4	100
06/30/08 - 07/06/08	168	4.3	12.4	7.5	100
07/07/08 - 07/13/08	168	5.2	12.5	7.7	100
07/14/08 - 07/20/08	168	4.6	10.2	6.9	100
07/21/08 - 07/27/08	168	4.2	8.1	6.5	100
07/28/08 - 08/03/08	168	4.8	7.6	5.9	100
08/04/08 - 08/10/08	168	3.0	6.4	5.0	100
08/11/08 - 08/17/08	168	4.8	7.5	5.8	100
08/18/08 - 08/24/08	168	4.7	7.5	6.0	100
08/25/08 - 08/31/08	168	5.5	8.9	6.9	100
09/01/08 - 09/07/08	168	2.1	8.3	5.8	96
09/08/08 - 09/14/08	168	4.1	6.3	5.2	100
09/15/08 - 09/21/08	168	3.0	6.1	4.1	98
09/22/08 - 09/28/08	168	3.8	5.9	4.7	100
09/29/08 - 10/05/08	168	4.3	6.3	5.4	100
10/06/08 - 10/12/08	168	5.3	6.8	6.0	100
10/13/08 - 10/19/08	168	4.9	6.6	5.6	100
10/20/08 - 10/26/08	168	5.8	8.1	6.6	100
10/27/08 - 11/02/08	168	6.5	8.9	7.5	100
11/03/08 - 11/09/08	168	5.5	7.7	6.4	100
11/10/08 - 11/16/08	168	6.3	7.4	6.8	100
11/17/08 - 11/23/08	167	6.9	8.5	7.6	100
11/24/08 - 11/30/08	59	7.9	8.7	8.3	100
12/01/08 - 12/31/08			NO DATA		

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TABLE A-22: WEEKLY DO SUMMARY STATISTICS AT 104TH AVENUE
ON THE CALUMET-SAG CHANNEL DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 3.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/08 - 01/06/08			NO DATA		
01/07/08 - 01/13/08	90	7.5	9.7	8.9	100
01/14/08 - 01/20/08	168	9.0	11.0	10.0	100
01/21/08 - 01/27/08	168	9.2	10.7	10.1	100
01/28/08 - 02/03/08	168	9.1	10.5	9.8	100
02/04/08 - 02/10/08	82	8.8	10.3	9.5	100
02/11/08 - 03/02/08			NO DATA		
03/03/08 - 03/09/08	109	9.0	10.2	9.6	100
03/10/08 - 03/16/08	167	8.1	9.2	8.6	100
03/17/08 - 03/23/08	168	7.4	9.3	8.3	100
03/24/08 - 03/30/08	168	8.0	10.1	9.2	100
03/31/08 - 04/06/08	167	7.5	9.7	8.4	100
04/07/08 - 04/13/08	168	7.5	8.9	8.3	100
04/14/08 - 04/20/08	168	7.8	9.0	8.4	100
04/21/08 - 04/27/08	168	6.7	8.4	7.6	100
04/28/08 - 05/04/08	168	5.5	8.2	6.8	100
05/05/08 - 05/11/08	168	5.6	7.7	6.5	100
05/12/08 - 05/18/08	168	6.7	7.5	7.0	100
05/19/08 - 05/25/08	168	6.8	10.1	7.9	100
05/26/08 - 06/01/08	60	6.7	9.9	7.7	100
06/02/08 - 06/15/08			NO DATA		
06/16/08 - 06/22/08	109	6.1	8.0	6.9	100
06/23/08 - 06/29/08	168	5.5	8.6	6.7	100
06/30/08 - 07/06/08	168	6.0	10.9	7.2	100
07/07/08 - 07/13/08	168	5.7	11.0	8.0	100
07/14/08 - 07/20/08	168	5.3	9.8	7.6	100
07/21/08 - 07/27/08	168	5.3	7.9	6.5	100
07/28/08 - 08/03/08	59	4.8	7.5	6.1	100
08/04/08 - 09/28/08			NO DATA		
09/29/08 - 10/05/08	109	5.4	6.4	6.0	100
10/06/08 - 10/12/08	168	5.1	6.8	5.9	100
10/13/08 - 10/19/08	168	4.7	5.9	5.3	100
10/20/08 - 10/26/08	168	5.4	7.1	6.3	100
10/27/08 - 11/02/08	168	6.6	8.2	7.4	100

TABLE A-22 (Continued): WEEKLY DO SUMMARY STATISTICS AT
104TH AVENUE ON THE CALUMET-SAG CHANNEL DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 3.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
11/03/08 - 11/09/08	84	6.0	7.2	6.6	100
11/10/08 - 11/23/08			NO DATA		
11/24/08 - 11/30/08	109	7.7	9.2	8.7	100
12/01/08 - 12/07/08	59	5.7	8.8	8.3	100
12/08/08 - 12/31/08			NO DATA		

TABLE A-23: WEEKLY DO SUMMARY STATISTICS AT ROUTE 83
ON THE CALUMET-SAG CHANNEL DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 3.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
01/01/08 - 01/06/08	144	9.3	10.7	10.1	100
01/07/08 - 01/13/08	168	7.5	10.3	8.7	100
01/14/08 - 01/20/08	168	8.3	9.9	9.1	100
01/21/08 - 01/27/08	168	9.2	9.9	9.5	100
01/28/08 - 02/03/08	168	8.8	10.2	9.7	100
02/04/08 - 02/10/08	168	8.9	10.7	9.7	100
02/11/08 - 02/17/08	168	8.6	10.5	9.5	100
02/18/08 - 02/24/08	168	8.1	10.9	9.7	100
02/25/08 - 03/02/08	167	7.4	9.9	8.7	100
03/03/08 - 03/09/08	168	9.0	10.2	9.6	100
03/10/08 - 03/16/08	167	8.4	9.5	8.9	100
03/17/08 - 03/23/08	167	7.5	9.6	8.5	100
03/24/08 - 03/30/08	168	8.1	10.1	9.2	100
03/31/08 - 04/06/08	168	7.1	9.2	8.0	100
04/07/08 - 04/13/08	168	7.3	9.2	8.0	100
04/14/08 - 04/20/08	168	7.3	8.6	8.0	100
04/21/08 - 04/27/08	168	6.8	8.9	7.7	100
04/28/08 - 05/04/08	167	5.2	8.0	6.6	100
05/05/08 - 05/11/08	168	5.5	7.7	6.6	100
05/12/08 - 05/18/08	168	5.9	7.8	6.5	100
05/19/08 - 05/25/08	168	5.7	8.6	7.2	100
05/26/08 - 06/01/08	168	4.8	10.1	7.2	100
06/02/08 - 06/08/08	168	2.4	5.5	4.0	90
06/09/08 - 06/15/08	168	3.0	7.4	4.5	99
06/16/08 - 06/22/08	168	5.3	9.7	6.8	100
06/23/08 - 06/29/08	168	4.8	8.1	6.2	100
06/30/08 - 07/06/08	168	4.4	9.9	6.8	100
07/07/08 - 07/13/08	59	7.4	11.6	9.0	100
07/14/08 - 07/20/08	110	4.3	8.4	6.7	100
07/21/08 - 07/27/08	168	4.1	8.3	6.0	100
07/28/08 - 08/03/08	168	4.5	8.5	5.9	100
08/04/08 - 08/10/08	168	3.4	5.7	4.6	100
08/11/08 - 08/17/08	168	4.8	7.0	5.7	100
08/18/08 - 08/24/08	168	4.4	6.8	5.8	100

TABLE A-23 (Continued): WEEKLY DO SUMMARY STATISTICS AT
ROUTE 83 ON THE CALUMET-SAG CHANNEL DURING 2008

Monitoring Dates	Number of DO Values	DO Concentration (mg/L)			Percent DO Values ≥ 3.0 mg/L IPCB Standard
		Minimum	Maximum	Mean	
08/25/08 - 08/31/08	168	4.6	7.7	6.2	100
09/01/08 - 09/07/08	168	2.7	7.5	5.6	96
09/08/08 - 09/14/08	168	4.6	6.2	5.3	100
09/15/08 - 09/21/08	168	3.2	5.8	4.5	100
09/22/08 - 09/28/08	58	4.8	5.2	4.9	100
09/29/08 - 10/05/08	110	5.2	6.1	5.7	100
10/06/08 - 10/12/08	168	5.2	6.7	5.9	100
10/13/08 - 10/19/08	168	4.8	6.0	5.4	100
10/20/08 - 10/26/08	168	5.1	7.3	6.4	100
10/27/08 - 11/02/08	168	6.9	7.7	7.3	100
11/03/08 - 11/09/08	168	5.8	7.4	6.5	100
11/10/08 - 11/16/08	168	6.3	7.5	7.0	100
11/17/08 - 11/23/08	168	6.4	8.0	7.6	100
11/24/08 - 11/30/08	168	7.1	9.1	8.2	100
12/01/08 - 12/07/08	168	7.3	9.5	8.5	100
12/08/08 - 12/14/08	168	8.9	10.5	9.8	100
12/15/08 - 12/21/08	168	10.4	13.2	11.3	100
12/22/08 - 12/28/08	168	11.1	13.0	12.3	100
12/29/08 - 12/31/08	72	10.9	11.5	11.2	100

TABLE A-24: SUMMARY STATISTICS FOR DISSOLVED OXYGEN MEASUREMENTS MADE DURING CROSS-SECTIONAL SURVEYS

Waterway, Station, and Date	Field Monitor DO (mg/L)	Cross Section Depth Range (feet)	N*	Cross-Sectional Dissolved Oxygen				Standard Deviation (mg/L)	Coefficient of Variation (%)
				Minimum (mg/L)	Maximum (mg/L)	Mean (mg/L)	Mean (mg/L)		
North Shore Channel									
<u>Main Street</u>									
04/04/08	18.23	3.1 - 4.8	8	17.89	18.76	18.29	0.29	1.61	
08/15/08	7.20	2.9 - 5.3	8	7.23	7.58	7.45	0.14	1.83	
11/14/08	14.86	3.1 - 4.3	8	14.50	16.11	15.31	0.66	4.29	
<u>Foster Avenue</u>									
04/08/08	8.61	3.2 - 8.2	9	8.47	8.53	8.49	0.02	0.25	
08/26/08	7.31	3.5 - 9.2	10	7.34	7.47	7.39	0.04	0.55	
11/18/08	7.48	3.2 - 9.2	9	7.58	7.66	7.62	0.03	0.35	
North Branch Chicago River									
<u>Addison Street</u>									
04/08/08	7.97	5.8 - 7.4	9	8.21	8.30	8.25	0.03	0.38	
08/26/08	6.69	5.6 - 8.3	11	6.66	6.91	6.83	0.06	0.93	
11/18/08	7.64	5.7 - 8.7	10	7.68	7.71	7.70	0.01	0.12	
<u>Fullerton Avenue</u>									
04/08/08	8.07	7.0-13.2	11	7.76	8.07	7.95	0.09	1.17	
08/26/08	5.55	10.3-13.8	12	5.71	6.07	5.85	0.11	1.84	
11/18/08	7.19	9.5-13.1	12	7.01	7.08	7.03	0.02	0.31	

TABLE A-24 (Continued): SUMMARY STATISTICS FOR DISSOLVED OXYGEN MEASUREMENTS MADE DURING CROSS-SECTIONAL SURVEYS

Waterway, Station, and Date	Field Monitor DO (mg/L)	Cross Section Depth Range (feet)	N*	Cross-Sectional Dissolved Oxygen				Standard Deviation (mg/L)	Coefficient of Variation (%)
				Minimum (mg/L)	Maximum (mg/L)	Mean (mg/L)	Mean (mg/L)		
North Branch Chicago River									
<u>Kinzie Street</u>									
04/08/08	7.80	9.1 – 20.8	12	7.46	7.61	7.52	0.04	0.55	
08/26/08	5.99	10.3 – 19.4	12	6.05	6.22	6.16	0.04	0.69	
11/18/08	7.05	11.3 – 21.4	12	7.03	7.11	7.07	0.02	0.27	
Chicago River									
<u>Clark Street</u>									
04/08/08	8.63	13.6 – 24.2	12	8.26	9.00	8.85	0.20	2.31	
08/26/08	7.60	13.0 – 22.0	12	7.36	7.81	7.70	0.13	1.71	
11/18/08	9.72	13.0 – 22.6	12	6.74	8.30	7.82	0.58	7.45	
South Branch Chicago River									
<u>Loomis Street</u>									
04/10/08	7.74	13.4 – 22.3	12	7.55	7.68	7.61	0.04	0.52	
08/19/08	6.76	13.8 – 23.0	12	6.16	6.80	6.61	0.21	3.22	
11/18/08	7.11	14.9 – 21.5	12	6.85	7.22	7.13	0.10	1.46	

TABLE A-24 (Continued): SUMMARY STATISTICS FOR DISSOLVED OXYGEN MEASUREMENTS MADE DURING CROSS-SECTIONAL SURVEYS

Waterway, Station, and Date	Field Monitor DO (mg/L)	Cross Section Depth Range (feet)	N*	Cross-Sectional Dissolved Oxygen				Standard Deviation (mg/L)	Coefficient of Variation (%)
				Minimu m (mg/L)	Maximu m (mg/L)	Mean (mg/L)			
Bubbly Creek									
<u>36th Street</u>									
04/10/08	18.91	1.5 – 4.2	7	19.58	20.20	19.88	0.23	1.18	
08/19/08	0.00	1.7 – 5.0	8	0.21	5.22	3.89	1.66	42.61	
11/21/08	6.71	3.7 – 4.8	9	6.74	7.23	6.88	0.15	2.14	
<u>Interstate Highway 55</u>									
04/10/08	9.19	4.1 – 10.3	10	9.50	9.69	9.59	0.05	0.53	
08/19/08	4.60	5.2 – 11.0	10	0.14	5.34	4.42	1.60	36.12	
11/21/08	7.63	5.6 – 11.9	10	6.82	7.72	7.52	0.26	3.46	
Chicago Sanitary and Ship Canal									
<u>Cicero Avenue</u>									
04/10/08	6.82	6.8 – 16.2	11	6.94	7.12	7.05	0.06	0.79	
08/19/08	5.24	6.1 – 18.9	11	5.37	5.70	5.56	0.11	1.92	
11/18/08	5.99	7.8 – 19.4	11	5.81	5.94	5.89	0.04	0.66	
<u>B&O Railroad</u>									
04/09/08	8.13	9.6 – 18.2	12	8.19	8.32	8.27	0.04	0.48	
08/20/08	6.04	7.2 – 18.6	11	6.00	6.10	6.06	0.03	0.58	
11/20/08	6.49	5.8 – 20.9	11	6.51	6.57	6.54	0.02	0.25	

TABLE A-24 (Continued): SUMMARY STATISTICS FOR DISSOLVED OXYGEN MEASUREMENTS MADE DURING CROSS-SECTIONAL SURVEYS

Waterway, Station, and Date	Field Monitor DO (mg/L)	Cross Section Depth Range (feet)	N*	Cross-Sectional Dissolved Oxygen Samples				Coefficient of Variation (%)
				Minimum (mg/L)	Maximum (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	
Chicago Sanitary and Ship Canal								
<u>Route 83</u>								
04/09/08	NA**	21.4 – 23.1	12	7.11	7.28	7.19	0.05	0.69
08/20/08	4.64	18.8 – 23.2	12	4.89	4.99	4.94	0.03	0.55
11/20/08	7.29	20.1 – 24.6	12	7.14	7.22	7.19	0.03	0.35
<u>Romeoville Road</u>								
04/09/08	NA	22.4 – 25.5	12	7.57	7.68	7.63	0.04	0.52
08/20/08	4.90	23.5 – 26.1	12	5.10	5.35	5.26	0.07	1.36
11/20/08	6.51	20.8 – 26.1	12	6.71	6.84	6.76	0.04	0.61
<u>Lockport Powerhouse</u>								
04/07/08	7.02	22.4 – 27.9	12	6.90	7.18	7.04	0.09	1.22
08/18/08	NA	18.7 – 29.2	12	5.47	6.47	5.94	0.36	6.00
11/17/08	7.61	22.6 – 31.9*	12	5.94	6.27	6.09	0.09	1.44
Little Calumet River								
<u>C&WI Railroad</u>								
04/09/08	14.09	9.5 – 15.7	12	13.77	14.52	14.22	0.21	1.48
08/20/08	7.51	8.8 – 12.5	12	7.46	8.20	7.71	0.26	3.32
11/19/08	13.46	6.7 – 14.2	11	12.47	13.09	12.72	0.22	1.71

TABLE A-24 (Continued): SUMMARY STATISTICS FOR DISSOLVED OXYGEN MEASUREMENTS MADE DURING CROSS-SECTIONAL SURVEYS

Waterway, Station, and Date	Field Monitor DO (mg/L)	Cross Section Depth Range (feet)	N*	Cross-Sectional Dissolved Oxygen Samples				Coefficient of Variation (%)
				Minimum (mg/L)	Maximum (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	
Little Calumet River								
<u>Halsted Street</u>								
04/09/08	7.29	6.2 – 14.3	11	7.02	7.65	7.28	0.27	3.65
08/20/08	7.55	4.5 – 14.2	10	6.92	8.08	7.37	0.36	4.95
11/19/08	7.96	5.3 – 12.5	11	7.42	7.63	7.57	0.06	0.77
Calumet-Sag Channel								
<u>Cicero Avenue</u>								
04/09/08	7.98	8.5 – 12.0	12	8.30	8.39	8.34	0.03	0.38
08/20/08	7.19	8.5 – 13.0	12	6.77	7.02	6.90	0.07	1.05
11/19/08	7.40	8.7 – 10.6	12	7.11	7.32	7.19	0.08	1.08
<u>Division Street</u>								
04/09/08	NA	6.5 – 13.2	11	8.10	8.16	8.13	0.02	0.26
08/20/08	6.63	5.0 – 13.0	11	6.96	7.27	7.07	0.12	1.69
11/19/08	NA	4.9 – 12.4	11	7.46	7.57	7.52	0.03	0.42
<u>104th Avenue</u>								
04/09/08	8.42	5.6 – 13.6	9	8.42	8.71	8.53	0.11	1.24
08/20/08	6.20	4.9 – 13.7	10	6.65	7.24	6.88	0.19	2.78
11/19/08	7.12	6.5 – 13.5	10	7.03	7.12	7.08	0.03	0.43

TABLE A-24 (Continued): SUMMARY STATISTICS FOR DISSOLVED OXYGEN MEASUREMENTS MADE DURING CROSS-SECTIONAL SURVEYS

Waterway, Station, and Date	Field Monitor DO (mg/L)	Cross Section Depth Range (feet)	N*	Cross-Sectional Dissolved Oxygen Samples					Coefficient of Variation (%)
				Minimum (mg/L)	Maximum (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)		
Calumet Sag Channel									
<u>Southwest Highway</u>									
04/09/08	NA	9.1 – 15.0	12	8.17	8.36	8.29	0.05	0.66	
08/20/08	6.81	6.1 – 15.0	11	7.04	7.83	7.28	0.25	3.43	
11/19/08	NA	6.0 – 13.6	9	7.08	7.21	7.13	0.04	0.53	
<u>River Mile 311.7</u>									
04/09/08	NA	7.5 – 13.3	11	8.55	8.74	8.63	0.07	0.81	
08/20/08	7.70	4.6 – 13.5	10	6.60	7.57	6.96	0.39	5.65	
11/19/08	7.17	4.3 – 13.1	10	7.03	7.21	7.14	0.06	0.87	
<u>Route 83</u>									
04/09/08	8.97	6.5 – 12.5	11	8.35	8.87	8.53	0.17	2.01	
08/20/08	6.68	8.8 – 13.5	12	6.77	7.13	6.92	0.10	1.52	
11/19/08	7.82	6.6 – 13.3	11	7.52	7.65	7.57	0.04	0.47	
Des Plaines River									
<u>Jefferson Street</u>									
04/07/08	8.94	8.9 – 22.2	12	8.54	8.78	8.65	0.09	1.02	
08/18/08	6.05	12.5 – 22.4	12	5.71	6.01	5.86	0.10	1.75	
11/17/08	9.14	13.7 – 23.5	12	8.88	9.02	8.95	0.05	0.54	

*Number of DO measurements made across transect during cross-sectional survey.

**NA = No Analysis.

ITEM 4

Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

***MONITORING AND RESEARCH
DEPARTMENT***

REPORT NO. 10-36

2009 ANNUAL SUMMARY REPORT

**WATER QUALITY WITHIN THE WATERWAYS SYSTEM OF
THE METROPOLITAN WATER RECLAMATION DISTRICT
OF GREATER CHICAGO**

July 2010

TABLE AII-3: TEMPERATURE VIOLATION HISTORY
2002 THROUGH 2009

Sampling Station (No. Name)	Ratio of Violations/Sampling Frequency per Year							
	09	08	07	06	05	04	03	02
Chicago River System								
30 Lake-Cook Road, West Fork North Branch	ND	ND	ND	ND	ND	ND	ND	ND
106 Dundee Road, West Fork North Branch Chicago River	0/11	0/10	0/4	0/5	0/4	0/8	0/3	0/5
103 Golf Road, West Fork North Branch Chicago River	0/11	0/10	0/11	1/12	0/10	0/10	0/8	0/9
31 Lake-Cook Road, Middle Fork North Branch	0/10	0/10	0/10	0/11	0/10	0/10	0/8	0/7
104 Glenview Road, North Branch Chicago River	0/12	0/12	0/11	0/12	1/12	0/12	0/3	0/7
32 Lake-Cook Road, Skokie River	0/10	0/10	0/9	0/12	1/11	0/10	0/8	0/7
105 Frontage Road, Skokie River	0/12	0/12	0/11	0/12	0/12	0/12	0/11	0/10
34 Dempster Street, North Branch Chicago River	0/12	0/11	0/11	0/12	0/11	0/12	0/11	0/10
96 Albany Avenue, North Branch Chicago River	0/12	0/12	0/11	0/12	0/11	0/11	0/10	0/11
35 Central Street, North Shore Channel	0/9	0/9	0/9	1/9	0/8	0/9	0/9	0/7
102 Oakton Street, North Shore Channel	0/11	0/11	0/12	0/12	0/12	0/11	0/10	0/10
36 Touhy Avenue, North Shore Channel	0/10	0/12	0/12	0/12	0/12	0/12	0/12	0/11
101 Foster Avenue, North Shore Channel	0/12	0/12	0/12	0/12	0/13	0/12	0/11	0/11
37 Wilson Avenue, North Branch Chicago River	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/11
73 Diversey Parkway, North Branch Chicago River	0/12	0/12	0/12	0/12	0/12	0/12	0/12	0/11
46 Grand Avenue, North Branch Chicago River	0/12	0/12	0/11	0/12	0/12	0/12	0/12	0/11
74 Lake Shore Drive, Chicago River	0/9	0/10	0/11	0/11	0/10	0/9	0/10	0/12
100 Wells Street, Chicago River	0/11	0/12	0/11	0/12	0/12	0/12	0/12	0/12
39 Madison Street, South Branch Chicago River	0/11	0/12	0/11	0/12	0/12	0/12	0/12	0/11
108 Loomis Street, South Branch Chicago River	0/12	0/11	0/12	0/12	0/10	0/12	0/12	0/11
99 Archer Avenue, South Fork South Branch Chicago River	0/11	0/12	0/11	0/7	0/11	0/12	0/12	0/11
40 Damen Avenue, Chicago Sanitary & Ship Canal	0/11	0/12	0/12	0/12	0/12	0/12	0/12	ND
107 Western Avenue, Chicago Sanitary & Ship Canal	ND	ND	ND	ND	ND	ND	ND	0/11
75 Cicero Avenue, Chicago Sanitary & Ship Canal	0/12	0/12	0/12	0/13	0/12	0/12	0/12	0/11
41 Harlem Avenue, Chicago Sanitary & Ship Canal	0/12	0/12	0/12	0/13	0/12	0/12	0/12	0/12
42 Route 83, Chicago Sanitary & Ship Canal	0/10	0/12	0/11	0/13	0/11	0/12	0/12	0/12
48 Stephen Street, Chicago Sanitary & Ship Canal	0/10	0/12	0/11	0/13	0/11	0/12	0/12	0/12
82 Lockport Trebler, Chicago Sanitary & Ship Canal	ND	ND	ND	ND	ND	ND	ND	ND
92 Lockport Forebay, Chicago Sanitary & Ship Canal	0/51	0/51	0/51	0/53	0/51	0/50	0/50	0/46
Calumet River System								
49 Ewing Avenue, Calumet River	0/7	0/9	0/9	0/11	0/11	0/10	0/12	0/10
50 Burnham Avenue, Wolf Lake	0/10	0/12	0/10	0/11	0/12	0/12	1/12	0/10
55 130th Street, Calumet River	0/9	0/9	0/9	0/11	0/11	0/11	0/10	0/10
51 IHB Railroad Bridge, Grand Calumet River	ND	ND	ND	ND	ND	ND	ND	ND
86 Burnham Avenue, Grand Calumet River	0/5	0/10	0/9	0/11	0/10	0/9	0/10	0/9
56 Indiana Avenue, Little Calumet River	0/8	0/9	0/9	0/11	0/9	0/9	0/11	0/12
76 Halsted Street, Little Calumet River	0/11	0/12	0/11	0/11	0/12	0/12	0/11	0/12
52 Wentworth Avenue, Little Calumet River	0/10	0/10	0/11	0/11	0/11	0/9	1/10	0/11
54 Joe Orr Road, Thorn Creek	0/9	0/9	0/10	0/9	0/8	0/7	0/3	0/7
97 170th Street, Thorn Creek	0/9	0/11	0/11	0/11	0/11	0/11	1/10	0/11
57 Ashland Avenue, Little Calumet River	0/9	0/10	0/11	0/11	0/11	0/10	1/10	0/11
58 Ashland Avenue, Calumet-Sag Channel	0/11	0/12	0/11	0/11	0/12	0/12	0/12	0/11
59 Cicero Avenue, Calumet-Sag Channel	0/10	0/11	0/11	0/11	0/12	0/12	0/11	0/9
43 Route 83, Calumet-Sag Channel	0/10	0/10	0/11	0/11	0/11	1/10	0/11	0/10
Des Plaines River System								
90 Route 19, Poplar Creek	0/11	0/11	0/11	0/12	0/11	0/11	0/10	0/8
63 Longmeadow Lane, West Branch DuPage River	ND	ND	ND	ND	ND	ND	0/1	ND
89 Walnut Lane, West Branch DuPage River	0/12	0/12	0/12	0/12	0/12	0/10	0/11	0/12
64 Lake Street, West Branch DuPage River	0/12	0/12	0/12	0/12	0/11	0/11	0/12	0/12
79 Higgins Road, Salt Creek	0/8	0/9	0/10	0/9	0/9	0/11	0/9	0/7
80 Arlington Heights Road, Salt Creek	0/12	0/12	0/12	0/12	0/12	0/12	1/12	0/9
18 Devon Avenue, Salt Creek	0/11	0/12	0/12	0/12	0/12	0/12	1/12	0/10
24 Wolf Road, Salt Creek	0/12	1/12	0/11	0/12	0/12	0/11	0/11	0/11
109 Brookfield Avenue, Salt Creek	0/11	0/11	0/11	0/12	0/12	0/11	0/9	0/4
21 First Avenue, Salt Creek	ND	ND	ND	ND	ND	ND	ND	0/3
77 Elmhurst Road, Higgins Creek	0/4	0/5	0/5	0/7	0/4	0/6	0/5	0/6
78 Wille Road, Higgins Creek	0/12	1/11	0/12	0/12	0/11	0/11	0/12	0/11
12 Lake-Cook Road, Buffalo Creek	0/9	0/10	0/9	0/9	0/6	0/7	0/8	0/6
13 Lake-Cook Road, Des Plaines River	0/12	0/11	0/12	0/12	0/11	0/11	0/12	0/10
17 Oakton Street, Des Plaines River	0/11	0/11	0/11	0/12	0/11	0/11	0/10	0/10
19 Belmont Avenue, Des Plaines River	0/12	0/11	0/11	0/12	0/11	1/11	0/12	0/10
20 Roosevelt Road, Des Plaines River	0/11	0/11	0/11	0/12	0/11	0/11	0/7	0/10
22 Ogden Avenue, Des Plaines River	0/11	0/11	0/11	0/12	0/12	0/10	0/5	0/10
23 Willow Springs Road, Des Plaines River	0/11	0/11	0/11	0/12	0/12	0/10	0/10	0/9
29 Stephen Street, Des Plaines River	0/11	0/12	0/11	0/12	0/12	0/10	0/11	0/11
91 Material Service Road, Des Plaines River	0/12	0/12	0/11	0/12	0/12	0/10	0/12	0/11
110 Springinsguth Road, West Branch DuPage River	0/9	0/11	0/10	0/11	0/11	0/10	ND	ND

ND = No Data.