

ILLINOIS POLLUTION CONTROL BOARD
April 7, 1988

CITY OF MORRIS,)
)
 Petitioner,)
)
 v.) PCB 86-4
)
 ILLINOIS ENVIRONMENTAL)
 PROTECTION AGENCY,)
)
 Respondent.)

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

This docket was initiated upon the January 3, 1986 Petition for CSO exception, filed by Petitioner, the City of Morris (City). Petitioner seeks exception to the treatment requirements of 35 Ill. Adm. Code Section 306.305, which must be met unless the Board grants an exception. In specific, Petitioner seeks to be relieved of the requirement to construct and operate certain combined sewer overflow treatment facilities. This was not a joint petition.

A merit hearing was held on December 12, 1986. Respondent, Illinois Environmental Protection Agency (Agency), filed its first Agency Response and Comments on February 19, 1987. On February 26, 1987 the Agency filed an Amended Agency Response; and on October 16, 1987 a Second Amended Agency Response and Status Report was filed. These subsequent filings were necessitated as a result of negotiations conducted with Petitioner and amendments to the Municipal Compliance Plan.

CSO REGULATIONS

The CSO regulations are set forth at 35 Ill. Adm. Code Subtitle C, Chapter I, Part 306; and 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.

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 efficient standards; and

- b) Additional flows, as determined by the Agency but not less than 10 times the 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.
- d) Compliance with a treatment program authorized by the Board in an exception granted pursuant to Subpart D.

The regulations allow the discharger to file a Petition For Exception either jointly with the Agency or singly. In order to justify a single petition [such as the one before the Board] the petitioner must meet the requirements of 35 Ill. Adm. Code Section 306.361(B),(C),(D), which states as follows:

Section 306.361 Justification of Joint Petition

".... exception justifications shall be established in the petition for exception as follows:

- 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 sideline 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.
- b) Where a minimal impact exception justification cannot be established pursuant to subsection (a), or where an exception will include a modification of otherwise applicable water quality standards, an exception justification shall include, at a minimum, evaluation pursuant to subsection (a) and evaluations 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.

- c) Exception justification which include projections of the improvement from alternative control programs may include reasonably reliable mathematical models based upon information gathered pursuant to subsection (b). The reasonable reliability of a mathematical model shall be assessed by reference to factors including but not limited to the model's scientific validity and the consistency with which the model reflects conditions in the stream as determined by monitoring data.
- d) Where special circumstances may render any evaluation inapplicable, for reasons of irrelevancy or expense of data collection in relation to the relevancy of the data, the petition shall include a justification for such inapplicability.

BACKGROUND

The City of Morris, located in Grundy County, Illinois has a population of approximately 8,833. The City is located on both sides of Illinois Route #47 from the north bank of the Illinois River to a point north of Federal Interstate, Route #80. The Illinois River flows from east to west along the southern boundary of the developed portion of the City. Local industries include Diamond International, Metro Rubber Corporation and The Northwestern Corporation.

The City of Morris sewage collection system consists primarily of combined sewers that have one overflow which discharges to a strip mine pond, six overflows which discharge to Nettle Creek, two overflows which discharge to the Illinois River, and the outfall from the excess flow treatment pond, which along with the treatment plant outfall, discharge to Nettle Creek. The sewage treatment plant, with design average flow of 2.0 MGD and maximum capacity of 4.00 MGD, operates pursuant to NPDES permit #IL0021113.

DESCRIPTION OF RECEIVING STREAMS

Nettle Creek

Generally speaking, the East Fork of Nettle Creek, which extends from the north edge of town to its confluence with the West Branch of Nettle Creek at a point approximately 1600 feet north of the Illinois River, has an average stream width of 20 feet, with a 10 foot high bank above the thalweg. The stream bed gradient is 0.015 ft. per ft., and the stream has a 10-year low-flow of 0 cubic feet per second. Below its point of confluence with the West Branch of Nettle Creek, the average stream width is 26 feet, and the height of the stream bank remains at approximately 10 feet. The stream bed

gradient is also 0.015 ft. per ft. through this stretch of stream with a 10-year low-flow of 0 cubic feet per second.

In most areas, the creek bottom is based on a limestone stratum that has been exposed due to the action of the stream. This bedrock bottom is overlain with some amounts of silt, sand, gravel, and larger stones. This loose granular material appears to be re-arranging itself after each flood and is sometimes shaped in a bar-like formation on the creek bed, or it accumulates in the depressions of the bedrock bottom.

In general, the stream banks have maintained a natural appearance; however, increased runoff over the past years has resulted in scouring the stream bed to rock, to a depth of approximately 10 feet below the surrounding land.

Even though the stream passes through woodland, it is almost entirely free of log jams and snags. Grass and weeds grow up to the edge of the water in many places and seem to have no effect on the flow of the stream and have not accumulated trash and sewer-borne debris.

Description of Stream-Side Property

The northern portion of Nettle Creek, from the north limit of town to U.S. Route 6, lays in a fairly shallow broad valley. Below U.S. Route 6 to the Illinois River the creek runs through a deeper valley with steeper sides, which lay at an approximate slope of 2 horizontal to 1 vertical. Occasionally, the bank on one side of the stream is lower than that on the other.

The land use along the northern stretch of the stream is large residential lots, with the houses located a fair distance from the stream bed. Near the southern part of the stream, the land use changes to industrial. The West Branch of Nettle Creek, which contains no sewer overflows, runs through Gebhard Woods State Park, and has never resulted in a critical comment from the Illinois Department of Conservation.

Illinois River

The average stream width in the Morris area is approximately 500-600 feet, with the average height of bank being 5 feet to 15 feet on the north bank of the River, and 6 feet to 8 feet on the south bank. The stream bed gradient is substantial at a 0 hydraulic gradient, with the lower level of the Dresden Lock being at elevation 485 feet and the upper level of the Marseilles Lock being at an elevation of 483 feet; approximately 25 miles separate the two points. The 10-year low flow at Morris is 3,188 cubic feet per second.

The bed of the Illinois River is basically carved into a clay material which is overlain with a black water-borne silt in many areas. In some places there are deposits of sand and gravel on the river bed in place of the black silt. The north bank of the River is generally covered with a fine river sand mixed with some gravel.

While the river is fairly natural in appearance, it has been dredged periodically to maintain a 9 foot shipping channel. Through the years, the dredged material has been deposited on the river bank adjacent to the stream. In general, this dredged material is what the north bank of the river is comprised of in the Morris areas.

Description of Stream-Side Property

Through the City of Morris area, the south bank of the River is primarily floodplain. East of Route 47 the land is mostly tillable with seasonal recreational use of the river bank. West of Route 47 the South bank turns into a low swampy area with a minor amount of tillable land. Further west a sand and gravel mining operation takes place. The north bank of the River rises at a fairly constant slope to the Illinois-Michigan Canal and then to the City of Morris.

The south bank of the Illinois River is fairly open and most of the area is tilled and planted. There is a line of trees along the waters' edge and a swamp-like area paralleling Route 47. The north bank of the Illinois River varies from areas containing trees and brush to sandy beaches.

Strip Mine Pond

The strip mine pond, into which SSO-2 and the Butler Street Overflow discharge, is located in the northeast part of town. The City maintains the water surface in this pond at an artificially low elevation through pumping facilities.

The average width of this pond is approximately 100 feet and the length is approximately 1300 feet. The height of bank from top of water to adjacent ground surface is 10-15 feet.

The bed of the strip mine pond is predominately clay material. The mine is a free standing lake with no variation in structure, and with a depth of approximately 10 feet.

This lake was formed by open pit mining of coal which was about 20 feet below ground surface.

There is no accumulation of debris within the pond and the banks are clean although covered in some areas with grass and weeds.

The west bank of the strip mine is residential. The residential property is separated from the strip mine by a chain link fence and bushes. The east bank of the pond is a strip mine area which consists of piles of gray clay. The west bank of the pond is extremely steep and devoid of cover, while the east bank contains some vegetation and some minor amount of grass near the waters' edge.

The quality of the water in the pond appears quite good and unaffected by very infrequent discharge from the combined sewer system.

Petitioner has provided the following data regarding CSOs:

<u>CSO Designation</u>	<u>Frequency of Overflow</u>	<u>Point of Discharge</u>	<u>Intensity of Rain Causing Overflow</u>	<u>Calculated Dilution Ratio</u>
CSO-2	6 Times/yr	Nettle Creek	0.5"/Hr	5040:1
CSO-3	6 Times/yr	Nettle Creek	0.5"/Hr	263:1
CSO-4	15 Times/yr	Nettle Creek	0.3"/Hr	138:1
CSO-5	18 Times/yr	Illinois Creek	0.25"/Hr	223:1
CSO-6	9 Times/yr	Illinois Creek	0.4"/Hr	88:1
SSO-1	1 Times/2 yr	Nettle Creek	3.46"/Hr	11302:1
SSO-2	1 Times/2 yr	Mine Pond	3.46"/Hr	38:1
SSO-Butler Street	3 Times/2 yr	Mine Pond	1.82"/Hr 2.38"/Hr 3.46"/yr	33:1
SSO-3	3 Times/2 yr	Combination Sewer	1.82"/Hr 2.38"/Hr 3.46"/Hr	Data Not Provided
SSO-4	3 Times/2 yr	Storm Sewer Nettle Creek	1.82"/Hr 2.38"/Hr 3.46"/Hr	2367:1

Existing Treatment Plant

The existing treatment plant consists of contact stabilization package plants in circular concrete tanks. This provides secondary treatment and chlorination; it was constructed in 1970.

There is little vacant land left for expansion on the existing property owned by the City at the sewage treatment plant. All of the neighboring property in the plant location is developed and occupied. The existing plant site does offer limited room for expansion of secondary treatment facilities.

At the present time the City of Morris' sewer system consists primarily of combined sewers which were built prior to World War II. This portion of the system experiences basement backups and overflows from the system during periods of high precipitation and high groundwater. High groundwater seriously affects the combined sewers because of the geology in most of the areas in Morris. Generally speaking, the City is underlain with bedrock at depths varying from 2 to 6 feet. The shallow bedrock traps precipitation in the overlying soils as groundwater, which migrates to loose joints in the combination sewer, but primarily migrates to drain tile which are constructed around basement foundations, where it enters the combined sewer system.

In some portions of the older part of town, the City has constructed storm sewers in an attempt to alleviate flooding problems in residential and commercial basements. This construction program has been successful to an extent, but does not totally eliminate the basement backup. Neither has the construction been effective in totally separating storm and sanitary sewers, so that these areas can still be considered to be served with combined sewers. In some of the new parts of the town, the sewer systems were constructed as sanitary and storm sewers, and in these locations no overflows exist nor does sewer overloading occur.

At the present time, there are 9 overflows. There is also one excess flow treatment pond discharge and one secondary treatment plant discharge.

INFLUENT/EFFLUENT INFORMATION

Data provided by Petitioner indicates the following data:

Average flow: 1.140 MGD Calendar 1986

Peak flow: 3.715 MGD 10/5/86

Peak sustained wet weather flow: 1.536 MGD October, 1986

3 low flow months (1986) = 0.884 MGD Average

Organic Load: 1,235 #/Day twelve month average influent BOD during 1986.

Industrial Component of Organic Load: Estimated to be 88 #/day based on the existing industrial flow of 0.035 MGD at an assumed strength of 300 mg/l.

Current Population: 8,833 per U.S. Census

Effluent Quality:

BOD₅: 12.9 mg/l twelve months average during 1986.

TSS: 8.8 mg/l twelve month average during 1986.

Fecal Coliform: 44 per 100 ml twenty month average from 1983 thru December 1984.

Other: 0.49 mg/l of chlorine residual and pH of 7.3 from May 1983 thru December 1984.

Water Quality Standards: 4.7 mg/l of ammonia nitrogen from May 1983

through December 1984.

PROPOSED MUNICIPAL COMPLIANCE PLAN

The Amended Municipal Compliance Plan, as proposed by Petitioner, is as follows:

1. De-Rate the existing secondary sewage treatment plant to 1.33 MGD.
2. Rebuild the existing raw sewage pumping station with two new variable rate pumps, each having a capacity of 3.181 MGD, and each controlled by a variable frequency drive which would match pumping with incoming flow.
3. Rehabilitate the old retired anaerobic digester to serve as a sludge-thickener/storage tank.
4. Construct a new outfall sewer from the secondary plant to the Illinois River.
5. Install a new recording, indicating, and totalizing meter in the excess flow treatment control building, and also install a new rotometer in the chlorination facilities at the excess flow treatment facility, which will allow feeding approximately 300 lbs of chlorine per day.
6. Continue to seek a CSO exception for existing overflow, the excess flow treatment pond discharge, and the sewage treatment plant bypass. During the design and construction phases and for a period of two years thereafter, monitor all sewer system overflows identified in the CSO report as SSO-1 thru SSO-4, and record overflow occurrences, approximate volumes and quality of the discharge. If discharges are a continuing problem, and relief is not granted from regulations by the Board, the City will construct additional facilities to correct the problem.
7. All nine overflows from the combined sewer system will be inspected to determine how much the overflow sills can be raised without causing basement backups. The diversion manholes will also be fitted with bar grates which will intercept floating solids in the diversion chamber and prevent them from discharging to the receiving stream. Any overflow which is affected by flooding from the Illinois River will be fitted with a flap gate to preclude river backup into the combined sewer system.

All of these overflows will be closely monitored by City personnel to determine the effectiveness of maximizing the flow in the trunk sewers, and to prevent unnecessary discharges.

The City will also construct storm sewers in three areas of town, two of which would drain to Nettle Creek, and one which would drain to the river, in an effort to reduce the amount of storm flow into the combined sewer system, and thereby provide additional capacity for sanitary sewage. These three sections of storm sewer are shown on accompanying Figure 5.

The proposed implementation schedule is as follows:

In order to comply with dry weather flow criteria the following construction must be completed by July 1, 1988: (i.e., new outfall sewer and rehabilitated digester)

- | | | |
|----|-----------------------|-------------------|
| A. | MCP approved | September 1, 1987 |
| B. | Complete design | January 1, 1988 |
| C. | Bid letting | March 1, 1988 |
| D. | Begin construction | April 1, 1988 |
| E. | Complete construction | July 1, 1988 |

The balance of the work at the plant will be scheduled as follows: (i.e., rebuilt pumping station and excess flow facilities)

- | | | |
|----|-----------------------|------------------|
| A. | Complete design | February 1, 1988 |
| B. | Bid letting | May 1, 1988 |
| C. | Begin construction | June 1, 1988 |
| D. | Complete construction | December 1, 1988 |

The combined sewer overflow work will be scheduled as follows:

- | | | |
|----|-----------------------|------------------|
| A. | Complete design | February 1, 1988 |
| B. | Bid letting | May 1, 1988 |
| C. | Begin construction | June 1, 1988 |
| D. | Complete construction | October 1, 1988 |

The storm sewer construction will be scheduled as follows:

Benton Street Section

- | | | |
|----|-----------------------|---------------|
| A. | Complete design | March 1, 1988 |
| B. | Bid letting | June 1, 1988 |
| C. | Begin construction | July 1, 1988 |
| D. | Complete construction | June 1, 1989 |

Jefferson Street Section

- | | | |
|----|--------------------|-----------------|
| A. | Complete design | January 1, 1989 |
| B. | Bid letting | April 1, 1989 |
| C. | Begin construction | May 1, 1989 |

D. Complete construction November 1, 1989

Pine Street Section

A. Complete design January 1, 1990
B. Bid letting April 1, 1990
C. Begin construction May 1, 1990
D. Complete construction November 1, 1990

Estimates by Petitioner place the total cost of the proposed compliance plant at 2,600,000., which is an increase of 0.85% per household to a total of \$13.49/mo/household user.

AGENCY POSITION

On February 23, 1987, the IEPA filed its initial Agency response and comments; although the Agency subsequently filed amended responses, these adopted the initial position which criticized Petitioner's proposal on several grounds. The Agency asserted that Petitioner failed to justify a permanent exception on several grounds. Specifically the Agency stated that Petitioner failed to provide complete information regarding impacts on receiving streams; Petitioner failed to show unreasonable hardship; Petitioner's plan incorporated unpermitted and unallowable overflows on sanitary sewers; and that additional monitoring is needed to clear up certain uncertainties about the effectiveness of Morris' proposal. The final Agency position recommends this Board's granting a provisional exception with continued monitoring for a period of several years.

The Agency contests the first flush analysis conducted by Petitioner. Additionally, data regarding frequency of CSO discharges was derived from calculating -- not flow monitoring. The Agency asserts that the calculated figures are incongruent with first flush analysis data contained in the June, 1985 CSO/SSSES report submitted by Petitioner. The Agency points out that if the rainfall intensity data [from the first flush analysis] is correct, then the actual rainfall frequencies of overflows would be much greater than indicated in the consultant's testimony. [R. 206]. The Agency correctly points out that the most accurate method of determining overflow frequency for a combined sewer overflow is through in-field monitoring at the pipe. Thus, the Agency concludes, Petitioner has failed to provide sufficient data regarding the rainfall intensities which result in overflows.

Additionally, the Agency avers that Petitioner failed to conduct a Phase III chemical and biological study pursuant to 35 Ill. Adm. Code 306.361. Although the city has argued that the City was informed by IEPA that such was not necessary, this has not been proved; and the effects of such proof is speculative at best, since these requirements are clearly set forth at 35 Ill.

Adm. Code 306.361. The Petitioner admitted that it did not perform the biological survey, or a stream chemical analysis or an analysis of toxics or metals. [R. 84, 88].

Petitioner attempted to justify its exception based on minimal discharge impact. 35 Ill. Adm. Code 306.361(a). But as the Agency correctly points out, Petitioner's evidence is based upon expected values [not observed or inspection reports]. Conversely, the Agency produced witnesses who testified from personal knowledge regarding odors, turbidity and debris in addition to the potential for human contact [especially at CSO-2 and CSO-6] [R. 210, 211].

In contesting Petitioner's claim of hardship the Agency asserts that Petitioner failed to adequately demonstrate why the City could not use general obligation bonds or revenue bonds or raise users fees. The Agency pointed out that even using the estimates from the City's mayor, the City currently may issue bonds for \$4,709,275. The Agency asserts that Petitioner could spend \$400,000 for the treatment plant, \$505,000 for the Benton Street sewer project, \$552,000 for the Jefferson Street project and \$643,000 for the Pine Street project -- all from general obligation bonds.

Petitioner testified that the current monthly user charge per household is currently \$9.49. The City's estimate for the increases in the sewer bill totals \$8.98 for a new sewer bill of \$18.47. The Agency testified that Morris users could afford a monthly Charge in the range of \$27 to \$39. [R. 221]. Although Petitioner contested the Agency's data regarding median household income, no other data was presented. [R. 230].

Finally, the Agency asserted that Petitioner included unallowable overflows on a separate sanitary sewer; specifically SSO-1, SSO-2 and SSO-Butler Street are claimed to be sanitary sewer overflows. This may or may not be merely a matter of semantics as indicated by Petitioner's consultant [R. 106] but the Board does not at this time decide this issue. It should be noted that notwithstanding its statements regarding the purported SSO's the Agency recommended to this Board that Petitioner be granted a provisional exception.

The Board agrees with the Agency that Petitioner has failed to justify its Petition for permanent exception. The proposed plan fails to address long term impacts and based upon the evidence presented granting of a permanent exception at this time would be premature. On the other hand Petitioner seems to be on the right track with its compliance plan. Only implementation of the above described compliance plan, with continued monitoring will provide the complete data necessary for a permanent exception.

ORDER

The City of Morris, Grundy County is hereby granted a temporary exception to the requirements of 35 Ill. Adm. Code 306.305(a) regarding first flush of storm flows and from 35 Ill. Adm Code 306.305(b), subject to the following:

1. The temporary exception is granted until January 1, 1992 from 35 Ill. Adm. Code 306.305(a) regarding first flush of storm flows and from 35 Ill. Adm. Code 306.305(b).
2. Morris shall implement the municipal compliance plan set forth at p. 8, above, of this Opinion and Order.
3. Morris shall implement the above referenced municipal compliance plan according to the schedule set forth at p. 8, above, of this Opinion and Order.
4. If, on or before November 1, 1991, the City of Morris fails to submit an amended petition for exception, this temporary exception will terminate on November 1, 1991.
5. The City shall comply with the provisions of 35 Ill. Adm. Code 306.361(b) and (c) unless, pursuant to subsection (d) the City includes a justification in its amended petition for the inapplicability of the required evaluations, or the Agency as a joint petitioner agrees that there is a minimal discharge impact.
6. The three segments of storm sewer work, that is, Benton Street, Jefferson Street and Pine Street, shall be completed by December 31, 1992.
7. Once the storm sewer improvements are completed, the City shall conduct an extensive flow monitoring study of the combined sewer system and assess decreases in overflow frequencies, durations and strengths. This study shall be submitted to the IEPA upon completion. During this period, Morris may undertake the Phase III Study or provide justification for not conducting a Phase III Study.
8. The City shall monitor overflow frequencies, duration and strength for SSO-1, SSO-2, and SSO-Butler Street during the period between the issuance of the Board Order and the completion of the storm sewer improvements and for a period of at least one year afterwards.
9. Should the monitoring results indicate the SSO-1, SSO-2 and SSO-Butler Street cannot be safely removed from the existing collection system, and that the overflows cannot be demonstrated to the Agency to be emergency

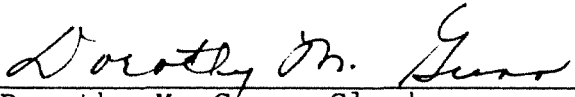
overflows, the City shall undertake whatever measures may be necessary to modify the system to remove these overflows.

10. The City shall conduct further investigation for the purpose of timely locating and removing all remaining sanitary sewage sources contributing to the replaced trunk sewer which terminates as CSO-2. Once the removals are completed, the City shall disconnect this sewer from the sanitary sewer and operate it as a storm sewer

Board Members B. Forcade and J. Marlin dissented.

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 7th day of April, 1988 by a vote of 5-2.



Dorothy M. Gunn, Clerk
Illinois Pollution Control Board