Metropolitan Water Reclamation District of Greater Chicago

RESEARCH AND DEVELOPMENT DEPARTMENT

REPORT NO. 05-10

COMBINED SEWER OVERFLOW IMPACT REPORT

August 2005

Metropolitan Water Reclamation District of Greater Chicago
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COMBINED SEWER OVERFLOW IMPACT REPORT

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INTRODUCTION

The Illinois Environmental Protection Agency (IEPA) issued National Pollutant Discharge Elimination System (NPDES) permits effective March 1, 2002 for the Stickney Water Reclamation Plant (WRP) (IL0028053), the Calumet WRP (IL0028061) and the North Side WRP (IL0028088) of the Metropolitan Water Reclamation District of Greater Chicago (District). Special Condition 7.A.7.b of these NPDES permits requires the District to inventory non-domestic discharges to the combined sewer system, assess the impact of these discharges on combined sewer overflows (CSOs) and evaluate modifications to the District's pretreatment program to minimize CSO impacts. This report documents the District's compliance with these requirements.

CSO IMPACT FROM BATCH DISCHARGERS

Initially, the District conducted an investigation of categorical significant user (CSIU) batch dischargers, with the goal of determining if their effects are significant during CSO events. The results indicate that CSIU batch discharges within the District's jurisdiction are not a significant contributor of toxics during CSO events due to the limited number of CSIU batch dischargers, the relatively small volume of the batch discharges and the distance from the discharge source to the CSO outfall.

There are approximately 350 CSIUs within the District's jurisdiction. Of those, 13 CSIUs are currently classified as batch dischargers to the District's sewerage system. The investigation included course-plotting of the CSIU's batch discharge to the nearest CSO outfall of Tunnel and Reservoir Plan (TARP) drop shaft (DS). Table 1 indicates the average volume and frequency of each batch discharger. The volume of the batch discharges is not significant in comparison to the volume discharged daily by all 350 CSIUs.

During the course-plotting investigation of the batch discharges, most discharges were correlated with CSO outfalls and DSs identified in the CSO Database compiled by the District's Engineering Department. The NPDES Permits for the CSO outfalls identified in the CSO database are also listed in Table 1. The CSO Database currently has identified over 500 CSO outfalls within the District's jurisdiction. Also, it was found during the investigation that not all CSO outfalls operate during a given rain event, nor do they operate simultaneously. Therefore, the discharge from a particular CSIU batch discharger facility may not discharge to the waterway through the nearest CSO outfall, but may be discharged through a downstream outfall in operation.

Due to the limited number of CSIU batch discharger facilities and the small discharge volumes of CSIU batch discharges, greater regulation of those facilities would not measurably reduce the discharge of toxic materials during CSO events. The results of this analysis were transmitted to the IEPA in a letter dated February 28, 2003.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 1

COMBINED SEWER OVERFLOW STUDY - BATCH DISCHARGER DATA

User No.	Regulated Category (40 CFR)	Average Discharge Volume*/Frequency	Distance to Waterway	CSO Outfall Permittee
12831	433	14,500/Monthly	2.5 Miles	Chicago
25667	433	4,000/Weekly	0.4 Miles	Evanston
11256	433	2,400 Daily	0.5 Miles	Chicago
10341	464 & 468	3,500/Daily	3.2 Miles	District
13489	463	325/Weekly	2.7 Miles	Chicago
24946	433	2,500/Semi-Annually	0.6 Miles	District
24694	433	500/Weekly	1.9 Miles	Des Plaines
10654	410	8,000/Weekly	0.8 Miles	Chicago
15773	433	51, 000/Semi-Annually	3.4 Miles	Chicago
12272	433	165/Infrequent	0.8 Miles	District
10877	433	27/Monthly	0.3 Miles	Evanston
25817	433	9,600/Quarterly	1.0 Miles	District
10899	433	300/Weekly	1.0 Miles	Chicago

* Volume in gallons

FORMULATION OF STUDY PLAN FOR CSO IMPACTS

The District expanded its assessment of the impact on CSO discharges to include all significant industrial users (SIUs) under our jurisdiction. In a June 30, 2004 status report to the IEPA, the District described a study plan formulated to accomplish the assessment. The study plan consisted of the following elements:

1. Prepare survey sheets for each significant non-domestic discharger (SND). Identify the local sewer, interceptor and Water Reclamation Plant to which the SND contributes, and the distance to the waterway and the categorically regulated status of the SND.
2. Obtain CSO outfall capacity information for the local sewers and interceptors at the respective Tunnel and Reservoir Project drop shafts from the District's Engineering Department.
3. Tabulate the design flow rates and the data from the survey sheets in spreadsheet format.
4. For each SND, determine a dilution ration (CSODR), rounded to the nearest one-thousandth, as the SND average daily flow volume divided by the CSO outfall capacity.
5. Place SNDs in one of four tiers as follows. Tier 1 discharges represent the highest impact potential. Tier 4 discharges represent the lowest impact potential:

    Tier 1: CSODR equal to 0.100 or greater

    Tier 2: CSODR equal to 0.050 to 0.099

    Tier 3: CSODR equal to 0.025 to 0.049

Tier 4: CSODR equal to 0.000 to 0.024

6. For each SND in Tier 1 and Tier 2, assess the technical and economical feasibility of withholding discharge during wet weather events. Each assessment shall include an on-site inspection and interview with the SND manager or designee.
7. Upon completion of the Tier 1 and Tier 2 assessments, evaluate progress to date. Make a determination regarding advisability or futility of performing assessments for SNDs in Tier 3 and Tier 4.
8. Transmit the results of the evaluation to the IEPA.

The District's Engineering Department provided information concerning the outfall capacity at each CSO outfall in each CSO drainage basin. Industrial Waste Division (IWD) personnel compiled survey data concerning 917 discharge locations at 652 facilities. 163 of the SNDs were found to be located in separate sewer areas. The NPDES permit requirement to assess CSO impacts is limited to CSO impacts from SNDs located in combined sewer areas. Thus, the District planned no further assessments of the SNDs located in separate sewer areas. The CSO and survey information was tabulated into a spreadsheet. The impact area of the surveyed SNDs included 129 CSO outlets in 118 CSO basins.

CSO IMPACT FROM SIGNIFICANT INDUSTRIAL USERS

No SNDs met the criteria for Tier 1, in which the discharge of the SND would be 10 percent or greater than the outfall capacity at the receiving CSO outfall. The following two non-categorically regulated SNDs met the criteria for Tier 2 and Tier 3, respectively:

User No.	Location	Outlet	Tier	CSODR
15827	14622 South Lakeside Avenue, Dolton, IL	1A	3	0.033
13787	1000 East Ohio Street, Chicago, IL	1A	2	0.056

The discharges from these two SNDs mainly consist of wash water from food process operations, non-contact cooling water, and water treatment residue. The District determined that the potential impact of these types of wastewater discharges on CSOs is not significant because these types of wastewater are similar to domestic wastewater. Thus, no further assessments of these two SNDs were performed.

489 SNDs were included in Tier 4. The District determined that the potential impact of the Tier 4 SNDs on CSOs is not significant because the individual discharge of each SND is less than two percent of the outfall capacity of the receiving CSO outfall. Thus, no further assessments of the Tier 4 SNDs were performed. However, further assessments of potential synergistic effects of the collective discharges to individual CSO outfalls from numerous SNDs were performed.

SYNERGISTIC EFFECTS AT CSOS

Using information from the District's Engineering Department and the Chicago Department of Water Management, an assessment of potential synergistic effects of multiple SNDs to individual CSOs was performed. The cumulative CSODRs at each CSO outlet were tabulated and ranked by Tier. The CSOs are listed in Table 2. No CSOs met the criteria for Tier 1, in which the cumulative discharges of the SNDs would be 10 percent or greater than the outfall capacity at the receiving CSO outlet. The following six CSOs were included in Tier 2 and Tier 3:

CSO Outlet No.	Location	Receiving Waterway	Tier	Cumulative CSODR
159	Fairbanks Court North	Chicago River	2	0.06825
125	Damen Avenue	North Branch Chicago River	2	0.06209
51	Dempster Street	North Branch Chicago River	2	0.05325
D149	Elm Street	Des Plaines River	3	0.04317
D146	Irving Park Road South	Des Plaines River	3	0.03454
D148	Addison Street South	Des Plaines River	3	0.02935

CSO No. 125 is located along a receiving waterway that is designated by the IEPA as a Secondary Contact waterway. CSO Nos. 159, 51, D149, D146, and D148 are located along receiving waterways that are designated by the IEPA as General Use waters. 25 SNDs were identified as contributors to the CSOs in Tier 2 and Tier 3. These SNDs are listed in Table 3.

Nine of the listed SNDs are non-categorical SIUs. The discharges from five of the non-categorical SNDs are domestic strength wastewaters that would be no different than residential wastewater flows. The discharge from one non-categorical SND is a critical service that cannot

reasonably be shut down. The discharges from three of the non-categorical SNDs are from food manufacturing processes that do not contain toxic pollutants. The District determined that there is no justification to have these SNDs cease discharge during CSO events.

Sixteen of the listed SNDs are subject to categorical pretreatment regulations. The discharges from twelve of the categorical SNDs are less than one percent of the flow capacities of their respective CSO outlets. The District determined that due to dilution of these SND flows with the remaining portion of flows to the respective CSOs, and distances of at least one half mile between the SNDs and the CSOs, there is no justification to have these SNDs cease discharge during CSO events.

The discharges from the other four categorical SNDs comprise 1.0 percent, 1.1 percent, 1.3 percent and 2.7 percent of the flow capacities of their respective CSOs. IWD personnel conducted on-site inspections at these four SNDs to gain an understanding of their operations, processes and discharge practices and to assess their capability to withhold discharge during relevant CSO events.

The results of the on-site inspections at the referenced categorical SNDs indicated that three of the SNDs do not have reserve storage capacity for withholding discharge and do not have flexibility to modify their respective operations without having an adverse impact on those operations. The District found no justification in having these three facilities cease discharge during CSO events since their operations cannot reasonably be shut down.

The results also indicated that one of the SNDs has sufficient operational flexibility to recycle process wastewater subject to categorical pretreatment regulations for several days at a time without affecting their operations. The sanitary wastewater, boiler blowdown and noncontact

cooling water flows from this SND have minimal effect on the quality of discharges at the associated CSO outlet, and cannot be modified on a short-term basis without having an adverse impact on the operations of the SND. The continuous discharge of non-categorically regulated process wastewater constitutes less than five percent of the SND flow and is also critical to the ongoing operation of the facility. Concluding the final report, the District notified the IEPA on March 31, 2005 of its determination that modification of the District's pretreatment program to minimize the CSO impact from this single SND is not warranted.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 2

SYNERGISTIC EFFECTS OF SIGNIFICANT NONDOMESTIC DISCHARGER (SND) LOCATIONS ON COMBINED SEWER OVERFLOW (CSO) DILUTION RATIOS[1] (CSODRs), SORTED BY CSODR

Waterway	Outlet	Outlet Capacity (cfs)	SND Discharges per Outlet	SND Flow (cfs) per Outlet	Avg. SND Miles to Waterway	Sum of SND CSODRs per Outlet	CSO Tier
Chicago River[3]	159 - Fairbanks Ct.	50	4	3.4123	0.67	0.0683	2
N. Branch Ch. Riv. dsc[2]	125 - Damen Ave.	4	3	0.2484	1.75	0.0621	2
N. Branch Chicago Riv.[3]	51 - Dempster St.	10	4	0.5325	3.35	0.0533	2
Des Plaines River[3]	D149 - Elm St.	20	7	0.8634	2.07	0.0432	3
Des Plaines River[3]	D146 - Irving Park Rd. S.	20	11	0.6907	0.98	0.0345	3
Des Plaines River[3]	D148 - Addison St. S.	8	5	0.2348	0.64	0.0294	3
Des Plaines River[3]	D147 - Addison St.	8	5	0.1694	2.30	0.0212	4
Des Plaines River[3]	D221 - Roosevelt Rd.	46	4	0.8951	1.97	0.0195	4
Little Calumet River	C26 - Dearborn St. Ext.	76	5	1.3136	0.24	0.0173	4
Des Plaines River[3]	D237 - 26th St.	23	5	0.3529	2.32	0.0153	4
N. Branch Ch. Riv. dsc[2]	134 - Courtland St.	17	1	0.2476	0.40	0.0146	4
S. Branch Chicago Riv.	177 - Washington St.	17	1	0.2066	0.75	0.0122	4
N. Branch Chicago Riv.[3]	60 - Dobson St.	84	1	0.9756	4.90	0.0116	4
Little Calumet River[3]	C70 - Union St.	151	3	1.7331	2.78	0.0115	4
S. Branch South Fork	241 - Ashland Ave.	27	7	0.3037	0.50	0.0113	4
Des Plaines River[3]	D118 - Howard St.	66	23	0.7355	2.65	0.0111	4
N. Branch Ch. Riv. dsc[2]	131 - McClean Ave.	250	8	0.9687	1.70	0.0111	4
CSSC	259 - 73rd Ave.	8	1	0.0822	1.00	0.0103	4

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 2 (continued)

SYNERGISTIC EFFECTS OF SIGNIFICANT NONDOMESTIC DISCHARGER (SND) LOCATIONS ON COMBINED SEWER OVERFLOW (CSO) DILUTION RATIOS[1] (CSODRs), SORTED BY CSODR

Waterway	Outlet	Outlet Capacity (cfs)	SND Discharges per Outlet	SND Flow (cfs) per Outlet	Avg. SND Miles to Waterway	Sum of SND CSODRs per Outlet	CSO Tier
Little Calumet River	C17 - Park Ave.	110	4	1.0477	2.15	0.0095	4
N. Branch Ch. Riv. dsc[2]	130 - Webster Ave.	35	4	0.3236	0.95	0.0092	4
CSSC	262 - Lawndale Ave.	60	7	0.5378	1.00	0.0090	4
CSSC	265 - 75th St.	65	3	0.5761	1.83	0.0089	4
CSSC	225 - Western Ave.	380	14	3.3295	2.20	0.0088	4
Silver Creek3	D173 - Division St.	82	12	0.6955	3.05	0.0085	4
S. Branch Chicago Riv.	194 - 14th St.	34	1	0.2791	0.10	0.0082	4
Weller Creek3	D60 - Mt. Prospect Rd. S.	30	3	0.2316	4.00	0.0077	4
CSSC	222 - Damen Ave.	16	1	0.1186	0.50	0.0074	4
Calumet River[3]	C2 - 94th Pl. Ext.	325	3	2.3035	2.30	0.0071	4
Little Calumet River[3]	C75 - Ashland Ave.	58	4	0.3991	0.30	0.0069	4
Des Plaines River[3]	D3A - Bender/Rand Rd.	80	1	0.5297	1.40	0.0066	4
Little Calumet River	C15 - Dorchester Ave.	96	3	0.6300	1.87	0.0066	4
Little Calumet River[3]	C54 - South Park Ave.	39	2	0.2430	1.10	0.0062	4
Calumet River[3]	C5 - 122nd St.	90	4	0.5546	2.73	0.0062	4
S. Branch Chicago Riv.	213 - Racine Ave.	49	1	0.3017	1.00	0.0062	4
CSSC	264 - 87th St.	243	24	1.2851	1.81	0.0053	4
N. Branch Chicago Riv.[3]	61 - Howard St.	49	3	0.2549	4.50	0.0052	4
Chicago River	161 - Michigan Ave.	171	6	0.8654	0.48	0.0051	4
Des Plaines River[3]	D206 - Main St.	38	6	0.1910	1.78	0.0050	4

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 2 (continued)

SYNERGISTIC EFFECTS OF SIGNIFICANT NONDOMESTIC DISCHARGER (SND) LOCATIONS ON COMBINED SEWER OVERFLOW (CSO) DILUTION RATIOS[1] (CSODRs), SORTED BY CSODR

Waterway	Outlet	Outlet Capacity (cfs)	SND Discharges per Outlet	SND Flow (cfs) per Outlet	Avg. SND Miles to Waterway	Sum of SND CSODRs per Outlet	CSO Tier
N. Branch Ch. Riv. dsc[2]	142 - Division St.	22	1	0.1068	0.25	0.0049	4
Cal-Sag Channel	C90 - Central Park Ave.	70	6	0.3381	5.73	0.0048	4
S. Branch Chicago Riv.	186 - Harrison St.	23	2	0.1040	0.90	0.0045	4
N. Branch Ch. Riv. dsc[2]	118 - Belmont Ave.	198	4	0.8893	1.23	0.0045	4
Addison Creek3	D280 - Gardner Rd.	68	9	0.3010	2.60	0.0044	4
CSSC	261 - Hanover St.	97	2	0.3421	2.89	0.0035	4
N. Branch Ch. Riv. dsc[2]	101 - Wilson Ave.	55	1	0.1783	2.30	0.0032	4
CSSC	251 - Laramie Ave.	620	21	1.9307	2.92	0.0031	4
Cal-Sag Channel	C81 - Division St.	135	5	0.4140	1.34	0.0031	4
N. Branch Ch. Riv. dsc[2]	116 - Addison St.	106	4	0.3247	3.10	0.0031	4
CSSC	237 - Kostner Ave.	1,280	37	3.8954	5.59	0.0030	4
Des Plaines River[3]	D121 - Touhy Ave.	18	1	0.0542	3.70	0.0030	4
S. Branch Chicago Riv.	209 - Halsted St.	38	1	0.1074	0.60	0.0028	4
North Shore Channel	18 - Main St.	323	7	0.8903	1.89	0.0028	4
CSSC	226 - Rockwell St.	600	20	1.4328	2.40	0.0024	4
Chicago River	163 - Rush St.	64	3	0.1463	0.83	0.0023	4
Grand Calumet River	C9 - Burnham Ave.	337	2	0.7420	2.93	0.0022	4
Chicago River	172 - Wells St.	114	3	0.2487	0.74	0.0022	4
S. Branch Chicago Riv.	178 - Washington St.	402	17	0.8700	1.28	0.0022	4
N. Branch Ch. Riv. dsc[2]	127 - Fullerton St.	73	1	0.1578	2.00	0.0022	4

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 2 (continued)

SYNERGISTIC EFFECTS OF SIGNIFICANT NONDOMESTIC DISCHARGER (SND) LOCATIONS ON COMBINED SEWER OVERFLOW (CSO) DILUTION RATIOS[1] (CSODRs), SORTED BY CSODR

Waterway	Outlet	Outlet Capacity (cfs)	SND Discharges per Outlet	SND Flow (cfs) per Outlet	Avg. SND Miles to Waterway	Sum of SND CSODRs per Outlet	CSO Tier
Grand Calumet River	C13 - Escanaba Ave.	45	4	0.0960	0.30	0.0021	4
Addison Creek3	D276 - Harrison St. E.	48	1	0.1387	2.80	0.0020	4
N. Branch Ch. Riv. dsc[2]	141 - Division St.	56	1	0.1083	0.38	0.0019	4
Des Plaines River[3]	D222 - Roosevelt Rd. E.	104	5	0.1925	2.99	0.0019	4
N. Branch Ch. Riv. dsc[2]	152 - Erie St.	15	1	0.0248	0.20	0.0017	4
North Shore Channel	16 - Lake St.	480	4	0.7435	2.90	0.0016	4
S. Branch South Fork	P.S. - Racine, 14 pumps	3,025	40	4.6226	1.93	0.0015	4
Little Calumet River	C31 - Parnell Ave.	100	2	0.1521	0.40	0.0015	4
N. Branch Ch. Riv. dsc[2]	155 - Kinzie St.	93	1	0.1408	3.75	0.0015	4
CSSC	240 - Natchez Ave.	357	4	0.5227	0.94	0.0015	4
North Shore Channel	27 - Howard St.	245	5	0.3531	1.74	0.0014	4
N. Branch Chicago Riv.[3]	82 - Cicero Ave.	75	5	0.1052	0.66	0.0014	4
N. Branch Chicago Riv.[3]	80 - Forest Glen	321	16	0.4477	2.38	0.0014	4
North Shore Channel	37 - Peterson Ave.	158	3	0.1984	1.00	0.0013	4
S. Branch Chicago Riv.	218 - Laflin St.	1,170	15	1.4533	4.70	0.0012	4
N. Branch Ch. Riv. dsc[2]	133 - Courtland St. W.	8	1	0.0096	0.30	0.0012	4
N. Branch Ch. Riv. dsc[2]	122 - Diversey Ave.	224	4	0.2495	0.30	0.0011	4
Chicago River	162 - Beaubien Ct.	200	2	0.2186	1.35	0.0011	4
CSSC	255 - Hiawatha Ave.	892	6	0.9495	8.23	0.0011	4
S. Branch Chicago Riv.	176 - Randolph St.	105	1	0.1105	0.40	0.0011	4

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 2 (continued)

SYNERGISTIC EFFECTS OF SIGNIFICANT NONDOMESTIC DISCHARGER (SND) LOCATIONS ON COMBINED SEWER OVERFLOW (CSO) DILUTION RATIOS[1] (CSODRs), SORTED BY CSODR

Waterway	Outlet	Outlet Capacity (cfs)	SND Discharges per Outlet	SND Flow (cfs) per Outlet	Avg. SND Miles to Waterway	Sum of SND CSODRs per Outlet	CSO Tier
Little Calumet River	C28 - Edbrooke Ave.	810	11	0.7943	2.66	0.0011	4
CSSC	220 - Paulina St.	290	2	0.3041	0.20	0.0011	4
CSSC	232 - Kedzie St.	180	2	0.1632	1.25	0.0009	4
Little Calumet River[3]	C57 - Indiana Ave.	46	1	0.0416	1.00	0.0009	4
N. Branch Ch. Riv. dsc[2]	95 - Lawrence Ave.	108	1	0.0959	6.00	0.0009	4
North Shore Channel	9 - Payne or Noyes	6	1	0.0053	1.70	0.0009	4
N. Branch Ch. Riv. dsc[2]	94 - North Branch P.S.	1,350	23	1.1619	3.20	0.0009	4
Des Plaines River[3]	D151 - Franklin St.	180	11	0.1521	2.75	0.0009	4
North Shore Channel	32 - Pratt Ave.	920	3	0.7295	2.37	0.0008	4
North Shore Channel	19 - Main St. E.	6	1	0.0046	0.90	0.0008	4
N. Branch Ch. Riv. dsc[2]	138 - Blackhawk St.	830	15	0.6172	2.55	0.0007	4
N. Branch Ch. Riv. dsc[2]	154 - Grand St.	33	3	0.0245	2.25	0.0007	4
S. Branch South Fork	250 - Iron St.	373	4	0.2452	0.68	0.0007	4
CSSC	239 - Leamington St.	2,860	11	1.8678	4.03	0.0007	4
N. Branch Chicago Riv.[3]	70 - Ebinger Dr.	116	4	0.0636	5.20	0.0006	4
CSSC	230 - Albany St.	316	3	0.1689	1.12	0.0005	4
N. Branch Ch. Riv. dsc[2]	128 - Fullerton St.	972	1	0.4882	0.10	0.0005	4
Cal-Sag Channel	C88 - Francisco Ave.	368	1	0.1843	0.30	0.0005	4
N. Branch Ch. Riv. dsc[2]	146 - Cortez St.	268	3	0.1307	4.42	0.0005	4
CSSC	236 - Pulaski Rd.	550	8	0.2535	1.43	0.0005	4

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 2 (continued)

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Waterway	Outlet	Outlet Capacity (cfs)	SND Discharges per Outlet	SND Flow (cfs) per Outlet	Avg. SND Miles to Waterway	Sum of SND CSODRs per Outlet	CSO Tier
North Shore Channel	1 - Sheridan Road	122	3	0.0561	0.50	0.0005	4
CSSC	224 - Oakley Ave.	271	1	0.1238	0.50	0.0005	4
S. Branch Chicago Riv.	203 - Canal St. S.	200	1	0.0888	1.25	0.0004	4
N. Branch Ch. Riv. dsc[2]	115 - Addison St.	389	3	0.1550	1.67	0.0004	4
CSSC	238 - Cicero Ave.	184	2	0.0607	2.80	0.0003	4
Des Plaines River[3]	D142 - Wilson Ave. Ext.	108	2	0.0337	2.80	0.0003	4
N. Branch Ch. Riv. dsc[2]	157 - Fulton St.	780	4	0.2333	0.93	0.0003	4
N. Branch Ch. Riv. dsc[2]	136 - North Ave.	88	1	0.0260	0.30	0.0003	4
N. Branch Ch. Riv. dsc[2]	117 - Roscoe St.	1,380	10	94.9432	5.13	0.0003	4
N. Branch Ch. Riv. dsc[2]	119 - Western Ave.	103	2	0.0297	0.55	0.0003	4
North Shore Channel	20 - Cleveland St.	51	1	0.0127	0.20	0.0003	4
Des Plaines River[3]	D101 - Prairie Ave.	76	2	0.0180	0.04	0.0002	4
Weller Creek3	D7 - Central Rd.	934	1	0.1736	2.10	0.0002	4
North Shore Channel	29 - Morse St.	250	2	0.0397	1.38	0.0002	4
North Shore Channel	30 - Pratt Ave.	242	1	0.0280	0.75	0.0001	4
Cal-Sag Channel	C82 - Division St. S.	352	2	0.0361	0.20	0.0001	4
CSSC	254 - Lombard	2,580	8	0.2476	6.25	0.0001	4
N. Branch Ch. Riv. dsc[2]	124 - Logan Blvd.	920	2	0.0852	2.00	0.0001	4
Little Calumet River	C29 - Wentworth Ave.	770	1	0.0703	2.50	0.0001	4
N. Branch Ch. Riv. dsc[2]	111 - Berteau	765	1	0.0594	2.20	0.0001	4

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 2 (continued)

SYNERGISTIC EFFECTS OF SIGNIFICANT NONDOMESTIC DISCHARGER (SND) LOCATIONS ON COMBINED SEWER OVERFLOW (CSO) DILUTION RATIOS[1] (CSODRs), SORTED BY CSODR

Waterway	Outlet	Outlet Capacity (cfs)	SND Discharges per Outlet	SND Flow (cfs) per Outlet	Avg. SND Miles to Waterway	Sum of SND CSODRs per Outlet	CSO Tier
Des Plaines River[3]	D100 - Thacker St.	38	1	0.0023	1.00	0.0001	4
North Shore Channel	41 - Bryn Mawr Ave.	69	1	0.0036	1.00	0.0001	4
N. Branch Ch. Riv. dsc[2]	113 - Irving Park Rd.	113	1	0.0051	0.10	0.0001	4
N. Branch Chicago Riv.[3]	57 - Oakton St.	91	1	0.0035	0.80	0.0000	4
CSSC	228 - California	950	3	0.0344	2.50	0.0000	4
CSSC	234 - Lawndale Ave.	141	1	0.0034	4.25	0.0000	4
N. Branch Ch. Riv. dsc[2]	137 - North Ave.	42	1	0.0002	0.50	0.0000	4

[1] The CSODR is determined as the SND average daily flow volume divided by the CSO Outlet capacity.
[2] Downstream of the confluence of the North Branch of the Chicago River with the North Shore Channel
[3] General use water quality standards apply to this waterway at the location of the corresponding CSO outlet

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 3

COMBINED SEWER OVERFLOW (CSO) STUDY LOCATIONS OF OUTLETS
WITH THE LARGEST COLLECTIVE DILUTION RATIOS (CSODRS)[1]

User No.	Local Sewer	Interceptor	Average Miles to Waterway	Regulated Category (40 CFR)	SND Station No.	Flow Volume (gpd)	Flow Volume (cfs)	CSODR Calc.	SND Tier
Stickney WRP, Basin and Outlet No. 159, Outlet Capacity = 50 cfs, to Chicago River [General Use Waterway]									
13787	Streeter Avenue	West Side 1	0.7	SIU	1A	1,810,000	2.8007	0.0560	2
13787	Streeter Avenue	West Side 1	0.7	SIU	2A	10,000	0.0155	0.0003	4
19705	Huron Street	West Side 1	0.6	SND	1Z	275,221	0.4259	0.0085	4
20143	Illinois Street	West Side 1	0.7	SND	2A	110,027	0.1702	0.0034	4
Outlet 159 Summary:			0.7		4	2,205,248	3.4123	0.0682	2
North Side WRP, Basin and Outlet No. 125, Outlet Capacity = 4 cfs, to North Branch Chicago River, dsc[2] [Secondary Contact Waterway]									
17893	Wellington Ave.	North Side 8	2.1	SND	14A	107,171	0.1658	0.0415	4
10814	School Street	North Side 3	1.7	413	1A	25,931	0.0401	0.0100	4
20916	Marshfield Ave.	North Side 3	1.5	SND	1A	27,397	0.0424	0.0106	4
Outlet 125 Summary:			1.8		3	160,499	0.2483	0.0621	2
North Side WRP, Basin and Outlet No. 51, Outlet Capacity = 10 cfs, to North Branch Chicago River [General Use Waterway]									
14225	Luther/Dempster	Howard 1	4.2	SND	17A	200,000	0.3095	0.0309	4
14225	Luther/Dempster	Howard 1	4.2	SND	13A	38,000	0.0588	0.0059	4
14298	Main Street	Howard 1	0.8	439	1A	20,000	0.0309	0.0031	4
11429	Austin Ave	Howard 1	4.2	414	3A	86,142	0.1333	0.0133	4
Outlet 51 Summary:			3.4		4	344,142	0.5325	0.0533	2

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 3 (continued)

COMBINED SEWER OVERFLOW (CSO) STUDY LOCATIONS OF OUTLETS
WITH THE LARGEST COLLECTIVE DILUTION RATIOS (CSODRS)[1]

User No.	Local Sewer	Interceptor	Average Miles to Waterway	Regulated Category (40 CFR)	SND Station No.	Flow Volume (gpd)	Flow Volume (cfs)	CSODR Calc.	SND Tier
North Side WRP, Basin No. 146, Outlet No. 149, Outlet Capacity = 20 cfs, to Des Plaines River [General Use Waterway]									
25846	Melrose Avenue	Salt Creek 1	2.5	433	1A	18,000	0.0279	0.0014	4
25846	Melrose Avenue	Salt Creek 2	2.5	433	2A	25,000	0.0387	0.0019	4
24170	Franklin Avenue	Salt Creek 1	1.2	SIU	3A	408,000	0.6313	0.0316	4
24639	Addison Street	Salt Creek 1	3.1	SIU	1A	90,851	0.1406	0.0070	4
13581	Belmont Avenue	Salt Creek 1	0.5	433	1A	12,100	0.0187	0.0009	4
13581	Belmont Avenue	Salt Creek 1	0.6	433	2A	3,000	0.0046	0.0002	4
24397	Addison Street	Salt Creek 1	4.1	433	1A	1,010	0.0016	0.0001	4
Outlet 149 Summary:			2.1		7	557,961	0.8634	0.0432	3
North Side WRP, Basin No. 146, Outlet No. 146, Outlet Capacity = 20 cfs, to Des Plaines River [General Use Waterway]									
13583	Byron Street	Salt Creek 1	0.5	413	1A	6,000	0.0093	0.0005	4
15939	Soreng East	Salt Creek 1	0.9	433	1A	25,400	0.0393	0.0020	4
13090	Bernice Avenue	Salt Creek 1	0.5	433	1A	20,580	0.0318	0.0016	4
11260	25th Ave	Salt Creek 1	1.3	433	1A	71,000	0.1099	0.0055	4
11576	25th St	Salt Creek 1	2.0	413	1A	74,000	0.1145	0.0057	4
25861	Waveland	Salt Creek 1	1.2	471/433D	1A	9,710	0.0150	0.0008	4
25861	Waveland	Salt Creek 1	1.2	471/433D	2A	50	0.0001	0.0000	4
25090	Soreng East	Salt Creek 1	0.9	SIU	1A	84,145	0.1302	0.0065	4
25090	Soreng East	Salt Creek 1	0.9	SIU	2A	1,000	0.0015	0.0001	4

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 3 (continued)

COMBINED SEWER OVERFLOW (CSO) STUDY LOCATIONS OF OUTLETS
WITH THE LARGEST COLLECTIVE DILUTION RATIOS (CSODRS)[1]

User No.	Local Sewer	Interceptor	Average Miles to Waterway	Regulated Category (40 CFR)	SND Station No.	Flow Volume (gpd)	Flow Volume (cfs)	CSODR Calc.	SND Tier
North Side WRP, Basin No. 146, Outlet No. 146 (continued)									
11920	Willow Ave	Salt Creek 1	0.5	413	2A	142,500	0.2205	0.0110	4
13676	Soreng Ave	Salt Creek 1	0.9	433	2A	12,000	0.0186	0.0009	4
Outlet 146 Summary:			1.0		11	446,385	0.6907	0.0345	3
North Side WRP, Basin No. 146, Outlet No. 148, Outlet Capacity = 8 cfs, to Des Plaines River [General Use Waterway]									
11138	King St	Salt Creek 1	0.2	413/433	2A	140,900	0.2180	0.0273	4
10134	King St	Salt Creek 1	0.8	420	1A	2,000	0.0031	0.0004	4
10134	King St	Salt Creek 1	0.8	420	2A	1,713	0.0027	0.0003	4
10134	King St	Salt Creek 1	0.8	420	4A	4,794	0.0074	0.0009	4
10134	King St	Salt Creek 1	0.8	420	5A	2,327	0.0036	0.0005	4
Outlet 148 Summary:			0.6		5	151,734	0.2348	0.0293	3

[1] The CSODR is determined as the SND average daily flow volume divided by the CSO Outlet capacity.
[2] Downstream of the confluence of the North Branch of the Chicago River with the North Shore Channel