

ILLINOIS POLLUTION CONTROL BOARD
November 29, 1988

IN THE MATTER OF:)
)
PETITION OF THE VILLAGE OF) PCB 85-213
WESTERN SPRINGS FOR EXCEPTION)
TO THE COMBINED SEWER OVERFLOW)
REGULATIONS)

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

This matter is before the Board on the December 26, 1985 Section 306.364, 35 Ill. Adm. Code 306.363 (1983), single petition* of the Village of Western Springs ("Village"). The petition requests relief from Section 306.305(a) and (b), which would otherwise require treatment or retention of a portion of the Village's combined sewer overflows ("CSOs") now entering Flagg Creek. The Board issued a "more information order" on January 9, 1986, noting a deficiency in the petition. The Village filed its amended petition on March 11, 1986. The Illinois Environmental Protection Agency ("Agency") filed its appearance on September 22, 1986.

The public hearing occurred June 10, 1988,** and one member of the public attended. The Village filed its Brief on August 30, 1988. The Agency filed a response brief on September 16, 1988. The Village filed its reply brief instanter on September 26, 1988. An affidavit accompanied the Village reply brief, which the Village refiled in a duly executed form on October 3.

I. Background

The Village is a suburb of Chicago, has a population of about 12,900 persons, and lies on a total of about 1550 acres. The Village has been fully developed for about 20 years, so its population has remained fairly stable since that time. The Village operates its own sewer system, which spans portions of

* The Village of Western Springs typed the December 26 petition as a Section 306.363 joint petition. The Agency did not join in the petition, R. 5 & 13, and now challenges the relief sought. Further, the record does not indicate that the Agency proposed an exception to the Village. See Section 306.360. For these reasons, the Board deems the Village's petition a single petition.

** The Board delayed hearings in this matter due to a shortage of available funds. See Order of February 6, 1986.

two drainage basins: the Salt Creek basin, about 550 acres, and the Flagg Creek basin, about 1000 acres. The Salt Creek basin combined sewers discharge to the Tunnel and Reservoir Plan ("TARP") of the Metropolitan Sanitary District of Greater Chicago ("MSD"). R. 10; Ex. 6, pp. 1-1 to 1-2. The CSO discharges from a portion of the Flagg Creek basin are the focus of this proceeding. About 1,800 persons in 600 houses reside in this portion of the Village. Ex. 5, Att. L; Ex. 6, p. 3-6.

The Village comprises several sewer drainage areas. See Ex. 9. Portions of Areas 5 and 6 are involved in this proceeding. Both are north of 47th Street in the Flagg Creek basin. Both are excluded from the TARP system. Area 5 drains a total of 89 acres, of which 24 acres have separate storm and sanitary sewers along 47th Street and Wolf Road. The separated storm water discharges to Flagg Creek. 65 acres of Area 5 have combined sewers. R. 11, 16-17, 22, 43 & 51-52; Ex. 6, pp. 3-1 to 3-2.

Area 6 drained 95 acres of combined sewers, and had 39 acres of separate storm sewers in Spring Rock Park and along the Burlington & Northern railroad tracks at the time the Village studied its CSOs and subsequently filed its petition for a CSO exception. At that time, the total CSO drainage area in Areas 5 and 6 was 160 acres. In mid-1986, the Village began separating sewers in Area 6, and completed this project by installing about 4,500 lineal feet of storm sewers at a cost of about \$900,000 for the separation of the sewers in 58 acres of this Area. This resulted in a 36 percent reduction in the combined sewer area subject to this proceeding, to about 102 acres. Area 6 now has 37 acres of combined sewers. R. 11, 22, 31-32, 51, 53 & 60; Ex. 2, pp. 3 & 7; Ex. 4; Ex. 5, pp. 11-13.

Area 5 combined sewers drain into the Fair Elms manhole at the intersection of 47th Street and Fair Elms Avenue. Area 6 combined sewers discharge into the 47th Street manhole, which is adjacent to the Fair Elms manhole at that intersection. Both manholes interconnect and collectively discharge into the Fair Elms sewer. That sewer runs due south to the intersection of 55th Street and Fair Elms Avenue, where it discharges to a MSD interceptor that runs west beneath 55th Street. R. 11, 43 & 52; Ex. 2, pp. 7 & 12; Ex. 5, Att. L. The estimated dry weather flows from Areas 5 and 6 are 0.17 and 0.15 cubic feet per second ("cfs"), respectively. The measured flows are 0.12 and 0.44 cfs, respectively. R. 54; Ex. 2, p. 7; Ex. 6, p. 3-7. The MSD interceptor at 55th Street has a maximum carrying capacity of 6.8 cfs, but the MSD installed an additional interceptor in 1987, which increases this to about 17 cfs. R. 18-19 & 62; Ex. 4; Ex. 5, p. 13. The Village has an additional restriction in the Fair Elms sewer that limits the combined discharges from Areas 5 and 6 to 6.4 cfs when the system surcharges. R. 54 & 81-82; Ex. 2, p. 42. The aggregated 1720 home drainage areas of the Village south of 47th Street, and therefore south of Areas 5 and 6, are on a

separated sewer system. R. 11 & 52; Ex. 2, p. 7; Ex. 5, Att. L. Areas 5 and 6 are apparently the only local combined sewage areas not included in TARP. R. 52.

During periods of heavy rain that result in CSO events, the flows from Areas 5 and 6 increase until the Fair Elms sewer becomes surcharged. At that point, the maximum rate of discharge from the Fair Elms manhole at 47th Street is limited to 6.4 cfs. The Fair Elms manhole, which drains Area 5, has a diversion outlet 3.32 feet above the outlet into the Fair Elms sewer. The 47th Street manhole, which drains Area 6, has a diversion outlet 1.33 feet above the normal outlet to the Fair Elms manhole. The 47th Street manhole diversion outlet is 0.19 foot higher than that of the Fair Elms manhole. Ex. 2, p. 12; but see Ex. 5, Att. L (giving slightly different elevations). Additional flows cause the sewage levels in the 47th Street and Fair Elms manholes to rise until they reach the diversion structure in these manholes. Diverted sewage goes to a common CSO discharge structure at 49th Street and Flagg Creek. R. 11 & 52; Ex. 2, pp. 3 & 7. The Village would consider increasing the height of these diversion structures, in order to increase the volume of retention in its sewers, as part of the relief in this proceeding--so long as this retention and the concomitant sewage backup does not cause basement or street flooding. R. 19; Ex. 4.

James E. Huff investigated the Village's CSOs to determine the volume of first flush of the Areas 5 and 6 sewers.* During the period Mr. Huff studied the Village's CSO, four rain events occurred. The sewers captured all the first flush from three CSOs, and 94.5 percent of the fourth. Ex. 2, pp. 17, 19, 23, 27, 31 & 36. At the time of his study, Mr. Huff determined the mean first flush was 260,000 gallons based on the then existing 160 acres of combined sewers in Areas 5 and 6. The observed first flush volumes ranged from 160,000 to 290,000 gallons. The average first flush contained 454 pounds of biochemical oxygen demands ("BOD₅"), for an average concentration of 209 milligrams per liter ("mg/l"); 1,509 pounds of total suspended solids ("TSS"), for an average of concentration of 733 mg/l; and 847 pounds of volatile suspended solids, for an average concentration of 391 mg/l. Mr. Huff estimated that the Village captured 95 percent of the first flush volume per annum, or 96.4 percent of the BOD₅ and 96.3 percent of the TSS. R. 54-55; Ex. 2, pp. 37 & 45.

* First flush is the volume of water and associated flow rate necessary to carry away the excess biochemical oxygen demand and solids accumulated in the sewers during dry weather periods until their concentrations diminish to those of dry weather flows. 35 Ill. Adm. Code 375.102 (1985); see R. 54; Ex. 2, p. 3.

Mr. Huff now estimates that the intervening sewer separations reduced the combined sewered area by about 36 percent, increased the volume captured to 97 percent, reduced the amount of BOD₅ lost by 51 percent, and reduced TSS loss by 61 percent. R. 59-60; Ex. 4. This would mean that the average rate of BOD₅ capture increased to 98.2 percent, and the average rate of TSS capture increased to 97.7 percent. He further estimates that the Village now captures 100 percent of the first flush for an estimated 43 of the 47 CSO events that would occur in a year. R. 61.

Mr. Huff studied Flagg Creek and concluded that the Village's CSO at 49th Street has no noticeable effect on the creek. The Agency concurs in his assessment. R. 110 & 118. Mr. Huff determined that this CSO did not apparently affect water quality as determined by macroinvertebrate diversity. He attributed the trend towards increasing diversity downstream to increasing stream flow. R. 55-56; Ex. 2, p. 42. Upstream and downstream sediment samples showed no sewage sediments and contained low levels of volatile solids. R. 56-57; Ex. 2, p. 42. Testing for metals and oil and grease* in the sediments showed no upstream or downstream trend. R. 57-58; Ex. 2, p. 42. Following one rain event during the study period, for which there was full capture, Mr. Huff observed wastewater-associated debris on the banks for about 100 yards, a "sheen" on the water in more stagnant areas, and a septic odor immediately downstream of the Village's CSO discharge. He observed a more pronounced septic odor and a greater quantity of sewage-related debris for 150 feet downstream from the MSD CSO. These are the only observed potential CSO effects, and the Village received no complaints about this or any other effects. R. 61; Ex. 2, p. 60. The Agency observed even less impact when it conducted a more limited inspection of the stream. R. 116-17.

Mr. Huff estimated that during the storm event which resulted in the greatest volume of first flush during the study period,** the Village CSO discharged 600,000 gallons into Flagg Creek. Based on the measured average flow of 108 million gallons per day ("MGD") at a downstream U.S. Geological Survey station, he estimated that the average flow at 49th Street was about 30 MGD at the time of this discharge. This translates to a 50:1 dilution ratio in the stream for this CSO. R. 59.

* A single high oil and grease sample came from where runoff enters the stream from a tollway oasis parking lot. R. 58.

** This storm of October 18, 1985 dropped 2.32 inches of rain and had a maximum intensity of 1.26 inches in one hour. Ex. 2, pp. 17 & 22-24; see R. 59.

Flagg Creek is heavily channelized, with a 10-foot wooded bank separating it from the residential land on the east and with the tollway on the west. The primary stream use is for urban drainage, and Mr. Huff observed no indication of recreational use. R. 58-59; Ex. 2, pp. 6, 53 & 55. The stream has its origin in Hinsdale, has a total length of 7.5 miles, and drains into the Des Plaines River. Its depth ranged from four to 30 inches within the three mile length studied by Huff, and its width ranged from nine to 49 feet. Ex. 2, pp. 53-56. Its origin is slightly over half a mile from the Village CSO. It receives several stormwater discharges; effluent, including treatment plant bypasses, from the Hinsdale Sanitary District (over two miles downstream); and CSO effluent from the MSD (about one-half mile downstream).

Mr. Huff felt these facts, combined with its intermittent nature, limited potential uses for Flagg Creek. R. 58; Ex. 2, p. 55. He believes that the total elimination of the Village's CSOs, by total sewer separation in Areas 5 and 6, would not result in a measurable improvement in stream water quality or a change in the potential stream uses. R. 64. The Agency agrees that the Village's CSO presently has no identifiable impact on Flagg Creek. R. 117.

The record indicates control alternatives available to the Village, the costs associated with some of these, and problems associated with others. The costs of completing the separation of Areas 5 and 6 sewers to eliminate the CSO is estimated as \$2,550,000. The cost of the partial separation already accomplished in Area 6 was \$900,000. R. 32-33; Ex. 4. The cost of improving the transport capacity to TARP is estimated at \$2,600,000, but the MSD drop shaft in that area lacks the capacity to accept the additional flows from Areas 5 and 6. R. 16-17, 22 & 26. In Mr. Huff's opinion, the least-cost alternative for elimination of the CSO is the construction of a 90,000 gallon retention reservoir, with some provision for later pumping the sewage back into the sewers. This would increase the volume of first flush captured. The costs associated with this alternative are \$300,000, exclusive of the cost of land acquisition, and have a \$3,500 annual operating cost. R. 62-63, 65-66 & 85-86; Ex. 2, p. 42. The Village currently owns no land on which to locate a retention facility, R. 22, but a potential area exists in a local park. R. 66. This location, however, might present odor problems if used for such a facility. R. 67.

Other alternatives arose in testimony given at the public hearing, without any estimates of their associated costs. The first alternative involves increasing the transport capacity in the Fair Elms sewer to 55th Street and the MSD system. Mr. Huff testified this would likely eliminate Village CSOs, but would also likely increase those occurring from the MSD CSO at 55th Street. R. 81-82 & 105-106. The other alternative is one which

would only reduce the CSO volumes discharged, but it would not eliminate them. This is the alternative the Village has offered to perform as part of the relief sought: the Village could raise the inverts of the 47th Street and Fair Elms Avenue diversion structures. This would increase the degree of sewer surcharging necessary to trigger a CSO, thus increasing the amount of retention by the system. This alternative could result in some street and basement backups if the invert is raised too high. However, the extent of its practicability and effectiveness are not indicated in the record. R. 19; Ex. 4.

Although the MSD CSOs at 55th Street have no direct relevance to the Village, the subject of those CSOs has arisen throughout this proceeding. It is therefore useful to outline a few facts pertinent to them before discussing the merits of the respective Village and Agency arguments.

The MSD CSO diversion structure is located near where the Village's Fair Elms sewer discharges to the MSD. Ex. 5, Att. L. The MSD diversion structure has four staged pumps. The first two turn on when the MSD interceptor first begins to surcharge, and these divert overflows to the TARP system. The second two turn on at higher levels of sewer surcharging, and they divert CSO effluent to Flagg Creek. Ex. 5, Att. K-M. Historically, the second two pumps operated about 20 hours each year. Since the 1987 construction of the additional MSD interceptor, an approximately 60 percent reduction in MSD CSOs has occurred. The pumps now operate about 8.3 hours each year. R. 62 & 69-70. Although the Village contributes combined sewage to the MSD CSOs, it is not the sole contributor. The LaGrange Highland Sanitary District also contributes wastewater, as possibly do other areas. R. 81, 84 & 113; Ex. 5, Att. L.

II. Discussion

The Agency challenges the requested CSO relief. In its post-hearing brief, the Agency challenges relief from Section 306.305(b) as unwarranted because the Village's sewers capture ten times their design and ten times their dry weather flows, see 35 Ill. Adm. Code 306.305(b), so the only issue involved is the Section 306.305(a) first flush capture. Agency Response at 1. The Agency then challenges any relief whatsoever because the effect of the Village's flow on the MSD CSOs is uncertain based on this record. Agency Response at 2. The Agency more fully expressed its concerns at hearing.

In its review of the Village's CSO for this proceeding, the Agency became aware of the relationship between the Village CSOs, the Village sewer system, the discharges to the MSD, and the MSD CSOs. The Agency corresponded with the MSD on this point, and submitted copies of some such correspondence into the record. See Ex. 10. The MSD apparently intended to reduce tributary

flows into its interceptor and eventually eliminate its CSO diversions. R. 95. The following exchange occurred on the record at hearing:

[Agency witness]: The concern [th]at the Agency has in regard to this proceeding is that it did not appear that [a] grant of an exception, to the extent that the Village had requested it, would allow MSD to accomplish that task and, therefore, we would have no compliance plan anymore for MSD[']s [CSO] outfall 141.

[Agency attorney]: When you say the MSD compliance plan was reducing the excess flows, in the case of Western Springs who would actually do the work of reducing the flows?

[Agency witness]: Western Springs.

R. 95-96

The Agency's witness later testified in response to questions by the Village that the Village's CSOs are dependent on transport to the MSD: "[O]bviously one could increase the transport capacity past the current overflow and, therefore, either decrease or eliminate the Village's overflow." R. 106.

As to the Agency's expressed concern that granting the Village relief will affect MSD's compliance plans for its 55th Street CSO discharges, the Board will not deny relief on this basis. The MSD did not participate in this proceeding and its CSO discharges are not involved. The only issues relevant here are the impact of the Village's CSOs and the costs and practicability of controlling them. It is on these issues that the Board must focus.

The record suggests that the Village's options for compliance with Section 306.305 are the total elimination of its CSOs, by construction of separate storm sewers at a cost of over \$2.5 million, or the full capture of the first flush, by construction of a retention facility at a cost of over \$300,000. The record does not suggest that the third alternative of raising the diversion inverts in the 47th Street and Fair Elms manholes would result in full compliance, although this would probably increase the rate of first flush capture. The initial issue with regard to Village compliance is the full capture of its first flushes, see R. 118; Agency Response at 1, and the construction of retention facilities is the least-cost alternative for compliance, so it is the \$300,000 cost upon which the Board will focus.

The record nowhere indicates that full capture of first flush would result in an improvement in stream water quality and potential uses. Rather, it suggests that the Village's CSOs currently have no cognizable impact on the stream. Thus, the record indicates that requiring the Village to spend \$300,000 to fully comply with Section 306.305 would confer little or no environmental benefit. Therefore, the imposition of this expense is presently not justified based on this record. The Board will therefore grant the requested relief as it applies to the volume of first flush capture, under Section 306.305(a).

The next issue relates to the requested relief from Section 306.305(b), upon which the Agency seems to more specifically focus in its response brief. Section 306.305 provides in significant part as follows:

All combined sewer overflows ... shall be given sufficient treatment to prevent pollution, or the violation of applicable water quality standards unless an exception has been granted by the Board

Sufficient treatment shall consist of the following:

...

(b) Additional flows, as determined by the Agency but not less than ten times the average dry weather flow for the design year, shall receive a minimum of primary treatment and disinfection with adequate retention time

35 Ill. Adm. Code 306.305 (1987).

Subsection b, therefore, would require the Village to retain, in addition to dry weather flows, a minimum of ten times the average dry weather flow, which is about .56 cfs,* or such additional flows as the Agency has determined are necessary "to prevent pollution, or the violation of applicable water quality standards." There is no argument that the Village's sewers currently retain "ten times the average dry weather flow for the design year" for eventual treatment by the MSD. The Agency has not argued that any treatment of "[a]dditional flows" is necessary at this time. Therefore, the Village is in compliance with subsection b, and there is no need for the Board to grant relief from this subsection.

* See supra page 2 (indicating an aggregated dry weather flow of 0.56 cfs for Areas 5 and 6).

In summary, the record supports a grant of relief under Part 306, Subpart D, 35 Ill. Adm. Code 306.350-306.374 (1987), from subsection a of Section 306.305 of the Board's CSO rules. The Board finds that "the existing physical conditions, the character of the area involved, including the character of surrounding land uses, zoning classifications, the nature of the existing ... receiving body of water, ... and the technical feasibility and economic reasonableness of ... reducing the particular type of pollution involved" in the Village's CSOs, Ill. Rev. Stat. ch. 111-1/2, par. 1027(a) (1988); see 35 Ill. Adm. Code 306.371(a) (1987), support the grant of this relief. The Agency has presented no cognizable arguments that would support a denial of this relief in light of the record before the Board. On the other hand, relief from subsection b of Section 306.305 is unwarranted because the Village is in compliance with that subsection.

Section 41 of the Environmental Protection Act, Ill. Rev. Stat. 1985, ch. 111-1/2, par. 1041, provides for appeal of final Orders of the Board within 35 days. The Rules of the Supreme Court of Illinois establish filing requirements.

ORDER

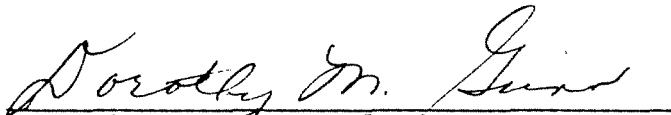
The Village of Western Springs is hereby granted an exception from subsection a of Section 306.305 of the Board's Water Pollution rules.

As a condition to the above exception, Western Springs shall raise the overflow inverts in the manholes at the intersection of 47th Street and Fair Elms Avenue, which discharge combined sewage to Flag Creek, to the maximum elevation that will not result in sewage backups into basements and/or street flooding.

IT IS SO ORDERED

Board Member Joan Anderson abstained.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Opinion and Order was adopted on the 29th day of November, 1988, by a vote of 6-0.


Dorothy M. Gunn, Clerk
Illinois Pollution Control Board