

ILLINOIS POLLUTION CONTROL BOARD  
February 5, 1987

IN THE MATTER OF: )  
)  
JOINT PETITION OF THE NORTH ) PCB 85-208  
SHORE SANITARY DISTRICT and )  
THE ILLINOIS ENVIRONMENTAL )  
PROTECTION AGENCY FOR EXCEPTION )  
TO THE COMBINED SEWER OVERFLOW )  
REGULATIONS )

OPINION AND ORDER OF THE BOARD (by B. Forcade):

This matter comes before the Board on a December 20, 1985, Joint Petition of the North Shore Sanitary District ("NSSD") and the Illinois Environmental Protection Agency ("Agency") for an exception to the Board's combined sewer overflow (CSO) regulations. Specifically, the petitions seek an exception to 35 Ill. Adm. Code 306.305(a) for the discharges from the excess flow facilities located at the Waukegan Sewage Treatment Plant (STP) and the Clavey Road STP and an exception from 35 Ill. Adm. Code 306.305(a) and (b) for the discharge from the excess flow facilities located at the North Chicago STP. All exceptions contemplated by the Petition are based on the minimal impact criteria found at 35 Ill. Adm. Code 306.361(a). Hearing was held on June 17, 1986, in Waukegan, Illinois. One member of the public was in attendance. Supplemental information, requested at hearing, was filed with the Board on July 18, 1986.

I. Background

The NSSD was formed in 1914 under the Sanitary District Act of 1911 (Section 276.99, et seq., chapter 42, Ill. Rev. Stat.). The District encompasses the area in Lake County, Illinois, lying east of the tollway extending from the Lake-Cook County Line Road north to the Wisconsin border, except for the Village of Deerfield, part of the Village of Bannockburn and the Wadsworth area. The eastern border is the Lake Michigan shoreline. The NSSD services approximately 210,000 people (R. 9-10, 12; Joint Petition, par. 1).

The few combined sewers within NSSD's service area are located in older portions of downtown Waukegan and an area in downtown Highwood (R. 16). The combined sewers comprise less than one percent of the total system (R. 46). Additionally, the NSSD has implemented an ordinance program requiring cities and villages to evaluate infiltration and inflow (I & I) to the sanitary sewers. Currently no additional I & I work is planned or deemed necessary (R. 15).

The NSSD operates four sewage treatment facilities of concern to this proceeding. The sewage treatment system has three CSO outfalls, two of which discharge to Lake Michigan and one that discharges to the East Fork of the North Branch of the Chicago River or Skokie River. Each CSO is associated with one of three treatment plants. These will each be discussed separately below.

A. Waukegan STP

The Waukegan STP service area is served primarily by separate sanitary sewers. The treatment plant is not capable of providing full treatment to all flows during wet weather periods. The Waukegan STP excess flow treatment facilities consist of two 1,375,000 gallon presedimentation basins with three retention reservoirs. Total storage capacity of all facilities is 40.75 million gallons. The Waukegan STP is designed to handle 19.8 million gallons per day (MGD) average flow with a maximum storm event capacity of 30 MGD. The total storm capacity of the plant and retention system is 70 MGD. All flows up to 30 MGD receive complete treatment and are discharged to the Des Plaines River. Flows above 30 MGD are pumped to the excess flow presedimentation basins. Flows above 70 MGD are discharged through a CSO to Lake Michigan. The overflow experiences some solids removal and is chlorinated before discharge.

The CSO discharge meets 30 mg/l for both biochemical oxygen demand (BOD<sub>5</sub>) and total suspended solids (TSS). However, the discharge is not permitted. Mean fecal coliform counts for 1982 were of 19,767/100 ml with a low of 1.0/100 ml and a high of 250,000/100 ml (Ex. 2). Between the years of 1978-1985, CSO events averaged 30 per year with a total yearly average volume of 350 MG. The number of discharges from the excess flow facilities is dependent on ambient weather conditions, rather than population growth or increase of base flow to the facilities. The first flush as defined in Agency regulations and contemplated by 35 Ill. Adm. Code 306.305(a) cannot be determined for the NSSD service area generally nor the Waukegan STP service area in particular. This is due to long and narrow dimensions of the drainage basin which results in a series of first flushes, none being the definitive first flush (R. 34-38). Even if a first flush could be determined, it is the opinion of NSSD that the cost of increasing retention capacity to accommodate the first flush would be equal to or exceed the original dollars spent on the existing presedimentation system (R. 34). No exception from Section 306.305(b) is sought for the

Waukegan CSO as all flows, even those above ten times dry weather flow, receive primary treatment and disinfection (R. 40).

The Waukegan STP is located adjacent to the Lake Michigan shoreline and is set back approximately 250 to 300 feet. The Waukegan CSO discharges into a pool which also receives storm water runoff from the surrounding area. The pool outlet cuts a channel across the beach and discharges into Lake Michigan (R. 81-82).

The land use in the vicinity consists of industrial development, the wastewater treatment plant and public beach along the shoreline. The beach is sandy for over 2,000 feet in both directions from the outfall. Approximately 150 feet west of the shoreline is an assortment of vegetation consisting of grasses, shrubs and trees (Ex. 3, 4-2). The channel cuts through the sand beach. The public beach is located south of the outfall, but the record indicates that the public uses the beach area north of the outfall as well. No fences inhibit access to the CSO pool and channel, and public use of the area is encouraged by the Waukegan Park District (R. 84-87, 114-116).

The NSSD's consultant conducted a field survey relating to the Waukegan CSO outfall on November 15, 1984. The most proximate CSO event was 5 months earlier on June 22-24, 1984. The consultant visually examined water quality at four locations in Lake Michigan near the CSO outfall and took sediment samples at three of those locations. Surface water sampling for phosphorous was also performed. Visual observation indicated that water quality was "very good," but that the lake bottom was churned from several days of strong easterly winds (R. 62). No oil films, sewage related debris or odors were detected. Visual inspection of sediment samples indicated essentially "clean" sand, with no sludge accumulation or odors (R. 67). The consultant also performed a physical survey of the beach and pool created by the outfall. Sediment samples from the pool showed a mixture of organic material and some sand with a musty odor (R. 67). A survey of the beach area found little debris, primarily composed of driftwood and litter. Two plastic sanitary items, which could be associated with either a CSO discharge or public beach use, were found a substantial distance from the outfall (R. 63). The consultant's report analyzed the impact of fecal coliform counts during the bathing season in terms of the trend in beach closings since the diversion of NSSD's effluent from Lake Michigan to the Des Plaines River. Beach closings, based on a 500/100 ml criterion, have decreased substantially and are relatively rare.

The consultant concluded that there was an overall negligible physical impact on the environment within the vicinity of the Waukegan CSO (Ex. 3, 1-1).

B. Clavey Road STP

The Clavey Road STP service area consists primarily of separate sanitary sewers, with the exception of a portion of downtown Highwood. The Clavey Road STP excess flow treatment facilities consist of two 3.4 million gallon presedimentation basins with four excess flow retention reservoirs, for a total capacity of 20.4 million gallons. All facilities are housed in a totally enclosed building. The Clavey Road STP has a capacity of 17.8 MGD average daily flow with an approximate 28 MGD maximum storm event capacity. Normal effluent from the plant is discharged to the Skokie River. Flows in excess of 28 MGD are pumped to the presedimentation basins where some solids removal occurs. If a storm continues, the presedimentation basins overflow. The overflow is chlorinated and discharged to the Skokie River.

The Clavey Road CSO is NPDES permitted at 30 mg/l for BOD<sub>5</sub> and TSS. Mean fecal coliform counts for 1982 were 70,264/100 ml, with a high of 330,000/100 ml and a low of 10.0/100 ml. Between the years of 1978-85, CSO events averaged 23 per year, with a total yearly average volume of 220 MG. The number of discharges from the excess flow facilities is dependent on ambient weather conditions. As with the Waukegan CSO, the first flush cannot be determined for this particular drainage basin but primary treatment and chlorination of at least ten times dry weather flow is provided. Consequently, no exception from Section 306.305(b) is sought.

The Clavey Road Plant is located south of Clavey Road and is adjacent to the Skokie River. The surrounding area consists of the wastewater plant on both sides of the Skokie River, a golf course further downstream along the east side of the river, and a botanical garden south of Lake-Cook Road. The land use is municipal and recreational. Some fishing takes place in the river (Ex. 5, 4-2).

The NSSD's consultant conducted a field survey relating to the Clavey Road CSO outfall on November 16, 1984. The most recent CSO event was on November 1 and 2, 1984 (Ex. 5, p. 4-1). Visual observations and sediment samples were taken at a point upstream of the CSO outfall, at the confluence of the CSO outfall and the Skokie River, and 450 feet downstream of the CSO

outfall. The water was clear and free of debris, except for floating leaves. No oil films, unnatural sludges or odors were detected. Sediment samples were a mixture of organic matter and sand. The consultant believed that the organic matter is probably a combination of decayed vegetation and storm water runoff solids. The exact origin of this organic material cannot be determined. Some minor CSO related sediment may have been within the segment of the ditch immediately downstream of the outfall but is difficult to determine and negligible (Ex. 5, p. 5-1). The consultant concluded the physical impact of the CSO discharge to the environment in the vicinity of the outfall was negligible (Ex. 5, p. 1-1).

C. North Chicago Plant

The North Chicago STP is used as a "roughing" or pretreatment facility from which dry weather and a portion of wet weather flows are pumped to the NSSD's Gurnee STP for full treatment and discharge to the Des Plaines River. The North Chicago facility is much smaller than the Waukegan or Clavey Road STP and consists of a 3.5 MGD trickling filter plant with a 1.8 MG capacity excess flow basin. There are no presedimentation basins at this facility. Peak rate pumping capacity is 25 MGD to the Gurnee STP. Overflows from the 1.8 MG excess flow basin are chlorinated, however, not enough sedimentation occurs for this to constitute primary treatment (R. 41). The cause of the overflows is lack of treatment and storage capacity at the Gurnee STP, rather than lack of storage, treatment or pumping capacity at the North Chicago STP. The Gurnee STP discharges to the Des Plaines River.

Overflows discharge to Lake Michigan via an underwater pipe which rests on pylons on the lake bed. The overflow discharge is NPDES permitted at 30 mg/l for BOD<sub>5</sub> and TSS but actually averages 110 mg/l for BOD<sub>5</sub> and 90 mg/l for TSS. Between 1978-85, CSO events averaged 27 per year, with a total yearly average of 110 MG. Mean fecal coliform counts for 1982 were 116,831/100 ml with a high of 850,000/100 ml and a low of 20.00/100 ml. As with the Waukegan and Clavey Road STP service area, the first flush, as defined in Agency regulations, cannot be determined. Unlike the other two facilities, treatment of ten times dry weather flow is not presently provided and, consequently, an exception from both Section 306.305(a) and (b) are requested.

The NSSD's consultant conducted a physical survey of Lake Michigan and the shoreline in the vicinity of the CSO outfall on November 15-16, 1984. The most

recent CSO events to this survey were on August 7, 1984, and September 13, 1984, when 1.5 MGD and 2.2 MGD, respectively, were discharged to Lake Michigan. The outfall is approximately 70 feet offshore, in five to six feet of water (R. 98). Sediment samples were taken immediately east of the outfall and sites north and south of the outfall. The three sediment samples were physically and visually identical, consisting primarily of sand.

The land use in the vicinity of the outfall consists of industrial development to the north and west, the wastewater treatment plant, an FBI shooting range, immediately to the south and Foss Park further south. The shoreline is protected by rip rap. The shoreline inspection extended approximately 1,000 feet north and south from the outfall. Materials found in the area consisted of driftwood. No CSO related debris was found. Some graffiti was found on the riprap.

The NSSD presently has plans and specifications prepared to provide for a 50 MG excess flow facility at the Gurnee STP. Phase I of the NSSD's plan will increase the daily average flow (DAF) at the Gurnee STP from 13.8 to 17.25 MGD. Peak flow capability will remain at 1.5 times DAF. Phase II of construction will provide a DAF of 19.6 MGD and a peak capacity of 39.2 MGD. Phase III of construction will provide the 50 MG excess flow facility and will be completed and operational by January 1, 1991. Phase I construction began in 1985 and Phase II will commence upon completion of Phase I. Phase I and II improvements will reduce the number of overflows to Lake Michigan at North Chicago by allowing a higher rate of pumping during storm events. All modifications combined will eventually decrease CSO events to an estimated 7 events per year with a total average of 20 MG per year and achieve 30 mg/l for BOD<sub>5</sub> and TSS by the year 2000.

## II. Discussion

The record indicates that the NSSD provides a high degree of treatment for at least two of its three CSO discharges. This high level of treatment obviates the need for exception to 306.305(b) for CSO's at Waukegan and Clavey Road. The NSSD plans to add additional treatment and retention capacity at Gurnee which will result in decreased CSO events from North Chicago. The evidence in the record also supports the Petitioner's contention that the CSO's are causing minimal environmental impact. However, the Board is concerned that the physical surveys conducted by the NSSD's consultant were, in most instances, remote in time from the

most recent CSO events. This fact is in part a consequence of the time schedule established by the CSO regulations (R. 89-92). There was also some citizen testimony regarding visible floating CSO debris in Lake Michigan that could be associated with the Waukegan CSO (R. 113). While the November, 1984, surveys may not be as representative as one would like, they do constitute the record before the Board. Additionally, proposed conditions to the exception would require regular inspection of the discharge area for sludge accumulation for a period of five years. The results are to be reported to the Agency. Such inspections would provide a feedback mechanism to the Agency regarding impact. Further remedial measures could be required based on these new facts.

While the Board finds that generally the CSO's have a minimal environmental impact, the Board is concerned about potential human health hazards associated with fecal coliform counts at the Waukegan CSO outfall. This particular outfall forms a pool and channel which cuts through a public sand beach. The record indicates that there are no fences, signs or other measure to limit public access to waters that can experience extremely high fecal coliform levels. The record does show that many people use both the north and south beaches, as bisected by the CSO channel, and that the City of Waukegan has promoted the near beach area which contains the CSO pool as a recreation area. This raises the clear possibility of children actually playing and wading in a CSO effluent discharge with fecal coliform levels of up to 250,000/100 ml. This is clearly a health hazard that cannot be characterized as "minimal." Additionally, there are a number of public beaches in the general vicinity that are potentially impacted by the CSO discharges. While the Petitioner correctly maintains that area beach closings have greatly decreased since the NSSD diverted its effluent from Lake Michigan to the Des Plains River in late 1970's, the Board's fecal coliform standard of 20/100 ml is routinely violated at Waukegan's North and Central beaches (Agency Motion to Supplement Record, Illinois Water Quality Report 1984-85, Figures K1 and K2).

As a final note, the Board does not make any findings of fact regarding the phosphorous or its impact on Lake Michigan or the Skokie River. These issues will more appropriately be addressed in NSSD's site-specific regulatory proposal, docketed as R86-3.

The Board believes that adding additional presedimentation and retention capacity at Waukegan and Clavey Road are not cost effective at this time. Efforts are better focused on the North Chicago CSO, which does merit improvement. The Board believes that the generally high

level of treatment of the CSO discharges is appropriate as at least two of the CSO's discharge to Lake Michigan. However, the Board does feel that some additional steps regarding the manner of discharge of the Waukegan CSO are warranted; in order to protect public health. The Board will grant the NSSD exception to the CSO treatment regulations.

### III. Conditions

The Agency and the NSSD have proposed conditions to attach to the Board's exception Order. These conditions would allow overflow discharges only where maximum practical flow is receiving full treatment and the excess flow basins are full to capacity. The conditions would also require Clavey Road to meet its NPDES permit limits, but would provide an exception from 306.305(b) and the NPDES permit limits for the North Chicago Plant until January 1, 1991. No limitations are suggested for the Waukegan CSO as that outfall is not NPDES permitted. However, the record indicates that that outfall meets 30 mg/l for BOD<sub>5</sub> and TSS. The Board will require as a condition for exception that the Waukegan CSO meet 30 mg/l for BOD<sub>5</sub> and TSS. This will ensure that this high level of treatment be maintained.

The Board will also require, as a condition for exception, that public access to the Waukegan CSO pool and channel be physically limited, either through the use of fences or a pipe to discretely convey the discharge through the dunes and across the beach. The Board believes that this condition is necessary to ensure that the impact of the discharge is indeed minimal.

Further proposed conditions require the construction of the additional excess flow facility at Gurnee. Completion of this facility will ultimately obviate the need for relief from 306.305(b) and the NPDES permit limitations of 30 mg/l for BOD<sub>5</sub> and TSS will, once again, be imposed.

This Opinion constitutes the Board's findings of fact and conclusions of law in this matter.

### ORDER

The North Shore Sanitary District (NSSD) is hereby granted an exception from 35 Ill. Adm. Code 306.305(a) for discharges from the excess flow facilities at its Waukegan Sewage Treatment Plant, with discharge to Lake Michigan, and for discharges from the excess flow facilities at its Clavey Road Sewage Treatment Plant, with discharge to the East Branch of the North Branch of the Chicago River (Skokie River), subject to the following conditions:

- a) In accordance with permit conditions, discharge shall not occur until the maximum practical flow is receiving



full treatment and the excess flow basins are full to capacity. All basins shall drain back through the treatment facilities after overflow events terminate.

- b) In accordance with its permit, the Clavey Road Plant excess flow discharges shall comply with limits of 30 mg/l for BOD and TSS, as determined by the specified averaging provisions.
- c) The Waukegan Plant excess flow discharges shall comply with limits of 30 mg/l for BOD and TSS as determined by the specified averaging provisions.
- d) Public access to the Waukegan Plant excess flows shall be physically prevented, such as by fences or a pipe that conveys the excess flow directly to Lake Michigan.
- e) The NSSD shall inspect the discharge areas regularly for accumulations of sludge or other evidence of sewage and report the findings annually to the Agency, for a period of five years.

The NSSD is hereby granted an exception from 35 Ill. Adm. Code 306.305(a) and (b) for discharges from the excess flow facilities at its North Chicago Sewage Treatment Plant, with discharge to Lake Michigan, subject to the following conditions:

- a) In accordance with interim operating procedures specified in NSSD's letter to the Agency, dated December 2, 1985, discharge from the excess flow facilities shall not occur prior to conveyance of the maximum practical flow to the Gurnee Plant and until the excess flow basin at North Chicago is full to capacity.
- b) Relief from 306.305(b) shall terminate upon completion of the proposed 50 million gallon excess flow facility at NSSD's Gurnee Sewage Treatment Plant. This facility shall be completed and operational by January 1, 1991. Upon completion, discharge to Lake Michigan shall not occur until flows exceed the capacity of the pump station conveying flows to the Gurnee Facility and the excess flow basin at the North Chicago Plant is full to capacity. Discharges from the Gurnee and North Chicago excess flow facilities shall then be required to comply with limits of 30 mg/l for BOD and TSS, as determined by specified averaging provisions in the discharge permit.
- c) NSSD shall inspect the discharge area regularly for accumulations of sludge or other evidence of sewage and report the findings annually to the Agency, for a period of five years.

With forty-five days of the date of this Order, NSSD shall execute a Certification of Acceptance and Agreement to be bound to all terms and conditions of this exception. Said Certification shall be submitted to the Agency at 2200 Churchill Road, Springfield, Illinois, 62706. The form of said Certification shall be as follows:

CERTIFICATION

I, (We) \_\_\_\_\_, hereby accept and agree to be bound by all terms and conditions of the Order of the Pollution Control Board in PCB 86-197, February 5, 1987.

\_\_\_\_\_  
Petitioner

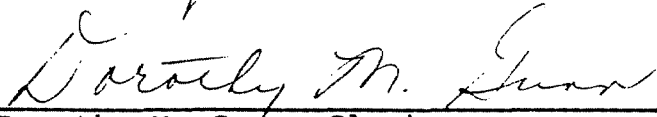
\_\_\_\_\_  
Authorized Agent

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

IT IS SO ORDERED.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Opinion and Order was adopted on the 5<sup>th</sup> day of February, 1987, by a vote of 6-0.

  
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Dorothy M. Gunn, Clerk  
Illinois Pollution Control Board