

ILLINOIS POLLUTION CONTROL BOARD
May 9, 1986

IN THE MATTER OF:)
)
THE JOINT PETITION OF THE CITY)
OF PEORIA AND THE ILLINOIS) PCB 85-210
ENVIRONMENTAL PROTECTION AGENCY)
FOR EXCEPTION OF THE COMBINED)
SEWER OVERFLOW REGULATIONS)

MR. RALPH EVANS APPEARED ON BEHALF OF THE CITY OF PEORIA

MR. E. WILLIAM HUTTON, ESQ. APPEARED ON BEHALF OF THE
ENVIRONMENTAL PROTECTION AGENCY

OPINION AND ORDER OF THE BOARD (by J. Marlin):

This matter comes before the Board upon a joint petition for a combined sewer overflow (CSO) exception filed pursuant to 35 Ill. Adm. Code 306.305 by the City of Peoria (Peoria) and the Illinois Environmental Protection Agency (Agency). The Board conducted a public hearing in Peoria on February 7, 1986. Members of the press and public attended the hearing. The Board has received no comment, other than that offered by Peoria and the Agency at the hearing.

As is discussed below, on March 14, 1986 the Board requested additional information from Peoria and the Agency. The Board received the response to the Interim Order on May 2, 1986, together with a motion for leave to file instanter, which is granted.

CSO Regulations

The CSO regulations are contained in 35 Ill. Adm. Code 306.302 et seq. They were amended in R81-17, 51 PCB 383, March 24, 1983. Section 306.305 provides as follows:

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

Sufficient treatment shall consist of the following:

- a) All dry weather flows, and the first flush of storm flows as determined by the Agency, shall meet the applicable effluent standards; and

- b) Additional flows, as determined by the Agency but not less than ten times to average dry weather flow for the design year, shall receive a minimum of primary treatment and disinfection with adequate retention time; and
- c) Flows in excess of those described in subsection (b) shall be treated, in whole or in part, to the extent necessary to prevent accumulations of sludge deposits, floating debris and solids in accordance with 35 Ill. Adm. Code 302.203, and to prevent depression of oxygen levels; or
- d) Compliance with a treatment program authorized by the Board in an exception granted pursuant to Subpart D.

Subpart D allows the discharger to file a petition for an exception either singly, or jointly with the Agency, as Peoria has done. A joint petition may seek an exception based on minimal discharge impact as provided in Section 306.361(a):

An exception justification based upon minimal discharge impact shall include, as a minimum, an evaluation of receiving stream ratios, known stream uses, accessibility to stream and side land use activities (residential, commercial, agricultural, industrial, recreational), frequency and extent of overflow events, inspections of unnatural bottom deposits, odors, unnatural floating material or color, stream morphology and results of limited stream chemical analyses.

Where a minimal impact exception cannot be established, or where an exception will include modification of water quality standards, Section 306.361(b) allows an alternative justification. In addition to the elements of paragraph (a), the justification must include:

(E)valuations of stream sediment analyses, biological surveys (including habitat assessment), and thorough stream chemical analyses that may include but are not limited to analysis of parameters regulated in 35 Ill. Adm. Code 302, analysis of toxics or metals if the collection system tributary to the overflow receives wastes which might contain them, sediment oxygen demand, volatile solids, and diurnal monitoring under both dry and wet weather conditions.

Peoria and the Agency believe they have made the "minimal impact" showing pursuant to Section 306.305(a). Alternatively,

they believe the petition is justified pursuant to Section 306.305(b). (R.41).

Exhibits

Peoria introduced four studies as exhibits at the hearing (also referred to as attachments A through D to the petition):

- | | |
|-----------|---|
| Exhibit 1 | Facilities Plan |
| Exhibit 2 | An Assessment of the Impact of Combined Sewer Overflows at Peoria on the Waters of the Illinois Waterway, Dept. of Energy and Natural Resources, September, 1983. |
| Exhibit 3 | The Procedures, Observations, and Results of a Mixing Zone Study for Combined Sewer Overflows at Peoria, Illinois, Department of Energy and Natural Resources, October, 1984. |
| Exhibit 4 | Report on Combined Sewer Overflow Control Plan, Greeley and Hanson and Randolph and Associates, Inc., December, 1985. |

Illinois River

Peoria is situated on the west bank of the Illinois River. East Peoria is directly across the river.

The Illinois River at Peoria forms a pool known as Peoria Lake. It is used for water skiing and other recreational purposes. Immediately below Peoria, the river is less suited for recreation because it is narrow, with heavy barge traffic and barge moorings. Access to the River from the city is by way of marinas, all of which will be upstream of the CSO outfalls upon completion of the project described below (R. 44).

The River has an average flow of about 15,000 cubic feet per second (CFS), with a ten-year low flow of around 4000 CFS (R. 28).

Peoria conducted a study to determine the CSO impact on water quality, sediment and benthic organisms. Parameters were measured above, among and below the CSO discharges during the summer of 1982. River flow was around 6000 to 10,000 CFS. Measurements were taken after CSO overflows in response to rainfall events of 0.33 to 1.44 inches per hour (R. 23).

Most water quality parameters measured were usually well within the general use water quality standards of 35 Ill. Adm. Code 302, including dissolved oxygen, pH, ammonia, cadmium, lead, zinc and temperature. (R.24). Four of 654 samples violated the

lead standard. The water quality standard for copper was violated above and below the CSO discharges. The CSO contribution to the violation was determined to be imperceptible (R. 25). Other parameters measured, for which there are no water quality standards, included biochemical oxygen demand (BOD), suspended solids and turbidity. The CSO contributions to suspended solids and turbidity were not significant compared with that originating from small water courses and overland drainage (R. 25). Overland urban drainage and other discharges were thought by petitioner to be as significant as CSO's with respect to BOD water quality (R. 26).

The study determined that the CSO outfalls were contributing to violations of the water quality standard for fecal coliform and were introducing undesirable floatables into the River (R. 26). The fecal coliform standard is 200 counts per 100 ml (Section 302.209). Floating debris is prohibited by Section 302.203. Above the CSO discharges fecal coliform ranged from 4 to 50 counts per 100 ml during dry weather, and from 3 to 4900 after rainfall events. Near and below the CSO discharges fecal coliform ranged from 5 to 340 counts per 100 ml during dry weather, but ranged up to 240,000 counts per 100 ml after rainfall events. (R. 26, Exh. 2, p. 37).

Peoria also conducted a study of the bottom sediments, including composition, percent volatile solids and concentrations of cadmium, copper, lead, zinc, grease and oil. (R. 24). Bottom sediments in the vicinity of CSO discharges were primarily sand, or a mixture of sand and rock. No sludge accumulations were encountered. Sediments showed an increase in grease and oil, zinc, and lead, which are indicative of urban storm drainage, rather than sewage (R. 26, Exh. 2, p. 59).

Bottom dwelling organisms were typical of those residing upstream in the Peoria pool. Densities were not typical of significant organic enrichment, as would be the case if sewage were a factor. The limiting factor for a well diversified bottom dwelling population is the unstable habitat of shifting sand, compounded by excessive wave action, rather than water quality. (R. 26, Exh. 2, p. 62).

Sewerage

The sewage system includes the original area of downtown Peoria in which sewers were built before 1900. They were designed as storm sewers which ran under streets toward the River. With the development of indoor plumbing, residential and other sanitary sewers were connected to the storm sewers. In 1931, Peoria completed construction of the Riverfront Interceptor sewer, which collected the dry weather flow from these sewers for transportation to the sewage treatment plant. Flows in excess of

dry weather flow were bypassed to the River, as well as flows when the River was above the Interceptor.

In its present configuration, the Riverfront Interceptor is 5.6 miles long, serving 5,080 acres, about 2,950 acres of combined sewers and 2,130 acres of separate sewers (R. 29). There are 23 regulator structures which discharge to 20 CSO outfalls. (R. 30). The Interceptor has around 499 overflow events per year (R. 31).

The Riverfront Interceptor flows to the Greater Peoria Sanitary District treatment plant. It has a capacity of about 80 million gallons per day (MGD) at the plant. The plant also receives up to 74 MGD from the Kickapoo Interceptor, which serves only separate sewer areas (R. 30, 47).

The plant treats up to 60 MGD. It has an 8.5 million gallon basin to store first flush flows for later treatment. Flows in excess of 60 MGD receive primary sedimentation (R. 30).

CSO Reduction Plan

Peoria presented a plan for reducing the frequency and intensity of CSO overflows. This is detailed in Exh. 4. The plan includes the elements described in the following paragraphs.

Peoria will construct a 5,100 foot, 48 inch sewer near the northern end of the Interceptor. This would provide storage for about 21 percent of the first flush at the upper overflows, which have the greatest impact on recreational uses (R. 32).

Peoria will build diversion sewers to consolidate five CSO outfalls into two outfalls, moving the outfalls downstream to minimize recreational impact (R. 33). A floatables capture system will be provided at many outfalls to capture floating solids. (Exh. 4, p. 62, R. 34). No capture will be provided at four downstream outfalls, because of excessive costs. However, the frequency and severity of overflows will be reduced by the other aspects of the project (Response to Interim Order).

Peoria will move regulator devices to higher ground, so that all will be functional up to the 25 year flood level. This will decrease the frequency of CSO discharges, and allow treatment of part of the flow up to the 25 year flood level. (R. 34, 38).

Peoria will reduce the area served by combined sewers by separating eight sewers. Peoria will extend sanitary sewers to divert sanitary flow from some of these, and will extend storm sewers to divert inflow from others (R. 33, 34).

The treatment plant capacity will be increased to accommodate higher flow rates from the interceptor. Additional

pumps will be installed to increase discharge capacity at high river stages. An additional sluice gate will be installed to bypass flows in excess of 154 MGD at the plant (R. 35).

The overall project will cost \$7,340,000, with an estimated annual operating and maintenance cost of \$102,000 per year. A 1976 plan to eliminate all CSO discharges was estimated to cost \$38,000,000, with \$467,000 in annual maintenance (R. 36). The addition of downstream floatables capture would add more than \$2,900,000. Adding swirl concentrator type floatable capture systems at six locations would add \$6.1 million (Response to Interim Order).

Grant funding may be available for a part of the cost. However, local government is prepared to pay the entire cost if necessary. (R. 12, 15, 19).

Not included in Exhibit 4, and perhaps more important in the long run, are Peoria's efforts to reduce and eliminate combined sewers in conjunction with new development and redevelopment. Peoria has an ordinance which prohibits the discharge of storm flow into a sanitary line (R. 56). New buildings must have separate storm and sanitary sewer systems, even if these ultimately discharge to the same combined sewer. (R. 56). When streets are reconstructed sewers are separated. Also, separate sewers are constructed within area redevelopment projects (R. 57). New separated storm sewers have also been constructed (R. 58).

Expected System Performance

Section 306.302 defines "sufficient treatment" for CSO discharges in the absence of an exception. This includes:

1. Treatment of all dry weather flows.
2. Treatment of first flush flows.
3. Primary treatment and disinfection for flows up to ten times dry weather flow.
4. Treatment of excess flows to prevent accumulations of sludge deposits, floating debris, solids, and to prevent suppression of oxygen levels.

As noted above, the existing system appears to be capable of performing without accumulation of sludge deposits or suppression of oxygen levels. Relocation of regulation devices will ensure treatment of dry weather flow up to a 25-year flood.

First flush can be defined in terms of the flow required to restore oxygen demand or suspended solids to normal values. If first flush is defined in terms of oxygen demand, Peoria will be

able to capture and treat nearly all of the first flush. However, it will fail to capture the entire first flush of suspended solids. Because of the low oxygen demand of the suspended solids flush, Peoria believes it represents a wash-out of grit collected by the storm sewer system, rather than of sanitary sewage solids. Such solids would also be washed out of a separated storm sewer system. (R. 53; Exh. 4, p. 30).

The Interceptor will capture from 3.8 to 22 times the dry weather flow at various CSO outfalls. (R. 33, 35). Overall, the project will result in treatment of four times dry weather flow. (R. 55).

The downstream CSO discharges will be without provision for capture of floating solids. (R. 35). However, these will discharge less frequently and are located below the area of heavy recreational use. Peoria will remain subject to Sections 302.203 and 306.305(c), which prohibit these discharges (Response to Interim Order).

Overall the number of CSO discharge events is expected to drop from 499 to 161 per year (R. 36). The number of days during which an overflow occurs would be reduced from around 40 to around 28 (Exh. 4, p. 84-85).

Improvement in Water Quality

Section 302.102 requires compliance with water quality standards at the edge of a mixing zone. Because of the size of the Illinois River, Peoria is able to take advantage of a large amount of dilution in a reasonable mixing zone even under low flow conditions. Peoria has conducted a study to define the size of an allowable mixing zone. (Exh. 3). The plan is expected to result in a considerable reduction in fecal coliform levels outside the mixing zone. Nevertheless, there will continue to be some violation of this standard. (R. 45). Peoria has requested no modification to the water quality standard.

Conclusion

Having considered the evidence and the factors enumerated in Section 306.361(a), the Board concludes that the Peoria CSO discharges will have a minimal impact. Although there will continue to be some violations of the water quality standard for fecal coliform, they will be greatly reduced in severity and frequency, and generally moved downstream away from areas of heavy recreational use. The Board will grant an exception with language similar to that recommended by Peoria and the Agency. In order to assure that this Order is not construed as authorizing Peoria to abandon its other efforts to reduce its CSO discharges, the Board will add conditions obligating Peoria to continue with its program of separating sewers in conjunction

with development projects. The Board recognizes that in certain situations this may not be feasible from an engineering standpoint.

The Board notes that the relief is restricted only to those substantive requirements for effluent treatment of CSO's, and not to relief from water quality standards. To insure that this issue is clear, the Board will introduce into the Order language identifying the scope of the exception as granted.

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

ORDER

- 1) The City of Peoria is granted an exception from 35 Ill. Adm. Code 306.305(a) and (b), subject to the following conditions:
 - a) All components of the recommended combined sewer overflow plan presented in Exhibit 4, and generally described in the above Opinion, shall be implemented in accordance with the time schedule contained in Paragraph 2.
 - b) Within eighteen (18) months after completion of system improvements, the City of Peoria shall report to the Illinois Environmental Protection Agency on performance and effectiveness of the improvements, including extent of overflow reduction, attainment of additional excess flow treatment at Greater Peoria Sanitary District Treatment Facility, adequacy of floatable capture appurtenances at each remaining overflow point and performance of backflow prevention facilities.
 - c) The City of Peoria shall, in addition to the plan contained in Exhibit 4:
 - i) Prohibit new connections of residential downspouts to sanitary sewers;
 - ii) Require that sanitary sewers and storm sewers exit new buildings as two separate lines;
 - iii) Construct separate storm and sanitary sewers to the extent feasible when streets are reconstructed and when area redevelopment occurs.
- 2) The City of Peoria shall fully implement all requirements of Paragraph 1 in accordance with the following time schedule:

Implementation Schedule

<u>Event</u>	<u>Date</u>
Begin Design of Improvements	October 1986
Complete Design of Improvements	February 1988
Complete Securing of Land and Easements	March 1988
Secure Construction Financing	April 1988
Construction of Improvements	
Phase I -Treatment Plant and) Upstream Storage Sewer)	June 1988 thru June 1990
Phase II -Sewer Separations)	June 1989 thru September 1992
Phase III -Remainder of Recommended) Project)	June 1990 thru August 1992
Achieve Full Operational Status	December 1992

- 3) Within forty-five (45) days after the date of this Order, the City of Peoria 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 Illinois Environmental Protection 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 85-210, _____, 1986.

Petitioner

Authorized Agent

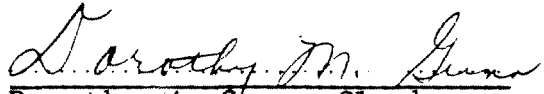
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Date

IT IS SO ORDERED.

J.D. Dumelle and J. Anderson concurred.
J.T. Meyer and B. Forcade dissented.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Opinion and Order was adopted on the 9th day of May, 1986, by a vote of 5-2.



Dorothy M. Gunn, Clerk
Illinois Pollution Control Board