BLOOMINGTON AND NORMAL
WATER RECLAMATION DISTRICT

COMBINED SEWER OVERFLOW OPERATIONAL PLAN

REVISION OF MAY 1995

CONTENTS

This submittal is made in response to your request in your letter of March 7, 1995 regarding the Bloomington and Normal Water Reclamation District (BNWRD) CSO operational report. The most expedient manner of supplying the requested information would appear to respond to the CSO Operational Plan Review Assessment on an item-by-item basis. Consequently, please find the remainder of this submittal in such a checklist format.

1. As indicated in the March 7 letter, this item seems to have been adequately addressed in the previous report. No additional submittal will be made at this time.

2. Table 1 is an outline of location, area served and receiving stream for each CSO which is the responsibility of the BNWRD.

   Figure 1 shows the location of each CSO described in Table 1.

   A more detailed narrative description and one- line diagram of each of the CSO's is presented in Attachment IV.

3. The IEPA joined the BNWRD in a petition before the Illinois Pollution Control Board (IPCB) in 1984 requesting an exemption due to economic hardship which allowed continuation of the combined sewer system of Bloomington and Normal. Please find a copy of this order included as Attachment I of this letter.

4. To the best of the BNWRD knowledge there are no sensitive areas proximate to any of the CSO discharge points.

5. This item was indicated to be acceptable on the original plan submittal. The BNWRD has undertaken many initiatives to minimize the discharge of pollutants from CSO outfall. A number of these items appear also to be relevant to items further along the checklist. To avoid redundancy, these initiatives will be described at this time and then referenced under this item as appropriate later in the "Assessment".

   A. In granting the CSO exemption, the IPCB required a number of infrastructure modifications. Al l of these modifications were required to minimize CSO activity. The following list summarizes these modifications:

      I A new interceptor was constructed from the junction of the West Branch of Sugar Creek with the Main Branch of Sugar Creek to the BNWRD treatment plant on the southwest edge of Bloomington. This interceptor is interconnected with the Old Main Interceptor and the 1964 Interceptor such that it provides relief to both lines during high flows. The line was completed in 1989. This line begins as a 36" pipe and terminates at the BNWRD treatment plant as a 42" line.

      ii A grit chamber was constructed on the West Slough Sewer near its discharge into the Old Main Interceptor. This chamber was designed

to prevent grit deposition and subsequent loss of transport capacity in the Old Main Interceptor from the West Slough Sewer which provides service to a significant part of the combined sewered portion of Bloomington. The grit chamber was completed in 1991 with subsequent mechanical retrofits realized until 1994. Currently the chamber is functioning quite effectively and removes very significant quantities of grit associated with storm flows.

iii Two of the ten BNWRD CSO outfall structures were modified in the late 1980's as required by the IPCB exemption. These modifications resulted in both elevating overflow weirs and reactivating abandoned structures to realize additional transport capacity.

B. In 1990 the BNWRD commissioned its retained consultant engineer, Farnsworth & Wylie, Bloomington, Illinois, to undertake a hydraulic analysis of the entire interceptor system to assure that all pipes were at full capacity before CSO activity was realized. Enclosed please find, as Attachment II, a report by Mr. Donald Merritt of Farnsworth & Wylie which summarizes this hydraulic analysis. The recommendations of Mr. Merritt were implemented by the BNWRD.

C. In 1992 the BNWRD again commissioned Farnsworth & Wylie to undertake an extensive research of all specifications, plans drawings, etc. which addressed the sewer system. This work was aimed at locating as much information as possible regarding the system so that maximum detail involving the system could be learned and thus actions taken to assure that maximum transportation capacity was maintained. This search involved review of extensive historic records. Please find enclosed as Attachment III a copy of the report which summarizes this work.

D. For approximately five years the BNWRD has been inspecting selected segments of the interceptor system by television to determine condition of the lines, significant infiltration and inflow (I&I) sources and locations of significant grit deposition or other conditions which would restrict flow through the system. This work has usually involved two main interceptors per year and has resulted in one to two miles of system being thoroughly investigated annually.

E. The BNWRD inspects all ten of its permitted CSO structures daily during normal working hours. If any of these outfalls are found to be active the field inspector determines if the discharge is the result of structural failure, line blockage or volume of flow. If either of the first two conditions are suspected to be the cause of the activity the inspector notifies the BNWRD Maintenance Department which immediately dispatches a crew to correct the situation. In keeping with this type of response, the BNWRD recently purchased a jetter truck which has greatly reduced the time necessary to clear obstructions. This program also assures that each overflow structure is visited daily thereby allowing BNWRD to maintain an awareness of the overall condition of the system.

F. The BNWRD regularly pumps down its influent wetwells so as to allow maximum velocity of sewage into the plant. This process is believed to provide maximum scour velocities which effectively self-clean the system thereby removing potential grit deposits or other flow obstructions.

6. Procedures implemented to maximize storage of pollutants in the system are found to be difficult to separate from procedures implemented to minimize discharge of pollutants from the system. However, to the best of the abilities of the respondents, such an attempt will be made. Presumably Items 5B and 5D above address this issue. Item 5B was the hydraulic study undertaken to assure that all pipes are at capacity before CSO activity was realized. Item 5D addressed the regular television inspection and resultant cleaning/repair work (if necessary) which was intended to maintain maximum system capacity.

7. Pollution prevention aspects of the present management system of the BNWRD interceptor system can principally be divided into three main issues:

A. As indicated in Item 5 above a great many efforts have been undertaken by BNWRD in recent years to assure that the interceptor system retains its theoretical capacity. This work has resulted in minimizing CSO activity thereby preventing pollution by minimizing release of pollutants into the environment.

B. The BNWRD has excess storm flow treatment capability. The present design maximum flow rate of the BNWRD treatment facility is 45 MGD. Beyond this 45 MGD capacity the BNWRD excess flow treatment unit provides primary treatment to an additional 42 MGD of flow. The BNWRD Operations Staff have frequently been able to easily exceed the complete treatment maximum flow rate capacity of 45 MGD by 5 to 10 MGD. Consequently, the BNWRD can provide a combination of total and primary treatment to almost 100 MGD during storm conditions or wet weather flows. The dry weather low flow experienced by BNWRD is approximately 11 MGD. Consequently, almost nine times the dry weather flow can receive some form of treatment by the BNWRD. This allows BNWRD to eliminate CSO activity in all but the most severe or prolonged storm events.

C. Actual control of the pollutants discharge into the BNWRD must also be recognized as a pollution control effort. The BNWRD Industrial Pretreatment Program is quite successful. A total of ten industries in Bloomington and Normal are permitted as significant industrial users. Four of these ten are Categorical industries. The combined permitted industrial clientele of BNWRD enjoy an excess of 98% compliance of all discharge limits enforceable against them. The Categorical industry compliance percentage is well in excess of 99%. The majority of industrial discharge excursions are attributable to several food processors and involve the Oil & Grease parameter. These discharges therefore do not involve release of potential toxicities into the interceptor system. The BNWRD Industrial Pretreatment Program has done much to address pollution prevention relevant to CSO activity.

8. The BNWRD has an extensive monitoring program which maintains a significant data base on receiving stream environmental conditions. This data base includes sewer flow monitoring, receiving stream water chemistry and receiving stream biological community composition. However, the impacts of CSO activity on the receiving stream are difficult to separate from the effects of storm water discharge to the stream, adjacent urban land uses, stream channel modifications and the intermittent flow nature of the receiving stream. Sugar Creek is a zero low flow stream. The effect of no water in the stream during dry seasons definitely has an impact on the composition of the aquatic biological community.

   No cumulative demonstrated improvement in the aquatic environment of Sugar Creek which can be attributed to the CSO modifications made to date by BNWRD has been observed, although the frequency of CSO activity is believed to have been reduced significantly. The IPCB final order in the exemption procedure (Attachment I, p. 7) states "... the Board concludes that the District's CSO's have a minimal impact on water quality and stream use." The BNWRD believes that the many other uses of Sugar Creek as described above contribute to the unbalanced nature of the aquatic community of Sugar Creek much more significantly than do the CSO's.

9. There presently appears to be significant confusion within and between both USEPA and IEPA regarding this item. Please be assured that BNWRD will comply with the appropriate procedures when the regulating authorities specifically define such procedures.

10. Latitude and longitude for each CSO owned by the BNWRD is given in Table 1.

11. The BNWRD does not perform street cleaning or leaf removal. in the communities, These activities are performed by the Public Works Department of the Town Of Normal and the Public Service Department for the City Of Bloomington.

   <u>City of Bloomington</u>
   According to the Public Services Director, streets are cleaned on a regular schedule. The downtown areas are swept 3 times per week. Residential subdivisions are swept every 60 days, or more often if the workload permits.

   Leaves are collected in the Fall and Spring of the year. In Autumn, leaves are collected from curbs using leaf vacs. Bagged leaves are collected in the Spring.

   <u>Town of Normal</u>
   The Public Works Director stated that most streets are swept monthly. Major and collector streets are cleaned weekly, as long as weather permits.

   Leaves are also collected in the Fall and Spring of the year. Methods are similar as used by Bloomington.

12. The BNWRD only owns and operates major sewer interceptors. There are no catch basins in the system.

The Town of Normal and City of Bloomington perform maintenance on their respective storm sewer systems. Both communities reported they do not have catch basins in their systems.

13. Historically, the BNWRD has performed inspection and cleaning on a periodic as needed basis. Beginning with the 1990-1991 budget year, the District initiated a program to perform a televised inspection of the entire interceptor sewer system. Consequently, $20,000 to $30,000 has been budgeted each year for television inspection of sewers by contract and an additional $15,000 for cleaning if needed. The program will last for an estimated ten years total. After the initial inspection program is complete, we anticipate interceptors will be re-inspected on a periodic basis as needed.

14. Refer to Item 5B above.

15. Refer to Item 14 above.

16. The first two sections of this item are not applicable to the BNWRD system. The remaining item has been indicated as satisfactorily addressed in the previous submittal. The previous submittal is again submitted with this document as Attachment IV. This issue, however, is again discussed at considerable detail in Items 5A and 5D above.

17. As discussed in detail in Item 5E above. The BNWRD inspects all of its CSO points on a daily work day basis.

18. The BNWRD does not have pump stations on the interceptor sewer system.

19. Inspection and cleaning of the interceptor sewer system is included in Item 13 above. The City of Bloomington and Town of Normal each inspect their respective collector sewer systems.

    The City of Bloomington attempts to clean each sewer annually. Specific problem areas are cleaned on 30, 60, or 90 day schedules.

    The Town of Normal does not have a fixed schedule of cleaning, but clean as many lineal feet of sewer as possible on an annual basis depending on workload and availability of labor. The quantity of sewer cleaned per year since 1991 are:

    CY 1991 - 105,123 lineal feet
    CY 1992 - 99,855 lineal feet
    CY 1993 - 50,000 lineal feet
    CY 1994 - 171,575 lineal feet

20. This item is not applicable to the BNWRD system.

21. The BNWRD does not allow service connections to the interceptor sewer system.

Connections to the City of Bloomington and Town of Normal sewer systems are governed by their respective Building Inspection Departments through local ordinances. Also, both municipalities have adopted the Illinois State Plumbing Code. The Plumbing Code prohibits storm water and ground water from discharge to the sanitary sewer system.

The BNWRD has cooperative agreements with both municipalities whereby building permits are not to be issued without the permit applicant first obtaining a BNWRD Sewer Connection Permit. Issuance of the BNWRD permit is governed by the Sewer Use Ordinance. The BNWRD Sewer Use Ordinance also prohibits discharge of unpolluted water to the sanitary sewer system.

During the 1980's both the City and the Town completed projects to disconnect footing drain tile from certain problem residential areas. Enforcement of current Building Codes is the primary means of preventing any more illegal sewer connections.

22. Again, this item is addressed by the discussion of Item5E above.

NPDES DISCHARGE NUMBER	NAME	OWNER	WEST LONGITUDE DD-MM-SS	NORTH LATITUDE DD-MM-SS	SEWERED AREA ACRES	DRAIN AREA ACRES	TRIBUTARY TO INTERCEPT	CUMULATIVE AREA OF INTERCEPT	RECEIVING STREAM	DRAIN AREA OF RECEIVE STREAM (AC)
004	WOOD STREET COMBINED SEWER	BNWRD	89-01-32	40-28-23	81	144	MAIN	10720	SUGAR CR	19740
005	WEST SLOUGH COMBINED SEWER	BNWRD	89-01-07	40-28-50	2000	2000	MAIN	10630	SUGAR CR	19540
006	GRAHAM ST. COMBINED SEWER	BNWRD	89-01-03	40-29-07	380	380	MAIN	8650	SUGAR CR	13390
007	COTTAGE AVE OVERFLOW	C.O.B	89-00-40	40-29-37	27	27	MAIN	8270	SUGAR CR	12827
008	WEST BRANCH SEWER OVERFLOW	BNWRD	89-00-18	40-29-42	1067	2980	MAIN	8240	SUGAR CR	12800
009	NORMAL VALLEY SEWER	BNWRD	89-00-16	40-29-42	2240	2240	MAIN	7340	SUGAR CR	9726
010	DIVISION ST. OVERFLOW	BNWRD	89-00-15	40-29-42	60	60	MAIN	5380	SUGAR CR	9726
011	48 INCH INTERCEPTOR EXTENSION	BNWRD	89-00-15	40-29-42	3039	3099	MAIN	5380	SUGAR CR	9698
012	DIVISION ST. SEWER OVERFLOW	C.O.B	89-00-05	40-29-46	32	32	MAIN	5380	SUGAR CR	9698
013	SANITARY RELIEF SEWER OVERFL	BNWRD	88-59-46	40-29-56	2959	9582	MAIN	5240	SUGAR CR	9582
014	FELL AVE BYPASS	BNWRD	88-59-12	40-29-41	102	102	MAIN	5210	SUGAR CR	6104
015	COLTON AVE OVERFLOW	C.O.B	88-58-39	40-29-17	100	1220	CNTRY CLUB	1220	CTRY CLB BR	720
016	LOCUST STREET OVERFLOW	C.O.B	88-58-34	40-29-07	650	1220	CNTRY CLUB	1120	CTRY CLB BR	650
017	TWIN GROVE STORM SEWER	T.O.N	89-00-03	40-30-27	60	60	WEST BR	790	WEST BRNCH	2700
018	CYPRESS ALLEY STORM SEWER	T.O.N	88-59-55	40-30-54	140	140	WEST BR	410	WEST BRNCH	2320
019	MORRIS AVE OVERFLOW	C.O.B	89-00-25	40-27-50	62	62	HIGH PK BR	670	GOOSE CR	815
020	VALLEY SEWER BYPASS	BNWRD	88-59-37	40-27-37	15	15	MAIN	NOTE 1	GOOSE CR	530

BNWRD = BLOOMINGTON AND NORMAL WATER RECLAMATION DISTRICT
C.O.B = CITY OF BLOOMINGTON T.O.N. = TOWN OF NORMAL

NOTE 1: Sanitary sewage flows to the Main Interceptor Via the West Slough Combined Sewer. CSO # 020 flows through the Big Four Valley Relief Sewer (Storm Sewer) which discharges to the Highland Park Branch (Goose Creek) near Main Street and Veteran's Parkway.

TABLE 1: COMBINED SEWER OVERFLOW LOCATIONS

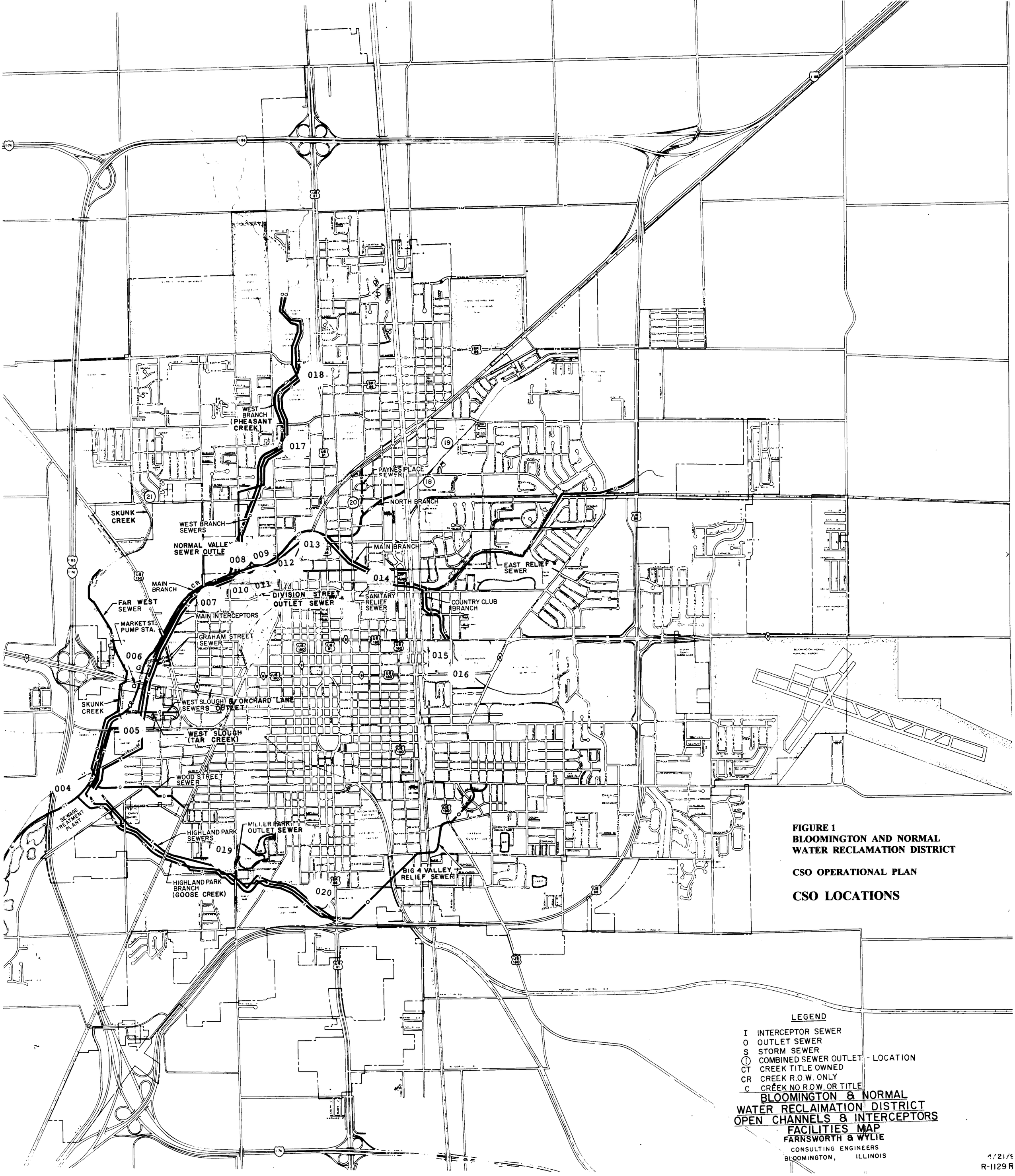

FIGURE 1
BLOOMINGTON AND NORMAL WATER RECLAMATION DISTRICT

CSO OPERATIONAL PLAN

CSO LOCATIONS

LEGEND

- I INTERCEPTOR SEWER
- O OUTLET SEWER
- S STORM SEWER
- (I) COMBINED SEWER OUTLET - LOCATION
- CT CREEK TITLE OWNED
- CR CREEK R.O.W. ONLY
- C CREEK NO R.O.W. OR TITLE

BLOOMINGTON & NORMAL
WATER RECLAIMATION DISTRICT
OPEN CHANNELS & INTERCEPTORS
FACILITIES MAP

FARNSWORTH & WYLIE
CONSULTING ENGINEERS
BLOOMINGTON, ILLINOIS

4/21/9
R-1129 R

ATTACHMENT I

IPCB EXEMPTION ORDER

ILLINOIS POLLUTION CONTROL BOARD
June 29, 1984

IN THE MATTER OF:	)	
	)	
JOINT PETITION OF THE BLOOMINGTON AND NORMAL SANITARY DISTRICT AND THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY FOR EXCEPTION TO THE COMBINED SEWER OVERFLOW REGULATIONS.	)	PCB 84-40

MICHAEL J. WILSON (CHESLEY AND WILSON) APPEARED ON BEHALF OF THE BLOOMINGTON AND NORMAL SANITARY DISTRICT, and

DAVID L. RIESER APPEARED ON BEHALF OF THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

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

This matter comes before the Board on the March 29, 1984 joint petition of the Bloomington and Normal Sanitary District (District) and the IEPA (Agency) for an exception, with conditions, to 35 Ill. Adm. Code 306.305(a) and (b) of the Board's combined sewer overflow (CSO) regulations which require that:

> "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 the average dry weather flow for the design year, shall receive a minimum of primary treatment and disinfection with adequate retention time."

The joint petition alleges that a) the District's existing CSO's have minimal water quality and stream use impact, and b) that construction and operation of proposed alternate facilities will save $34.7 to $39.3 million versus the costs to fully comply with the Board's CSO regulations.

Hearing was held on May 11, 1984, at which some members of the press and public were present but did not testify. Testimony and exhibits (Exh. 1-10) were presented by the petitioners at hearing. At the request of the hearing officer at hearing, the Agency submitted, on May 17, 1984, a letter containing alternate language for conditions 6 and 7(h) contained in the Agency's

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October 3, 1990

J. Michael Callahan
Executive Director
Bloomington-Normal Water
Reclamation District
West Oakland Avenue Road
P.O. Box 3307
Bloomington, IL 61702-3307

SUBJECT: Draft - BNWRD Overflow Study, 1990

This report outlines the results of a study of the network of interceptors and combined sewer overflows from Cottage Avenue to the 60" relief sewer at what is commonly called the Steak and Shake overflow and makes recommendations in order to minimize bypassing.

The purpose of the study of this area was to determine the proper settings for overflow controls to ensure that all interceptors in the study area are flowing at full capacity conveying wastewater to the treatment plant before overflows occur.

Plans of all previous sewer work were assembled and reviewed from which the attached schematic of the area of study was developed. Key details of the schematic were field verified. In addition, earlier combined sewer overflow studies and other data were reviewed and the schematic updated to include recent improvements.

A field inspection was conducted to inspect the general condition of all elements associated with the various overflows. Such items as gates, weirs, weir height, manholes and structures were inspected as closely as flow conditions permitted.

The following paragraphs summarize the findings of the field inspection of key points and recommendation for changes in overflow controls. (The overflow numbers used are the NPDES permit overflow designations.)

106 E. WASHINGTON
PONTIAC, IL 61764
PHONE 815/844-5571

309 W. MAIN ST.
CLINTON, IL 61727
PHONE 217/935-4551

007 Cottage Avenue

Weir Manhole is masonry - Condition Good

Weir is Brick & Mortar Sloping with flowline of manhole.

15" from south is reference. Weir is 0.55 feet above flowline of the 15" from south.

15" out north is 0.15 feet below 15" south inlet

8" out northwest is 0.35 feet below 15" south inlet. Weir is 0.70 feet above flowline of 8"

Note: A setting of 0.75 feet above the 15" inlet from the south should ensure that the 8" sewer flows full, minimizing bypassing.

Conclusion: Weir may be 0.20 feet low at 15" from south and 0.05 feet low at 8" out to northwest. Manhole should be inspected during overflow to see if 8" is full before bypassing.

008 West Branch

Weir Manhole - Concrete Condition Good

Weir is a combination of formed concrete bottom with adjustable aluminum notched plate. Good condition and level.

Outlet gate on 18" outlet to the west is in bad shape and should be removed.

33" from north is reference. Weir is 1.4 feet above flowline of 33" from north.

18" outlet to west is 0.05 feet below 33" north inlet flow line. Weir is 1.45 feet above 18" flow line.

Note: A setting of 1.57 feet above 33" should fill 18" outlet, minimizing bypassing.

Conclusion: Weir may be 0.17 feet low. Manhole should be inspected during high flows along with receiving manhole on south side of Sugar Creek to determine if, in fact, maximum flow is moving in 24" under creek before bypassing.

East manhole is ±1' below ground.

012 Division Street Combination and Relief Sewer

West 012A Weir Manhole Condition Good

Weir is a concrete channel on north edge of manhole with rectangular notch for overflow to relieve the 18" Division Street Combination Sewer.

18" sewer from east is reference. Weir opening is 1.0 feet above flowline of 18" from east.

18" sewer out west is ± the same as east 18" inlet.

36" relief sewer inlet from east is ±3.63 feet below flowline of 18" sewer from the east.

42" relief sewer outlet to the west is ±3.93 feet below flowline of 18" sewer from the east.

Note: Division Street 18" combined sewer connects to overflow 010.

Some road material is in 18" channel.

East 012B Manhole - Masonry Condition Fair

No weir - elevation of pipes control relief.

18" sewer from east is reference.

18" sewer outlet west is 0.06 feet below flowline of 18" from east.

12" bypass south to 36" relief sewer is ±0.40 feet above flowline of 18" from east.

There are also two inlets connected to manhole with 12" to the north and 12" to southeast.

013 Steak and Shake

Two weirs are in place across the 60" relief sewer. One downstream 15" outlet and one downstream of the 24" outlet. Structures are in good shape.

60" from east is reference. Weir behind 15" outlet is 1.67 feet above flowline of 60" sewer from east.

Weir behind 24" outlet is 3.05 feet above flowline of 60" sewer from east.

15" sewer outlet is ±0.08 feet below flowline of 60" flowline.

24" sewer outlet is ± at the flowline of 60".

The location and height of weirs are such that the 15" will take first flow and 24" overflow from 15". Pipes will be at capacity before a bypass occurs.

Observation of flow at junction chamber indicated little or no flow in the 33" sewer to the north. Inspection of the junction manhole at the intersection of the 33" and the 60" Normal Valley sewer showed little or no flow from the 33" and a considerable build up of solids in the manhole. Cleaning of the sewer under the creek and maybe part of the Normal Valley is indicated.

ILLINOIS POLLUTION CONTROL BOARD
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January 20, 1984 letter (Gr. Exh. 10, Attach. E). This May 17, 1984 letter is accepted as Exhibit 11.* No other written submittals or comments have been received.

THE DISTRICT AND ITS CSO DISCHARGES

The District presented seven witnesses at hearing:

1. Mr. James M. Pappas, District Executive Director and Chief Engineer;

2. Mr. Douglas C. Melton, Engineer with Farnsworth & Wylie Consulting Engineers;

3. Mr. John M. Callahan, District Field Superintendent;

4. Dr. Harry Huizinga, Aquatic Biologist on the Illinois State University faculty;

5. Mr. George Swier, Director of Engineering & Water, City of Bloomington;

6. Mr. Sam Wylie, City Engineer, Town of Normal; and

7. Mr. James Pemberton, Trustee and Clerk of the District.

Additionally the Agency presented testimony of Mr. Toby Frevert, an engineer and technical standards advisor with the Division of Water Pollution Control, whose duties include analyzing and coordinating the CSO exception applications. As much of the testimony and accompanying exhibits (Exh. 1-9) referenced the petition and attachments (Gr. Exh. 10, Attach. A through H), hearing testimony will not be directly set forth, but will instead be referenced as appropriate.

The Bloomington and Normal Sanitary District, in McLean County, encompasses the City of Bloomington (Bloomington) and the Town of Normal (Normal), which have combined 1980 populations of 79,927. Major local industries/institutions include State Farm and Country Companies Insurance, Illinois State and Illinois Wesleyen Universities, General Electric, Eureka Williams, Ralston Purina and Firestone Companies.

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*The Board wishes to note, in this second of these CSO exception procedures cases, that the well-organized presentations and responses to questions by the resource persons at hearing greatly assist the Board. As the Board earlier suggested in PCB 83-231 (Pontiac/Agency CSO petition), future petitioners are advised to also examine the record in this PCB 84-40 petition.

The District, whose area encompasses about 25 square miles, owns and operates the 16 MGD treatment plant and interceptor sewers which receive flows from partially local combined sewer systems owned by Bloomington and Normal. The major portion of the District lies in the 34.5 square mile drainage area of Sugar Creek and its tributaries. Sugar Creek is tributary to Salt Creek and the Sangamon River. Only the southeast portion of Bloomington lies in the Kickapoo drainage basin (Exh. 1).

The treatment plant's design average flow capacity needs are estimated to be 20.3 MGD by the year 2005. The total capacity for peak flow after the proposed dry weather treatment expansion is completed will be 82 MGD, of which 42 MGD is excess flow receiving primary treatment and disinfection. An additional 158 MGD would have to be captured and similarly treated if the District were required to comply with the Board's CSO regulations (Exh. 2). Depending on land availability for siting, the compliance costs would range from $34.7 to $39.3 million (R. 17, Exh. 3, 4). Additionally, operation and maintenance costs for the additional interceptors and treatment facilities are estimated to range, annually, from $319,000 to $363,000.

There are eighteen existing CSO discharge points, eleven discharging directly into Sugar Creek and the remaining seven discharging into its tributaries. Ten outlets are on the District's interceptors, three on Normal's sewers, and five on Bloomington's. (R. 20, Pet. Exh. D, Exh. 1.)

In July, 1980, the District began a 5 days/week overflow monitoring program at ten CSO locations on Sugar Creek, accompanied by a maintenance program to remove debris, repair weir leakage, etc. to minimize non-rainfall caused overflow occurrences. By the end of 1982, there were 6,500 overflow inspection reports. (R. 24, Exh. B, ch. 6.)

Additionally, in 1980 the District spent $173,000 to clean 7,000 feet of 51", 36", and 27" interceptors, with 6,500 feet televised. Another $15,000 was spent to clean junction boxes.

Two months after the completion of sewer cleaning, the 51" interceptor began to quickly accumulate grit at a point immediately downstream of the junction box, thus reducing sewer capacity and aggravating the CSO problem. Starting February, 1981, a monthly grit monitoring program, covering over 10,000 feet at 31 sites on the main 51", 36", and 27" interceptor was commenced. Starting in January, 1982, approximately 60 flow measurements (as of April 30, 1984) at each of 23 locations on five interceptors were undertaken (R. 25, 31, also see Pet. ch. 7, Exh. B).

The District has a water quality monitoring program utilizing 13 stations located as follows: Seven upstream in the vicinity of the CSO's, two immediately upstream and 600 yards

downstream of the treatment plant, and four farther downstream at 1, 2, 3, and 4 mile intervals from the plant. Over 11,000 analytical tests/year are performed. (See Pet. ch. 12, Exh. B and ch. 15, Exh. C.)

Finally, a biological survey was conducted in July and August, 1983 to evaluate the CSO impacts on macroinvertebrate and fish, and stream conditions at 19 stations as follows: seven on the main branch of Sugar Creek above the treatment plant, two of which were above any overflows; two on intermittent steams receiving overflows from the West Slough and Graham Street sewers; two on the West Branch, one above and one below overflows; two on Skunk Creek with no overflows; one on Goose Creek, and five at stations on the Main Branch below the treatment plant at distances of 600 yards and 1, 3, 4 and 7 miles.

RESULTS OF THE BIOLOGICAL SURVEY
(See Gr. Exh. 10, Exh. C., Tables 1-9)

Initial Agency concerns regarding "some statistical detail aspects of one of the data analysis techniques" used in the study have been satisfied. No question has existed concerning the quality or validity of the raw data (see Gr. Exh. 10, Exh. E., p. 2 and R. 89-91).

The macroinvertebrate studies indicated that the majority of the 19 sites were classified as semi-polluted or unbalanced, using the Agency stream quality classification, with no substantial differences attributable to CSO impact. Although the sampling was done during the hot weather and drought conditions of July and August 1984, the stream appeared to be unbalanced, but not polluted, and the DO remained around 6.0 mg/1. throughout the stress period (Exh. C, p. 16-33, Table 10).

The fish collections indicate that Sugar Creek can support a diverse number of fish species. Although the residual chlorine from the tertiary treatment effluent was associated with a considerable reduction of diversity of macroinvertebrates and fish populations just below the discharge, recovery occurred one mile below the plant.

Although Sugar Creek suffers the impacts of pollution and disruption as an agricultural and urban drainage stream, there were "no directly observable effects of combined sewer overflows on the biological conditions of Sugar Creek" (R. 38).

LOCAL SEWER PROBLEMS

Bloomington has experienced sewer backups and basement and surface flooding. During the past four years it has spent over $1 million on flood reduction projects, has separated over 5,000 feet of combined sewers, and has corrected backyard flooding in

several neighborhoods. In 1983, Bloomington constructed two detention basins to intercept storm water and reduce combined sewer surcharging. To reduce basement flooding in the separate sewer areas, illegal downspout and drain tile connections are being disconnected. Bloomington also plans to spend $800,000 in additional flood control measures.

Normal also has attempted to address surcharging and basement flooding resulting from a development boom starting in the 1950's. Presently about 85% of the known private cross-connections, a major source of the backup problem, have been corrected. Some recent major surcharging incidents were caused by manholes left open during construction of a major trunk line as well as drainage into sewers left open during home construction were excavated basements filled (R. 51-54).

Both communities have sewer cleaning programs designed primarily to prevent sewer backups (R. 72, 74).

STREAM AND LAND USE CHARACTERISTICS

Sugar Creek is classified as a general use stream. It is not used for water supply and the only known secondary contact is for trapping. Because of lack of dry weather stream flow there are no recreational opportunities in the overflow areas.

Most of the channels in the urban area have been straightened, deepened, and often paved to increase capacity for storm water drainage, considered its primary use. Land use is mainly residential, commercial or underveloped. The Creek flows range from zero to as high as 4,000 to 6,000 cfs. A rain of one to two inches results in a flow of at least 1,000 cfs. (See Pet., ch. 9, Exh. B.)

There were no sludge deposits found in the Main Branch or major tributary creeks. Sludge deposits were noted in two open ditches between the Graham Street and West Slough Sewer outlets and the Main Branch. The only flow in these ditches is from the overflow from the sewer outlets. (R. 55-58.) The Proposed Alternate CSO Program includes construction of paved channels to eliminate low spots in the ditches.

CONCLUSIONS FROM MONITORING PROGRAMS

The monitoring program showed that four of the ten overflows accounted for 65% of the total observed.

Regarding DO, of the total 901 samples, there were 63 with DO less than 6 mg/l; in only 12 of these did an overflow occur less than five days prior to sampling. Since there was no evidence of sludge deposits, it is concluded that the DO readings are not correlated to CSO events. It does not appear that BOD is

significantly affected by CSO either. (R. 61, 62.) The District and the Agency asserted that no first flush study was done to determine overall quality and quantity of the CSO's because a) it would be time consuming and very expensive and b) the minimal impact on water quality from the existing overflows was evident.

JUSTIFICATION FOR EXCEPTION

The Agency, the District and the consulting engineers feel that exception to Rule 306.305(a) and (b) is warranted because a) there is minimal CSO impact on the stream, and CSO's do not restrict water use, b) the added cost of full compliance is prohibitively expensive and should not significantly improve water quality, c) the proposed alternate control program will provide benefits at a reasonable cost. (R. 63-64.)

THE RECOMMENDED ALTERNATE CONTROL PROGRAM

The District feels the various components of the recommended CSO control program correct or alleviate specific problems found in the studies. The controls are: (See Exh. 5.)

1. Construction of a grit chamber for the interceptor from the West Slough Sewer to discharge to the 51" Caroline Street interceptor. By alleviating the problem of grit deposition in the 51" interceptor, its capacity would increase by about 50%, resulting in an additional 10 mgd flow to the treatment plant and a proportionate decrease in CSO from the outlets along the interceptor. The estimated cost is $289,000.

2. Construction of paved bottoms in the two ditches, as described supra, p. 5. The estimated cost is $187,600.

3. Revisions to piping of the Sanitary Relief Sewer area to better utilize available capacities of two sewers (48" and Normal Valley) below this point. This would increase intercepted flow by 16 MDG (from 20 to 36 MGD) and reduce CSO frequency. The estimated cost is $96,700.

4. Various revisions to piping and adjustment of weirs to reduce CSO. Estimated cost is $23,900.

5. Construction of additional interceptor from the Normal Valley sewer area to the treatment plant to receive the additional flows from the piping revisions in 3) and 4) above. Available capacity will increase from 16 to 30 MGD. The estimated cost is $1,298,000.

The overall increase in District transport capacity by restoring the 51" capacity and construction the new interceptor is about 24 MGD, reducing overflows by as much as 1,200 MGD per year. Additionally, about 329,000 pounds of pollutant BOD materials will be removed.

The total cost of the alternate CSO program is estimated at $1,896,000. Compliance with the Board's regulations for CSO controls would, as stated earlier, cost $34,.7 to $39.3 million.

The total costs of all construction projects are: (R. 64-67)

Ammonia Control, Expansion and Upgrading	$14,677,000
Sludge Processing and Disposal	5,028,000
	$19,705,000
CSO Control Program	1,896,000
Total	$21,601,000

The taxpayer impact would vary considerably between financing the costs for a CSO program with and without an exception. The District has a general obligation bonding power (financed through property taxes) of $28 million. The total tax rate for all government bodies presently averages $5.25/$100 assessed valuation.

If the full $39.3 million for CSO controls is required, and a 55% federal grant (75% funding is unavailable) is obtained, financing the local share of $17.7 million would increase property taxes by $0.45/$100 assessed valuation over a 15 year period. If the alternate $1.9 million program is allowed, property taxes would increase $.044/$100 assessed valuation over a 6 year period. The full CSO program would increase total taxes by 8.6%; while the alternate CSO program would increase taxes less than 1%.

In addition, the local share of the costs of the sludge processing and disposal and ammonia controls will require an average tax levy over 15 years of $0.27/$100 assessed valuation.

Regarding annual operating costs, the full required CSO program is estimated to cost $363,000 versus the proposed alternate at $101,000. The increase in sewer rates would be $0.13 and $0.04/1000 gallons respectively. (R. 78-81.)

The District hopes to have its project design completed and approved as quickly as possible in order to be able to get federal funding in October, 1985. All funds for this and the upcoming federal fiscal year are already obligated (R. 83-84).

THE RESOLUTION

Based on the results of the comprehensive stream inspection and water quality data, and the biological survey, the Board concludes that the District's CSO's have a minimal impact on water quality and stream use. In addition to the District's proposed construction program, its post-construction program

of monitoring for three years the overflows, grit deposition, water quality, biological effects, and sewer flows can continue to assure that CSO impact will be controlled.

Given these circumstances, and the economic considerations - a savings of some $35 million - the District has persuasively shown that its alternate program approach is preferable to full compliance with the Board's CSO regulations.

The Board accordingly finds that the Petitioners have provided the justification for 1) the granting of an exception to 35 Ill. Adm. Code 306.305(a) and (b), and 2) the District's proceeding with the alternate program as proposed, outlined as conditions in the attached Order. While the Board is aware that these conditions have been agreed to, the Board will require execution of a certificate of acceptance, as the amendatory letter of May 17 lacks the District's signature.

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

ORDER

1. The Bloomington and Normal Sanitary District (District) is hereby granted an exception from 35 Ill. Adm. Code 306.305(a) and (b), subject to the following conditions:

   a) The District shall execute outlet channel improvements below West Slough and Graham Street combined sewer overflows as proposed on pages 17-1 and 17-2 of the BNSD Combined Sewer Overflow Study Phase III & IV report dated September, 1983 (Gr. Exh. 10, Exh. C).

   b) The District shall install operate and maintain the grit removal facility at the juncture of West Slough Sewer and the 51 inch interceptor as proposed in pages 17-2 through 17-5 of BNSD Combined Sewer Overflow Study Phase III & IV report dated September, 1983.

   c) The District shall complete the piping modification to sewer system in the vicinity of Overflow 013 as proposed in pages 17-4, and 17-6 through 17-8 of BNSD Combined Sewer Overflow Study Phase III & IV report dated September, 1983.

   d) The District shall complete the piping modifications to the sewer system in the vicinity of overflows 011, 010, and 009 and construction of a new interceptor from this area to the District's treatment plant grounds as proposed in pages 17-8 throught 17-11 of BNSD Combined Sewer Overflow Study Phase III & IV report dated September, 1983.

e) Subsequent to the completion of the grit removal facility and its being placed into operation, the District shall monitor the downstream interceptor once per month at representative manholes for a 12 month period to demonstrate effectiveness of grit removal facility in maintaining full transport capacity of the downstream interceptor. Upon completion of the monitoring period a report describing the results of the monitoring shall be submitted to the Agency.

f) The District shall maintain its current monitoring activities including a) inspection of overflows on a 5 day per week frequency, b) water chemistry monitoring at all Sugar Creek sampling stations except for 8 and 9 on a once per week frequency from April through October and a once every two week frequency from November through March with Stations 8 and 9 monitored daily throughout the year, and c) a biological survey of Sugar Creek on an annual basis. Biological surveys shall be performed during the late spring-early summer season. These monitoring activities shall be maintained for a period of 3 years following completion of conditions a) through d) above.

2. Within forty-five days of the date of this Order, the District 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, IL 62706. The forty-five day period shall be held in abeyance during any period that this matter is being appealed. 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 84-40, June 29, 1984.

_____
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 27th day of June, 1984 by a vote of 5-0.

Dorothy M. Gunn

Dorothy M. Gunn, Clerk
Illinois Pollution Control Board

ATTACHMENT II

CSO HYDRAULIC STUDY

FARNSWORTH & WYLIE, P.C.
ENGINEERS & SURVEYORS

2709 McGRAW DRIVE
BLOOMINGTON, IL 61704
PHONE 309/663-8435
FAX 309/663-1571

October 3, 1990

J. Michael Callahan
Executive Director
Bloomington-Normal Water
Reclamation District
West Oakland Avenue Road
P.O. Box 3307
Bloomington, IL 61702-3307

SUBJECT: Draft - BNWRD Overflow Study, 1990

This report outlines the results of a study of the network of interceptors and combined sewer overflows from Cottage Avenue to the 60" relief sewer at what is commonly called the Steak and Shake overflow and makes recommendations in order to minimize bypassing.

The purpose of the study of this area was to determine the proper settings for overflow controls to ensure that all interceptors in the study area are flowing at full capacity conveying wastewater to the treatment plant before overflows occur.

Plans of all previous sewer work were assembled and reviewed from which the attached schematic of the area of study was developed. Key details of the schematic were field verified. In addition, earlier combined sewer overflow studies and other data were reviewed and the schematic updated to include recent improvements.

A field inspection was conducted to inspect the general condition of all elements associated with the various overflows. Such items as gates, weirs, weir height, manholes and structures were inspected as closely as flow conditions permitted.

The following paragraphs summarize the findings of the field inspection of key points and recommendation for changes in overflow controls. (The overflow numbers used are the NPDES permit overflow designations.)

106 E. WASHINGTON
PONTIAC, IL 61764
PHONE 815/844-5571

309 W. MAIN ST.
CLINTON, IL 61727
PHONE 217/935-4551

007 Cottage Avenue

Weir Manhole is masonry - Condition Good

Weir is Brick & Mortar Sloping with flowline of manhole.

15" from south is reference. Weir is 0.55 feet above flowline of the 15" from south.

15" out north is 0.15 feet below 15" south inlet

8" out northwest is 0.35 feet below 15" south inlet. Weir is 0.70 feet above flowline of 8"

Note: A setting of 0.75 feet above the 15" inlet from the south should ensure that the 8" sewer flows full, minimizing bypassing.

Conclusion: Weir may be 0.20 feet low at 15" from south and 0.05 feet low at 8" out to northwest. Manhole should be inspected during overflow to see if 8" is full before bypassing.

008 West Branch

Weir Manhole - Concrete Condition Good

Weir is a combination of formed concrete bottom with adjustable aluminum notched plate. Good condition and level.

Outlet gate on 18" outlet to the west is in bad shape and should be removed.

33" from north is reference. Weir is 1.4 feet above flowline of 33" from north.

18" outlet to west is 0.05 feet below 33" north inlet flow line. Weir is 1.45 feet above 18" flow line.

Note: A setting of 1.57 feet above 33" should fill 18" outlet, minimizing bypassing.

Conclusion: Weir may be 0.17 feet low. Manhole should be inspected during high flows along with receiving manhole on south side of Sugar Creek to determine if, in fact, maximum flow is moving in 24" under creek before bypassing.

East manhole is ±1' below ground.

009 Normal Valley

Weir Structure - Concrete condition good to fair.

Weir is concrete which is in good condition, some old forms still remain.

60" from the east is reference. Weir is 1.45 feet above flowline of 60".

24" outlet is _____ below 60"

Note: The Weir elevation will minimize any bypass at existing elevation.

During inspection, the following was noted.

1. A piece of wood was across outlet with a buildup of detritus. This was causing a slight backup.

2. Overflow spillway has some spalling with reinforcement exposed. Cleaning, bonding, and new slab overlay is recommended before further damage occurs.

3. 60" sewer shows some signs of settlement or sag on top. This should be monitored.

4. Manhole access is buried.

010 Division Street Combined Sewer

Weir Manhole - Masonry Condition Good

Weir is concrete sloping with bottom of manhole

24" sewer from southeast is reference. Weir is 0.35 feet above 24"

8" out west is 0.25 feet below 24" southeast inlet.

16" out northwest is 0.40 feet below 24" southeast inlet. This 16" changes to 18".

Note: Weir height at 24" inlet is ±0.25 feet low. It should also be level in order to fill 8" and minimize bypassing. Also, the City has replaced the old 18" from the weir manhole to Sherman Street with a new 24" line.

011 1967 Main Interceptor

1. South Weir Manhole Condition Good

Weir has concrete base of ±8" with aluminum notched plate. Behind plate is a wood plug closing all but 8 or 9 inches of the 48" pipe.

48" from east is reference. Aluminum weir plate is 1.61 feet above flowline of 48" from east.

18" out west is same elevation as 48" from east and is equipped with an outlet gate

48" out northwest is same elevation as 48" from east.

2. North Weir Manhole Condition Good

No weir

48" from southeast is reference.

21" out west is 2.33 feet below 48" from southeast.

48" out northwest is same elevation as 48" from southeast.

Note: There is a 3"-6" layer of sediment in the 48" inlet pipe at the south manhole.

District should install 1.60 feet weir just downstream of 21" outlet in the north manhole.

Following installation of the weir, the wood plug at the 18" outlet in south manhole should be removed in total leaving only the original aluminum weir plate in place.

District should remove gate on 18" outlet at south manhole.

18" will then take first flow and 21" overflow from 18". Pipes will be at capacity before a bypass occurs with weir settings indicated above.

012 Division Street Combination and Relief Sewer

West 012A Weir Manhole Condition Good

Weir is a concrete channel on north edge of manhole with rectangular notch for overflow to relieve the 18" Division Street Combination Sewer.

18" sewer from east is reference. Weir opening is 1.0 feet above flowline of 18" from east.

18" sewer out west is ± the same as east 18" inlet.

36" relief sewer inlet from east is ±3.63 feet below flowline of 18" sewer from the east.

42" relief sewer outlet to the west is ±3.93 feet below flowline of 18" sewer from the east.

Note: Division Street 18" combined sewer connects to overflow 010.

Some road material is in 18" channel.

East 012B Manhole - Masonry Condition Fair

No weir - elevation of pipes control relief.

18" sewer from east is reference.

18" sewer outlet west is 0.06 feet below flowline of 18" from east.

12" bypass south to 36" relief sewer is ±0.40 feet above flowline of 18" from east.

There are also two inlets connected to manhole with 12" to the north and 12" to southeast.

013 Steak and Shake

Two weirs are in place across the 60" relief sewer. One downstream 15" outlet and one downstream of the 24" outlet. Structures are in good shape.

60" from east is reference. Weir behind 15" outlet is 1.67 feet above flowline of 60" sewer from east.

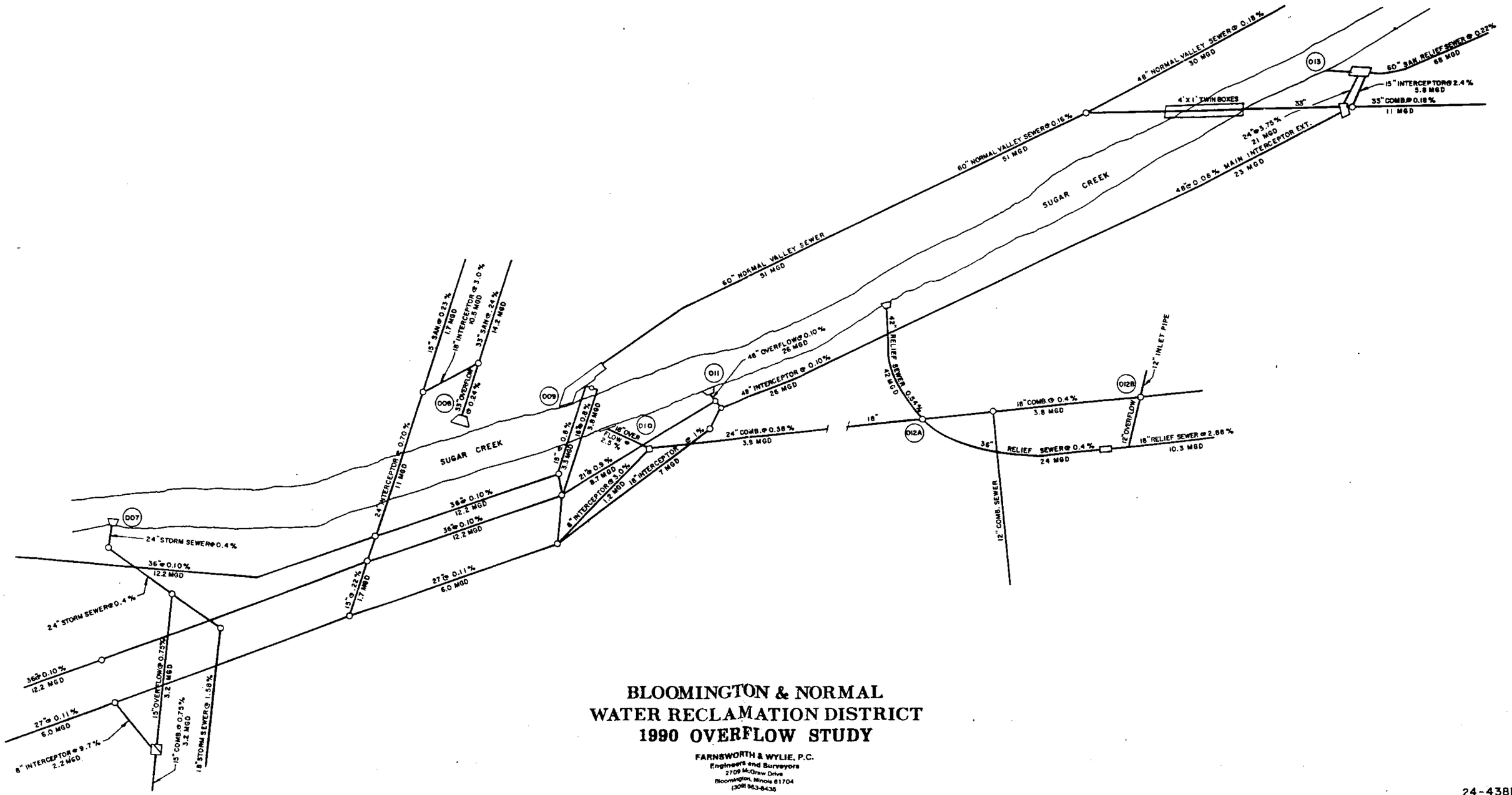
Weir behind 24" outlet is 3.05 feet above flowline of 60" sewer from east.

15" sewer outlet is ±0.08 feet below flowline of 60" flowline.

24" sewer outlet is = at the flowline of 60".

The location and height of weirs are such that the 15" will take first flow and 24" overflow from 15". Pipes will be at capacity before a bypass occurs.

Observation of flow at junction chamber indicated little or no flow in the 33" sewer to the north. Inspection of the junction manhole at the intersection of the 33" and the 60" Normal Valley sewer showed little or no flow from the 33" and a considerable build up of solids in the manhole. Cleaning of the sewer under the creek and maybe part of the Normal Valley is indicated.



BLOOMINGTON & NORMAL
WATER RECLAMATION DISTRICT
1990 OVERFLOW STUDY

FARNSWORTH & WYLIE, P.C.
Engineers and Surveyors
2709 McGraw Drive
Bloomington, Illinois 61704
(309) 663-8435

24-4381

ATTACHMENT III

OPEN CHANNEL
AND
INTERCEPTOR SEWER INSTALLATIONS STUDY

FARNSWORTH
&
WYLIE
P.C.

Engineers • Architects • Surveyors

BLOOMINGTON & NORMAL

WATER RECLAMATION DISTRICT

OPEN CHANNEL & INTERCEPTOR

INSTALLATIONS

APRIL, 1992

2709 McGraw Drive
Bloomington, Illinois 61704
Phone: 309 663-8435
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INDEX

LIST OF FIGURES

PURPOSE OF REPORT

The purpose of this report is to bring together all available data on the various construction activities except sewage treatment facilities of the Bloomington and Normal Water Reclamation District (formerly known as the Bloomington and Normal Sanitary District).

In 1989 the name of the District was changed to the Bloomington and Normal Water Reclamation District to more accurately depict its purpose. In this report the Water Reclamation District is referred to as the "District" or as "BNWRD" and the Town of Normal and City of Bloomington as "TON" or "Town" and "COB" or "City" respectively.

EARLY HISTORY

Sewage from the original sewer systems of Bloomington and Normal was discharged directly to Sugar Creek without treatment. Portions of each system also served parts of the other municipality.

In 1914 a complaint was filed by a downstream landowner with the former Illinois Rivers and Harbors Commission alleging that the waters of Sugar Creek were being polluted by discharges from both systems. After a public hearing the Commission issued orders against the City and the Town requiring that all discharges of raw sewage cease by September 1, 1916.

At that time there were no statutes allowing the erection of a jointly owned treatment facility or one city to provide treatment for another.

The order was amended to extend the time to April 1, 1917 to allow the cities to seek legislation permitting cities to organize Sanitary Districts for the disposal of sewage. The Legislature in 1917 enacted a "Sanitary District" Act providing, among other things, that contiguous territory containing one or more cities or towns, so situated that a common outlet sewer and treatment plant would conduce to the preservation of the public health could be incorporated as a Sanitary District. It also provided for organization, government and financing of the District. Neither the City nor the Town took immediate steps to organize a district.

In May, 1919 the Illinois Department of Public Works and Buildings investigated the situation and heard each municipality admit that conditions were bad, but each took the position that neither could do anything because of lack of funds. The Department issued a strongly worded letter which said that if steps were not taken to form a Sanitary District the Department would call on the Attorney General to bring such action in court as necessary to enforce the outstanding order. About this time several suits for damages were filed by downstream landowners.

Necessary preliminary steps were undertaken to organize a District and a referendum was held on November 9, 1919, which was approved 2368 to 104. The District was formed and the Board, after a year of study and planning, held a special election on November 2, 1920 for the purpose of voting on a bond issue of $800,000 and on doubling the annual tax levy. 4221 votes were cast in favor of issuing the bonds and 4221 votes against. The tie caused the defeat of the issue. The tax increase was defeated 4129 to 3672.

In December 1921 another bond issue of $400,000 to finance part of the work was defeated 3148 to 398.

During the next few years work was done on improving Sugar Creek using funds from annual levies.

In 1925 the Circuit Court ordered the abatement of the nuisance within twelve months. Voters in another election held in October, 1925 approved the issuance of $700,000 in bonds, 1818 to 256. Plans were completed and construction started in April, 1926.

More detailed information can be found in letter file "BNWRD, Organization of the District and Early History 1912-1932." This file also contains a copy of a thesis entitled "The Sewage Treatment Plant of the Bloomington & Normal Sanitary District" by J. J. Woltmann, Consulting Engineer for the District 1919-1952. This thesis was submitted to the University of Illinois in partial fulfillment of the requirements for the professional degree of Civil Engineer which was awarded to him in 1932.

OPEN CHANNELS

At the time the District was organized, Sugar Creek was an open sewer below Main Street in Normal. It was in poor physical condition with many pools of septic sewage in the summer time with resultant odor problems.

One of the first construction projects was to clean out Sugar creek from Six Points Road west of Bloomington upstream to Linden Street in Bloomington in order to provide a better means to "get raw sewage out of the Twin Cities". Since that time, there has been an ongoing program to improve both the main channel and its tributaries, most of which receive overflows from the old existing combined sewer systems as well as stormwater.

The channels have, over the years, been called various runoff branches of Sugar Creek even though some have other names. In descriptive material, the alternate names have been included.

Bridges over the various channels have been constructed by the City, the Town, the District, State of Illinois, Bloomington Township, McLean Co. and various railroads. During early construction on the Main and North Branches, existing street bridges were replaced as joint ventures between the District and either the City or the Town with the District paying for the estimated cost for a structure to restore the crossing to its former usefulness and the municipalities paying for any additional cost for widening, sidewalks and other improvements. As other

ditches were cleaned or relocated, the District for the most part, provided new structures.

There has been no overall pattern for District participation in structure costs. Decisions were made on a case by case basis.

Included with descriptive material on each channel is a listing of structures with known information of ownership and listing of plan file numbers available in F&W files.

For the most part, the District purchased permanent rights-of-way or took title to the land required for construction. In some cases when extra land was purchased, in order to not leave small tracts remaining, the excess property was later sold to adjoining owners.

The F&W file locations of right-of-way plats are noted where available. It is a good idea to check McLean County Abstract Company and Law and Justice Center records to determine the actual description used for purchase and whether subsequent land transfers were made. The District has on file the original documents for the purchases filed by project and grantor names.

MAIN BRANCH

Most of the early improvements were made with very sketchy plans. No attempt has been made to include a complete listing of their early plans for the work. Instead, the branch has been divided into sections and salient data given for each section including plans for latest improvements where available. Improvements to two tributaries were also made to provide better outlets for sewer overflows.

Six Points Road to Sewage Treatment Plant

1925 When the creek was cleaned out and straightened the property downstream from the plant was owned by the Nord Family and a permanent easement was purchased by the District.

1925-1983 The Nords leased and/or sold the adjacent land to McGrath Sand and Gravel Company. The District also sold its easement to McGrath. After McGrath ceased operations, the Nords started a landfill in the area. During the McGrath & Nord operations, the creek channel was shifted many times to facilitate gravel removal and landfill operations. The District performed no maintenance operations during this period.

1984 Plans were prepared for reconstruction of the creek in the area and the construction of a storm water detention basin. No construction has been performed.

Plans

1984 Six Points Road to I-55 & 74 Div II 24-3019, 1

Nord Detention Basins 24-3019, 3

Right-of-Way

1984 Nord Farm (Not purchased) 24-3019

McLean County Landfill (Not purchased) 24-3019

Bridges

McGrath (Nord) West of I-55 - 1928 - BNWRD Abandoned 18-80 when District sold land to McGrath

I-55 State of Illinois

Sewage Treatment Plant Site

1983 An existing borrow pit between the creek and the ICG Railroad was converted to a detention basin.

1985 The creek on site was improved as part of sewage treatment plant improvements.

Plans

1983 Detention Basin No. 1 24-3019, 2

1985 Sewage Treatment Plant Improvements 24-3375

Bridge

ICG RR - Railroad

Plant to Washington Street

1944 The creek was cleaned and straightened

1987 Plans were prepared for improvements of the creek but no construction has been done.

Plans

1944 24-226-13

1987 24-3019

Right-of-Way

1987 Stark (Not purchased) 8-S-1578

Parker (Not purchased) 8-S-1578

Bridges

Wasington Street - McLean County

Plans have been prepared for replacement as joint project of COB and McLean County.

Washington Street to Market Street

1989 Creek cleaned and reconstructed.

Plans

1989 Sugar Creek Phase III Improvements - Market Square 24-3019

Right-of-Way

1989 24-3984

Bridge

Market Street - (Route 9) State of Illinois

Market Street to Cottage Avenue

1981 This section was cleaned and reconstructed as a joint project of BNWRD and COB, who shared equally in the costs. BNWRD maintains the section from Market Street to Route 150 and COB the section from Route 150 to Cottage Avenue.

1982 A sanitary sewer siphon was constructed by the COB under the creek just west of Cottage Avenue bridge.

Plans

1981 Sugar Creek Improvements Market to Cottage	24-2724
1982 COB Cottage Avenue Sewer Scott Estate	24-2930-20

Right-of-Way

1981 Rowe 3 plats	24-2724
Other plats	8-S-1404

Title to easements from Market to Rt. 150 is in the BNWRD and from Rt. 150 to Cottage in the COB.

Bridges

Forrest Street - Bloomington Township Abandoned in 1946

N&W Railroad - Railroad

Route 150 - State of Illinois

Cottage Avenue - 1938 - BNWRD 24-182

1968 Replaced by COB 159B-TR,

Normal Township 112B-TR & McLean County SB4-71

Cottage to Adelaide

1946 This section was cleaned out and some bank protection pilings were installed.

Plans

1946 Cleanout	24-226,13-17
Bank protection	24-226,19-20

Rights-of-Way

1925 - Letter File "BNWRD Open Channel Sugar Creek Cottage to ICG RR west of Main ROW 1925"

Bridge

Adelaide Street - 1928 - BNWRD & TON 18-32 & 18-79

1944 Replaced by TON 24-227

Adelaide to ICG Railroad West of Main St.

1946 This section was cleaned out and channel pavement was installed from ICG Railroad west 500± feet.

1980 600 feet of pavement constructed west of 1946 pavement.

Plans

1946 Cleanout 24-226,13-17

Pavement 24-226, 18

1980 Pavement 24-2724

Right-of-Way

1925 Plats Letter File "BNWRD Open Channel Sugar Creek Cottage to ICG RR West of Main ROW 1925"

Bridges

Bloomington Waterworks Foot Bridge - 1923 BNWRD - Abandoned 18-28

ICG Railroad - Railroad

ICG Railroad West of Main to ICG Railroad East of Clinton

1935-1946 This entire section was paved, part by WPA in 1935 and part in 1946 by contract.

Plans

1935-1939 WPA work — No Plans

1946 Virginia to Fell — 24-226, 23

Right-of-Way

Plats Letter File "BNWRD Open Channel Main and North Branches ICG RR to ICG RR ROW 1925"

Bridges

Kingsley Street (Rt. 51) - 1976 - State of Illinois

Main Street (Rt 51) - State of Illinois

Main Street Sidewalk Bridge - State of Illinois

Virginia Avenue - 1923 - BNWRD & TON (tracing missing) 24-10

University Street - 1923 - BNWRD & Ton (tracing missing) 24-11

Franklin Avenue - 1923 - BNWRD & TON 18-37 & 18-38

1940 - TON Deck Replaced 24-227

Illinois Wesleyan Athletic Field - 1973 - University

Fell Avenue - 1908 - COB

Clinton - 1910 - COB - COB preparing plans for replacement

ICG RR - Railroad Abandoned

ICG Railroad to Country Club Branch

1968 The ditch was paved and bank protection installed.

Plans — 24-979, C1-C4

Right-of-Way

Plats — 8-S-678

Country Club Branch to Ewing Park

1981 The creek upstream of the Country Club Branch was paved to Ewing Park as a joint project of the TON and COB. Each maintains that part of the creek lying within its corporate limits.

Plans 24-2503

Right-of-Way

Worksheet - Bloomington C.C. Branch to Maplewood Subdivision & R-1018

In Maplewood located on Lots dedicated with Subdivision

Bridge

Maplewood 1958 - TON 24-357

1981 Abutments Reconstructed 24-2503

Ewing Park & Upstream

COB and TON each maintain that part of the creek lying within its corporate limits.

WEST SLOUGH (Tar Creek)

1925 The creek was cleaned out to provide an outlet for overflows from West Slough Box Sewers.

1985 The creek was paved the entire length from Caroline Street to the Main Branch.

Plans

1985	24-3358, 12, 14-16

Right-of-Way

1985 Stark	8-S-1656-4,1&2
Faber	8-S-1256-4A
Thomson	24-3374

GRAHAM STREET SEWER OUTLET

1925 The creek was cleaned out to provide an outlet for overflows from the Graham Street Sewer.

1985 The entire creek was paved from sewer outlet to the Main Branch.

Plans

1985	24-3358, 12-13

Right-of-Way

1985	24-3287

WEST BRANCH (Pheasant Creek)

1947 The existing West Branch channel was relocated and improved from the Main Branch to Gregory Street. The channel was paved from 125 feet South of Hovey Avenue to 100' North of the outlet of the TON Cypress Alley Sewer on Illinois State University property.

Note ISU agreed to mow slopes of West Branch from College to Gregory in a letter from Preston Ensign, Business Manager, January 14, 1962. This does not apply to maintenance of concrete pavement.

1989 The ditch was cleaned and reshaped from Hovey Avenue south to the Main Branch, the pavement was extended 70 feet, energy dissipators were installed, and tile outlets were riprapped.

Plans

1947 24-226, 26-27

1989 on 24-3553

Right-of-Way

1947 Plats "Letter File BNWRD Open Channels West Branch ROW 1947"

1989 24-2420

8-S-916

Bridges

Hovey Avenue - 1946 BNWRD 24-226, 28

Adelaide St. - 1955 TON 24-417

College Avenue - 1980 TON Sec 80-117-00-BR MFT 24-2673, 1

ISU Campus

Double Box - 1963 ISU
Plans - Lankton, Ziegle & Terry, Peoria
Pedestrian Bridge - 1968 ISU
LZT Plans - See letter file "BNWRD Open Channel West Branch ISU Foot Bridge 1988"

Gregory Street - 1970 TON 68 BIBCS MFT 24-1382

NORTH BRANCH

1925 The North Branch was cleaned out from Main Street to Linden Street.

1946 The creek bottom was paved from Main Street to the ICG Railroad.

Right-of-Way

The District purchased permanent right-of-way from Main Street to the ICG Railroad. No purchases were made from the railroad to Linden Street. Plats in Letter File "BNWRD Open Channels Main & North Branches ICG RR to ICG RR 1925."

Bridges

University Street 1925 TON and BNWRD	18-33
Franklin Avenue 1925 TON and BNWRD	18-36
1925 Sidewalk Bridge	18-38
Glen Avenue 1923 TON and BNWRD	18-31
Fell Avenue Original TON	
New Deck TON 91-B-CS	24-1816
Broadway 1925 TON and BNWRD	18-56
1925 Sidewalk Bridge	18-53
Linden Street 1925 TON and BNWRD	10-35
1925 Sidewalk Bridge TON and BNWRD	18-34
1951 Deck Replacement TON 19-CS	24-304
1961 Deck Widened TON 42-CS	24-806

PAYNE'S PLACE OUTLET

1946 The 64th Illinois General Assembly appropriated $200,000 for the state's share of the cost of improving the Town of Normal Sewer & Drainage System for the prevention of floods affecting ISNU. At this time both Town and District had G.O. Bond issues covering various sewer and open ditch projects in the community.

An agreement between the State, Town and District provided the division of projects to be constructed by the Town and District and the allocation of state funds. See Letter File "BNWRD Open Channel Payne's Place Construction 1946-7" for particulars.

One of the projects was for an "open ditch" between Vernon Avenue and BNWRD Ditch. A 1947 agreement between the Town and District provided:

1. Town to obtain all necessary easements.

2. BNWRD to provide engineering services and construct a closed sewer from Vernon Avenue to a point 235 ft. south of the center line of Vernon Avenue and a paved ditch from there to outlet to the North Branch west of Franklin Avenue.

3. Town to assume the "construction maintenance of the entire sewer and water course."

4. District to maintain open ditch including mowing of weeds and grass, the clearing away of all debris and other necessary maintenance, but not including construction or maintenance repair.

For further particulars see Letter File above.

1946 Paved from Payne's Place Box Sewer South to North Branch.

Plans

1946 24-226, 32

1950 Proposed Extension Hovey to ICG RR (not built) 24-280

Right-of-Way

1942 TON has copies of Right-of-Way documents.

Plats are in Letter File "BNWRD Open Channel Payne's Place ROW."

COUNTRY CLUB BRANCH

1947 The existing ditch was relocated and reconstructed from the Main Branch South of Emerson & East of Linden Street, south to north side of the arch culvert at Empire-Colton intersection. The ditch is paved its entire length. District owns and maintains this section.

1948 COB paved the ditch from Empire to Locust

1980± COB enclosed the ditch from Locust to Towanda

1989 Ditch enclosed by School District 87 and COB from Empire to Locust

Plans

1947 Ditch Construction & Paving 24-226, 33

1948 Ditch Construction & Paving Warren and Van Praag - Plans at COB

1980± Box Sewer Plans at COB

1989 Ditch Enclosure 24-4003

Right-of-Way

1947 Strip Map 24-261

Plats - Letter File "BNWRD Open Channel Country Club Branch ROW 1947"

Bridges

Emerson Street - 1946 BNWRD 24-226, 37

Eastholm St. - 1946 BNWRD 24-226, 35

Marion St.-Rosney - 1946 BNWRD 24-226, 34

N-S Alley E. of Eastholm - 1946 BNWRD 24-226, 36

Empire St. COB

Wingwalls to north & Barrel Extension to south COB -

1947 Warren and Van Praag Plans

HIGHLAND PARK BRANCH (Goose Creek)

1927 In connection with the construction of the original sewage treatment plant, a portion of the creek on the site was enclosed in a 7'-10' box to facilitate use of the site. The outlet to the Main Branch was paved.

1934-37 The channel from the plant to Main Street was straightened and cleaned out as a WPA project. Ditch checks and four farm bridges were constructed but no paving was done.

1971 Channel through Willow Creek Mobile Home Park from Alexander Road to the ICG railroad was cleaned out and banks sloped by the Developers.

1975 An additional 7' x 10' box was constructed on the plant site, the outlet paving was widened and the inlet channel was widened and paved 250 feet upstream.

1985 The remainder of the channel was paved to Oakland Avenue on the plant site.

1985 COB constructed a detention basin in Highland Park Golf Course.

1937-1990 No other major work was done on the creek except for isolated maintenance, repairs to washouts and installing riprap.

Plans

1927 Box Sewer and paved channel on STP site	30-12, 27
1934-37 No formal creek plans	
Bridges	18-136
1971 Willow Creek Improvements	24-1599 & 24-1685

1975 STP Plans 24-2000

1985 STP Div. D 24-3566, 15

1985 Highland Park Detention Basin at COB

Right-of-Way

1934 District obtained permission to repair and reconstruct ditch from property owners. There was no exact description of location of creek. Four farm bridges were built for owners as part of consideration but District did not agree to replace bridge damage at a later date. All easements contained a section giving the District permission to discharge water from another watershed carried by the Big-Four Valley Relief Sewer into the creek. See Letter File "BNWRD Open Channel Highland Park Branch ROW 1934."

1971 Willow Creek Mobile Home Park ROW dedication 8-S-791

24-1685

Bridges

Oakland Avenue - McLean County

Alexander Road - 1986 Bloomington Township and McLean County

Farm Bridges - 1936 Chambers, Knuth, Pelz, & Woisocky properties 18-136

Hinshaw Avenue - Bloomington Township Sec 80-05119-00-BR 24-895

Butcher's Lane - Bloomington Township

Morris Avenue - State of Illinois

Forrest Park - BNWRD 1945 24-223

Springfield Road - COB

Highland Park Golf Course - COB

Skunk Creek

Skunk Creek outlets to the west side of the Main Branch south of Market Street. It provides an outlet to the area lying generally west of Cottage Avenue North of Hovey Avenue in Normal. The District has never made any improvement to the creek or acknowledged any responsibility for its maintenance.

MAIN INTERCEPTORS ALONG MAIN BRANCH OF SUGAR CREEK

Main Sewers

General: Original interceptor construction required extension of existing TON & COB outlet sewers. Main Interceptors are discussed as a group and lateral sewer descriptions follow in the text. Additional lateral sewer revisions were also construction in 1965 & 1985.

1926-1927 BNWRD constructed the first 51"-27" Main Interceptor discharging to the sewage treatment plant from the plant Northwesterly along the general route of the Main Branch and lying east and south of the creek to a point on the south bank opposite the outlet of the Normal Valley Combined Sewer west of Adelaide Street. This sewer went through the eastern part of St. Mary's Cemetery South of Washington Street. The 51" and 36" portions of the sewer were constructed of segmental blocks.

1965 A 36" Second Main Interceptor was constructed from the STP to the upper end of the 1926 Main Interceptor. The route bypassed the cemetery to Washington and Caroline Street then followed the 1926 sewer route. A 48" sewer was constructed from the upper end of the 36" sewer easterly along the South bank of the Main Branch to the east side of the ICG railroad and a new junction box for the Kelsey and Sanitary Relief Sewer flows was constructed. This box was replaced in 1987. See information in later text.

1987 A 42" & 36" Third Main Interceptor was constructed along the same general route as the 1965 sewer to the upper end of the 36" 1965 sewer.

1988 That portion of the 51" 1927 First Main Interceptor on Caroline Street between the south side of Washington Street and the south side of the West Slough junction chamber was removed and replaced with 48" pipe. The 36" sewer from the junction chamber north to 100 ft. south of Market Street was replaced with 36" concrete pipe and the existing sewer filled with cement grout.

1992 Approximately 90 feet of the 51" First Main Interceptor under the Conrail RR adjacent to the south side of Washington Street will be replaced with 48" pipe.

Plans

1926 - Profile of First Main Intercepting Sewer	R-1136
Topographic Map of Sugar Creek Valley shows routes of 1926 & 1944 Sewer	30-13
1965 36" & 48" Second Main Interceptor Plans	24-979
1987 42" & 36" Third Main Interceptor Plans	24-3358
1988 51" & 36" Caroline Street Sewer replacements	24-3358
1989 51" Sewer under Conrail Replacement	8-M-664

Rights-of-Way

1926 Letter File "BNWRD Sewers Main Interceptor ROW 1926"	
1965	8-S-475
1987	8-S-1656-1-23 24-3565

Wood Street Sewer Outlet

1928 Extended existing 20" and 24" COB sewers outletting in East ICG Railroad ditch 800± feet South of Oakland Avenue with 33" to 54" pipe to Main Branch in the STP site. Dry weather flow discharged to 51" First Main Interceptor.

1975 Intercepting chamber revised.

1987 Intercepting chamber revised.

Rights-of-Way

Plats are not in Farnsworth & Wylie files

Plans

1928 Sewer & Structure	18-81
1965 Structure revisions	24-979, 138
1987 Structure revisions	24-3358, 8

West Slough and Orchard Lane Sewers Outlet

1927 The COB West Slough and Orchard Lane Sewers were extended 150± feet west to a junction box at Stillwell Street and the LE&W railroad. Twin 7'3" x 8'0" box sewers were constructed from the junction chamber west to an outlet to Tar creek on the west side of Caroline Street. In the junction chamber all dry weather flow was diverted to the South box. At Caroline Street dry weather flow was diverted to the 51" interceptor.

1947 A third 7'3" x 8'0" box was constructed abutting the north side of the twin boxes from Caroline Street to the junction chamber which was revised. COB constructed additional Orchard Lane and West Slough Outlet Sewers easterly from the junction chamber.

1964 Revised outlet structure when Second Main Interceptor was constructed.

1987 Revised outlet structure when Third Main Interceptor was constructed.

Plans

1927 Original twin box and chambers	18-66, 1-5
1947 Additional box	24-226, 2-4
1964 Revised outlet structure	24-979, B9
1974 Revised outlet structure	24-3358, 9-10

Rights-of-Way

Plats are missing from Farnsworth & Wylie files

Graham Street Sewer Outlet

1927 A 60" sewer was constructed from the COB Graham Street Sewer outlet on the west side of the LE&W railroad to the Main Interceptor with an overflow structure and outlet channel to the Main Ditch.

1947 An additional 60" sewer was constructed 15 feet south and parallel to the 1927 sewer to connect to a new 60" sewer constructed by the COB. A junction structure and 50 feet of outlet paving were constructed.

1964 Revised outlet structure when Second Main Interceptor was constructed.

1987 Revised outlet structure when Third Main Interceptor was constructed.

Plans

1927 Structure	18-66, 1-6,7
1947 Sewer extension and structures	24-226, 11,12
1964 Outlet structure revision	24-979, B
1987 Outlet structure revision	24-3358, 11

West Branch Sewer Connection

1965 Interceptor connection was revised when Second Main Interceptor was constructed.

Plans

1965 Interceptor Line Number 1	24-979, B-7

Normal Valley Sewer Outlet

1925 The TON built an outlet structure on the north bank of the Main Branch.

1927 A connection was made from the outlet structure to the upper end of the 27" First Main Interceptor.

1965 The connection to the First Main Interceptor was revised when Second Main Interceptor was built.

1985 The connection to the Interceptor was revised when Third Main Interceptor was built.

Right-of-Way

1927 and 1946 - Plats are missing from F&W files

Plans

1925 Outlet structure	18-45
1927 Connection to Interceptor	18-66, 8
1965 Connection to Interceptor	24-979, B6, B10
1985 Connection to Interceptor	24-3358-5,6

Division Street Sewer Outlet

1925 The Division Street Sewer which discharged to the Main Branch at Adelaide Street was extended with 18" pipe to discharge near the upper end of the First Main Interceptor. Dry weather flow was diverted to the First Main Interceptor.

1965 New connection provided to Second Main Interceptor.

Plans

1925 Division Street Sewer Extension	18-24
1965 Connection	24-979, B7

Right-of-Way

Plats missing from F&W files

Normal Valley Sewer at ICG Railroad

1925 A retaining wall was constructed to protect the TON 48" brick sewer at the North Railroad abutment.

1933 Part of the sewer washed out under the railroad and was repaired.

Plans

1925	24-12, 2
1933	18-133

Kelsey Street Sewer Outlet

1922± The COB 48" brick sewer which starts at Kelsey Street near the Illinois Wesleyan University stadium and flows northwesterly crossing under the ICG railroad and the Main Branch and connects to the Normal Valley Sewer West of the railroad. When the original deepening and straightening of the Main Branch was constructed, the top of the sewer was above the bottom of the creek. A double 12" x 48" box section with transition sections was constructed with the box top at the flow line of the creek.

1947 The dry weather flow from the BNWRD Sanitary Relief Sewer was diverted to the Kelsey Street Sewer.

1956 When the 48" Second Main Interceptor was constructed to the site, all of the flows in the Kelsey Street Sewer and the diverted flow from the Sanitary Relief Sewer were discharged to the new 48" and the connection to the Normal Valley Sewer was abandoned. The intercepting connection to the Sanitary Relief Sewer was enlarged.

1987 A new junction structure was built to reactivate the connection to the Normal Valley Sewer so that sewage flows to both

the 48" and Normal Valley Sewers. An additional intercepting line was built to the Sanitary Relief Sewer.

Plans

1922 Kelsey Street Sewer Outlet Revisions	24-12, 2
1947 Sanitary Relief Sewer	24-226
1965 Junction Structure	24-979, B7
1987 Junction Structure	24-3358, 11

Right-of-Way

1965	8-S-475

WEST BRANCH SEWERS

1934 - BNWRD West Branch Sanitary Sewer This is a 15"-8" sewer built as a WPA project to serve the McLean County Fairview Sanitarium (Building adjacent to northeast corner of Normal's Fairview Park now used by the McLean County Health Department). This sewer was built generally following the route of the West Branch before it was reconstructed and relocated. A portion of this sewer was repaired in 1988 where it crosses the West Branch between Hovey and the Main Branch. This sewer was the first sewer constructed in the twin cities as a sanitary sewer. The storm water connection ordinance was not generally enforced and many footing drains were connected to laterals of this sewer. A portion of this sewer passes under the ISU General Services Building.

1960 - TON West Branch Sanitary Relief Sewer This 33"-24" sewer was constructed from the Main Interceptor at the Main Branch north along the east bank of the West Branch to Eastview Drive. This sewer was inter-connected with the BNWRD sewer north of Oakdale school and 100' east of Adelaide St. The BNWRD Sewer was abandoned between these two points.

1962 - TON West Sanitary Sewer Interceptor 24"-18" sewer constructed from Eastview Drive to Fairview Sanitarium. It was later extended north by TON as "North Sewer" across I-55.

NOTE District agreed to Maintain TON Sewers from Fairview south.

Plans

1936	BNWRD West Branch Sanitary Sewer	24-130
1960	TON West Branch Sanitary Relief	24-702, 9-11
1962	TON West Sanitary Sewer	24-855, 2-3
1968	TON North Sewer	24-1384, 8
1988	West Branch Sewer Repair at Sugar Creek Crossing S. of Hovey	18-773

Right-of-Way

1934 - Letter File "BNWRD Sewers West Branch Sewer ROW 1933"

1960 & 1962 Sewers were constructed in West Branch Creek ROW to Gregory Street

Beyond Gregory - TON 85-706

SANITARY RELIEF SEWER

1947 This 60"-42" combined sewer starts on the south bank of the Main Branch at the east side of the ICG railroad and runs east along the Main Branch to the Country Club Branch and then south along the west bank of the Country Club Branch to the Colton-Empire intersection. It was extended by the COB in 1948 to the Southeast.

The dry weather flow was diverted near the outlet to the 33" brick Kelsey Street Sewer which connected to the Normal Valley Sewer on the North bank of the Main Branch.

1965 A 48" sewer was constructed from the upper end of the Second Main Interceptor west of Adelaide Street east along the south bank of the Main Branch to connect to the Kelsey Street Sewer. The connection to the Normal Valley Sewer was plugged and all intercepted sewage was carried by the new 48" sewer. The connection from the Sanitary Relief Sewer was enlarged.

1987 A new junction chamber was constructed and the connection to the Valley Sewer reactivated so the flow is either to the Valley Sewer or the 48" sewer. An additional intercepting connection was provided from the Sanitary Relief to the new junction chamber.

Plans

1947	Original Construction	24-226, 5-9
	COB extension Warren & Van Praag Plans at COB	
1965	Junction Revisions	24-979, B-7
1987	New Junction Chamber	24-3358, 11

Right-of-Way

1947 Sewer constructed within creek ROW.

1965 Junction Chamber 8-S-475

EAST RELIEF SEWER

1970-1972 A 48"-36" sewer was constructed from a connection to the BNWRD Sanitary Relief Sewer at the Southwest corner of the intersection of the Main & Country Club Branches northeasterly along the south & east banks of the Main Branch to the east ROW line of Veteran's Parkway. This sewer was extended east across Veteran's Parkway by COB.

The sewer to Veteran's Parkway was constructed as a cooperative project by BNWRD, TON and COB. The salient points of the tri-party agreement are:

1. BNWRD maintains and controls sewer
2. All connections must be approved by District
3. Cost share was BNWRD $100,000, TON 25% and COB 75% of remainder
4. Allocated capacities are:

   48" and 42" sewers COB 70%, TON 30%

   36" sewers COB 75%, TON 25%

A copy of the Agreement is in letter file "BNWRD Sewers East Relief Sewer 1973."

1970 TON constructed the portion of the sewer lying between Vernon Avenue and Veteran's Parkway as Normal Southeast Sanitary Sewer. At this time, a temporary Pumping Station was installed discharging to the existing TON SE interceptor. This pumping station was abandoned after BNWRD constructed the sewer below Vernon Avenue in 1972.

NOTE: COB GE sewer & TON SE Interceptor are cross connected to this sewer just west of Ewing Park.

Other Sewers Along Same General Route

1954 - COB GE Sewer 24"-18" sewer follows the same general route to Vernon Avenue then runs east on the north side of Vernon Avenue-GE Road to the General Electric Plant. This sewer is subject to high rates of infiltration through joints which were an early bituminous type which are no longer used.

1959 - TON SE Interceptor This 12" sewer follows the same general route to Jersey Avenue. It was abandoned when the East Relief sewer was constructed.

Historical Note The TON was permitted to connect the Maplewood Subdivision sewers to the 24" COB G.E. sewer and the TON contributed to the cost of the outfall sewer. The COB balked at connection of Robinwood Subdivision sewers (north of Jersey & west of the creek) so the TON built the SE interceptor as an outlet.

Plans

1970	Southeast Sanitary Sewer - Vernon to Veterans Parkway	24-1667, 4-7
1972	East Relief - Sanitary Relief Sewer to Vernon	24-1775
1954	COB G.E. Sewer	24-364
1959	TON S.E. Interceptor	24-691

Right-of-Way

Right-of-way for East Relief dedicated to BNWRD.

Plats 8-S-911

HIGHLAND PARK SEWERS

1935 A 24"-15" sanitary sewer was constructed by WPA forces from the sewage treatment plant to East Main Street then south to Greenwood Avenue (Veteran's Parkway).

1971 COB built sewer from Main Street east to Bunn Street. The force main from the COB Ireland Grove Pumping Station discharges to this sewer.

1975 A 48"-27" Interceptor was constructed from the sewage treatment plant to Main Street generally parallel to the 1936 sewer. This sewer was extended to the east by the COB as the Bunn Street Trunk Sewer.

Plans

1935	Location Plan	24-140
	Plans	24-145
1971	COB Bunn Street Trunk Sewer	24-1752
1975	Interceptor	24-2000, B6-B11

Right-Of-Way

1935	Work Sheet	18-119
	Plats - Letter file "BNWRD Sewers Highland Park Sanitary Sewer ROW 1935."	
1975	Plats	8-S-1120

Miller Park Lateral

1936 A 12" sewer was constructed on Morris Avenue to the bath house area in Miller Park. It was connected to an existing sewer which was connected to an Imhoff tank which discharged to Highland Park Creek. The Imhoff Tank was abandoned and filled.

Plans 24-145

Right-of-Way

Construction Permit from State of Illinois for work along Morris Street (SB1. Rt. 4). See letter file above.

FAR WEST SEWERS

1960± COB built a 12" sewer along the south side of Market Street to serve the area between the Main Branch and I-55 & I-74. It discharges to a pumping station on the west bank of the creek the station discharges to an existing sewer which empties into the BNWRD Main Interceptor system at Caroline Street.

1968 An agreement was signed by BNWRD, COB, and TON to provide sewer services to the Far West sides of COB & TON by the construction of a sewer from the Sewage Treatment Plant north to a point 4600± feet north of Market Street to a proposed lateral "F" to be constructed by the TON Northeasterly. The provisions of the agreement provided:

1. The TON to build a 24" sewer from the existing COB Market Street pumping station West along the South side of Market Street to the East side of Skunk Creek, and a 36" & 30" sewer North 4600 feet to lateral "F".
2. BNWRD to take over the Market Street Pump Station from COB and increase capacity by increasing motor speed and enlarging impellers to maximum size.
3. BNWRD to construct a 36" sewer from Market Street south to the Sewage Treatment Plant when funds became available.
4. BNWRD to continue to operate the pumping station after sewer construction to the plant since all Market Street area east of Skunk Creek would still be served by the station.
5. BNWRD to maintain the entire sewer from plant to lateral "F".

6. BNWRD to approve all connections to sewer (see agreement for allocation of capacity).

1968 TON constructed its portion of sewer and BNWRD increased pump capacity.

1976 BNWRD constructed sewer from plant to Market Street.

Plans

1968 TON West Sewer	24-1384, 3,4
1976 BNWRD West Sewer	24-2000, B3-B7

Market Street P.S. - COB Market St. Sewer - Crawford, Murphy & Tilley plans at COB office. See F&W correspondence file "BNWRD Sewers Market Street (Rt. 9) Pump Station."

Right-of-Way

1968 Market Street North (TON)	8-S-707
1976 STP to Market Street (District)	8-S-1121

BIG FOUR VALLEY RELIEF SEWER

1935 A 72" sewer was constructed to divert some storm water entering the COB Big Four Valley Sewer at its upper end on the west side of the Illinois Central railroad (later Illinois Central Gulf) east of the Lincoln & Bunn St. intersection.

The sewer extends from a junction chamber with the Big Four Valley Sewer southwesterly and discharges into the Highland Park Branch in Highland Park Golf Course southeast of the pro shop. The sewer was built partially in tunnel.

Since water was taken to another watershed, when ROW easements were obtained for improvements to the Highland Park Branch, specific permission was obtained from each property owner for discharge of storm water from another watershed. Eventually, discharges from both the Big Four Valley Sewer and this Relief Sewer reach the Main Branch of Sugar Creek, but at different locations.

1941 The sewer was extended to Oakland Avenue & Meadows where a cross connection was reported to have been constructed by the COB between this sewer and the COB sewer on Oakland Avenue. A lateral was built on Maizefield from Meadows to Oakland. The COB extended this sewer in the late 1940's.

1987 A study was made by Harza Engineering Company on the effect of the Highland Park Detention Basin on the discharge capacity of the Valley Sewer under various outflow conditions. It is on file at the District and F&W BNWRD Baker Street Detention file.

1988 The walls of the junction chamber at the upper end of the sewer were raised 4 feet± to help relieve flooding downstream due to overflows from the chamber.

1991 A detention basin has been designed for the Baker-Ash area upstream from the inlet to the Valley Sewer. It was constructed in 1991 as a joint project of the COB and District.

Plans

1935 - General Location Plan	8M-19
Construction	24-152
1941 Extension to Oakland & Meadows	24-181
1941 Extension Maizefield Meadows to Oakland	18-154
1988 Junction Chamber Revisions	24-3741
1991 Baker-Ash Detention Basin	24-4164

Right-of-Way

Right-of-Way for that part of sewer constructed in tunnel covers only the space occupied by the sewer with no surface rights. Plats are filed in "BNWRD Big 4 Valley Relief Sewer and Extension ROW 1935" letter file.

Baker-Ash Detention Basin purchases 24-4124

PAYNE'S PLACE SEWER

1947 A 4'3" x 7'0" box sewer was constructed from an existing culvert across Vernon Avenue south through Payne's Place to approximately 200 ft. south of Hovey Avenue, discharging to an open ditch 450' north of the North Branch. Existing street crossing culverts were not replaced but bottoms were repaved. All construction between Hovey Avenue and the ICG railroad was done by the TON.

The Sewer was built partially with State of Illinois funds and partly by District funds. See Payne's Place Outlet page 17 for details. The sewer is maintained by the TON.

Plans 24-226, 31-32

Right-of-Way

Right-of-Way dedications were obtained by the TON. See Payne's Place Outlet for details.

WEST BRANCH (PHEASANT CREEK)

PAYNES PLACE SEWER

NORTH BRANCH

SKUNK CREEK

WEST BRANCH SEWERS

NORMAL VALLEY SEWER OUTLET

MAIN BRANCH

EAST RELIEF SEWER

MAIN BRANCH

FAR WEST SEWER

DIVISION STREET OUTLET SEWER

SANITARY RELIEF SEWER

COUNTRY CLUB BRANCH

MAIN INTERCEPTORS

MARKET ST. PUMP STA.

GRAHAM STREET SEWER

SKUNK CREEK

WEST SLOUGH & ORCHARD LANE SEWERS OUTLET

WEST SLOUGH (TAR CREEK)

WOOD STREET SEWER

SEWAGE TREATMENT PLANT

HIGHLAND PARK SEWERS

MILLER PARK OUTLET SEWER

HIGHLAND PARK BRANCH (GOOSE CREEK)

BIG 4 VALLEY RELIEF SEWER

LEGEND

I INTERCEPTOR SEWER
O OUTLET SEWER
S STORM SEWER
(1) COMBINED SEWER OUTLET - LOCATION
CT CREEK TITLE OWNED
CR CREEK R.O.W. ONLY
C CREEK NO R.O.W. OR TITLE

BLOOMINGTON & NORMAL WATER RECLAIMATION DISTRICT OPEN CHANNELS & INTERCEPTORS FACILITIES MAP

FARNSWORTH & WYLIE
CONSULTING ENGINEERS
BLOOMINGTON, ILLINOIS

4/21/92
R-1129 REC.

ATTACHMENT IV

1990 CSO OPERATIONAL PLAN

BLOOMINGTON AND NORMAL
WATER RECLAMATION DISTRICT

COMBINED SEWER SYSTEM
OPERATIONAL PLAN

February, 1990

The Bloomington and Normal Water Reclamation District (BNWRD), in accordance with NPDES Permit No. Special Condition , hereby submits a maximum conveyance operational plan for the BNWRD interceptor system. This plan contains both historic procedures used by BNWRD in monitoring and operation of the interceptor system as well as proposed future activities which when combined should afford a comprehensive operation and maintenance approach to interceptor management.

The BNWRD interceptor system is a combined sewer system. The system consists of seven major interceptor sewers converging on the treatment facility site in southwest Bloomington. Several of these interceptors are interconnected. Multiple extensions have been constructed on the head works of several of the interceptors. The system was formally detailed in 1983 by Farnsworth and Wylie, Consulting Engineers, in preparation for a joint petition by BNWRD and the Illinois Environmental Protection Agency (IEPA) to the Illinois Pollution Control Board (IPCB) for exception to Rule 602 (c) addressing combined sewer overflows (CSO). The IPCB granted such exception to BNWRD by its decision in Docket R84-40. This exception was granted contingent upon BNWRD addressing several issues specified by the IPCB. These issues have been addressed and will be discussed later in this plan.

I. System Inventory

A. System Maps

Attachment I to this text is the description of the interceptor system taken from the Farnsworth and Wylie report (BNSD) Combined Sewer Overflow Study, (Phases I and II) compiled in 1983 in preparation for the IPCB exception petition. Attachment I contains both a narrative describing the interceptor system as well as a general facility map. Also, drawings and a narrative description of each of the CSO structures are included in Attachment I. The BNWRD has detailed plans and maps of the entire interceptor system as well as sewer maps of both Normal and Bloomington on file. However, the bulk of these materials prohibits their inclusion in this report.

All but one of the BNWRD interceptors are described in Attachment I. One of the IPCB conditions of the exception granted in 84-40 was the construction of a new interceptor paralleling the Old Main and New Main Interceptors. The construction of this interceptor was undertaken as Division B in the 1985-90 BNWRD expansion project. This interceptor will be described in this text since it did not exist at the time of preparation of the Farnsworth and Wylie 1983 report.

The Division B interceptor begins at a junction chamber with the New Main Interceptor immediately upstream of the Plant #1 and #2 barscreen at the BNWRD plant site. This interceptor then parallels both the Old and Main interceptors in a north easterly direction across the BNWRD property. Near the northeastern boundary of the BNWRD property, the Division B interceptor veers from the Old and New Main Interceptors and crosses property owned by David Stark to Washington St. Washington St. is crossed immediately east of the Sugar Creek bridge by the interceptor. The interceptor is then laid parallel to Sugar Creek, on the east bank, until the junction of Sugar Creek with the West Slough. The interceptor then runs due east along the south bank of the West Slough to

Caroline St. At Caroline St. the Division B interceptor turns north and parallels the Old and New Main Interceptors to their upstream extent between Cottage Ave. and Adelaide St. on the south bank of Sugar Creek. The Division B interceptor has no CSO discharge points but it is interconnected with the Old and New Main interceptors. The interceptor is 42" diameter concrete pipe at the treatment plant and decreases to 36" diameter concrete pipe at the source.

B. Hydraulic Analysis

The Farnsworth and Wylie report (BNSD) Combined Sewer Overflow Study, (Phases I and II) compiled in 1983 contains hydraulic analyses of Districts interceptor. Flow data is included as Attachemnt 3.

C. Regular Flow Measurements

In 1989 the BNWRD awarded a contract to ADS Services, Inc., Huntsville, Alabama. To install ten flow monitors on the BNWRD interceptor system. Five of these monitors were installed at the BNWRD plant site on major interceptors. These installations are considered permanent. The remaining five monitors were installed in the community at points determined to be important both with respect to system capacity and storm water conveyance. These latter installations are considered temporary and after several years of data collection these monitors are to be moved to different sites as needs are determined. Attachment 2 contains a brief narrative describing the ADS system, a map of the system installation, drawings of each installation and an example of the computer printouts compiled from the collected data.

The ADS system is expected to detect increased interceptor flow quantities attributable to storm water as well as the sources of the stormwater in flow. Such information will allow informed decisions to be made regarding the need and available options to control storm water inflow. Also, the entire interceptor system capacity will be determined through the ADS monitoring system thereby providing very valuable information for planning decisions addressing future community growth and the subsequent need for increased service.

D. Sampling Program

The BNWRD has historically undertaken a very vigorous monitoring program regarding the interceptor system. The various components of that program are presented below:

E. Grit Measurements

Grit measurements are taken monthly at sites throughout the interceptor system. Thirty one sites on the Old Main interceptor and 23 sites on the New Main interceptor are monitored. Additionally, various sites on the other interceptors are checked randomly to determine possible buildups. This monitoring program was begun in 1981 and continues to date.

F. Overflow Monitoring

All CSO points are monitored daily on a Monday through Friday basis. CSO activity is determined to be attributable to flow volume, structural failure or line blockage. Structural failures or blockages are addressed as soon as possible to eliminate the cause of the CSO activity.

G. Creek Water Quality Monitoring

The BNWRD has an extensive network of water quality stations along Sugar Creek. All CSO points are bracketed by water quality monitoring stations. Consequently, the impact of CSO activity on the water quality of the receiving stream can be determined. The BNWRD water quality monitoring network is sampled weekly. Analyses performed include:

1. BOD
2. NH3
3. D.O.
4. pH
5. temperature
6. Fecal Coliform
7. Turbidity

This water quality monitoring allows for the determination of CSO impact on Sugar Creek.

H. Sewer Flow Depth

BNWRD began recording the depth of flow at specific sites on the interceptor system in 1982. A total of 25 sites have been measured weekly since January, 1982. The 1983 Farnsworth and Wylie report compiled the data collected in this monitoring program from January, 1982 through December, 1982. Attachment III contains exhibits from the Farnsworth and Wylie report which present both a narrative explaining flow computations as well as the computed flows for select sites on the system.

The flow data collected by this program when combined with the data collected by the automated ADS system, should give a very thorough picture of interceptor capacities and storm event impact on the system.

II. Administrative Aspects

A. Sewer Use Ordinance

The BNWRD enacted BNWRD Ordinance No. 547 An Ordinance Enacting A General Waste Control Program Regulating the Use of the Public Treatment Works and Public and Private Sewers and Drains in the Bloomington and Normal Sanitary District, on January 14, 1985. This ordinance controls the discharge to and use of the BNWRD interceptor system. Additionally, the BNWRD enacted an enforcement management system (EMS) on September 12, 1988. The EMS prescribes specific responses for violations of the sewer use ordinance. Both

Ordinance 547 and the BNWRD are included as Attachment IV.

B. Analysis of Flow Capacity Increase When Approaching System Capacity

The BNWRD is presently involved in a growth projection study which will address the Bloomington and Normal community service needs for the next fifty years. Demographics, economic development and population growth are areas the factors being addressed by this study. When completed, this study will be combined with data obtained from the interceptor flow monitoring program, CSO activity frequency and treatment plant loadings to determine the needs for future expansions of capacity.

III. Maintenance

A. Sewer System Inspections

The BNWRD owns approximately 90,000 LF of interceptor sewers ranging in size from 51" diameter to 8" diameter and varying in age from 2 years to 60+ years. During FY 1989-1990, the District has planned the T.V. inspection of 1100 LF of sewer.

Currently, the BNWRD is investigating alternative means for cleaning and inspection of the entire system on a 7-10 year recurring schedule. Alternatives include contracts, purchase of inspection and cleaning equipment, and cooperative agreements with the City of Bloomington and Town of Normal for joint use of equipment.

B. Sewer System Controls

Combined sewer overflows are controlled, by overflow wiers or baffle plates. Attachemnt I contains descriptions of overflows.

Wet weather flow into sewers is also controlled by storm water detention basins constructed by both the Town of Normal and City of Bloomington. The BNWRD has a policy to assist the communities to construct detention basins, and has a current committment to provide $650,000 to the City of Bloomington for construction of one such project. (See Attachment 5 for copy of the intergovernmental agreement.)

C. Sewer Flushing/Cleaning

As part of the 1985-1990 BNWRD expansion project, a grit chamber was constructed on the West Slough sewer at the juncture with the Main Interceptor. This grit chamber is intended to prevent a significant volume of grit from entering the Main Interceptor sewer.

For the current year, the District plans to clean a 575' section of 51" diameter sewer where measurements indicate the heaviest accumulation of grit.

Refer to 3A above. An inspection program may include cleaning prior to inspection, and will reveal problem areas requiring additional work. Rehab work on sewers can be funded by a corporate levy on property within the District.

The City of Bloomington and Town of Normal are each separate political entities from the BNWRD, and each community owns and operates their own sewage collection system that are tributaries to the BNWRD interceptor system. The maintenance efforts of the two communities benefit the District's interceptor system. The maintenance efforts of the two communities benefit the District's interceptor system and treatment plant. Both communities have active sewer cleaning and street sweeping operations. For 1989, the total effort for both communities in these two activities is:

Street Sweeping	10,544 miles
Street Sweeping debris	5,970 cu. yds.
Sewers cleaned	559,200 lineal ft.

4. Control Strategy

Physical controls, inspections and policy have been previously included in Sections I and II.

At the treatment plant, wet wells are pumped down twice weekly to provide free outfall condition in the sewer and reduce backwater in the interceptor sewers near the plant. Flow velocity for self-cleaning of sewers is maximized.

5. Schedule of Activities

The 1985-1990 expansion program is substantially complete, and included the new interceptor and grit chamber discussed earlier in this plan. Also discussed in other sections are flow monitoring, planned inspections and community growth and service needs studies. Plans for sewer system construction, maintenance and repair, or modifications will be developed based on information from these efforts, plus information from current monitoring activities.

ATTACHMENT 1

3. BACKGROUND INFORMATION ON THE BLOOMINGTON AND NORMAL SANITARY DISTRICT

3.1 Bloomington and Normal S.D. - General

The Town of Normal and City of Bloomington are located in the drainage area of Sugar Creek and it's branches, except for the south eastern portion of Bloomington, south of Illinois Route 9 and east of Veterans Parkway, which drains to the Little Kickapoo Creek.

The Bloomington and Normal Sanitary District was organized in the fall of 1919. Prior to this time, both the City of Bloomington and the Town of Normal were discharging their untreated combined sewage into Sugar Creek and its branches. The State of Illinois, through its Rivers and Lakes Commission, had taken official notice of the situation and ordered the nuisance caused by the discharge of untreated sewage abated by September, 1916. Extensions to this time limit were later granted.

The solution to the problem was difficult because of the inability to raise sufficient funds and because both cities discharged their sewage into the creek and in several instances used common outlets. At this time there was no provision in the statutes giving cities authority to join together in collecting and treating sewage. The 1917 Sanitary District Act allowed contiguous territory containing one or more cities or towns to incorporate as a Sanitary District in order to provide common outlet sewers and treatment plant facilities. The present District was formed under this Act.

During the period between 1921 and 1925 several improvements were made to Sugar Creek using money alloted to the District through the annual tax levy. The funds from the 1925 bond issue were used to construct intercepting sewers, extend existing sewer outlets to the interceptor, and to construct a sewage treatment plant. The improvements were put into operation in April of 1928.

Since the original bond issue more issues have been voted. The first, was authorized in 1935 to pay the District's share of the Big Four Valley Storm Sewer in the southeast portion of Bloomington. The remainder of the cost of this sewer was obtained through a W.P.A. grant. Another bond issue in 1946 was used to finance construction of improvements to Sugar Creek and the extension of storm and relief sewers in various portions of the two cities. In addition to the improvements financed by bond issues, several projects were undertaken in the 1930's using W.P.A. funds and funds from current operating budgets.

In recent years, additional improvements included an additional main interceptor sewer and additional secondary treatment facilities in 1965. In 1975, secondary treatment capacity was expanded, tertiary treatment was added and primary treatment and chlorination were constructed for excess wet weather flow received at the plant.

The area served by the Bloomington and Normal Sanitary District includes the municipal boundaries of the City of Bloomington and the Town of Normal. According to the 1980 census, the total population of Bloomington and Normal is 79,927.

The Bloomington and Normal Sanitary District Facilities Map (Figure 1) shows the Creek and interceptor facilities of the District, along with monitoring site locations, overflow locations, and other features discussed in later sections of this report.

3.2 Sugar Creek - General

The Bloomington and Normal Sanitary District lies principally at elevations ranging from 745 to 850 feet above mean sea level. The south east portion of the City of Bloomington lies in the Little Kickapoo drainage area. The remainder of the City of Bloomington lies in the drainage area of Sugar Creek whose several branches along with a tributary,

Skunk Creek, serve as the major storm drainage outlets. The Main Branch of Sugar Creek begins several miles east of the twin cities, runs west and northwesterly along the northern part of Bloomington, then south along the west side of Bloomington, then west past the site of the Sanitary District Plant near Interstate 74-55, southwest of Bloomington. The Country Club branch runs northwest from the Bloomington Country Club grounds to the main branch near Linden St. The North Branch starts northeast of Normal and runs southwest across Normal and discharges to the main branch at North Main St. Another branch of the creek, known as the West Branch, runs through the western portion of Normal from the north corporate limits to an outlet into the main branch between Cottage Avenue and Adelaid St. The Highland Park Branch serves the southwest portion of Bloomington, running from the area near the intersection of south Main St. (Route 51) and Veterans Parkway to the District's treatment plant site. The Skunk Creek tributary enters Sugar Creek between Washington Street and Market Street and drains the far western portion of Bloomington and Normal and also an as yet undeveloped area of farm ground which lies to the west and north of the community.

The south east portion of the City of Bloomington which lies in the Little Kickapoo Creek Drainage Basin has pump stations to lift the sewage into sewers that flow by gravity to the sewage treatment plant.

3.3 Sewage Treatment Facilities

The district's sewage treatment facility is designed for an average dry weather flow of 16 M.G.D., and a population of 102,400. The plant has three (3) secondary treatment processes which operate in parallel, and a tertiary treatment unit for the dry weather flow up to 32 M.G.D. An excess flow treatment unit providing primary treatment and disinfection with a capacity of 42 M.G.D. for all flow received at the plant above the 32 M.G.D. dry weather flow treatment capacity. The total hydraulic capacity of 74

M.G.D. of the plant is equal to the total capacity of all sewers discharging to the plant.

In 1981, a total flow of 6886 M.G. was treated, of which 6586 M.G. or 95.6% was given complete secondary and tertiary treatment. In 1982, the total flow treated was 7173 M.G. and 6640 M.G. (92.6%) was given complete secondary and tertiary treatment.

3.4 Interceptor Sewers

The sewers constructed by the District have been variously termed Interceptors, Outlet, Relief and Sanitary Sewers. In the strict sense, an intercepting sewer is one that picks up dry weather flow and a part of the wet weather flow from combined sewers and transports it to the treatment plant. The remaining combined flow is allowed to overflow to the open ditch system. The main interceptor sewers of the Sanitary District from the plant to the ICG RR are shown in Figure 2.

Main Interceptors

In 1925 a 51-inch segmental tile block interceptor was constructed from the sewage treatment plant to the outlet of the West Slough Sewer on Caroline Street approximately 300 feet north of Washington Street. From here, a 36-inch segmental block sewer was constructed to the Graham Street Sewer outlet. A 27-inch vitrified clay pipe sewer was built to the Normal Valley Sewer outlet.

The following main outlet and combined sewers are connected to this main interceptor sewer, and have overflows:

Wood St. combined sewer - NPDES 004
West Slough combined sewer - NPDES 005
Graham St. combined sewer - NPDES 006
Cottage Ave. combined sewer - NPDES 007
West Branch sewers - NPDES 008
Division St. combined sewer - NPDES 010

In 1967 a 36-inch interceptor sewer was constructed from the sewage treatment plant to the upper end of the old interceptor sewer. It is cross-connected to the original interceptor. North of Washington Street it parallels the first sewer. At Washington Street it runs west to the area west of St. Mary's Cemetery and then south to the treatment plant. The Normal Valley sewer is connected to this interceptor and has an overflow. (NPDES 009)

Main Interceptor Extension

In 1967 a 48-inch sewer was constructed from the upper end of the main interceptor northeasterly along the Main Branch to the outlet of the Sanitary Relief Sewer just east of the ICGRR west of Main Street. The overflow from the 48-inch interceptor is NPDES 011. At that time, the Kelsey Street 33" brick sewer, which formerly discharged to the Normal Valley sewer, was closed off at the Creek and was connected to the interceptor extension. It also picked up the dry weather flow from the Sanitary Relief Sewer which formerly was intercepted and discharged to the Normal Valley Sewer.

Sanitary Relief Sewer and Extension

In 1947 the Sanitary Relief Sewer was constructed from east of the ICGRR along the Main Branch of Sugar Creek and along the Country Club Branch to Empire Street. This acted as a relief sewer, an interceptor, and an outlet for several east side Bloomington and Normal sewers. The overflow from the Sanitary Relief Sewer, where it is connected to the 48-inch interceptor extension is NPDES 013. A combined sewer on Fell Avenue is connected to the Sanitary Relief Sewer and has an overflow (NPDES 14). In 1948 the City of Bloomington constructed an extension from Empire to Locust St.

3.5 Drainage Basins and Trunk Sewers

The following sections provide data on the various creek and sewer drainage areas in Bloomington and Normal.

The Main Branch of Sugar Creek is served by the interceptor sewers described in section 3.4. The Main Branch has major tributaries as follows:

Country Club Branch. This basin outlets to the Sanitary Relief Sewers and its extension overflows are at Locust St. (NPDES 016) and Colton Ave. (NPDES 015)

North Branch. This basin has major sewers, the Normal Valley Sewer, and the Northeast Trunk Sewer. The Normal Valley Sewer discharges to the new main interceptor and the Northeast Trunk Sewer connects to the Normal Valley Sewer. The Valley Sewer has an overflow to the Main Branch (NPDES 008) near its connection to the main interceptor.

West Branch. This basin's outlet sewers connect to the main interceptors and have an overflow into the Main Branch. (NPDES 008)

Other major creek and sewer drainage areas are the Highland Park Branch and the Skunk Creek Tributary. Both of these areas outlet to sewers which are connected directly to the sewage treatment plant

3.5.1. Country Club Branch

Creek

The Country Club Branch has been paved and straightened by the District from it's outlet at the Main Branch, south to Empire Street. The City of Bloomington continued the pavement to Locust St. The City of Bloomington recently constructed a box culvert storm sewer from Locust Street to Towanda Avenue, through the Bloomington High School Athletic Facilites.

Sewers

The upper end of the Sanitary Relief Sewer which was constructed by the District in 1947, parallels the Country Club Branch from the Main Branch to Empire and Colton Streets. The sewer is 48 inches in diameter. The City of Bloomington constructed the Sanitary Relief Sewer Extension south on Colton (36" diam) to the Colton Ave. overflow and then 30" to the Locust Street overflow.

Within the sewered area of the Country Club Branch, 115 acres of golf course and 55 acres of Eastland Shopping center do not contribute significant sewage flows.

Locust Street Overflow - NPDES 016 (Figure 3)

At Locust Street, the dry weather sanitary sewage flow in a 66-inch diameter sewer is diverted by a concrete weir into the upper end of the 30-inch Sanitary Relief Extension. At this location the drainage basin area of the Country Club Branch is 650 acres. The sanitary sewage from approximately 695 acres of land which includes the State Farm Building and the Broadmoor Subdivision area which is not in the natural watershed of the Country Club Branch is pumped into the sewer prior to the overflow. The area which is pumped is a separate sanitary system while the area in the natural watershed is mostly a combined sewer system.

Of the 1,120 acres sewered at this overflow, 285 acres have combined sewers and 835 acres are separate sanitary sewers discharging to combined sewers. The population served at this overflow is 8,820. This overflow (016) is in structurally excellent condition. Materials and debris get caught in the sewer line at the connection due to an iron rod constructed vertically in the 30-inch pipe

Colton Avenue Overflow - NPDES 015 (Figure 4)

At Colton Avenue the dry weather flow sanitary sewage is carried by the 36-inch Sanitary Relief Sewer Extension. Also the dry weather flow of the area served by the 18-inch combination sewer is carried by that sewer since no flow has been observed from the 18 inch cross connection during low flow periods. During periods of high flow the excess from the 18 inch combination and from the 24 inch Colton Avenue sewer enter the 36 inch Sanitary Relief Extension. The area served by these sewers is 100 acres of which 80 acres is residential and 20 acres is school. A high level 36 inch overflow diverts high flows into the Country Club Branch. The total sewered area at this location is 1220 acres while the drainage basin area of the Country Club Branch is 720 acres. The population served by the sewer at this overflow is 9520.

The structural condition at this location is good. There is a 6" cast iron pipe through the overflow line 1.5' ± above the invert. The 18" combined sewer on Colton is reported to be in very poor condition.

FIGURE 3
LOCUST STREET
NPDES 016

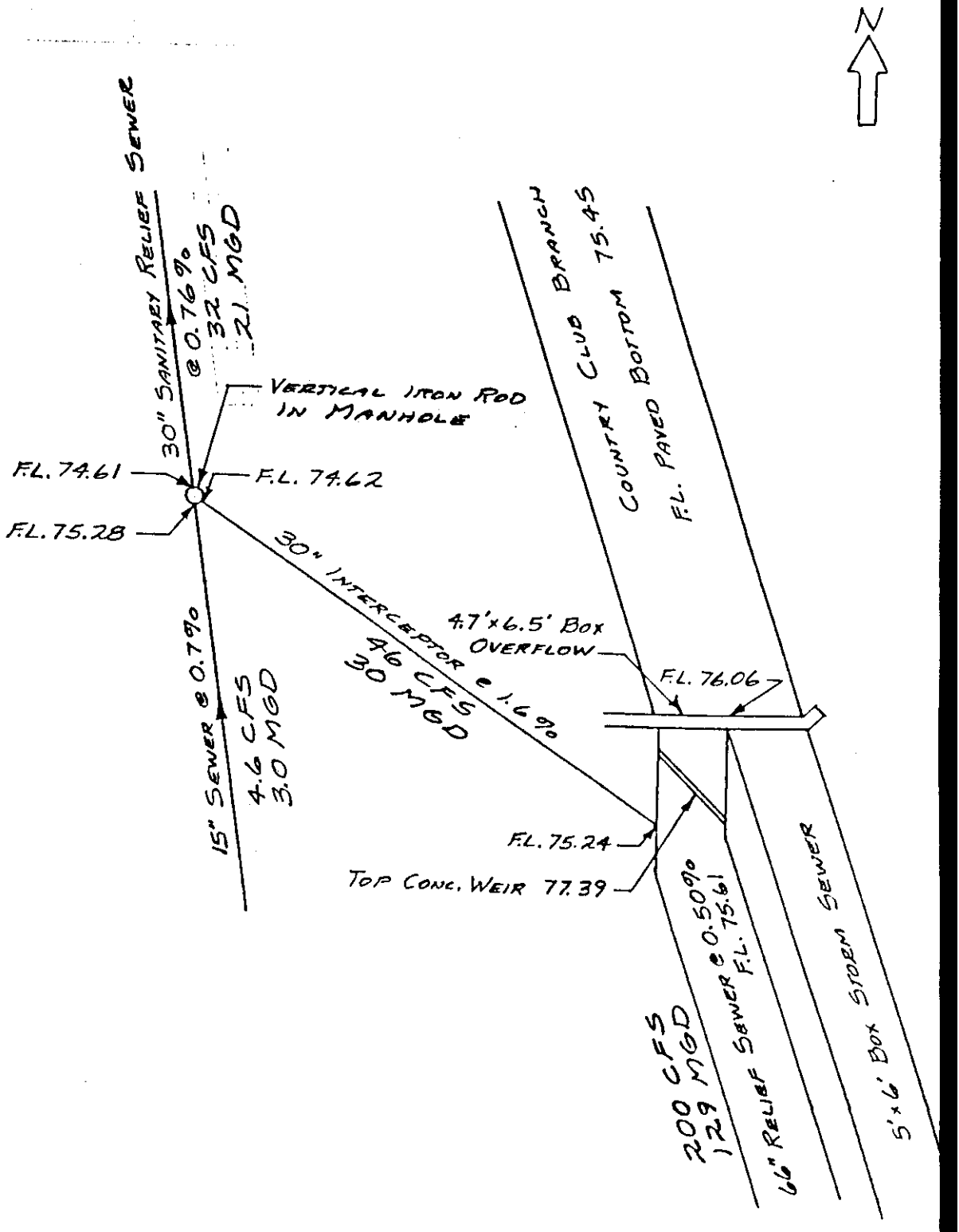

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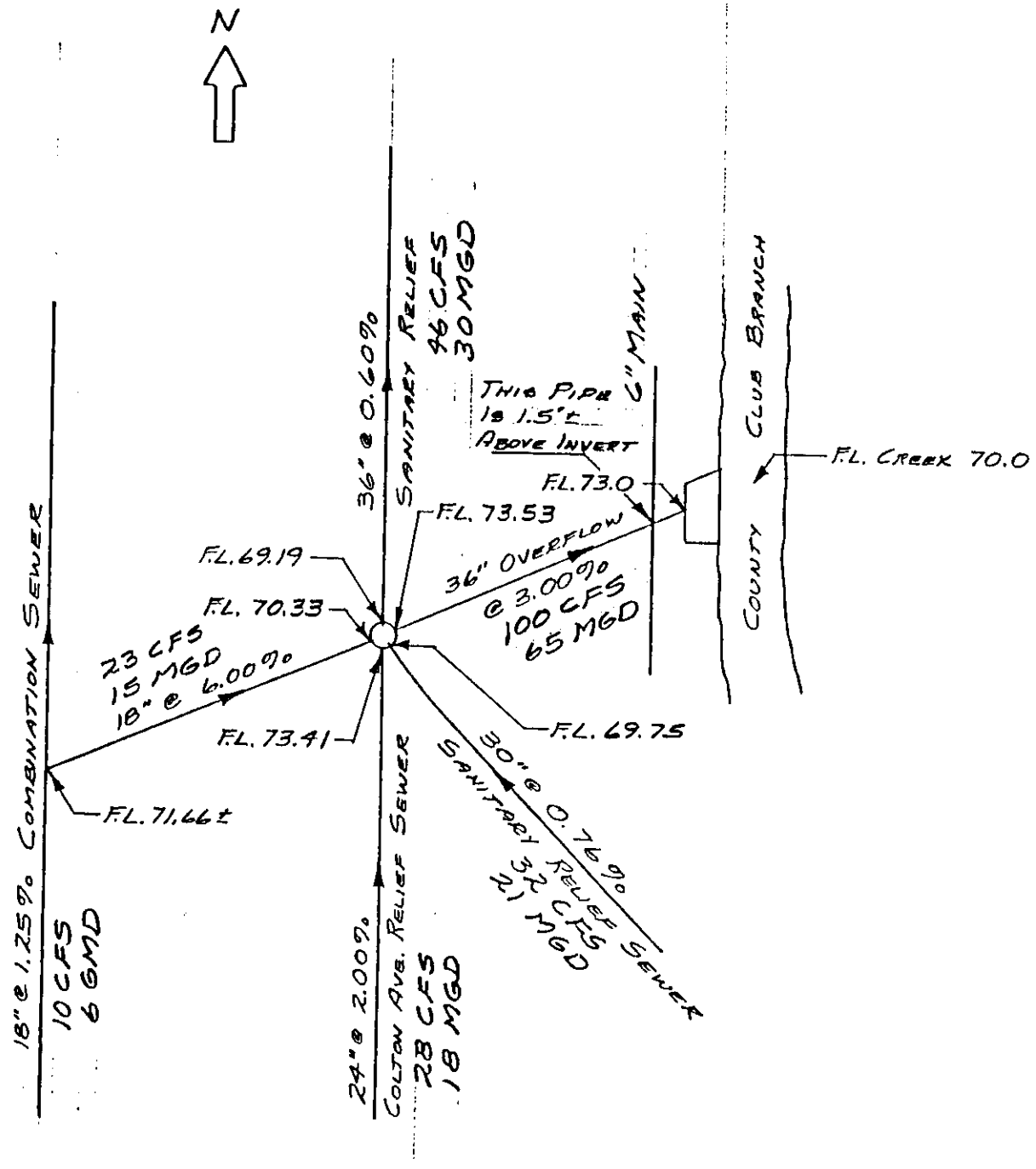
FIGURE 4
COLTON AVENUE
NPDES 015



1461-08

3.5.2 Main Branch

Creek

Since the beginning of the District, work has been performed on the Main Branch from Six Points Road which is approximately one mile downstream from the treatment plant, to near the intersection of Veteran's Parkway and General Electric Road. The Main Branch is paved from midway between Adelaide Street and the ICG Railroad to Ewing Park which is approximately 3/4 miles east of the Country Club Branch. The Main Branch is controlled and maintained by the District from the plant to the Country Club Branch. The City of Bloomington and Town of Normal each control and maintain portions lying within their corporate limits east of the Country Club Branch.

The District continues to perform maintenance improvements to the Main Branch, the most recent being cleaning and straightening from Market Street to Adelaide Street.

The District has plans prepared for improving the Main Branch from the Six Points Road to Market Street, which has storm water detention ponds incorporated into the design. One detention pond is proposed to be constructed in 1983, north of the treatment plant.

Sewers

The main interceptor sewers, described in section 3.4, provide the outlet sewers from the Main Branch and its tributaries.

East Sanitary Relief Sewer

In 1972 a Sanitary Relief Sewer was built from the Sanitary Relief Sewer starting east of Linden and north of Emerson Street northeasterly along the line of Main Branch of Sugar Creek to Veterans Parkway. This was constructed as a joint project by the City of Bloomington, the Town of Normal and the Sanitary District. It is maintained by the Sanitary District. It

was constructed to provide additional capacity for the two communities in excess of the two existing City and Town sewers paralleling this sewer.

Fell Avenue Overflow - NPDES 014(Figure 5)

When the 60 inch Sanitary Relief Sewer was constructed in 1947, the City of Bloomington constructed a 24' relief sewer from the 60" sewer to Beecher Street to relieve the upper end of the Kelsey Street Sewer. At this time a high level overflow was constructed from the 60 inch sewer to the Main Branch of Sugar Creek.

In 1952 the City of Bloomington constructed a 30 inch sewer from the 60" Relief Sewer to Kelsey Street to intercept all flow from the old 30 inch Kelsey Street brick sewer. This sewer enters the Sanitary Relief down stream from the high level by pass.

The drainage area of the Fell Avenue combination sewers is 102 acres of which 91 acres is residential and 10 acres is Illinois Wesleyan University.

The total drainage area of the Main Branch of Sugar Creek at this location is 6,104 acres; 2927 acres is currently sewered and developed and served by the 60 inch Sanitary Relief. The population served by the Sanitary Relief is 22,440 people.

Volume discharges occur here with less frequency than any of the Main Branch overflows monitored by the Sanitary District. The structural condition of the 24-inch overflow pipe is poor. The other sewers at this location are structurally sound.

Sanitary Relief Overflow - NPDES 013 (Figure 6)

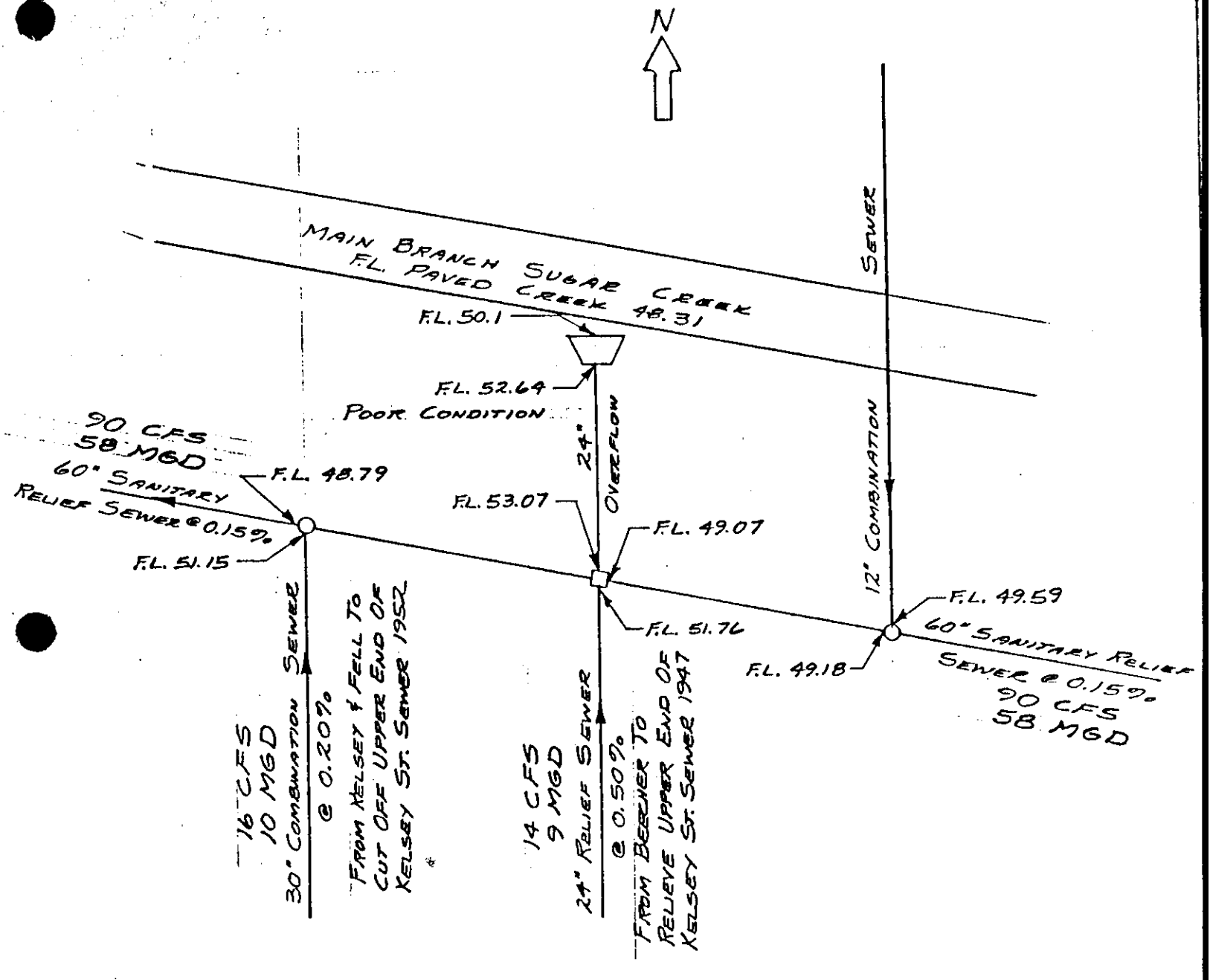
Originally the 33" brick Kelsey Street Sewer discharged directly to the Main Branch of Sugar Creek. As part of the Interceptor Sewer Project the sewer was extended under the creek by constructing two 4' x 1' concrete box sewers and connected to the Normal Valley Sewer.

In 1947 when the Sanitary Relief Sewer was constructed the dry weather flow was diverted to the Kelsey Street Sewer.

In 1969 as a part of the Main Interceptor Extension Project the Kelsey Street Sewer and the dry weather flow connection from the Sanitary Relief Sewer were connected directly to the Interceptor Extension and the twin box sewers were abandoned.

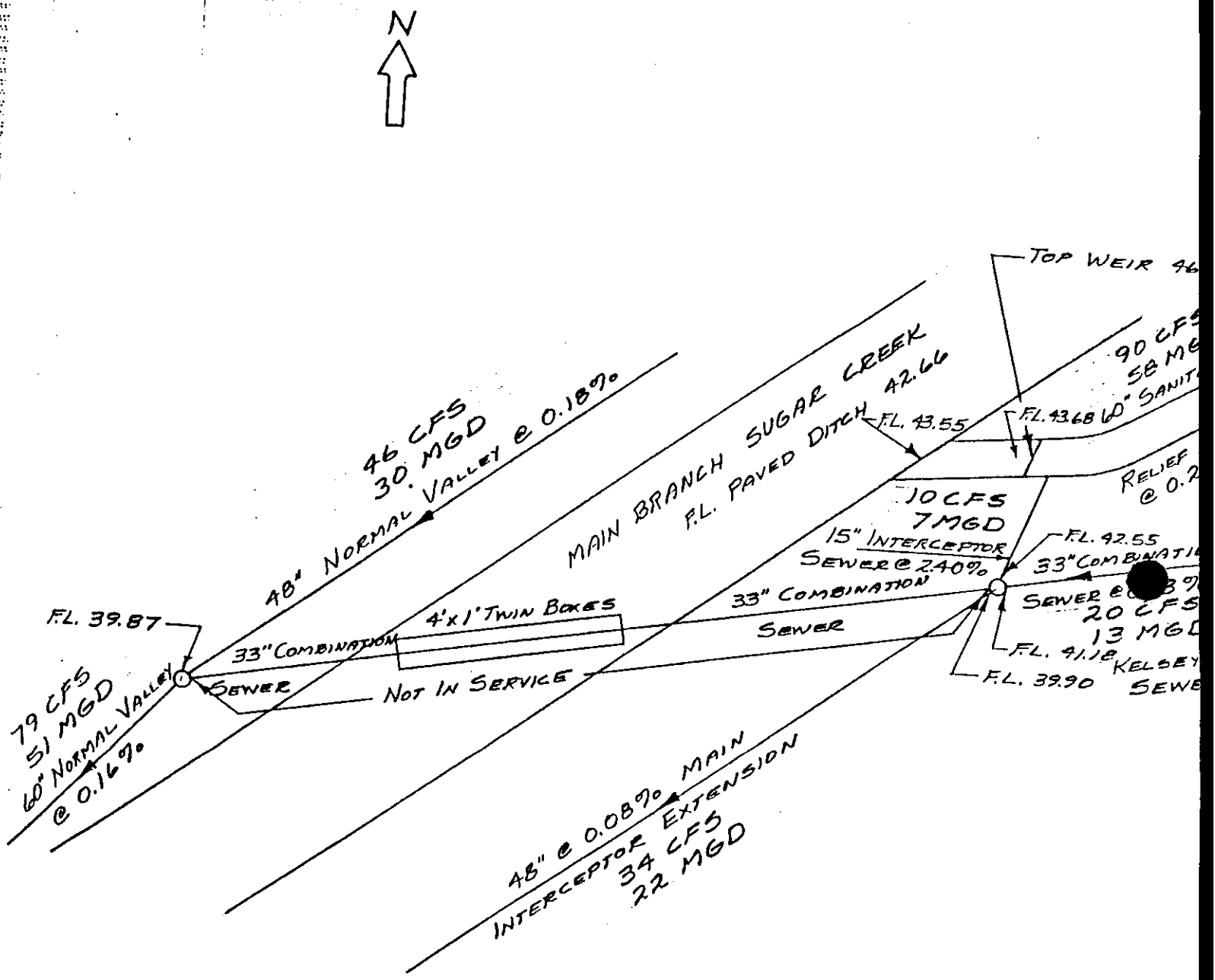
At this location Sugar Creek has a total drainage area of 9582 acres. The Interceptor transports the dry weather flow from 2959 sewered and developed acres with a population of 22,665.

FIGURE 5
FELL AVENUE
NPDES 014



1461-04-07

FIGURE 6
SANITARY RELIEF
NPDES 013



1461-40

Division Street - NPDES 012 (Figure 7)

Sewer

In 1946 the City of Bloomington constructed a relief sewer to drain the Division St. subway east of Adelaide St. as a relief for the Division St. sewer. This relief sewer discharges into Sugar Creek just west of Adelaide St. as a 42 inch sewer. The sewer continues south and east along Adelaide Street and Division Street until it ends at Roosevelt Avenue as an 18 inch sewer.

Overflow - NPDES 012A

At the intersection of Division and Mason Streets, a manhole was constructed at the intersection of the relief sewer and the 18" Division Street combination sewer. The combination sewer crosses the relief sewer at an elevation approximately 4 feet higher than the relief sewer. The dry weather flow is contained in the 18 inch combination sewer. Excess flow in the 18 inch sewer overflows a weir in the manhole and falls into the 42 inch relief sewer and discharges into the Main Branch.

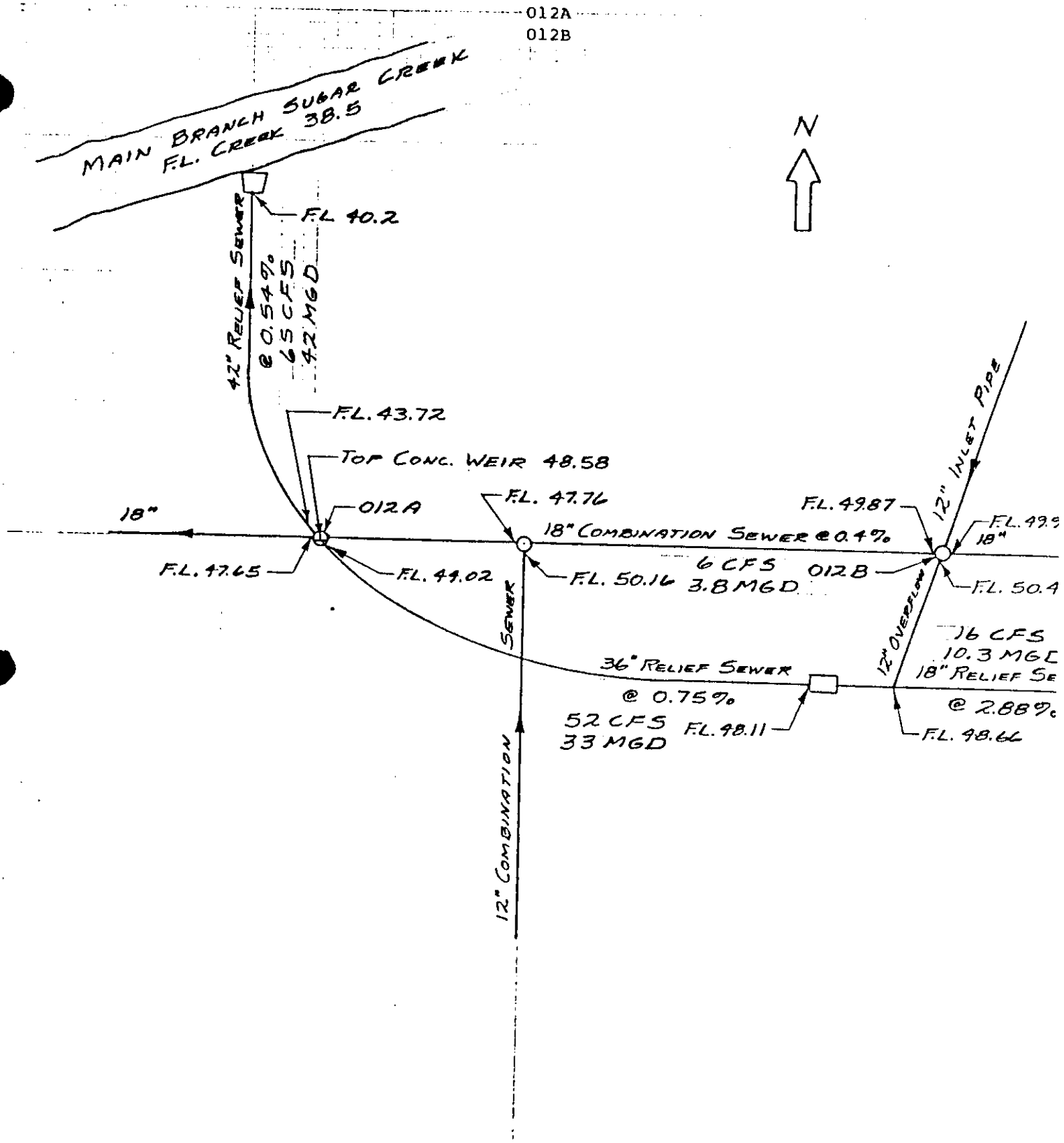
Sewer Overflow - NPDES 012B

At the Division Street Subway the 18 inch combination sewer is approximately 1 foot higher than the relief sewer. A high level inlet pipe is connected to the combination sewer and continues to the relief sewer. The dry weather flow is contained in the 18 inch Division Street sewer, but the inlet connection allows any excess to flow to the Relief Sewer.

The area served by the 18 inch combination sewer is 32 acres of which 28 acres are residential and the remainder is manufacturing.

The total drainage area of Sugar Creek at Adelaide Street where the 42 inch relief sewer enters is approximately 9618 acres.

FIGURE 7
DIVISION STREET
NPDES 012
012A
012B



1461-29-31

48 Inch Interceptor Extension Overflow - NPDES 011 (Figure 8)

Approximately 1200 feet west of Adelaide Street the dry weather flow from the 48 inch main interceptor extension is diverted into an 18 inch clay sewer into the old 27 inch main interceptor. The total drainage area of Sugar Creek at this location is 9698 acres. The 48 inch sewer transports the dry weather flow from 3039 developed and sewered acres.

The population served by the interceptor at this point is 23,535.

This location has the most frequent overflows, based on the District's overflow monitoring program described in chapter 6. The weir at the overflow structure has been raised to within 9 inches of the top. The wooden plank weir which was constructed on the top of the original concrete weir has been frequently noted in the District's inspection reports as "leaking weir." Gravel deposits are in the interceptor.

Division Street - NPDES 010 (Figure 8)

When the main interceptor was constructed the Division Street sewer was connected to the original main interceptor. A concrete weir was constructed in a manhole and the Division Street dry weather flow was diverted to the interceptor through an 8 inch clay tile. The Division Street sewer transports the dry weather flow for a 60 acre area. This area has a four acre manufacturing area while the remainder is residential.

The main interceptor at this location carries the dry weather flow of 3099 acres of sewered and developed land. The drainage area of Sugar Creek at the overflow location is 9726 acres. The population served by the interceptors at this overflow is 23,890 people.

Normal Valley Sewer

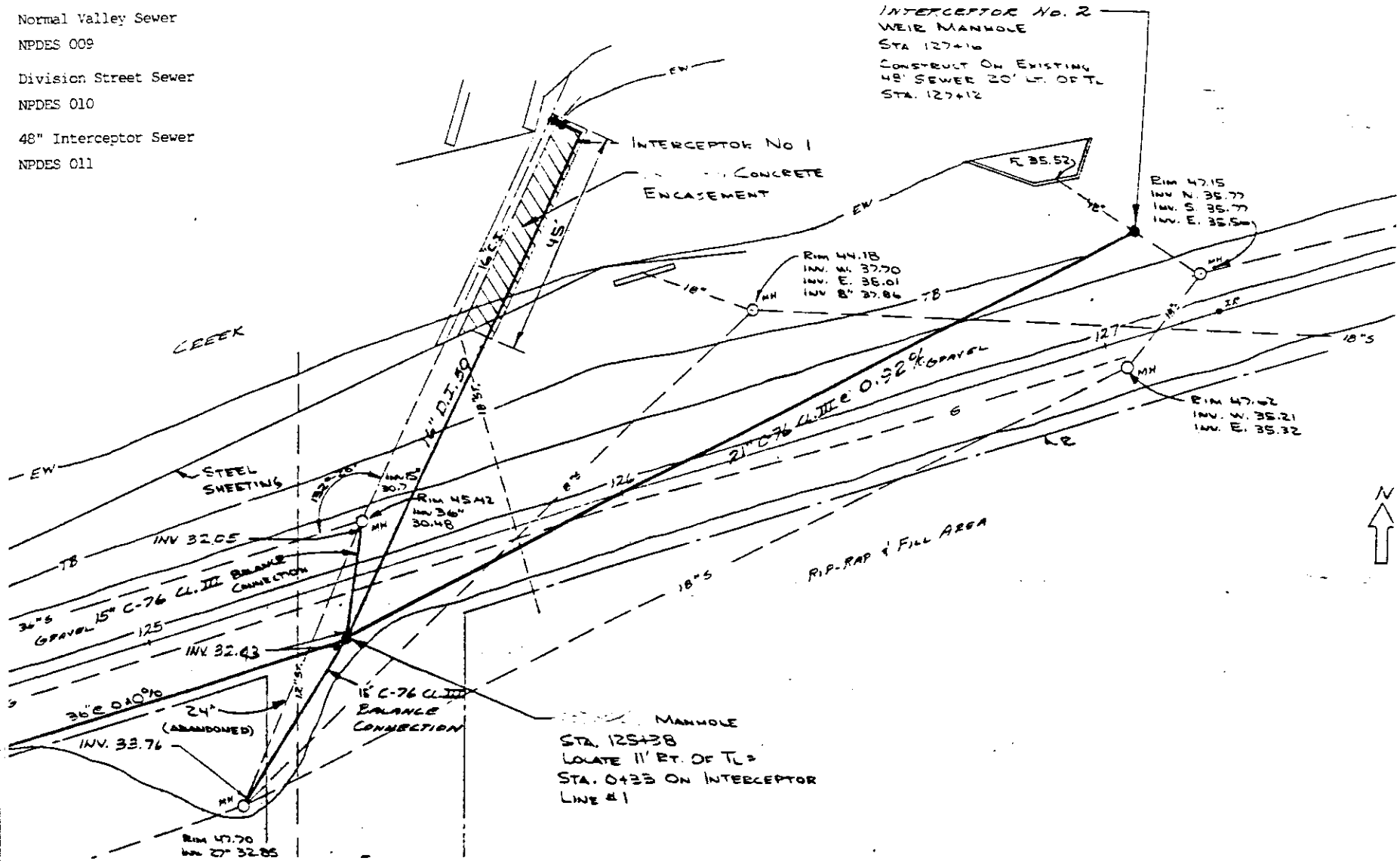
NPDES 009

Division Street Sewer

NPDES 010

48" Interceptor Sewer

NPDES 011



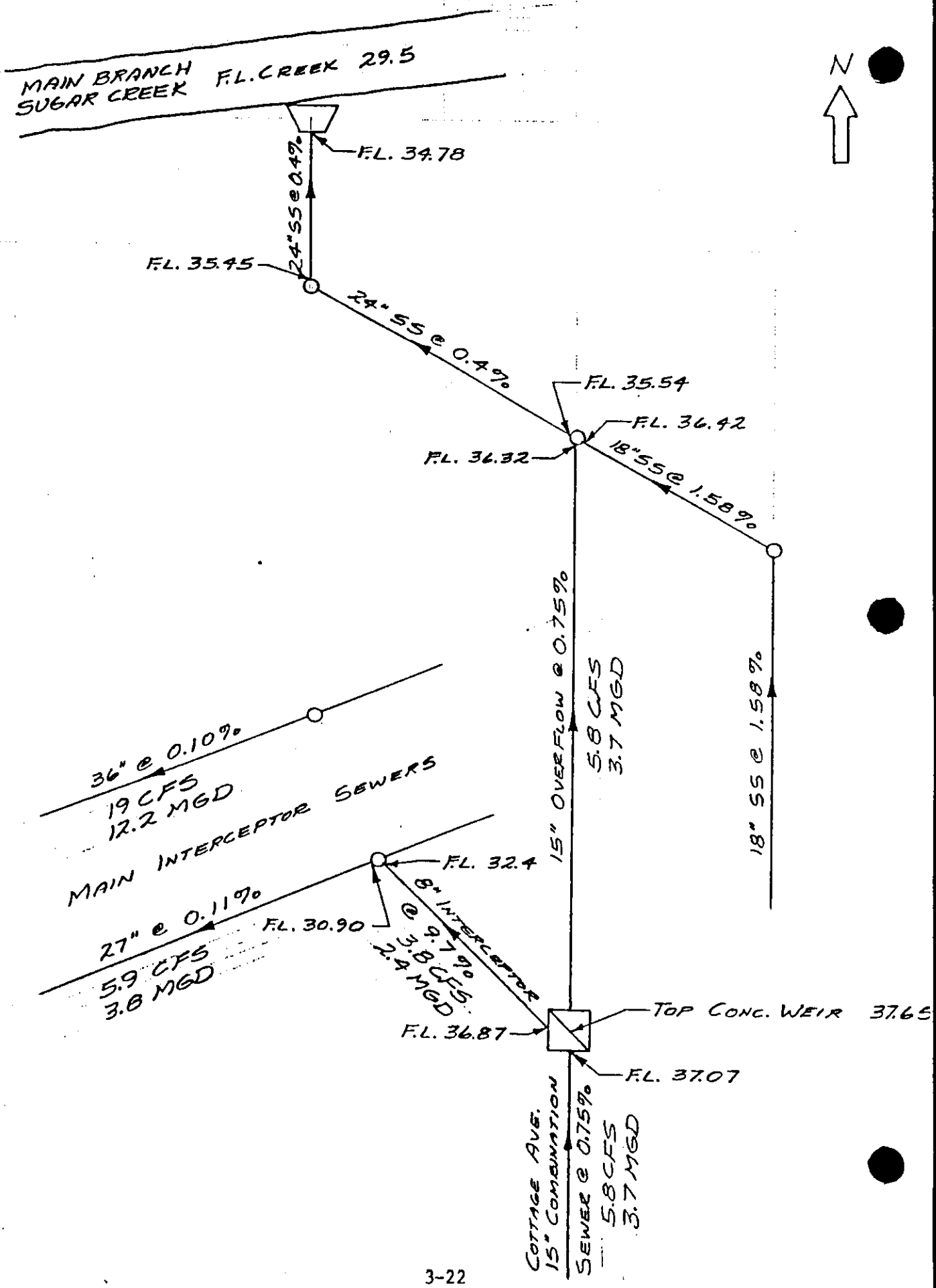
Cottage Avenue - NPDES 007 (Figure 9)

An existing 15 inch City of Bloomington combined sewer serves a 27 acre area. The dry weather flow is diverted by an 8 inch pipe to the original 27 inch Main Interceptor. Originally the excess flow continued down this 15 inch sewer and discharged into Sugar Creek on the east side of Cottage Avenue. A parallel storm sewer was constructed on Cottage Avenue during a recent street improvement project. The excess flow in the 15 inch sewer now discharges into the 24 inch storm sewer which discharges into Sugar Creek on the west side of Cottage Avenue.

The 27 acre area is residential except for 2 acres of park land.

The drainage area of the main branch of Sugar Creek at this location is 12,827 acres. The two Main Interceptors at this point transport the sanitary sewage to the treatment plant from a sewered and developed area of 5982 acres, which has a population of 50,640 people.

FIGURE 9
COTTAGE AVENUE
NPDES 007



1461-16

3.5.3 North Branch

Ditch

The North Branch has been deepened, straightened and paved from its outlet into the main branch at Main Street to the ICG Railroad. This portion is controlled and maintained by the District. The North Branch has also been deepened and straightened from the ICG Railroad northeasterly to the intersection of Veterans Parkway and Fort Jesse Road during subdivision expansion in the late 60's and early 70's. This portion is controlled and maintained by the Town of Normal.

Sewers

Normal Valley

The Normal Valley Sewer generally serves that part of the drainage area which is north of the ICG Railroad. This sewer is brick with sizes of 60 inch diameter to 33 inch diameter.

Northeast Trunk Sanitary Sewer

The Northeast Trunk Sewer starts at the intersection of Cullom and Franklin Streets where it connects into the old 48 inch brick Normal Valley. This sewer actually consists of two sewers, a 24 inch older sewer from Franklin Avenue to Linden Street and a 30 inch new sewer in approximately the same location. The 24 inch older sewer is in poor condition. The sewer from Linden Street to the north line of Greenbriar Subdivision varies from 27 inches to 21 inches. The other sewer which terminates just north of College Avenue varies from 18 inches to 15 inches.

The natural drainage area of the North Branch is 4160 acres. However, the Cypress alley storm sewer drains 710 acres of this watershed to the West Branch. Therefore the drainage area of the North Branch at is mouth is 3,450 acres.

It should be noted that 1676 acres of land in this basin is not anticipated to develop.

Overflow Normal Valley (NPDES 009) (Figure 8)

When the main interceptor was constructed by the District, the dry weather flow of the Normal Valley Sewer was diverted to the original main interceptor. Revisions were performed in 1966 and the dry weather flow was diverted to the new 36 inch interceptor by a 16 inch ductile iron pipe.

The area presently served by the Normal Valley sewer is 1951 acres with a population of 19,990. The future area that could be served could be increased to 2240 acres. The total drainage area of the Main Branch at this location is 9726 acres

3.5.4. West Branch

Ditch

The West Branch has been deepened and straightened from its junction with the Main Branch to Gregory Street. It has been paved from a point just below Hovey Avenue to a point just south of Gregory Street. The District controls and maintains the portion from the Main Branch to College Avenue, Illinois State University maintains the banks on that portion from College Avenue to Gregory Street. The Town of Normal controls and maintains the remaining portions of the creek which are within its corporate limits. Additional channel widening and straightening has been performed upstream of Gregory Street during the course of subdivision construction.

Sewers

During the 1930's a sanitary sewer was constructed by the District from the Main Interceptor up along the general line of the West Branch Creek to the former Fairview Sanitarium which is now the McLean County Nursing Home on Main Street in Normal. This sewer is maintained by the District. This sewer varied in size from a 15-inch to an 8-inch. An additional parallel sewer was later constructed starting with a 33-inch and terminating with a 10-inch under U.S. Route 51 just south of Northtown Road.

The additional sewer was constructed by the Town of Normal, and portions of the original sewer were eliminated during construction. The District maintains the newer sewer from the Interceptor to the Nursing Home.

Cypress Alley - NPDES 018 (Figure 10)

The 84" Cypress Alley storm sewer was constructed from the West Branch just south of Gregory Street, east and north to Cypress and Fell Avenue. This brought a drainage area of 710 acres into the West Branch which is

not in its normal drainage basin. Also relief sewers were constructed and connected to the Cypress Alley Sewer. It was believed that cross connections existed between these sewers and sanitary sewers in this area. Field inspection determined that only one of these cross connections now exists at the intersection of Locust Street and University Streets.

Cypress Alley - NPDES 018A (Figure 10)

The dry weather flow from an 11.5 acre residential area flows south down the University Avenue sanitary sewer. A 12 inch high level pipe is connected between the storm and sanitary sewer manholes at Locust and University Streets. Excess flow in the sanitary sewer can bypass into the 15" relief sewer and discharge to the Cypress Alley which in turn discharges into the West Branch.

College Avenue - NPDES 025 (Figure 11)

At the intersection of University and College Avenue a 10 inch sanitary from the north which drains a 14.5 acre tract of residential homes joins a 10 inch sanitary which serves two ISU Class Room Buildings, discharges into a 10 inch sanitary sewer recently constructed by the State of Illinois. At this intersection a 12 inch by-pass was formerly connected to a branch of the Twin Grove Storm Sewer. It is now connect to a recently constructed leg of storm sewer which eventually discharges into the West Branch at College Avenue. This has been assigned a tentative NPDES number.

Twin Grove Storm Sewer - NPDES 017

The Twin Grove Storm Sewer was constructed from the West Branch between Hale and Adelaide Streets west to Main and Dry Grove Street and then north and east to University and College Avenue. Several cross connections have been constructed between the sanitary sewers and this storm sewer at various locations.

The drainage area of the West Branch creek where the Twin Grove Storm Se enters the West Branch is shown on Page 3-34.

FIGURE 10
CYPRESS ALLEY STORM SEWER
NPDES 018
018A

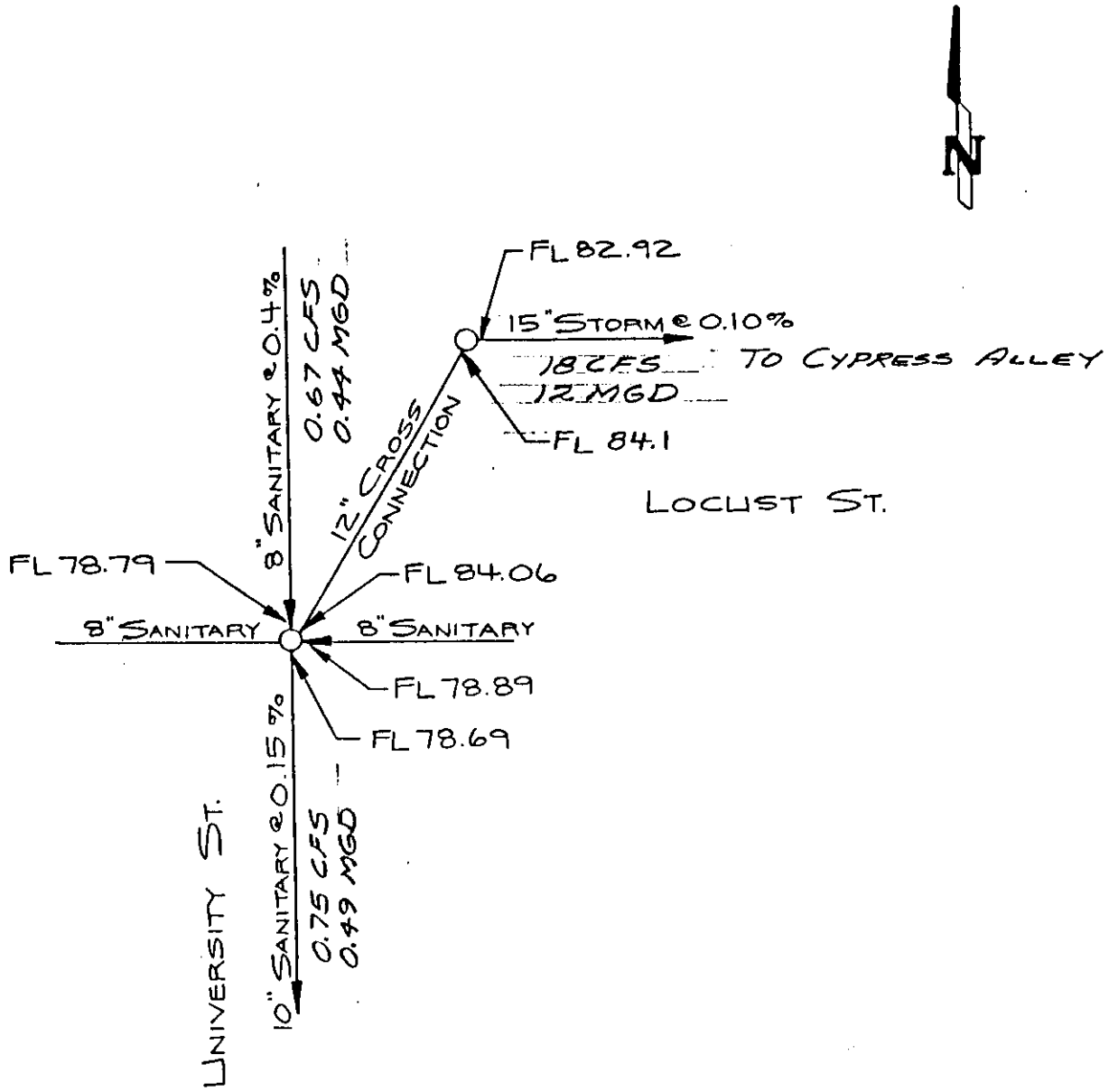
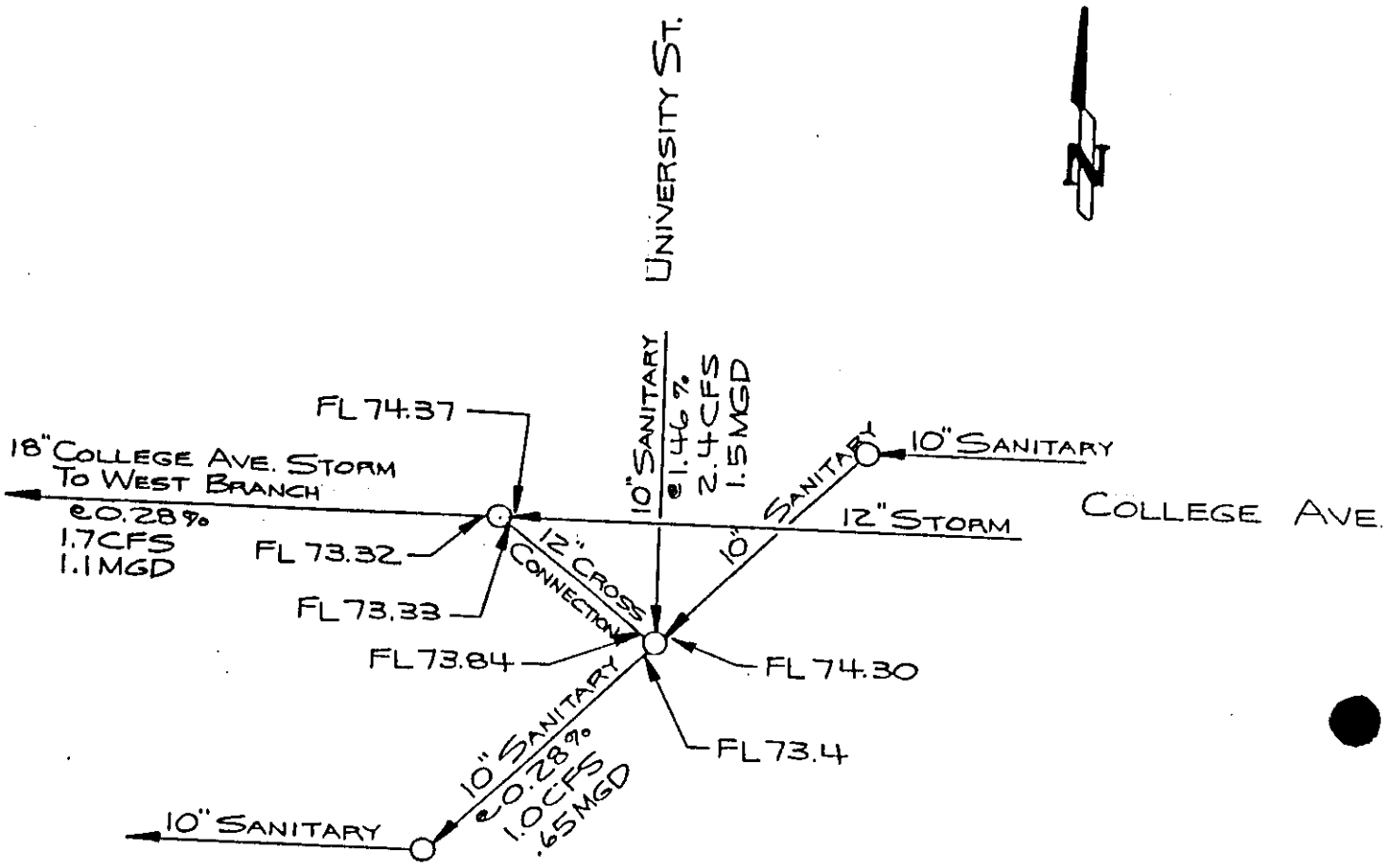


FIGURE 11
COLLEGE AVE
NPDES 025



Overflow - NPDES 017C (Figure 12)

At the intersection of Main Street and Sudduth Road the dry weather sanitary sewage from the areas at College and University plus additional University buildings flows westerly in a 15" sanitary sewer. The excess flow flows to a 24" storm sewer through a high level 12" overflow pipe between manholes and is eventually discharged to the West Branch at the Twin Grove outlet.

Overflow - NPDES 017B (Figure 13)

At the intersection of Main Street and Dry Grove an 8 inch sanitary sewer which contains the dry weather flow from ISU Buildings runs north on Main Street. At this intersection a 12 inch high level by-pass connects the sanitary to an 18 inch storm sewer which eventually permits excess flow to discharge into the West Branch in the Twin Grove Storm Sewer.

Overflow - NPDES 017A (Figure 14)

On Kingsley Street in front of Normal Community High School the 48" Twin Grove Storm Sewer crosses under the 18 inch Kingsley Street sewer.

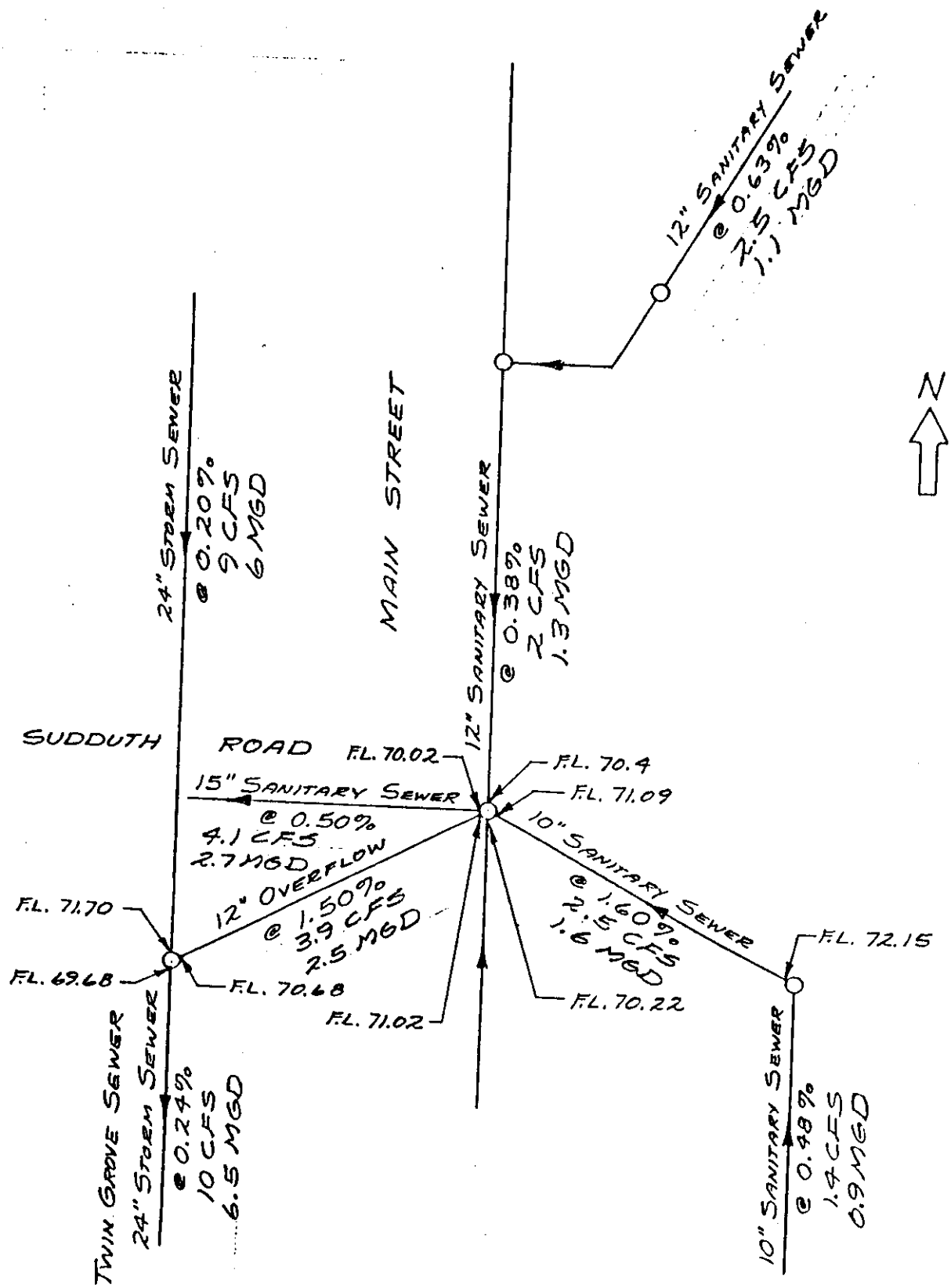
A manhole is constructed at this location which allows the excess flow in the 18 inch sanitary sewer to top a concrete weir in the manhole and fall into the 48 inch sewer. This excess flow is then discharged into the West Branch.

West Branch Overflow - NPDES 008 (Figure 15)

The dry weather flow in the 33 inch sewer is diverted to a manhole on the 15 inch line and a 24 inch line under Sugar Creek connects to the new 36-inch Main Interceptor. A cross connection exists with the original 27-inch interceptor at this location. The overflow location is just up stream of the West Branch at Sugar Creek.

Overflows occur at this location during heavy rainfall periods only. There are not a large number of overflows. The manholes in this area are in fairly good structural condition. These manholes are somewhat prone to

FIGURE 12
TWIN GROVE
NPDES 017
017C



1461-37

FIGURE 13
TWIN GROVE
NPDES 017
017B

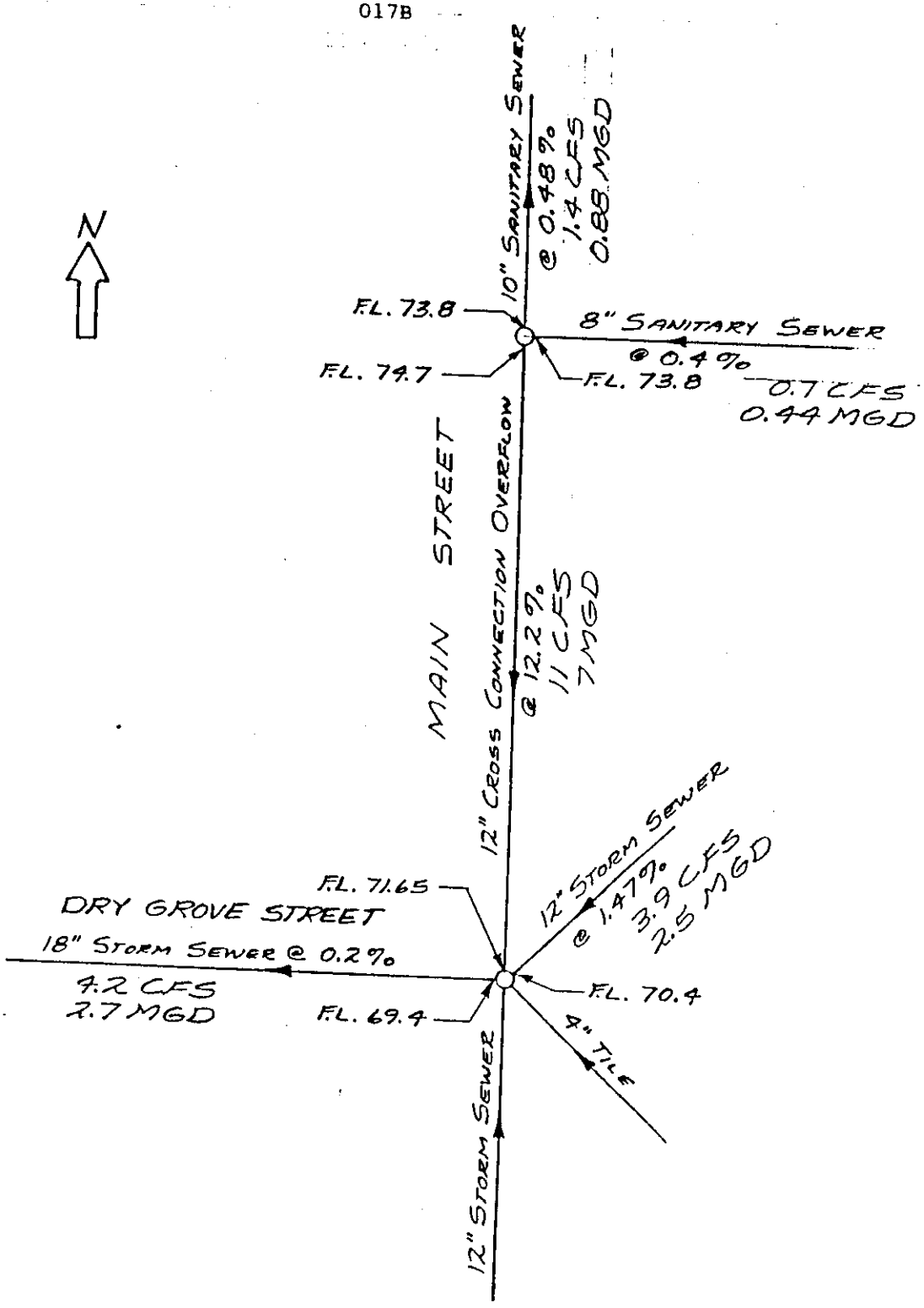
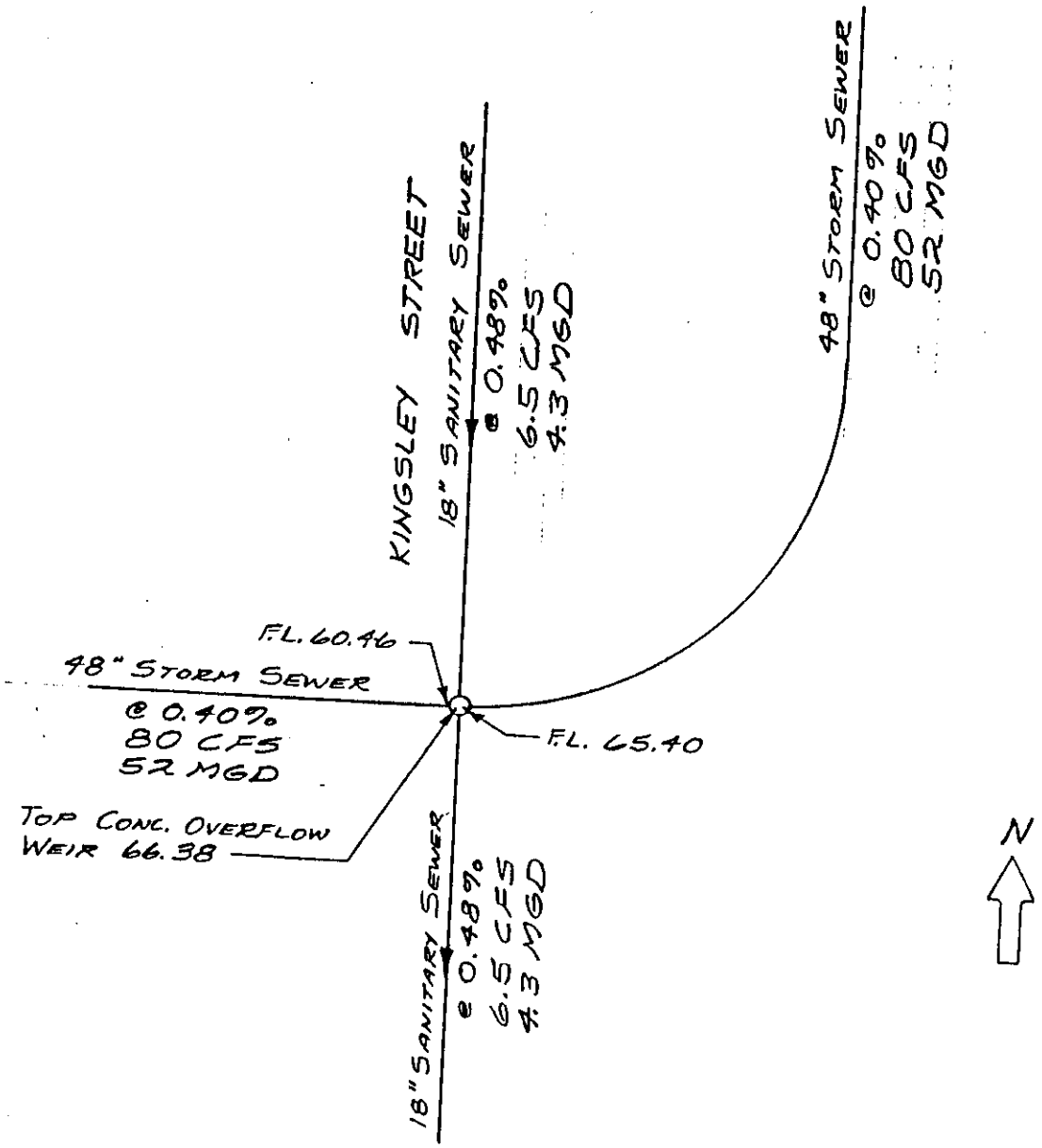
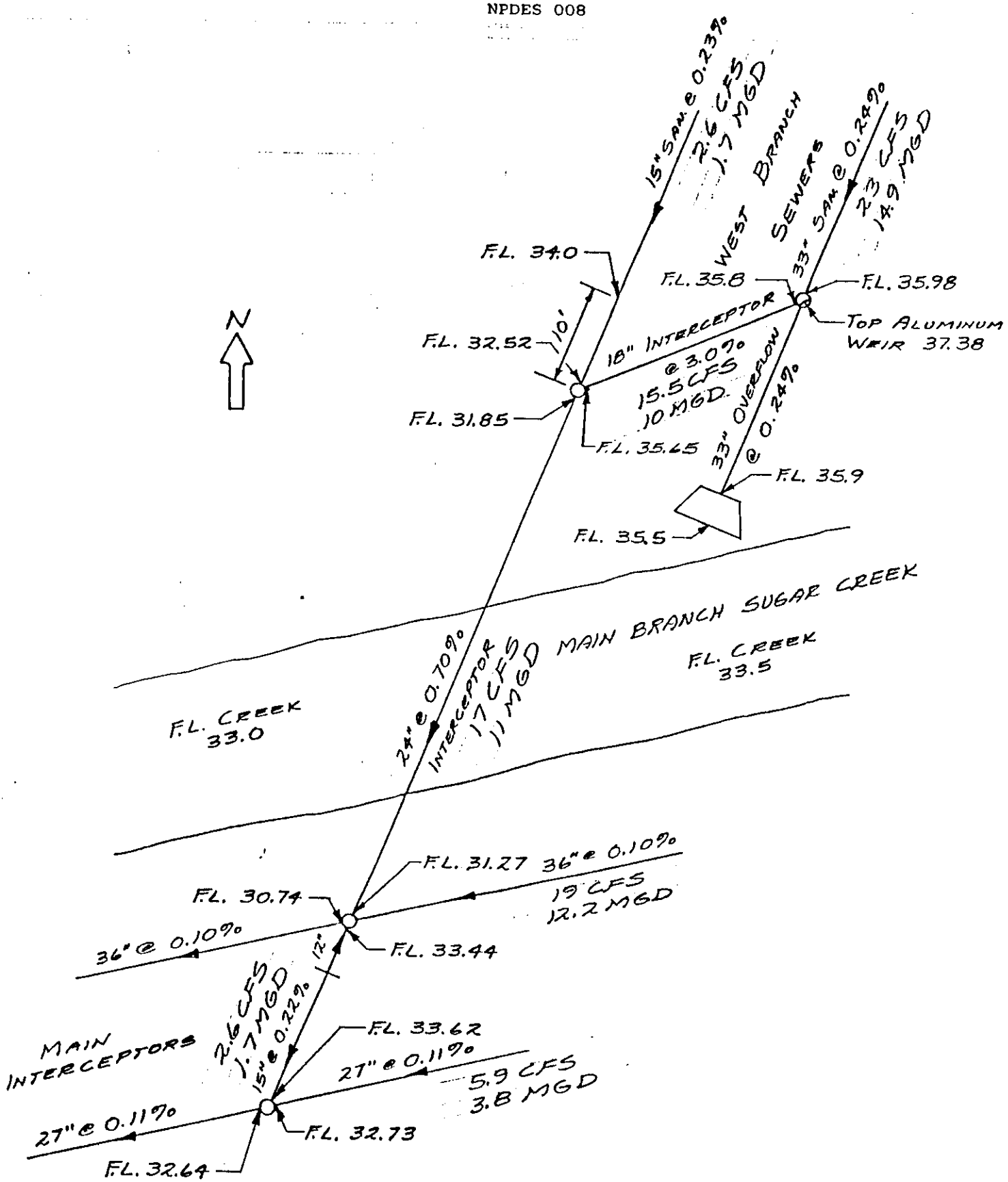


FIGURE 14
TWIN GROVE
NPDES 017
017A



1461-27

FIGURE 15
WEST BRANCH
NPDES 008



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blockages by debris.

The two Main Interceptor Sewers are inter-connected and there are some grit deposits in both interceptors.

The area served at the present time by the West Branch Sewers totals 907 acres with the following breakdown:

Residential	565 acres
Commercial	120 acres
Schools, churches	190 acres
Industrial	32 acres
	907 acres

In the future, the sewered area could be increased to 1067 acres.

The drainage area of the West Branch Creek is 2980 acres, and the total of the Main Branch and West Branch is 12,800 acres. The breakdown of the drainage area of West Branch is as follows:

At Gregory St.	1613 acres
At Cypress Alley 84"	2323 acres
At Twin Grove 48"	2700 acres
At Main Branch	2980 acres

3.5.5 Graham Street

Creek

A short section of ditch was extended from the Graham Street sewer outlet to the Main Branch, a distance of approximately 300 feet. The only flows in this section of ditch are the overflows from the Graham Street Sewer.

Sewers

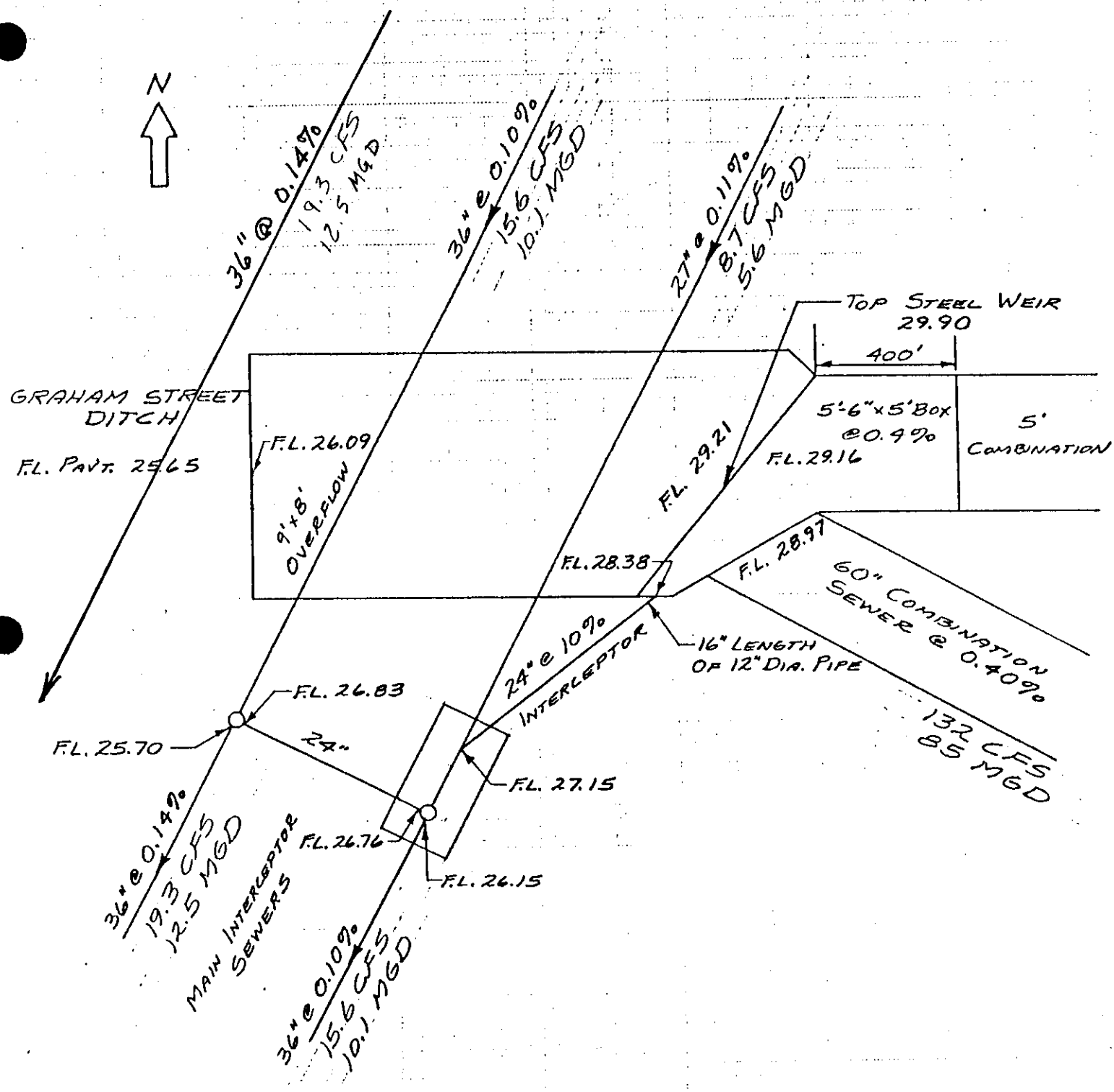
When the Main Interceptor was constructed by the District, the Graham Street Sewer was extended 480 feet from its outlet to the interceptor. In 1947 an additional parallel outlet was constructed. Both of these sewers are 5 feet in diameter.

Overflow NPDES 006 (Figure 16)

The drainage basin area of the Graham Street sewers is 380 acres which is fully developed and served by combination sewers. The dry weather flow

of these sewers is diverted to the main interceptors by a concrete weir in a junction chamber and into a 24" pipe in which is inserted a short 12" nozzle. The two main interceptors are cross connected at the junction chamber The total drainage area of the interceptor sewers at this location is 13,390 acre of which the interceptors transport the dry weather flow of 6364 acres that is developed and sewered. Population served by the Graham Street sewer is 2250.

FIGURE 16
GRAHAM STREET
NPDES 006



3.5.6 West Slough

Ditch

The District straightened and deepened the creek from the outlet of the West Slough Sewers on Caroline Street to the Main Branch.

Sewers

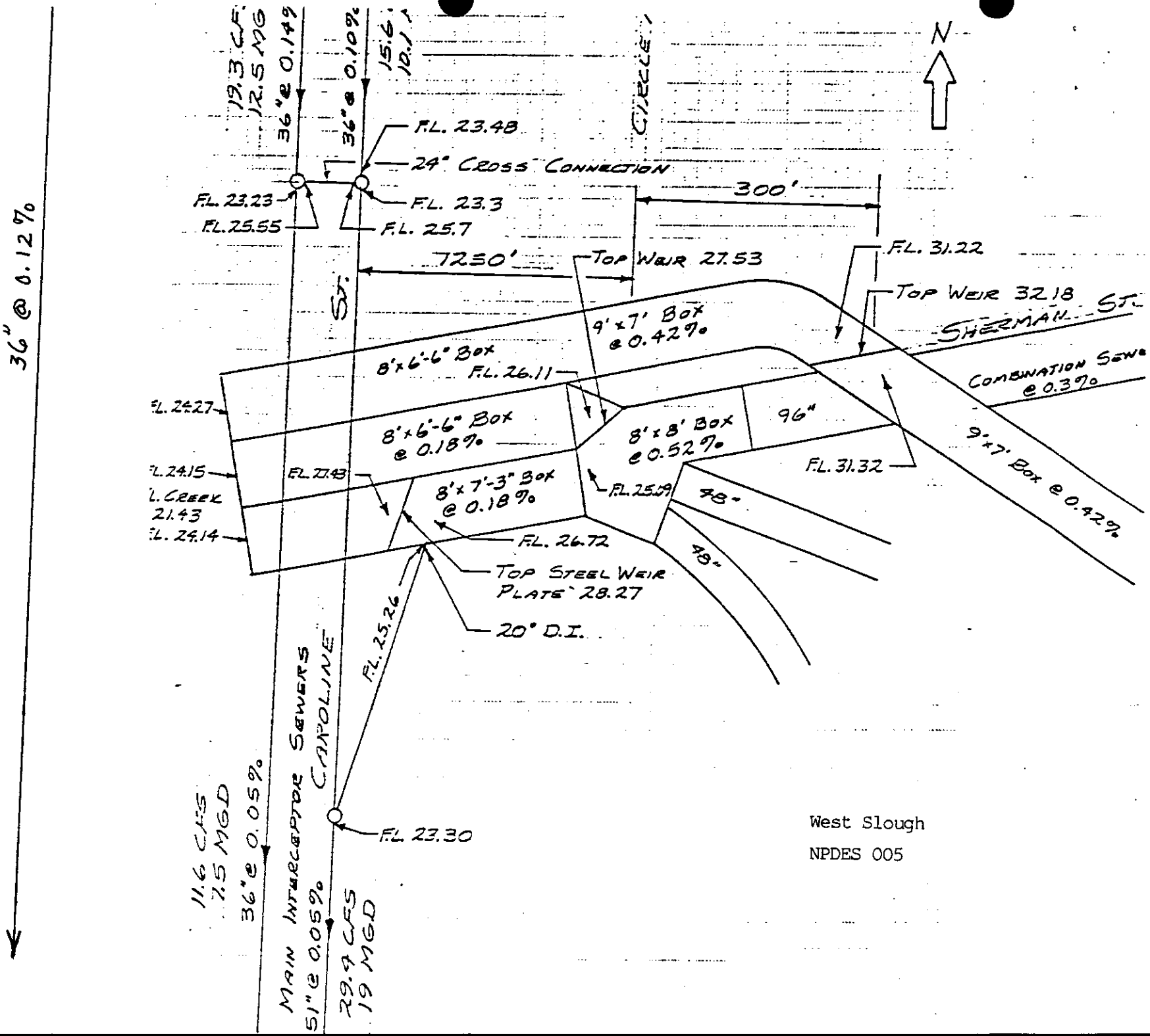
When the main interceptor was constructed by the District the West Slough Sewer was extended as a double box from near Stillwell Street to Caroline Street. An additional parallel box was built in 1946.

Overflow NPDES 005 (Figure 17)

Concrete diversion weirs are constructed in the north two boxes at Stillwell Street to divert the dry weather flow into the south box. A weir in this box at Caroline Street diverts the flow to the 51 inch interceptor thru a 20" cast iron pipe. The structures and sewers in this overflow area are in excellent condition. The West Slough Sewers serve an area of 2000 acres which is all combined sewered. This area is the central core of Bloomington and includes the downtown business area.

The main interceptor sewers serve a developed area of 8353 acres which has a population of 70,817.

The drainage of Sugar Creek is 19,540 acres at this location.


N
36" @ 0.12%
19.3 CFS
12.5 MGD
36" @ 0.14%
36" @ 0.10%
15.6 CFS
10.1 MGD
CIRCLE
F.L. 23.48
24" CROSS CONNECTION
F.L. 23.23
F.L. 25.55
F.L. 23.3
F.L. 25.7
300'
7250'
TOP WEIR 27.53
F.L. 31.22
TOP WEIR 32.18
SHERMAN ST.
ST.
9'x7' BOX @ 0.42%
8'x6'-6" BOX
F.L. 26.11
CONBINATION SEWER @ 0.3%
F.L. 24.27
8'x6'-6" BOX @ 0.18%
8'x8' BOX @ 0.52%
96"
F.L. 31.32
F.L. 24.15
F.L. 27.43
8'x7'-3" BOX @ 0.18%
F.L. 25.09
48"
L. CREEK 21.43
F.L. 24.14
F.L. 26.72
TOP STEEL WEIR PLATE 28.27
20" D.I.
F.L. 25.26
11.6 CFS
7.5 MGD
36" @ 0.05%
MAIN INTERCEPTOR SEWERS
CAROLINE
51" @ 0.05%
29.7 CFS
19 MGD
F.L. 23.30
West Slough
NPDES 005

3.5.7 Wood Street Overflow - NPDES 004 (Figure 18)

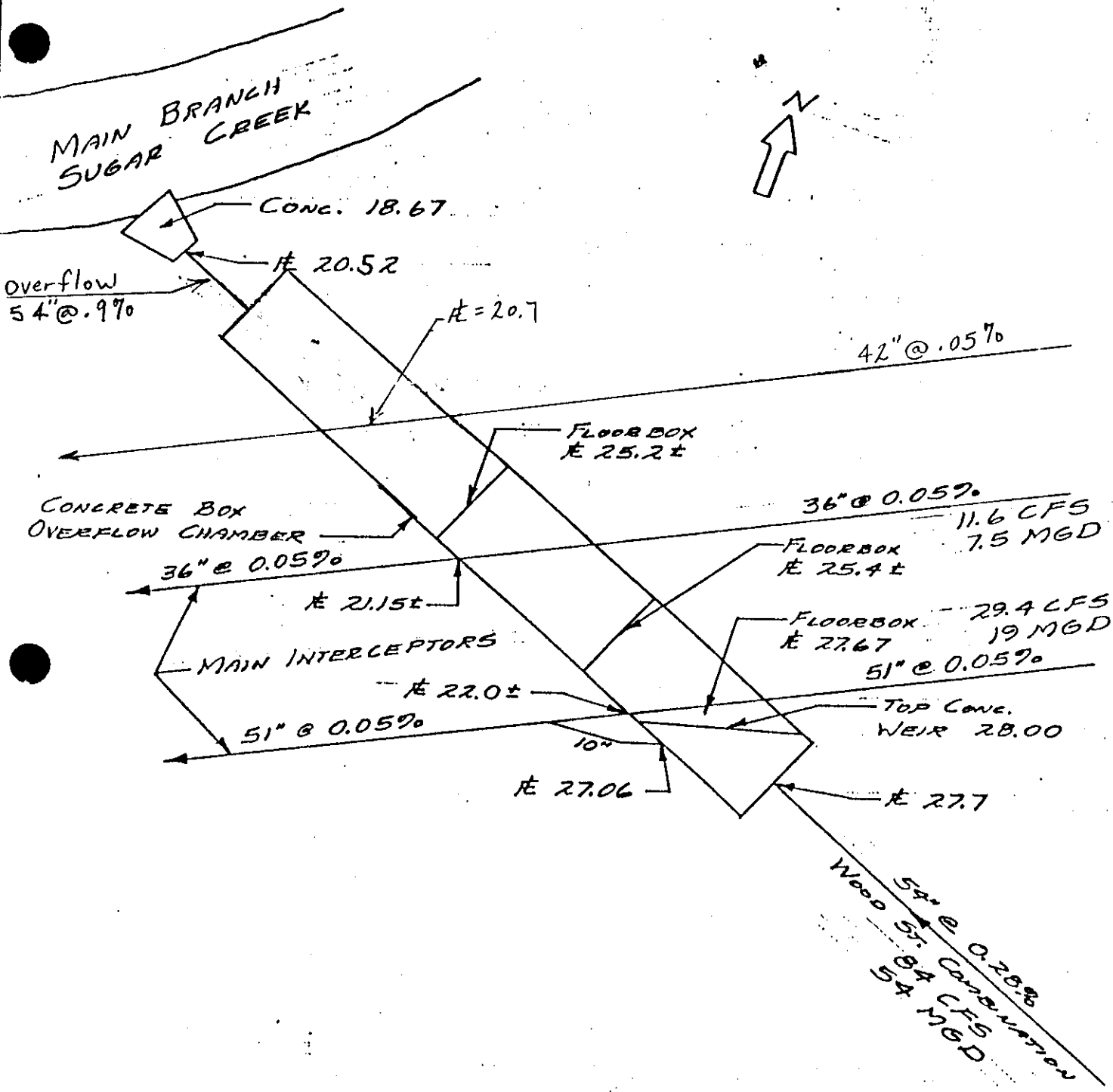
The Wood Street Sewer is a combined sewer which serves an area east of the Treatment Plant. At the Treatment Plant, a concrete box overflow structure is constructed over the 51-inch and 36-inch main interceptors. A small weir in the box directs the dry weather flow into a 10-inch connection to the 51-inch interceptor.

Wet weather flow tops the small weir and discharges to Sugar Creek through the 51-inch sewer.

This sewer serves a residential area of 81 acres. Additional acreage which includes an auto wrecking firm, BNSD property and undeveloped land could discharge to this sewer. Proximity to the BNSD will probably prevent the undeveloped land from being residential area.

The flow in this sewer is low in both dry weather and wet weather.

FIGURE 18
WOOD STREET SEWER
NPDES 004



1461-43

3.5.8 Summary of Drainage Areas and Populations for Main Branch of Sugar Creek

Tables 1 through 4 which follow provide a summary of the sewered areas, population, land use, zoning, and creek drainage areas for all of the overflows and Main Branch Creek system. These areas include the Main Branch, West Branch, North Branch and Country Club Branch. All of these areas are served by the two main interceptors which discharge to the treatment plant. The two drainage basins not included in this summary are Skunk Creek and Highland Park Branch, which discharge directly to the Treatment Plant. Populations shown do not include any connected industrial or commercial population equivalents.

The data presented in the following Tables are summarized below:

Main Branch Creek System

	Type of Sewers	area (acres)	Population
S.C.	Sanitary Sewer discharging to combined	1187	8,920
C.	Combined Sewer	2989	25,150
P.S.	Partially Separated Combined Sewers	1047	13,450
S.I.	Sanitary sewer discharging to interceptor	2203	16,330
S-P.S.	Sanitary sewer discharging to partially separated sewers.	1008	7,460
Total in Main Branch Basin		8434	71,310

3.5.9 Skunk Creek Tributary

Creek

The Skunk Creek Tributary has had no work performed on it by the District and the District has no control over it. Portions of Skunk Creek have been straightened and cleaned during subdivision work in the Town of Normal, and the Town maintains these portions.

Sewers

In 1968 a sanitary outlet sewer was constructed as a cooperative project by Bloomington, Normal and the Sanitary District starting at Market Street and extending north along Skunk Creek to a point where a 15-inch sewer outlets from the Town of Normal. This sewer serves practically all the new developed area west of Cottage Avenue between Division Street extended and Gregory Street, including the Normal Industrial Park and Parkside School. A temporary connection was made east along Market Street to a City pumping station at the Main Branch which served Market Street west of the Creek and discharged to the Main Interceptor at Caroline Street. The capacity of the pumping station was increased by installing larger motors and impellers and increasing the speed. The District agreed to maintain and operate the pumping station and the sewer.

In 1979, a 36-inch outlet sewer was constructed for this sewer from Market Street to the treatment plant by the District. The pumping station is still in operation to serve only the Market Street properties lying between Skunk Creek and the Main Branch. The new 36-inch sewer discharges directly to the Treatment Plant.

An extension of the sanitary outlet is nearing completion that will serve a large area along the Route 55-74 corridor on the west side of Normal, from south of Hovey Avenue to I-74 west and I-55 East north of Normal.

There are no combined sewers in this basin, and no overflows.

3.5.10 Highland Park Branch

Creek

The Highland Park Branch has been straightened and some ditch checks and other riprapping improvements have been made from it's outlet in the sewage plant property southeasterly to Main Street. At various times the District contributed to the cost of building and rebuilding several bridges across the creek.

In 1934 a storm sewer 72 inches in diameter was built to relieve the Big Four Valley area which generally paralleled the route of the Big Four Railroad tracks through the City of Bloomington. This sewer, approximately one mile in length, extended from the Illinois Central Railroad and Lincoln Street southwesterly to an outlet into the Highland Park branch near Main Street. This sewer diverted a considerable amount of storm water that formerly flowed into sewers serving the business district and other built-up portions of the City of Bloomington causing flooded basements.

Sewers

In 1934 a 24 inch sanitary sewer was constructed from the treatment plant southeasterly, passing through Forrest Park and then to Main Street. A lateral sewer was also constructed from this sewer along Morris Avenue to connect to an existing sewer south of the bath house at Miller Park.

In 1976 a parallel sewer was constructed from the Plant to Main Street. It serves as an outlet sewer for sewers serving the land to the south and also receives discharge from the City of Bloomington's Ireland Grove Pumping Station.

Valley Sewer Outlet - NPDES 020

The 72 inch relief sewer constructed by the Sanitary District from Highland Park to Lincoln and Bunn Streets was extended by the District to the Chamber of Commerce addition in the late 30's. In 1946 the City of Bloomington extended the sewer further east and north in the Chamber of Commerce Addition to Oakland Ave. High level by-passes were constructed at 3 locations

between the storm relief sewers and combination sewers.

Maizefield & Florence Avenue - NPDES 020A (Figure 19)

The dry weather flow from a 3 acre residential area flows north in the Florence Avenue 12" combination sewer. A high level by-pass connection allows the excess flow to enter the Maizefield 24" storm sewer.

Maizefield & Kreitzer - NPDES 020B (Figure 20)

The dry weather flow from a 3 acre residential area flows north in the Kreitzer Avenue 12" combination sewer. A high level by-pass connection allows the excess flow to enter the Maizefield 24" storm sewer.

Maizefield & McGregor - NPDES 020C (Figure 21)

The dry weather flow from a 9 acre residential area flows north in the McGregor Street 12" combination sewer. A high level by-pass allows the excess flow to enter the Maizefield 30" storm sewer.

Morris Avenue Overflow - NPDES 019 (Figure 22)

In 1934 a sanitary sewer was constructed from the treatment plant southeasterly, passing through forrest park and then to main street. A lateral sewer was also constructed form this sewer along Morris Avenue to connect to an existing sewer south of the bath house at Miller Park. This sewer formerly discharged through an Imhoff tank to the Highland Park Branch. This tank was abandoned. North of the Miller Park bath house, the existing combination sewer has a manhole with a diversion weir. The dry weather flow of an area which includes Miller Park and some residential area east of it is contained in the sewer. The wet weather flow tops the weir and a 12 inch cross connection to an 18 inch tile, which then discharges into the Highland Park Branch in Park Hill Cemetery.

The Miller Park sewer serves a 22 acre portion of Miller Park and a 40 acre residential area east of Miller Park.

FIGURE 19
VALLEY SEWER
NPDES 020
020A

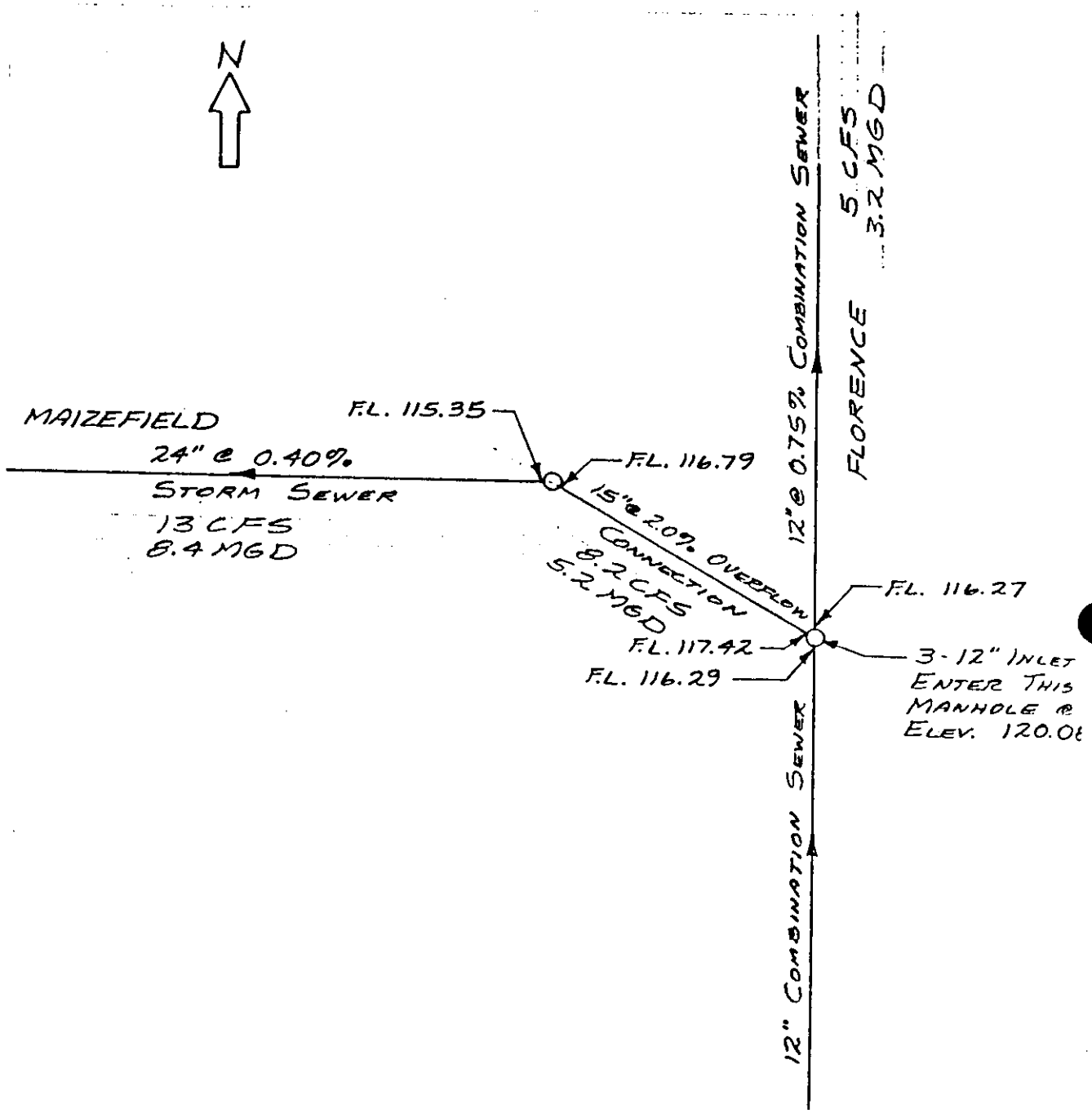
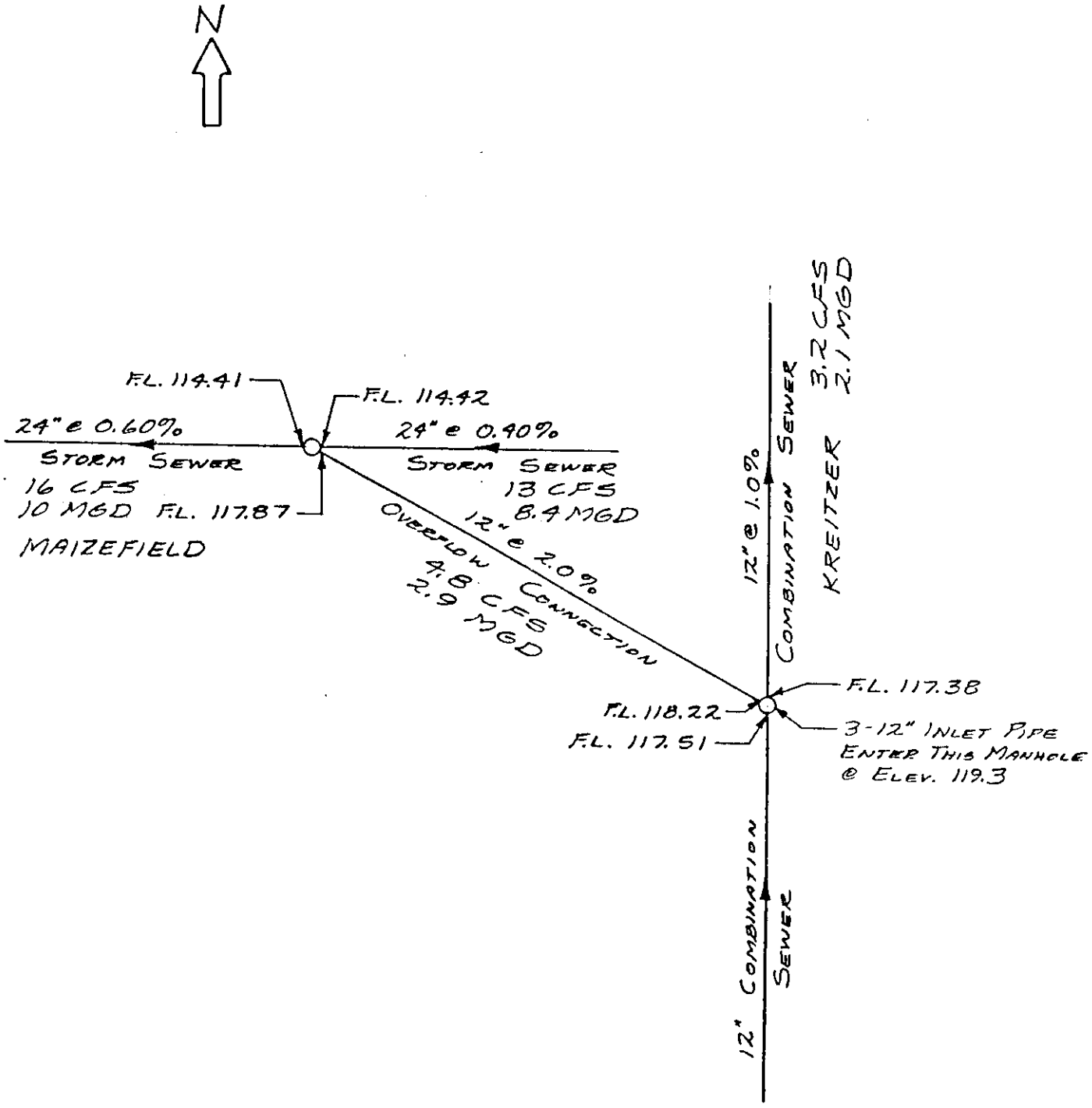
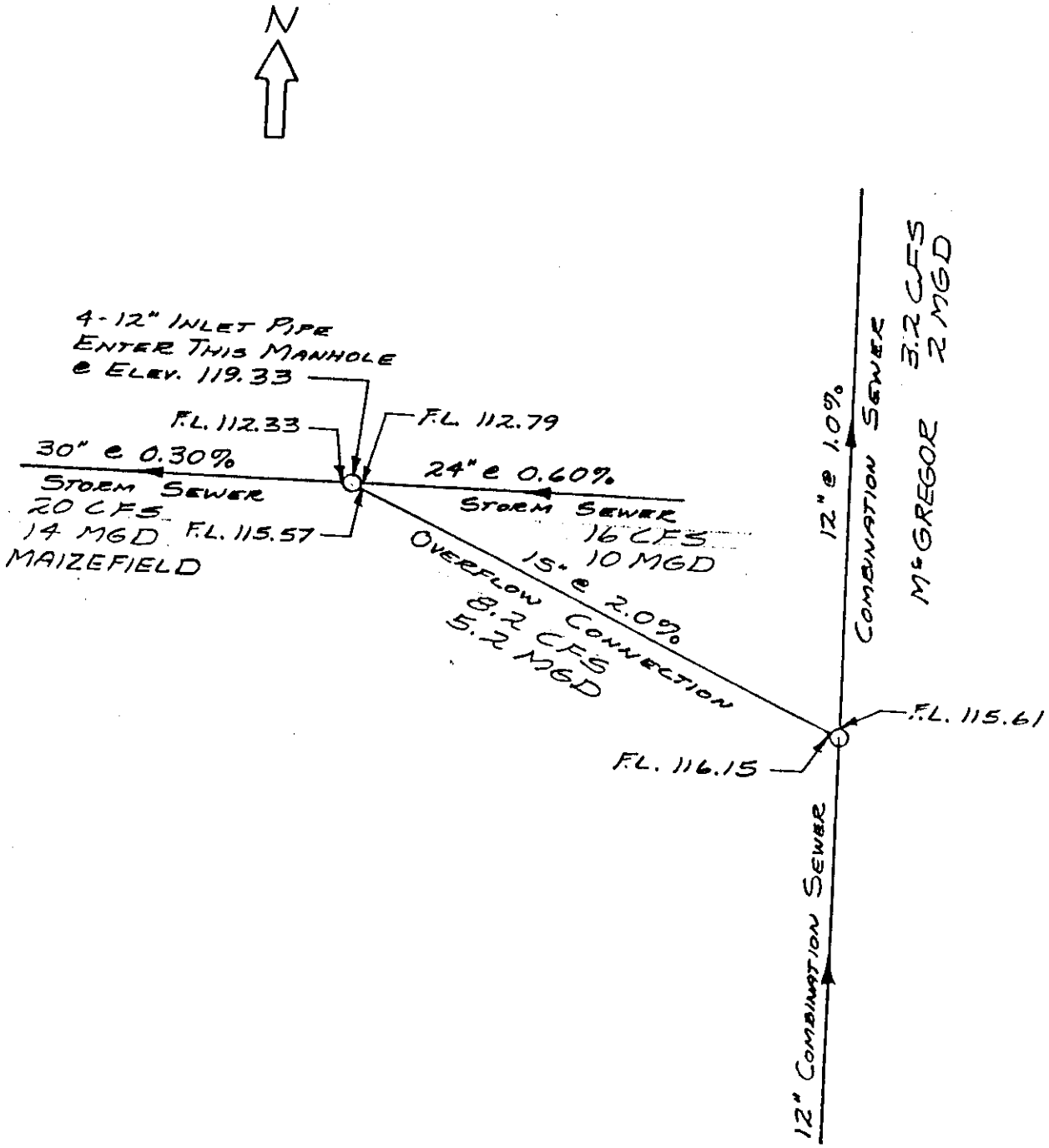


FIGURE 20
VALLEY SEWER
NPDES 020
020B



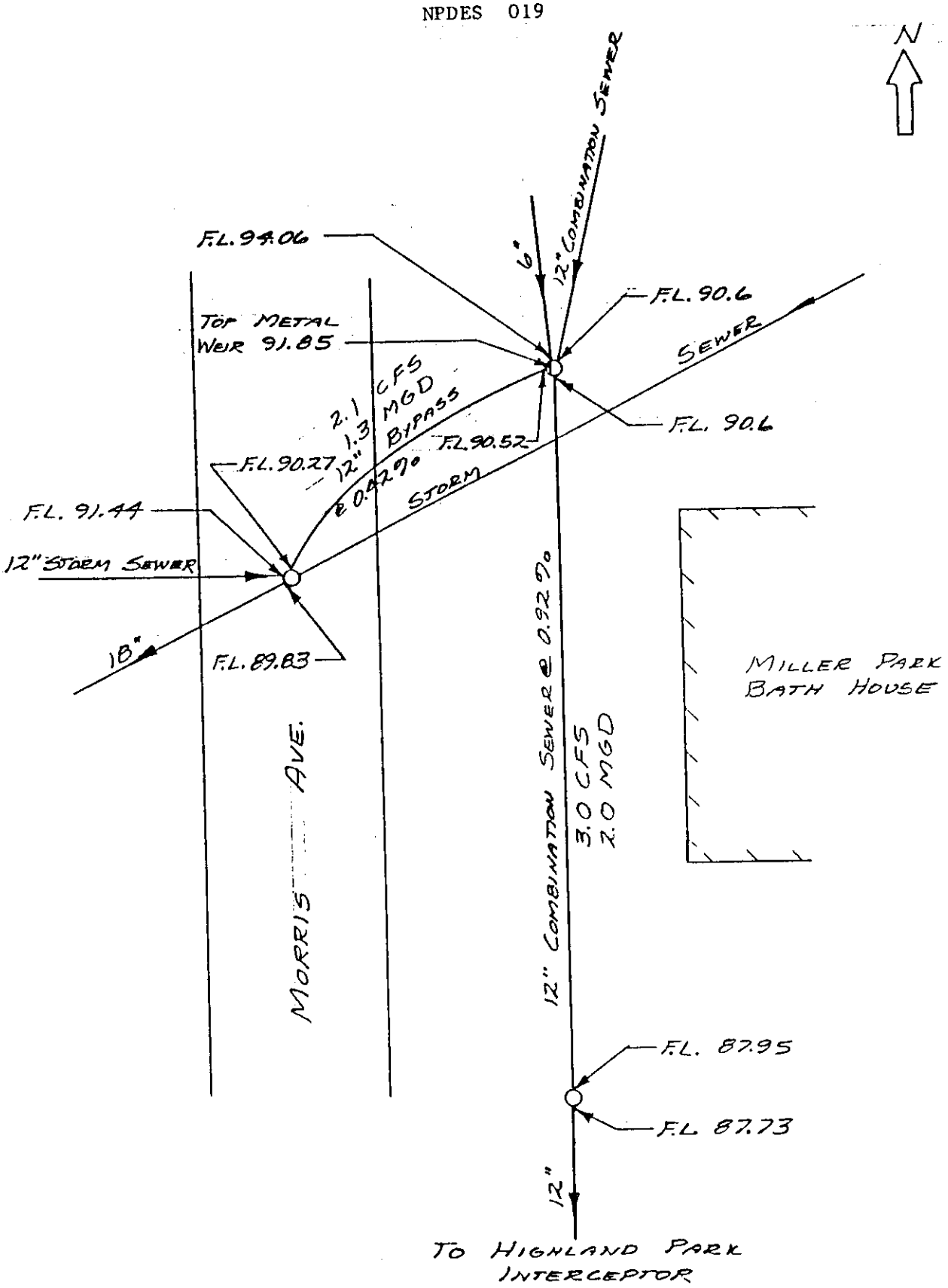
1461-38

FIGURE 21
VALLEY OVERFLOW
NPDES 020
020C



1461-39

FIGURE 22
MORRIS AVENUE
NPDES 019



1461-42

ATTACHMENT 2

A. EXECUTIVE ABSTRACT

1. Introduction

On the 25th day of September, 1989, ADS Services, Inc. entered into an agreement with the Bloomington & Normal Sanitary District for supplying and installing an interceptor monitoring system.

Our contract agreement consisted of furnishing all labor, equipment, services, materials, and other means and to do all work necessary to construct the complete remote control flow monitoring system. The system also includes a 3 month warranty period beginning December 1, 1989. Following the warranty period, a comprehensive service maintenance period will begin and continue until November 30. 1990. The system includes 10 Quadrascan 3000 series in-line monitors and the ADS Quadrascan software. Training will be provided for the software.

The sanitary sewage interceptor system for the Bloomington & Normal Sanitary District conveys sewage to a wastewater treatment plant. The ADS monitors installed as part of this agreement will record flows for the purpose of providing wastewater volume received at the wastewater treatment plant.

2. Sewer Construction/Condition

The observed construction of manholes and sewer lines in the study area was favorable. The manholes that were inspected for this project were structurally in good condition. All but two of the locations in which the monitors were installed had concrete pipes. Half of the flow monitoring locations showed some evidence of surcharging, however, some of it seemed to be old.

3. Concerns

The safety of our field crews is a major concern for ADS. Each of the manholes descended on this project was in good shape, with strong ladder rungs. However, large quantities of H2S gas, up to 30 ppm, were detected at several sites. The sites where H2S gas was detected were MP2, MP3 and MP4. The H2S concentrations at these sites are most likely due to their proximity to the wastewater treatment plant.

A few of the sites appear to be prone to condensation during the winter months. These sites are MP7, MP8 and MP9. The steam and condensation is evident in the site photographs included in the report. Because of the condensation, frequent sensor scrubs are anticipated at these three sites.

4. System Capacity

Backwater conditions normally exist at three sites (MP3, MP4, MP5) during dry weather periods. These sites are located near the W.W.T.P. where they are backed up from the treatment plant. As a result, the hydraulic calibrations taken at these sites were done during the minimum flows when free flow conditions existed. The remaining sites appear to have adequate capacity during dry weather flows.

B. ACTIVITY SUMMARY

1. **Agreement** - On the 25th day of September, 1989, ADS Services, Inc. located in Huntsville, Alabama entered into an agreement with the Bloomington & Normal Sanitary District. ADS was chosen to manufacture, install and maintain 10 flow monitors within the Bloomington wastewater collection system for flow quantification.

2. **Map Review** - The complete sanitary sewage interceptor system for the Bloomington & Normal Sanitary District was divided into mini-systems. The maps were reviewed and the monitoring locations were chosen by the Consulting Engineering firm of Farnsworth and Wylie, P.C. Pre-investigations were performed by representatives from ADS in September of 1989.

3. **Investigations of the Manholes** - Meaningful flow data can be acquired only where suitable hydraulics are present. The suitability of a site is determined by the presence of those conditions necessary to derive an accurate depth-to-discharge curve for use in the open channel flow equation. These conditions are:

    a. Uniformly shaped pipe for monitor placement, upstream from manhole.

    b. Uniform flow, away from the influence of other tributary entries or hydraulic jumps such as those caused by offset pipe joints.

After ADS entered into a signed agreement in September of 1989, an ADS Project Manager performed detailed field investigations. During this phase, the ADS Project Manager descended all monitoring manholes to identify those areas where hydraulic conditions would be suitable.

4. **Installations** - The complete installation process can be broken down into three phases: (A.) Monitor installation; (B.) Calibrations; (C.) Telephone hook-ups.

A. The 3000 series quadredundant flow monitors were installed during the time frame of October 6 through October 11, 1989. The sensors at all of sites were placed upstream of the invert in order to avoid the jumpy or bad hydraulics that are usually present in the invert.

B. Calibration.of all equipment is performed before the installation occurs. The purpose of the calibration is to insure sensor accuracy, and as a preventive maintenance measure to ensure overall project uptime and accuracy of the data.

A critical factor in producing accurate flow data is the taking of accurate hydraulic calibrations in order to establish an energy gradient. Hydraulic calibrations were performed in a gravity "free flow" pipe whenever possible.

C. Another important step in the installation process is passing the phone orders and obtaining phone lines for each site. Although this process can often introduce great delays on a project, such was not the case on this project.

5. Monitoring Startup - Each ADS flow monitor, acting in synchrony with all other units, acquires and stores a reading every 15 minutes. This is a depth of flow reading and a velocity reading.

A. Quality Assurance - The quality of the data collected throughout the startup period is analyzed throughout the project. Regular field visits to each flow monitor include the following functions:

<u>Verify Depth of Flow and Velocity:</u> The field crew member descends the manhole to measure the depth of flow at the sensor. This manual depth reading is confirmed with the monitor reading for unit accuracy. An instantaneous velocity reading is also taken with a hand held velocity meter.

Measure Silt Level: The field crew member measures the depth of siltation, if any, at the sensor.

Perform Hydraulic Calibrations: Flows are quantified by: (1) velocity test; (2) weir test; (3) wetwell calibrations; (4) depth-to-discharge tables.

Confirm Monitor Synchronization: The field crew and the data analyst check the ADS flow monitor's timing with the master clock in the computer to assure that all readings are being taken simultaneously.

Review of Raw Data: After the phone lines are connected, the data analyst makes routine data collects twice per week. The analyst reviews all readings for consistency and searches for those deviations in flow patterns which indicate system anomalies. These data collects also allow the data analyst to assure that the data being collected is valid and that the high field standards demanded by ADS are being maintained.

ADS FLOW MONITORING METHODS

Experience in over two hundred flow monitoring projects has led ADS to development of the most accurate and effective flow monitoring methods available in the marketplace today. ADS monitors are truly a spinoff of the US Space Program. Dr. Peter Petroff who participated in the NASA Nimbus and Pegasus projects developed the first ADS flow monitor and has been improving them ever since. He brought with him the concepts of no moving parts and multiple redundancy. Today, ADS monitors survive longer and have a better service record than any other monitors, in part because of the lessons learned in space.

Obtaining flow data in sewers, accurate to within plus or minus ten percent is difficult due to transient hydraulic conditions, a hostile, corrosive environment, human measurement, calibrations error, etc. Yet, the need for accurate wastewater flow data exists in every collection system - "You can't manage what you can't measure".

Open channel flow equations developed earlier in this century are accurate for measuring freely discharging flows, particularly in regular cross-sections. Most equations for quantification of flow are dependent upon constant gravitational forces and the relative homogeneity of wastewater along with theoretical and empirical research for each site. Manning equation is the most accurate of the open channel flow equations, thus, ADS uses the modified Manning equation wherever applicable. Manning equation for calculating flow is accurate only under free-flow conditions and the formula is:

$$Q = A * V, \quad \text{or Quantity} = \text{Area} * \text{Velocity}$$

where: $$V = 1.486 * Rh^{(2/3)} * S^{(1/2)} / n$$

Variable Definitions:

Q - Quantity. All quantity figures are presented in the units of MGD (Million gallons per day).

A - Wetted Area. The cross-sectional area ia a function of the pipe size and shape, which are documented by the ADS Project Manager, and of the depth of flow, which is recorded by the sensor. The small area occupied by the sensor is subtracted from the cross-sectional area, to find the actual wetted area.

V - Velocity. In Manning equation velocity is calculated from other more easily measured variables.

ADS

S - Slope. In Manning equation slope refers to the physical slope of the pipe. But in ADS methodology, the slope refers to the hydraulic slope calculated from other variables more easily measured in the field.

n - Roughness or friction coefficient. The "n" factor is an empirically derived, dimensionless coefficient with values which vary from 1.00 to 1.22 according to the d/D ratio (depth of flow divided by diameter). ADS uses values from a hydraulic handbook published by Brater and King.

S^(1/2)/n - Energy Gradient. The expression S^(1/2)/n in Manning equation is known at ADS as the Energy Gradient. ADS field personnel calibrate every site several times to statistically determine the value of the actual energy gradient.

Rh^(2/3) - Hydraulic radius. The wetted area divided by the wetted perimeter.

1.486 - Conversion factor from metric units (cubic meters per second) to English units (feet per second).,

When non-free-flow conditions occur, ADS uses the continuity equation (Q=AV) to calculate flow, where area is derived from the depth sensor as in Manning equation but velocity is calculated using the data from the ADS velocity sensor.

Extensive experience by the engineering community has shown that obtaining open channel flow data accurate to within plus or minus ten percent is extremely difficult. This difficulty has many contributing factors: non uniform cross-sectional areas, poor hydraulic conditions, siltation, hostile environments, equipment malfunction, human error, etc. Yet the need for accurate flow data to provide quantification, location, and isolation of severe infiltration/inflow problems remains critical.

Investigation into the best means of obtaining the most accurate flow data possible has led ADS to determine that there are 6 critical elements that must be optimized in order to provide clients with better than ten percent accuracy on flow data:

1. Good Equipment
2. Proper Hydraulics
3. Trained Field Crews
4. Sensor Confirmation
5. Flow (Hydraulic) Calibrations
6. Data Analysis/Quality Control

ADS has developed the best possible solutions to each of the above listed elements as follows:

<u>Good Equipment</u>

For long term monitoring, ADS uses its Quadrascan flow monitor. The main features of this unit are: (a) quadredundant ultrasonic depth sensor, (b) velocity sensor, (c) remote microprocessor and memory for storage of data, (d) and telemetric unit for interrogation and communication over voice grade telephone lines.

a) Quadredundant ultrasonic depth sensor

The ultrasonic depth sensor, or "bat", received its nickname because it hangs upside down in dark places and emits a high pitched ultrasonic chirp when activated. The bat can measure distances with laboratory accuracies of up to 0.02 inches. The sensor itself has four ultrasonic crystals which can be used for either sending or receiving signals, yielding twelve usable combinations or sensor pairs. This quad-redundancy is extremely useful in case of debris being deposited on one crystal after surcharging or moisture buildup.

b) Velocity sensor

The velocity sensor developed by ADS Services was designed to operate in conjunction with the Quadrascan permanent monitoring system, utilizing the quadredundant ultrasonic depth sensor. The velocity sensor was originally conceived as an auxiliary option that would enhance the usefulness of the existing permanent monitor by allowing an accurate flow quantity to be determined during backwater and surcharge conditions.This condition has previously been difficult to monitor accurately since ADS calibration methodology was based on a modified Manning equation, which assumes free-flow conditions at all times.

The velocity sensor consists of a ultrasonic crystal encased in an inert epoxy shell. With a low profile and streamlined shape, it is easily mounted on the bottom of the pipe. It is important to note here that the sensor dies not read the velocity solely at the bottom of the pipe, which is one of the most turbulent, unreliable areas of a pipe from which to take a velocity measurement. Rather, the ultrasonic crystal sends out a carrier signal which is reflected off the surface of the flow (or top of a pipe if it is full) and intercepted back at the crystal. The crystal monitors and interprets two characteristics of the reflected signal in order to derive the velocity of the flow.

The raw values obtained must then be calibrated to the actual flow conditions. The velocity sensor developed by ADS was not intended to act as a "stand alone" instrument. Without any additional calibrations with which to match the raw values measured by the ADS velocity sensor, the readings would be meaningless. The data from the velocity sensor is calibrated to Manning during free-flow conditions.

ADS can measure most velocities using the velocity sensor accurately to within 0.1 feet per second. Velocity data is most often used during inflow events where some hydraulic backup occurs. Under these conditions it is much more accurate than Manning equation. During free-flow periods, the bat has an accuracy of 0.02 inches and yields a slightly more accurate calculation of discharge than does the velocity sensor. Therefore ADS uses depth data for all depths below the onset of hydraulic backup. For depths above the onset

of hydraulic backup, ADS uses velocity data.

ADS has developed software that eliminates the need for actual computation by an operator. However, common sense and a knowledge of the limitations of the system are needed in order to ensure that accurate velocity data is produced. The accuracy of the velocity data obtained by the ADS system is closely related to the skill and knowledge of the operator.

c) Remote microprocessor and memory for storage of data

The monitor can be activated to "wakeup" and record data from both the depth and velocity sensors. This wakeup can be programmed to occur at regular set intervals from two and a half minutes up to once per hour. ADS through years of experience has determined that data recorded every fifteen minutes is sufficient in most situations to properly quantify flow.

When a wakeup occurs, the monitor records data and stores it into its memory. The monitor under the usual ADS monitor configuration will hold up to 26 days of data (depending upon the monitor model). After the 26 days have past, the monitor will record over the oldest data in the monitor. Therefore data in the monitor must be collected on a regular basis to prevent loss of data. ADS recommends collection every three to four days for sufficient lead time to allow crews to perform any work necessary before the monitor begins to overwrite data. The usual configuration consists of data recorded from the velocity sensor and four depth sensor pairs. The monitor can be programmed to record data from any one of the twelve depth sensor pairs. The time to fill the monitor memory is shortened if the monitor is programmed to wake up more often.

d) Telemetric unit for interrogation and communication over voice grade telephone lines

The monitors are interrogated automatically by the telephone through a central computer which utilizes the ADS Quadrascan software. Data is transmitted at a baud rate slow enough for even the oldest lower grade telephone networks. To minimize disruption to data analysis, data may be collected automatically at night.

The ADS Quadrascan software automatically dials each monitor up the three times if necessary, connects, logs on, does a monitor system check, collects all the data, checks the data received and compares it to the data sent, appends it to the database in the central computer, prints a message to a historical log, and then call the next monitor in the sequence.

ADS has eliminated the need for regular site visits by providing a telemetric link for performing data collection and certain maintenance functions. The analyst can remotely call up the monitor and fire all the depth sensor pairs, looking for the pairs with the most reliable data while the field crews are being schedule to clean the sensor. Also the analyst can check the monitor batteries and display on the computer screen an instantaneous depth

and velocity reading.

Proper Hydraulics

One of the least understood requirements for accurate flow data is proper hydraulics. All other requirements can be met, but rendered useless, if proper hydraulics do not exist at the monitoring site. Proper hydraulics include having as much of a uniform flow as possible with little turbulence and, if possible, a site which does not ever surcharge.

Prior to commencing any fieldwork, ADS reviews existing information on the collection system such as sewer maps, treatment plant records, previous studies, etc.

After flow monitoring locations are selected, an ADS Project Manager will investigate the selected sites. It is the responsibility of the Project Manager to choose the best site. Free-flow hydraulics are the prime consideration. All other considerations aside from client insistence are secondary. One key to collecting accurate data is choosing sites with good hydraulics. Having non-uniform flow or daily surcharging are conditions which would be best avoided. Extensive experience in judging a potential monitoring site's hydraulic suitability is required in order to satisfy this important criterion.

The ADS method of ensuring proper hydraulics consists of the Project Manager personally descending each manhole in order to determine its hydraulic suitability for flow measurement. Ultimately, only one out of every three manholes visited is acceptable for flow monitoring. In large lines and combined sewer systems, site investigations will concentrate more on where within a given site location sensors need to be place to assure the best possible flow quantification and equipment survival.

The condition of non-uniform flow is extremely difficult, if not impossible, to quantify. The ADS system was designed to be used up the pipe where smooth flow is most likely to occur. This makes available a large number of possible locations. If calibration data indicates non-uniform flow conditions, the monitor can usually be relocated upstream or downstream. Typically, the presence of non-uniform flow is discovered during investigation and the problem is avoided from the onset.

System isolation, collection system geometry and client preference often force ADS to monitor in manholes which have less than perfect hydraulics. Some manholes are under free-flow conditions only during the lowest flows and the rest of the time they are partially under hydraulic backup on in non-free-flow conditions due to some hydraulic constriction downstream.

Should flow at the site begin to backup, the energy gradient immediately changes invalidating Manning equation. Velocity sensing used in conjunction with the standard depth sensor enables flows to be determined during non-free-flow conditions. This method has been successfully employed by ADS on all projects utilizing Quadrascan units and on all temporary monitoring surveys since 1980. Accuracy during non-free-flow conditions is less than during free-flow

conditions.

Trained field crews

ADS Project Managers have to enter each manhole and visually inspect the hydraulics and physical criteria for more accurate flow quantification. Site preparation, hydraulic calibration and equipment confirmation are performed by the trained field crews to ensure high accuracy.

Sensor calibration

The most important variable in flow monitoring, depth, is the single major cause of flow monitoring error. In many cases, a three-quarter's of an inch error can be twenty five percent of the total quantity of flow. Because of this, ADS has developed extremely strict procedures for insuring that the depth of flow that is measured and recorded is accurate to the nearest eighth of an inch.

Flow (hydraulic) calibration

ADS crews perform line calibration checks for typical installations up the pipe with open channel flow, to develop a depth to discharge curve and thus a calibrated Manning equation.

ADS ensures an accurate hydraulic radius as well as an accurate area measurement by placing the ADS ultrasonic depth sensor upstream of the manhole in the pipe rather than in the trough of the manhole. Troughs rarely have regular geometric cross-sections so placing the sensors up the pipe eliminates painstaking empirical work. It becomes a matter of simple geometry to calculate both "Rh" and the area of flow. ADS personnel are trained to take several diameter measurements in different directions on each pipe to be monitored. Actual measurements as opposed to nominal diameters are used to calculate flow rates.

During hydraulic calibration, ADS takes manual depth of flow and peak velocity readings. If flow data from early morning measurements shows a characteristic difference from daytime flow measurements, ADS conducts intensive calibrations during the early morning hours. This gives the analyst a wide range of calibration data at varying depths.

The velocity of the flow is a function of the wetted area, the approach, and the friction. ADS has developed a series of tests to solve for the energy gradient. The physical slope of the line is often unmeasurable. Even more important, since there are changes in slope between reaches, the physical slope is not as critical as the hydraulic gradient, i.e., the slope of the surface of the water of the monitor site. When the hydraulic slope is expressed with the friction component, the energy gradient at the source point is determined.

Depth is measured directly beneath the sensor with a ruler and peak velocity is measured in the

same place with a modified portable electromagnetic point velocity probe. The velocity meters are sent in for regular calibration. If the site has silt, the field crews first measure depth from the top of the silt to the surface of the water then push the ruler to the bottom of the pipe and measure the total depth. The difference between the two depths is the silt depth. Silt is very important since it must be subtracted from the wetted area to calculate accurate quantity.

For velocity calibrations, the peak measured velocity must be converted to average velocity to get the instantaneous flow rate. ADS performs field testing to get a relationship between peak measured velocity and average velocity. The average velocity is determined by measuring the velocity in the cross-sectional area in an grid pattern. The average velocity is then calculated. This ranges from 0.88 to 0.92 of the peak velocity, usually equally 0.90.

Calibration data is entered into a computer which assesses each site individually to determine whether or not enough calibrations have been obtained. ADS personnel keep returning to each site for more calibration data until certain statistical levels of confidence have been achieved.

ADS obtains discharge rates at each site from the field calibrations to develop an energy gradient as determined by a modified Manning formula. If the energy gradient is consistent through a variety of depths and through time, the site in under free-flow conditions. At most sites, flow will be computed using the Manning equation. Using the instantaneous depth and flow rates, an energy gradient is calculated.

If free-flow conditions exist at a site with non-circular cross-section the area, perimeter and chord will be based on actual cross-sectional information. Where free-flow conditions do not exist and no standard flow equation exists for a site, the analyst will use a depth to discharge table based on calibrations. The computer will interpolate flow rates directly from the table.

The criteria for a final energy gradient in a circular pipe are:

- the precision of the EG is less than 10 percent

- at least 10 field calibrations

- calibrations occur 2 hours apart

- calibrations occur on 6 different days

- depths of flow measured vary from daily minimum to maximum

- one early morning visit

- if early morning values are not consistent with the rest of the measurements, intensive calibrations will be taken in the early morning to construct a depth to discharge curve.

Special Applications

Flume sites

Depth confirmations and field calibrations are performed just like a pipe installation, but field personnel must also measure the physical dimensions of each flume since not all flumes are constructed uniformly and are not geometrically the same.

Palmer-Bowlus Flume

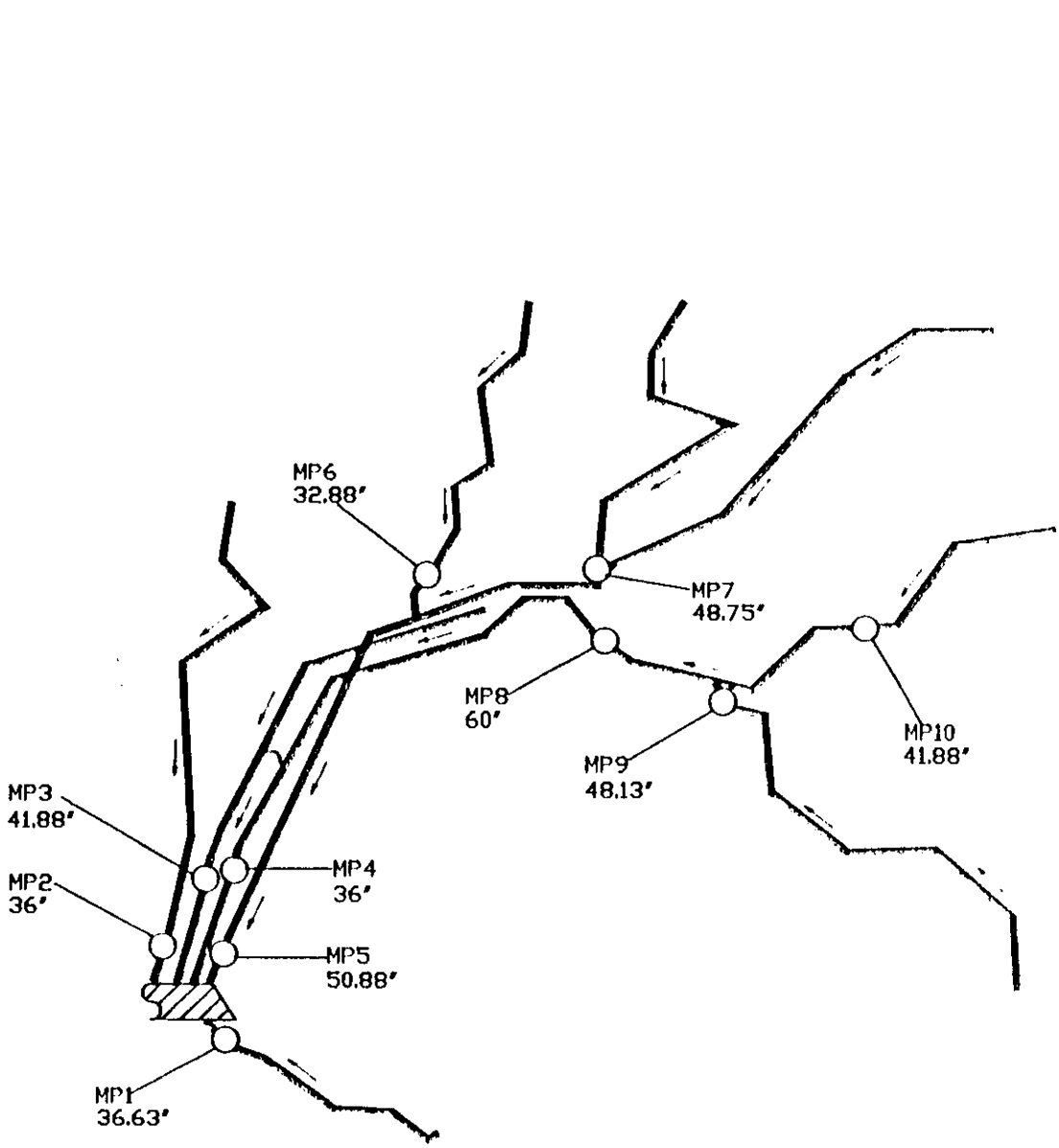
Palmer-Bowlus Flumes are more common in the western half of the United States and are designed for no silt buildup. The ultrasonic depth sensor is placed a distance of one half the flume width upstream of the beginning of the shelf. Field calibrations and measurements are taken at this point. Another very critical measurement is the shelf height located downstream. When comparing field quantity calculated by field depth and velocity measurements to theoretical quantity, the shelf height must be subtracted from the field depth since the theoretical is the depth and quantity over the shelf.

How the Data is Displayed

Data from the database is printed out in two forms: color hydrographs and long-tables. Both are included in this report. The hydrographs are weekly or monthly graphs of quantity versus time. Quantities are calculated using the modified Manning equation. These quantities are more accurate and are relied upon when free-flow conditions are present. Quantities can also be derived using the continuity equation where velocity is determined from the velocity sensor. During high flow periods when Manning and continuity quantities differ by more than ten percent, the site is entering non-free-flow conditions and continuity quantities are more accurate.

The Manning long tables have depth of flow readings presented every fifteen minutes and average quantities presented every hour. The energy gradient is located at the top of the long table. For each day, total flow as well as maximum and minimum flow rates are listed. Total flow and average daily flow are listed at the bottom.

Bloomington, Illinois
Flow Schematic



ADS SERVICES, INC.
2227 Drake Avenue
Huntsville, AL 35805

SCALE N/A	APPROVED BY	DRAWN BY JAB
DATE 12/12/89		REVISED
TITLE		SHEET 1 OF 1
PROJECT BLOOMINGTON, IL	FILE MP1L	DRAWING NUMBER

ADS Services, Inc.

Site Report

REWARD IF FOUND - (205) 883-9323

Town	Manhole #	AN
Bloomington		MP1
RG Zone	Rat. # / Reg. / S/C	Monitor #
Velocity	Install Q.C.	Diameter
		35.75"x35½"

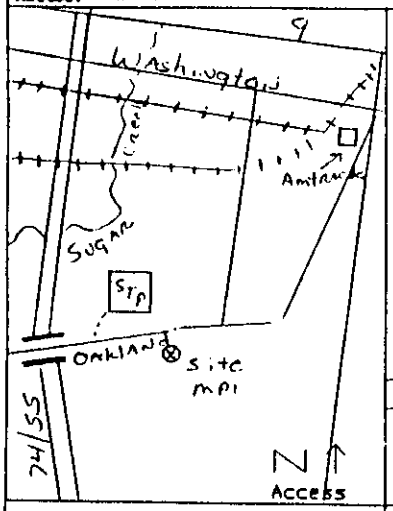
Project/Phase: Bloomington/Normal Date: 10/2/89 Name: DM

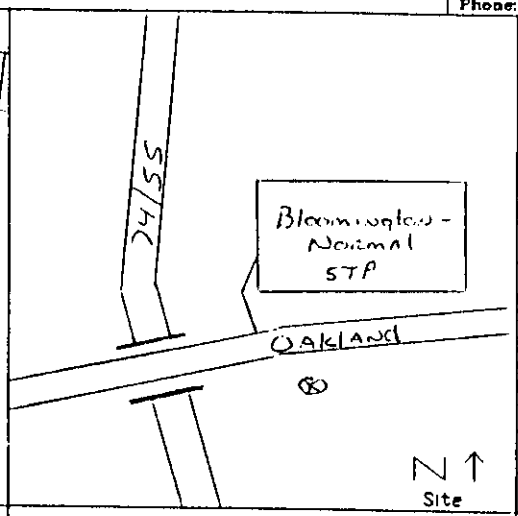
Address/Location: West Oakland Avenue (across from the Bloomington/Normal Sanitary Plant)

Phone Co. Address: Same as above

Phone:

Access: Drive





SAFETY:

Manhole Depth: 8'

Traffic: Light

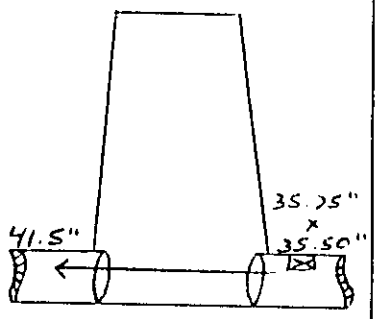
Gas ● Investigation: None

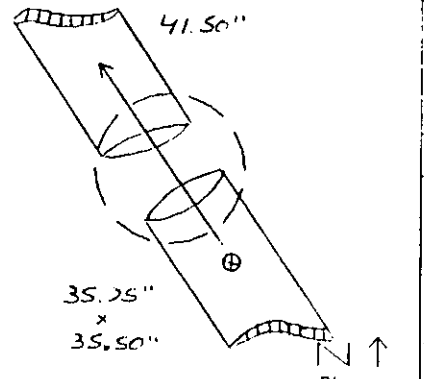
Manhole Condition: Good

Frame: Regular/Irregular Regular

INSTALLATION INSTRUCTIONS:

Install 3' upstream to avoid possible drawdown





Q.C. Inspector:

Date:

Comments:

Approval:

Access Pole #: No number

Distance from M/H: 115'

Road Cut Length:

Trench Length: 115'

R.O.W. and #: Easement

Mini System Character: Residential/Commercial/Industrial/Vacant Residential

Hydraulics: Smooth flow in a tight pipe. No problems expected.

General Conditions: Excellent transition through manhole. Pipe enlarges to 41.50", but no backup is noted.

BACKUP	Y	N	?	DISTANCE
Trunk		X		
Lift Sta.		X		
STP			X	
Other Input		X		
Ind. U/S		X		
L/S U/S		X		

Pipe Type: VCP (Concrete) Aggregate Brick Steel Other

DOF: 4.5" +/- .13 Time: 16:30 Vel 3.70 fps Silt: None

Surcharge: None Height: Maintenance:

Upstream Manhole:

Downstream Manhole: 90 degree turn

SUP 45. KDB 2/89

BLOOMINGTON AND NORMAL SANITARY DISTRICT

Manhole : MP1
Address : West Oakland Avenue

Site MP1 is located on a 36.0 inch line, and flows into a 42.0 inch pipe as it exits through the invert. This line services the south side of Bloomington.

The hydraulics for this site, proved to be suitable for flow monitoring. On most dry days, there is minimum fluctuation in the average depths. The average depths at this site range from 3 inches to 4 inches, with velocities of approximately 3.8 fps.

ADS field crews were on site during the monitoring period of this site, and noted no visible signs of any backup, infiltration, or inflow. However, this site is located in the bottom of a drainage ditch, and the possibility of in inflow may be present during a significant rain event.

ADS Services, Inc.

Site Report

REWARD IF FOUND - (203) 883-9323

Town	Manhole #	AN
Bloomington		MP2
RG Zone	Bat. # Reg. S/C	Monitor #
Velocity	Install Q.C.	Diameter 36"

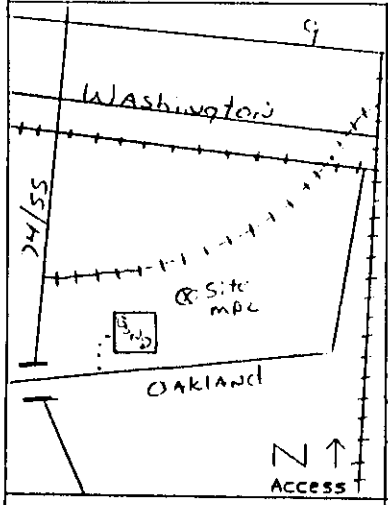
Project/Phase: Bloomington/Normal Date: 10/4/89 Name: BB

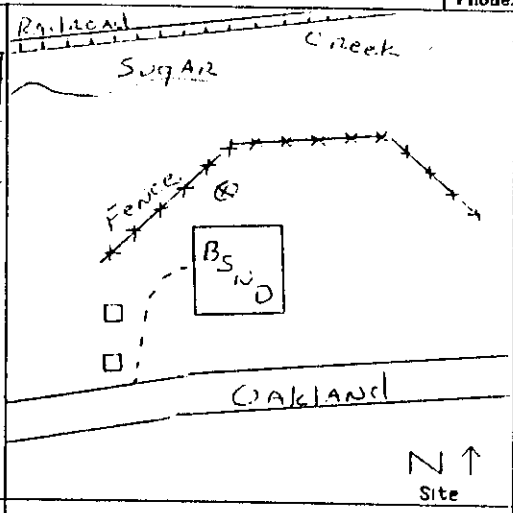
Address/Location: Northeast corner of Bloomington and Normal Sanitary District

Phone Co. Address: Same as above

Access: Drive

Phone:





SAFETY:

Manhole Depth: 20'

Traffic: None

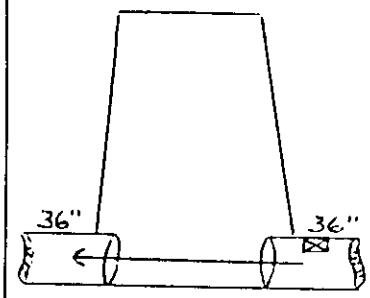
Gas & Investigation: Yes

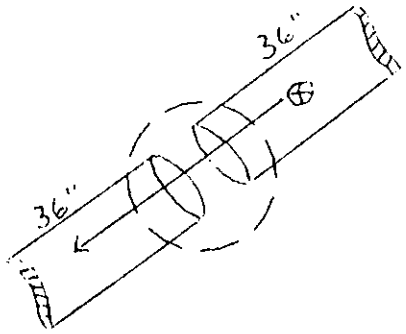
Manhole Condition: Good

Frame: Regular/Irregular Regular

INSTALLATION INSTRUCTIONS:

Install sensors 6' up the pipe





Q.C. Inspector:

Date:

Comments:

Approval:

Access Pole #:

Distance from M/H:

Road Cut Length:

Trench Length:

R.O.W. and #:

Mini System Character: Residential/Commercial/Industrial/Vacant Commercial

Hydraulics: Smooth flow - 45 degree bend no problem. 800' upstream of input to WWTP - enters plant by

General Conditions: itself and is pumped out - should not back up (per Mike Callahan). Slightly offest joints and visible infiltration in manhole.

BACKUP	Y	N	?	DISTANCE
Trunk		X		
Lift Sta.		X		
STP		X		
Other Input		X		
Ind. U/S		X		
L/S U/S		X		

Pipe Type: VCP (Concrete) Aggregate Brick Steel Other

DOP: 9.50" +/- Time: 16:15 Vel 1.89 fps Silt: None

Surcharge: No Height: Maintenance:

Upstream Manhole: 90 degree

Downstream Manhole: WWTP

SUP 45. KDB 2/89

BLOOMINGTON AND NORMAL SANITARY DISTRICT

Manhole : MP2
Address : Northwest Corner of BNSD

Site MP2 is located on a 36.0" line, and takes a 45 degree bend through the invert. The bend has no effect on the hydraulics at this site. The area that this site monitors is commercial and residential, with a small amount of industry. The main industry for this area is the New Diamond Star Motors Plant.

This site is approximately 800' upstream of the treatment plant. Although the site is located relatively close to the treatment plant, no signs of backup, or surcharge conditions are present during this period of monitoring. There does not appear to be much infiltration into the line from any of the rain events experienced during the project duration.

ADS Services, Inc.

Site Report

REWARD IF FOUND - (203) 993-9323

Town	Manhole #	AN
Bloomington		MP3
RG Zone	Bat. # / Reg. S/C	Monitor # 7708
Velocity	Install Q.C.	Diameter 41.63"x42"

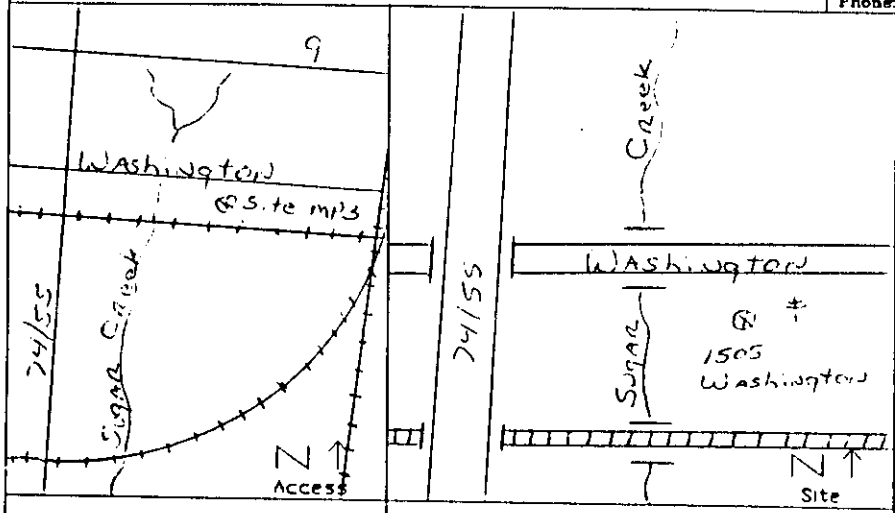
Project/Phase: Bloomington/Normal Date: 9/29/89 Name: DM

Address/Location: 1805 Washington

Phone Co. Address: Same as above

Access: Drive

Phone:



SAFETY:

Manhole Depth: 8'

Traffic: None

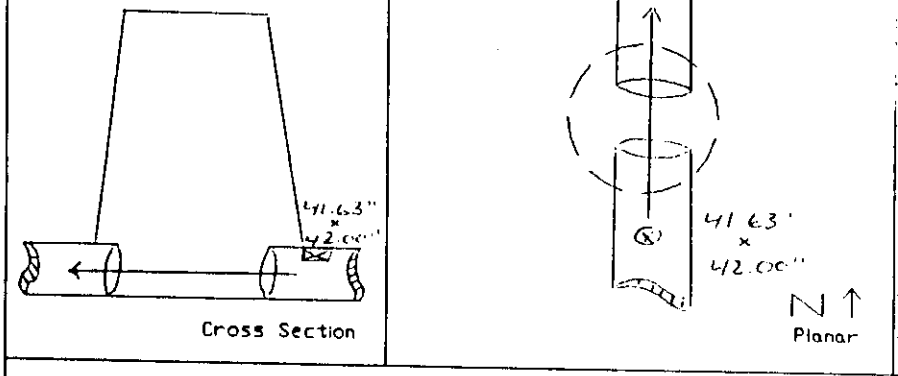
Gas & Investigation: Yes

Manhole Condition: Good

Frame: Regular/Irregular Regular

INSTALLATION INSTRUCTIONS:

Install 3' upstream



Q.C. Inspector:

Date:

Comments:

Approval:

Access Pole #: GTE #5

Distance from M/H: 80'

Road Cut Length:

Trench Length: 80'

R.O.W. and #: Easement

Mini System Character: Residential/Commercial/Industrial/Vacant Residential

Hydraulics: Smooth flow - will be in backwater in peak dry weather flows due to input elevation to plant.

General Conditions: Calibrations will be done in free-flow conditions. PM needs to contact Mike Callahan at BNSD to increase discharge rate of plant flow channel (backwater conditions necessitate)

Pipe Type: VCP (Concrete) Aggregate Brick Steel Other

DOF: 18.50"+/- .13 Time: 8:45 Vel 1.77 fps Silt: 5.0"

Surcharge: Yes Height: Maintenance:

Upstream Manhole:

Downstream Manhole: Approx. 400'

BACKUP	Y	N	?	DISTANCE
Trunk		X		
Lift Sta.		X		
STP	X			
Other Input		X		
Ind. U/S		X		
L/S U/S		X		

SUP 45 . KDB 2/89

BLOOMINGTON AND NORMAL SANITARY DISTRICT

Manhole : MP3
Address : 1805 Washington Avenue

The size of this pipe is 42.0 inches, and is very new with no signs of any infiltration or inflow in the invert. The service area for this site is mostly residential with some commercial business present.

Whenever velocity and Manning's quantities diverge more than 10 percent during high flows, the site is entering backwater conditions. Velocity quantities are more accurate during this period. Total flow for the day and week will have to be adjusted when quantities are used. The only time this site is flowing in true freeflow is during dry weather conditions, in the early morning hours. The cause of the backwater conditions is attributed to the close proximity of the treatment plant.

ADS Services, Inc.

Site Report

REWARD IF FOUND - (205) 883-9323

Town	Manhole #	AN
Bloomington		MP4
RG Zone	Bat. # / Reg. / S/C	Monitor #
Velocity	Install Q.C.	Diameter 36"

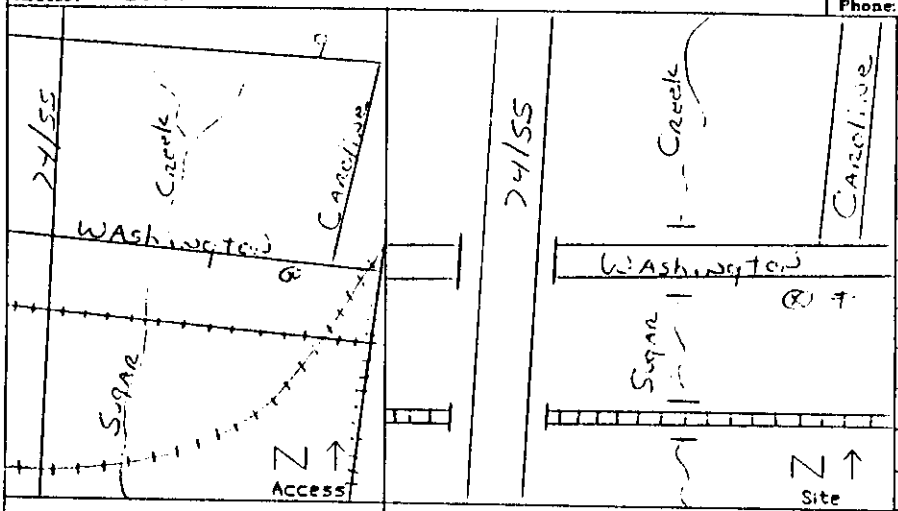
Project/Phase: Bloomington/Normal Date: 9/29/89 Name: DM

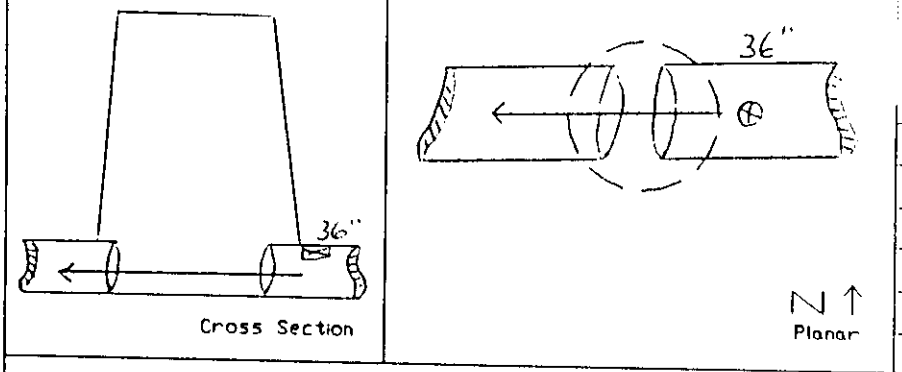
Address/Location: 1805 Washington Avenue

Phone Co. Address: Same as above

Access: Drive

Phone:





SAFETY:

Manhole Depth: 8'

Traffic: None

Gas ● Investigation: Yes

Manhole Condition: Good

Frame: Regular/Irregular Regular

INSTALLATION INSTRUCTIONS:

Sensor 3' downstream

Q.C. Inspector:

Date:

Comments:

Approval:

Access Pole #: GTE 1680

Distance from M/H: 30'

Road Cut Length:

Trench Length: 30'

R.O.W. and #: Easement

Mini System Character: Residential/Commercial/Industrial/Vacant Res./commercial

Hydraulics: Smooth flow - will be in backwater in peak dry weather flows due to input elevation to plant.

General Conditions: Calibrations will be done in free-flow conditions. PM need to contact Mike Callahan at BNSD to increase discharge rate of plant flow channel (backwater conditions necessitate)

Pipe Type: VCP (Concrete) Aggregate Brick Steel Other

DOP: 24.25"/- .13 Time: 9:28 Vel: 1.91 fps Silt: 1.38"

Surcharge: Yes Height: 48" Maintenance:

Upstream Manhole:

Downstream Manhole: 90 degree

BACKUP	Y	N	?	DISTANCE
Trunk		X		
Lift Sta.		X		
STP			X	
Other Input		X		
Ind. U/S		X		
I/S U/S		X		

SUP 45. KDB 2/89

BLOOMINGTON AND NORMAL SANITARY DISTRICT

Manhole : MP4
Address : 1805 Washington Avenue

Site MP4 is located on a 36" line with average depths that range from 5.0" to 10". This site will remain backed up from the treatment plant during normal dry weather conditions. The level of the wet well for this site is usually kept at half the diameter of the influent pipe, as normal operating procedure.

Whenever velocity and Manning's quantities diverge more than 10 percent during high flows, the site is entering backwater conditions. Velocity quantities are more accurate during this period. Total flow for the day and week will have to be adjusted when quantities are used.

ADS Services, Inc.

Site Report

REWARD IF FOUND - (205) 883-9323

Town	Manhole #	AN
Bloomington		MP5
RG Zone	Bat. # Reg 098951A S/C	Monitor # 7707
Velocity 3214	Install Q.C.	Diameter 52¼" x 49"

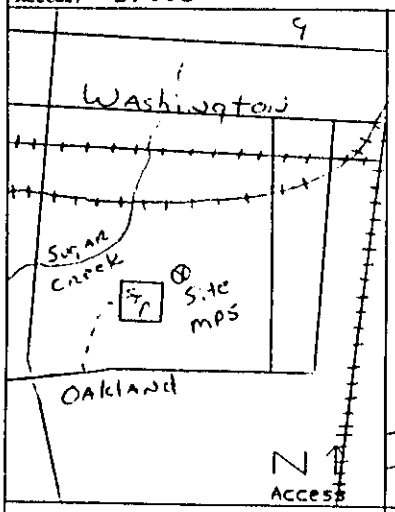
Project/Phase: Bloomington/Normal Date: 9/27/89 Name: BB

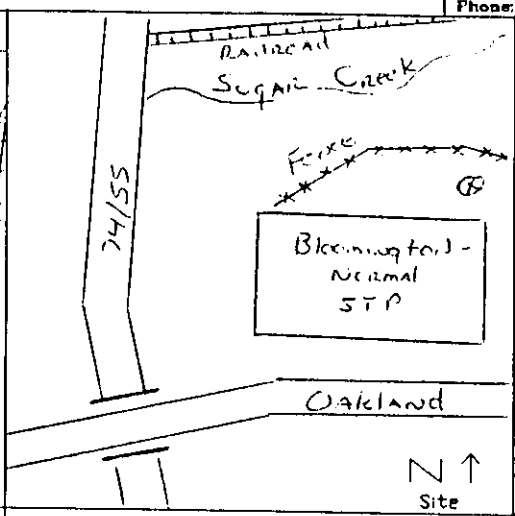
Address/Location: Northeast corner of Bloomington/Normal WWTP (on West Oakland Avenue)

Phone Co. Address: Same as above

Access: Drive

Phone:





SAFETY:

Manhole Depth: 18'

Traffic: None

Gas ● Investigation: None

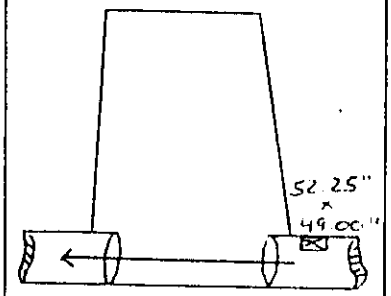
Manhole Condition: Good

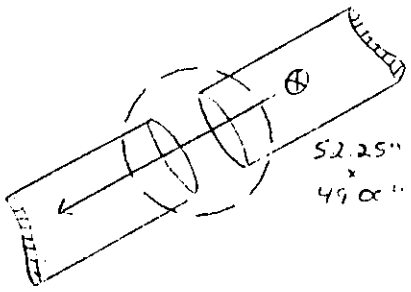
Frame: Regular/Irregular Regular

INSTALLATION INSTRUCTIONS:

Special mount 18" - 24" in pipe

Velocity on half ring





Q.C. Inspector:

Date:

Comments:

Approval:

Access Pole #: No # (end of Olive)

Distance from M/H: 300'

Road Cut Length:

Trench Length: 300'

R.O.W. and #: WWTP

Mini System Character: Residential/Commercial/Industrial/Vacant Res./commercial

Hydraulics: Smooth flow in heavily silted clay tile pipe. Silt is non-porous - will need to subtract

General Conditions: 5" from diameter.

BACKUP	Y	N	?	DISTANCE
Trunk		X		
Lift Sta.		X		
STP	X			1200'
Other Input		X		
Ind. U/S		X		
I/S U/S		X		

Pipe Type: VCP Concrete Aggregate Brick Steel Other Clay Tile

DOP: 17.0"+/- .25 Time: 9:15 Vel: 1.82 fps Silt: 5"±.25"

Surcharge: Yes/old Height: 50" Maintenance:

Upstream Manhole: Substantial industrial input

Downstream Manhole: Backwater probable (closer to WWTP)

SUP 45 · KDB 2/89

BLOOMINGTON AND NORMAL SANITARY DISTRICT

Manhole : MP5
Address : Northeast Corner of the BNSD Treatment Plant

The flow at this site is very laminar, and should produce good depth data. The level of the wetwell is kept at half the diameter of the influent pipe. As with sites MP3, and MP4, this site remains backed up during the normal daily flow pattern, and achieves true free flow conditions during the early morning hours.

ADS Services, Inc.

Site Report

REWARD IF FOUND - (203) 883-9323

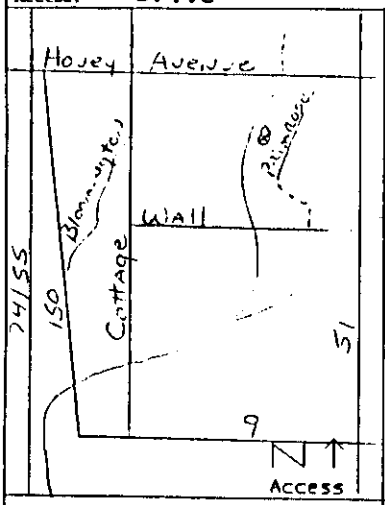
Town	Manhole #	AN
Bloomington		MP6
RG Zone	Bat. # Reg. S/C	Monitor #
Velocity	Install Q.C.	Diameter 32.88"
Phone:		

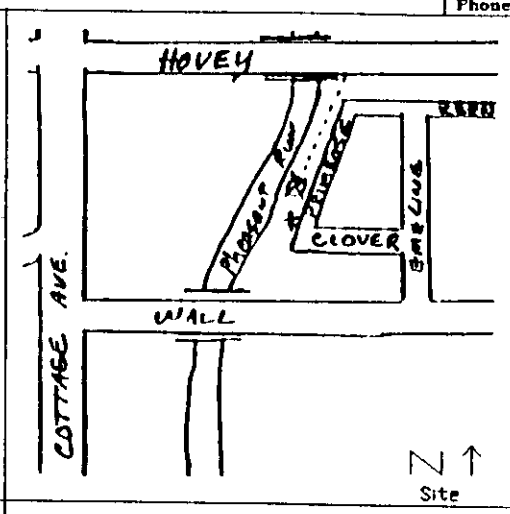
Project/Phase: Bloomington/Normal Date: 9/29/89 Name: DM

Address/Location: Behind 1009 Primrose Lane (near Pheasant Run)

Phone Co. Address: Same as above

Access: Drive





SAFETY:

Manhole Depth: 8'

Traffic: None

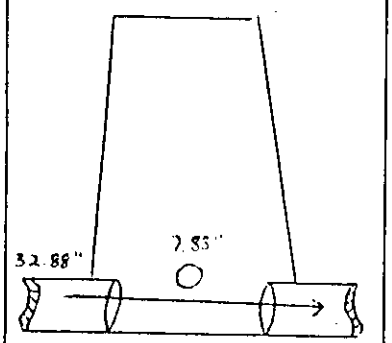
Gas ● Investigation: None

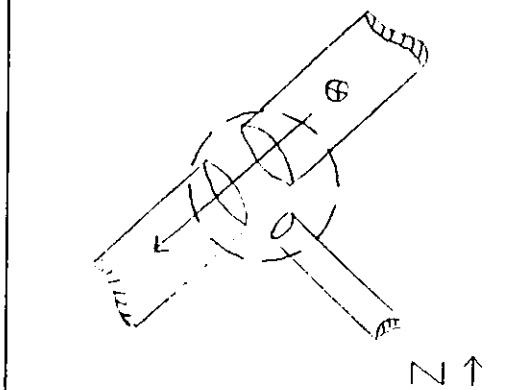
Manhole Condition: Offset rim

Frame: Regular/Irregular Irregular

INSTALLATION INSTRUCTIONS:

Sensors should be at least three pipe diameters upstream





Q.C. Inspector:

Date:

Comments:

Approval:

Access Pole #: GTE L96686,P1009

Distance from M/H: 50'

Road Cut Length:

Trench Length: 50'

R.O.W. and #: Easement

Mini System Character: Residential/Commercial/Industrial/Vacant Residential

Hydraulics: Smooth flow - good site. VCP service line of 7.88" is present.- DOF of .25" should not present a problem. Manhole needs to be reset.

General Conditions:

BACKUP	Y	N	?	DISTANCE
Trunk		X		
Lift Sta.		X		
STP		X		
Other Input		X		
Ind. U/S		X		
L/S U/S		X		

Pipe Type: VCP (Concrete) Aggregate Brick Steel Other

DOP: 8.25" +/- Time: 10:51 Vel: 2.10 fps Silt: None

Surcharge: No Height: Maintenance:

Upstream Manhole: 32.75" x 31.75" obstruction causes backup

Downstream Manhole: 32.88" x 32.75" with slight bend - may back up

BLOOMINGTON AND NORMAL SANITARY DISTRICT

Manhole : MP6
Address : 1009 Primrose

Site MP6 handles the North Central Area of Normal. This area is mostly residential, and commercial, with some manufacturing.

There is an 8.0" side connection that services the home at this address. This connection does not appear to hamper the flow characteristics at this site.

ADS Services, Inc.

Site Report

REWARD IF FOUND - (205) 883-9323

Town	Manhole #	AN
Bloomington		MP7
RG Zone	Bat. # Reg. S/C	Monitor #
Velocity	Install Q.C.	Diameter 48.75"

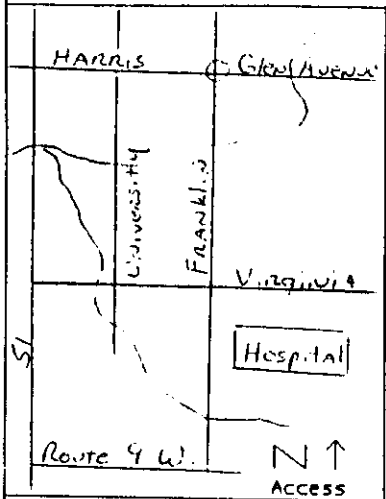
Project/Phase: Bloomington/Normal Date: 9/29/89 Name: BB

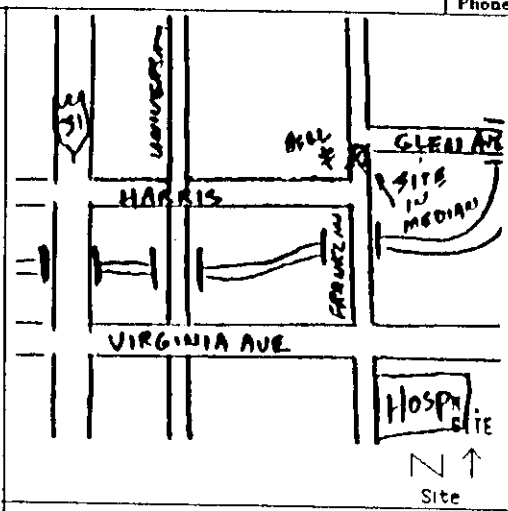
Address/Location: 1100 Franklin Avenue (junction of Franklin and Glenn Avenue)

Phone Co. Address: Same as above

Access: Drive

Phone:





SAFETY: One rung

Manhole Depth: 10'

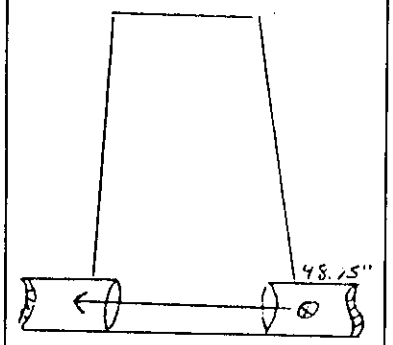
Traffic: None

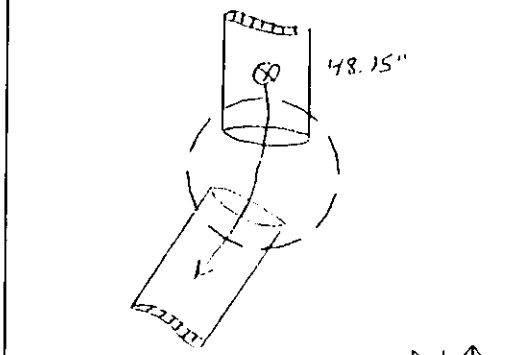
Gas & Investigation: None

Manhole Condition:

Frame: Regular/Irregular Irregular

INSTALLATION INSTRUCTIONS:





Q.C. Inspector:

Date:

Comments:

Approval:

Access Pole #: No number

Distance from M/H: 40'

Road Cut Length: 30'

Trench Length: 10'

R.O.W. and #: Easement

Mini System Character: Residential/Commercial/Industrial/Vacant Residential

Hydraulics: Fairly smooth flow for a brick pipe. Two 12" laterals have little flow. Downstream bend ok.

General Conditions: All four storm connections are plugged. Line is mostly sanitary.

BACKUP	Y	N	?	DISTANCE
Trunk		X		
Lift Sta.		X		
STP		X		
Other Input		X		
Ind. U/S		X		
L/S U/S		X		

Pipe Type: VCP Concrete Aggregate (Brick) Steel Other

DOP: 10.50" +/- .50 Time: 10:59 Vel 2.80 fps Silt: None

Surcharge: None Height: Maintenance

Upstream Manhole:

Downstream Manhole: Poor hydraulics - 4" waves

SUP 45 .KDB 2/89

BLOOMINGTON AND NORMAL SANITARY DISTRICT

Manhole : MP7
Address : 1100 Franklin Avenue

This manhole is constructed of old red brick. A special installation was used at this site, because the bricks in the line are slightly offset from one another.

Due to moisture buildup on the ultrasonic sensors, intermittent loss of data is seen throughout the November-December monitoring period. Condensation has been present since the beginning of flow monitoring at this site.

ADS Services, Inc.

Site Report

REWARD IF FOUND - (205) 883-9323

Town	Manhole #	AN
Bloomington		MP8
RG Zone	Bat. # Reg 098957A S/C	Monitor # 7710
Velocity 3216	Install Q.C.	Diameter 60½" x 59½"

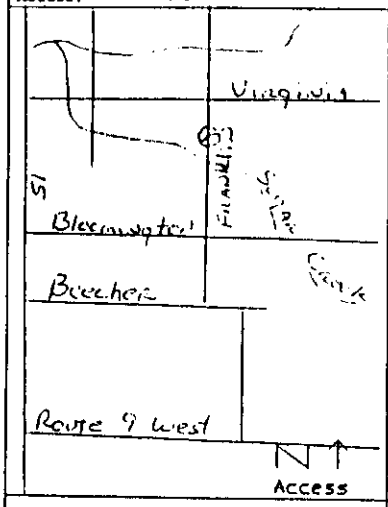
Project/Phase: Bloomington/Normal Date: 10/2/89 Name: DM

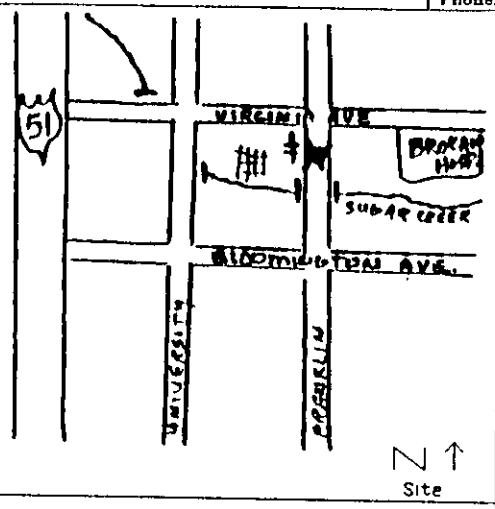
Address/Location: Franklin Street (at back entrance of Brokaw Hospital - in median)

Phone Co. Address: Same as above

Access: Drive

Phone:





SAFETY:

Manhole Depth: 8'

Traffic: None

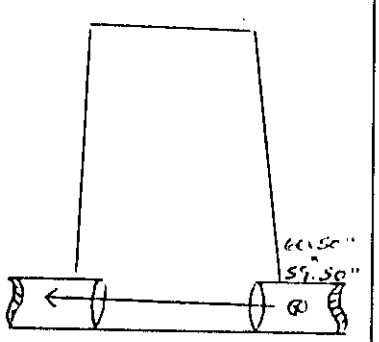
Gas ● Investigation: None

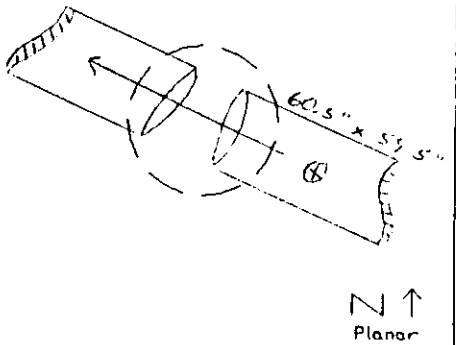
Manhole Condition: Good

Frame: Regular/Irregular Regular

INSTALLATION INSTRUCTIONS:

Special sensor 6" upstream
Velocity sensor on half ring or full ring





Q.C. Inspector:

Date:

Comments:

Approval:

Access Pole #: No number

Distance from M/H: 35'

Road Cut Length: 28'

Trench Length: 7'

R.O.W. and #: Easement

Mini System Character: Residential/Commercial/Industrial/Vacant Residential

Hydraulics: Smooth flow - should be no problems.

General Conditions: Good, tight pipe.

BACKUP	Y	N	?	DISTANCE
Trunk		X		
Lift Sta.		X		
STP		X		
Other Input		X		
Ind. U/S		X		
L/S U/S		X		

Pipe Type: VCP (Concrete) Aggregate Brick Steel Other

DOF: 9.25" +/- .13 Time: 15:20 Vel: 5.01 fps Silt: None

Surcharge: None Height: Maintenance.

Upstream Manhole: Junction with 24"

Downstream Manhole: Illegal conduit in pipe may restrict the flow.

SUP 45, KDB 2/89

BLOOMINGTON AND NORMAL SANITARY DISTRICT

Manhole : MP8
Address : Franklin Street

The manhole at this site is constructed of red brick, and the pipe is constructed of concrete. Condensation has always been present at this site. Several products have been used to help alleviate this problem.

ADS Services, Inc.

Site Report

REWARD IF FOUND - (203) 883-9323

Town	Manhole #	AN
Bloomington		MP9
RG Zone	Bat. # Reg S/C	Monitor #
Velocity	Install Q.C.	Diameter 49" x 48¼"

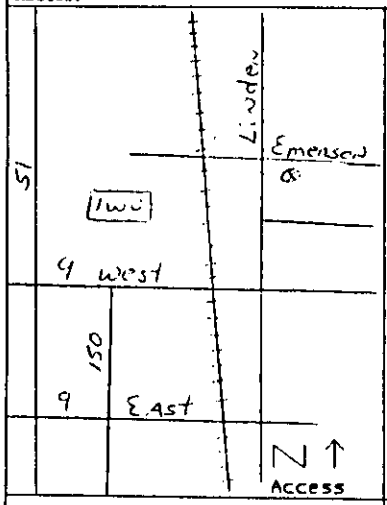
Project/Phase: Bloomington/Normal Date: 9/28/89 Name: BB

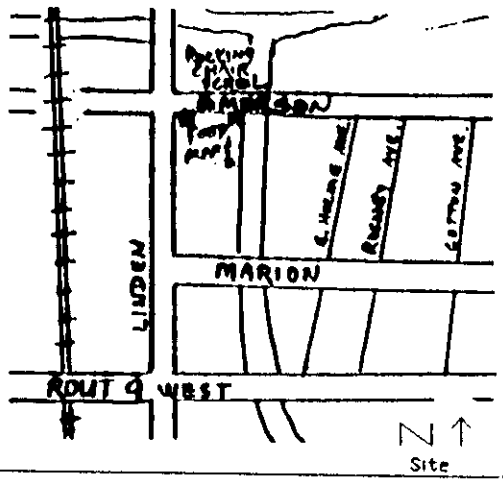
Address/Location: South side of Emerson Avenue (200' east of Linden Street)

Phone Co. Address: Same as above

Access: Drive

Phone:





SAFETY:

Manhole Depth: 9'

Traffic: None

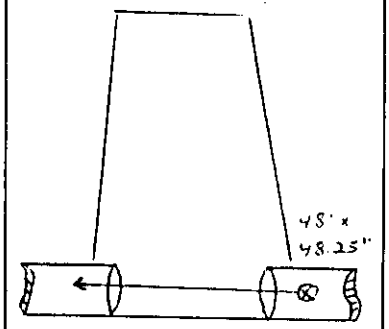
Gas ● Investigation: None

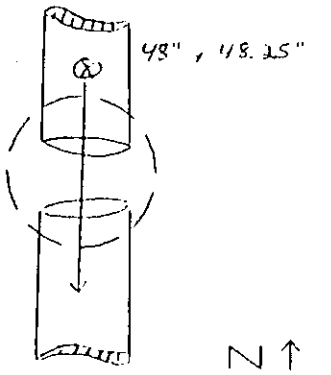
Manhole Condition: Good

Frame: Regular/Irregular Regular

INSTALLATION INSTRUCTIONS:

Install 8" upstream past the first pipe joint





Q.C. Inspector:

Date:

Comments:

Approval:

Access Pole #: Pedistal KL807GTE

Distance from M/H: 55'

Road Cut Length: 3'

Trench Length: 52'

R.O.W. and #: Easement

Mini System Character: Residential/Commercial/Industrial/Vacant Residential

Hydraulics: Smooth flow with a good grade. The 6" side connection should be no problem.

General Conditions: Downstream laterals (12" and 24") may activate in wet weather - no concern in dry weather.

Pipe Type: VCP (Concrete) Aggregate Brick Steel Other

DOF: 8.75" +/- Time: 9:49 Vel: 1.98 fps Silt: None

Surcharge: Yes Height: 60" Maintenance: Cleam D/S junction

Upstream Manhole: Okay

Downstream Manhole: Junction with 60" line causes backwater

BACKUP	Y	N	?	DISTANCE
Trunk			X	
Lift Sta.		X		
STP		X		
Other Input		X		
Ind. U/S		X		
L/S U/S		X		

SUP 45, KDB 2/89

BLOOMINGTON AND NORMAL SANITARY DISTRICT

Manhole : MP9
Address : Emerson Avenue 200' South of Linden

The general conditions of this site are good. This site also has a problem with buildup of moisture on the ultrasonic sensors.

During installation of this site ADS field crew noted a small drop connection. There are also two downstream laterals that are used for flow balancing. These downstream laterals are not active during dry weather, and the rainfall amounts during this monitoring period was not significant enough to activate these laterals.

ADS Services, Inc.

Site Report

REWARD IF FOUND - (205) 883-9322

Town	Manhole #	AN
Bloomington		MP10
RG Zone	Bat. # Reg. 098953A S/C	Monitor # 7706
Velocity 3213	Install Q.C.	Diameter 41.88"

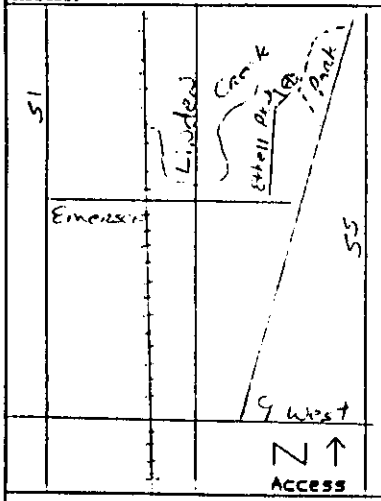
Project/Phase: Bloomington/Normal Date: 10/4/89 Name: BB

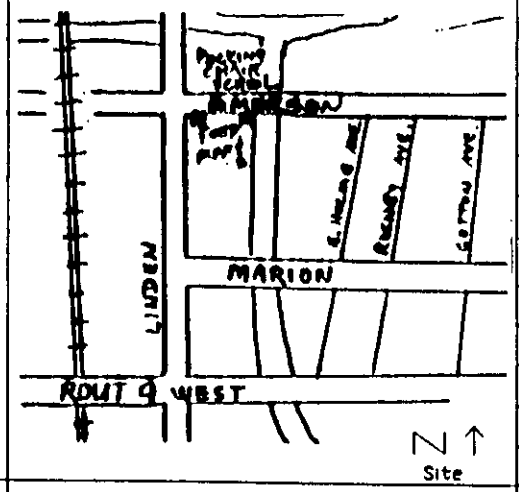
Address/Location: Ethell Parkway (across from entrance to Ewing)

Phone Co. Address: Junction of Ethell Pkwy..and Mark

Access: Drive

Phone:





SAFETY:

Manhole Depth: 8'

Traffic: None

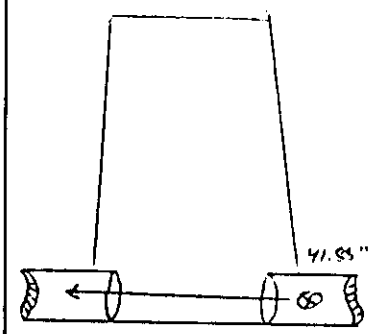
Gas ● Investigation: None

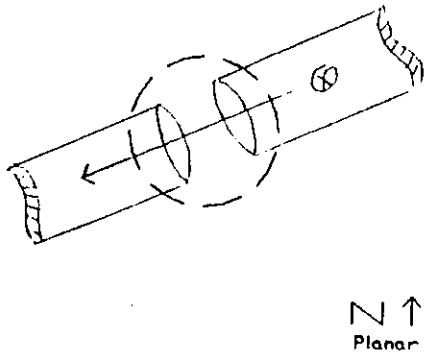
Manhole Condition: Good

Frame: Regular/Irregular Irregular

INSTALLATION INSTRUCTIONS:

Install 3' - 4' upstream





Q.C. Inspector:

Date:

Comments:

Approval:

Access Pole #: No number

Distance from M/H: 400'

Road Cut Length:

Trench Length: 400'

R.O.W. and #: Easement

Mini System Character: Residential/Commercial/Industrial/Vacant Res./commercial

Hydraulics: Fairly smooth flow in a tight pipe.

General Conditions:

BACKUP	Y	N	?	DISTANCE
Trunk		X		
Lift Sta.		X		
STP		X		
Other Input		X		
Ind. U/S		X		
L/S U/S		X		

Pipe Type: VCP (Concrete) Aggregate Brick Steel Other

DOF: 7.50"+/- ¼-.38 Time: 12:30 Vel 2.70 fps Silt: None

Surcharge: Yes/old Height: Maintenance:

Upstream Manhole: Two manholes upstream junction w/12" or 18"

Downstream Manhole: Junction with 24" and 12" - 90 degree bend

SUP 45 . KDB 2/89

BLOOMINGTON AND NORMAL SANITARY DISTRICT

Manhole : MP10
Address : Ethell Parkway

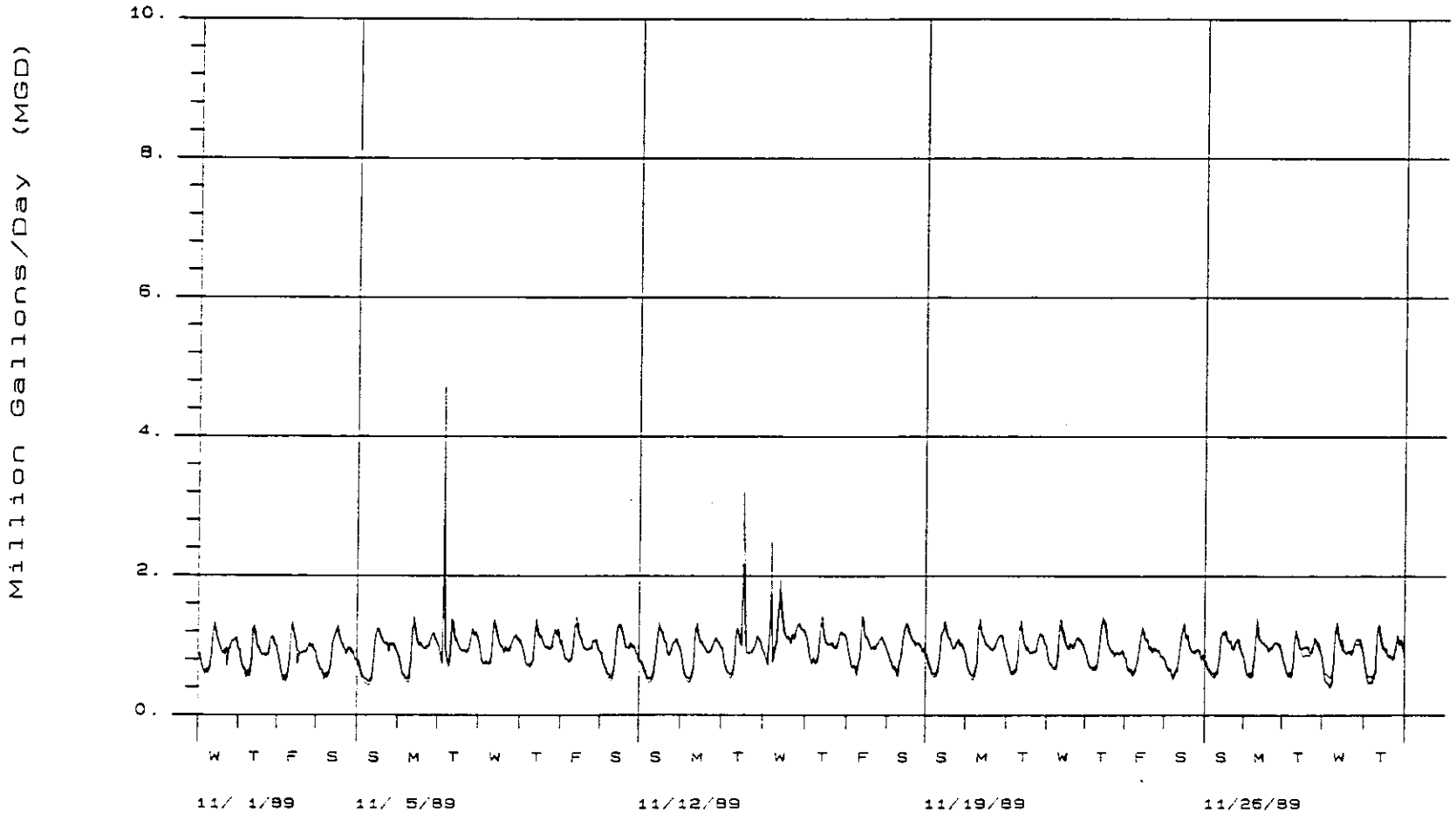
The hydraulics at this site are very good for flow monitoring. Flows at this site are very laminar. On most dry days depth range from 5.0"-8.0", with average velocities of 2.2 fps. This line handles residential, and commercial areas, with some industry.

ADS SERVICES, INC.

MP1

FARNSWORTH and AYLIE, P.O.

BLOOMINGTON and NORMAL, IL.



01-09-90 17:39:56

Sensor: MAN VM

ATTACHMENT 3

7.2 Analysis of Flow Data

When the velocity of flow in the sewer is measured along with the depth, the flow can be computed by two methods. The most direct solution is to use the pipe diameter and depth of flow to determine area of flow (ft^2) and the measured velocity (ft./sec) to determine flow (cubic feet/sec), or: Q(cfs) = Area (ft^2) x velocity (ft/sec). Manning's equation ($Q = \frac{1.486}{n} AR^{2/3} s^{\frac{1}{2}}$) is another method where:

Q = Flow (CFS)
n = Manning coefficient for the pipe
A = Area of flow (ft^2)
R = Hydraulic Radius (ft)
S = Slope of pipe (ft/ft)

The Manning equation can be used without measuring flow velocity, however it is necessary to estimate the values of "n" and "s" if the velocity of flow is unknown. Estimating values for "n" and "s" can lead to significant errors in the calculation of Flow (Q) for several reasons. Values for "n" are typically in the range of 0.013 to 0.015 for new sewers and those in good condition. However "n" can be 0.017 or more. If the pipe is very old, with debris in the pipe, or pipe joints that are offset due to differential settlement, "n" could be up to 0.020. Another problem is that the "n" coefficient varies with the depth of Flow in the pipe. Values for the coefficient cited in the literature were developed on the basis of full pipe flow, but when the depth is less than 2/3 full, "n" is 20 to 30 percent higher. All of these problems with estimating "n" can lead to errors in the calculation of flow in excess of 25%.

The average slope (S) of a sewer can be measured with a fair degree of accuracy from one manhole to the next with surveying equipment. However, the measurement of depth of flow is made within the manhole, not in the pipe between manholes. The actual slope within the manhole is usually not the same as the slope between manholes. The bottom of the manhole is flat,

(7.2 continued)

and often, the slope of the first section of sewer pipe on either side of the manhole is quite different than the slope of the rest of the pipe because during construction the section of pipe entering and/or leaving the manhole is adjusted to fit the manhole elevation.

Due to these factors, the actual slope of the invert (and the energy gradient) can not be assumed to be the same in the manhole as the average slope between manholes.

The above problems with the estimating of "n" and "s" can be eliminated by using the velocity measurements at each site to modify Manning's equation. The result is a "calibrated" equation that fits the particular site.

A "calibrated" Manning equation was developed for several of the sites, using the following procedure:

1) For each specific site, the following items were determined for three (3) concurrent measurements of depth and velocity:

   a) Pipe diameter, D (ft) measured
   b) Depth of flow, Y (ft) measured
   c) Area of flow, A (ft^2) computed at depth (Y)
   d) Hydraulic Radius, R (ft) (computed) at depth (Y)
   e) $AR^{2/3}$ computed
   f) Average velocity, V (ft/sec) measured

2) With the area of flow and velocity determined above, the flow, (Q, CFS) for each of the three (3) representative measurements of depth and velocity is determined by:
   $Q(CFS) = A\ (ft^2) \times V\ (fps)$

3) In Manning's equation, the quantity $(\frac{1.486}{n} s^{\frac{1}{2}})$ is a constant for a specific site. If this quantity is replaced by a constant (K), Manning's equation becomes: $Q(CFS) = (K)\ AR^{2/3}$ Using Q as determined in step 2, above, the constant (K) can be computed for the site from the equation, $K = \frac{Q(CFS)}{AR^{2/3}}$. The K values were based on 3 representative measurements. If more measurements were used the accuracy would be improved, however the accuracy of field flow measurements in sewers is rarely better than $\pm$ 15%. Computed K valves are shown in Table 12.

4) When "K" = $\frac{1.486}{n} s^{\frac{1}{2}}$ has been determined, the flow can be computed from depth of flow (Y) using the modified Manning's equation. The results of the computed flows are shown in Table 13. (Flows (MGD) shown in parentheses are values

TABLE 12

Computed "K" values for Sewer Flow Measurements FLOW (CFS) = (K) $AR^{2/3}$

Site No.	Pipe Dia. (ft)	Date	Depth Y(ft)	Area of flow A $(ft)^2$	Hydraul. radius R (ft)	$AR^{2/3}$	Ave. velocity V(ft/sec)	Flow (AV) Q(CFS)	K $Q/AR^{2/3}$	Ave. K
4	5.00	2/15	1.50	4.96	.855	4.468	2.94	14.58	3.26	
		7/30	0.75	1.85	.465	1.110	1.71	3.16	2.85	
		11/18	1.08	3.20	.656	2.416	2.00	6.40	2.65	2.92
5	4.00	4/20	2.00	4.69	.857	4.230	1.80	8.44	2.00	
		7/16	0.75	1.18	.372	0.610	1.80	2.12	3.50	
		7/30	0.92	2.18	.546	1.460	1.62	3.53	2.43	2.66
6	5.00	2/15	1.00	2.80	.603	2.00	2.48	6.94	3.47	
		7/20	0.58	1.34	.377	0.70	2.07	2.77	3.96	
		12/7	1.42	4.50	.807	3.90	2.80	12.60	3.23	3.55
10	2.75	3/11	0.86	1.57	.483	.966	3.39	5.32	5.51	
		9/9	0.33	0.40	.207	.140	2.21	0.88	5.71	
		12/2	0.42	0.56	.255	.225	1.71	0.96	4.27	5.16
12	2.25	4/20	2.25	3.98	.563	2.713	1.60	6.37	2.35	
		9/23	1.58	2.97	.666	2.260	1.40	4.16	1.84	
		12/2	2.00	3.73	.674	2.870	1.80	6.71	2.38	2.19
13	3.00	4/20	1.88	4.69	.852	4.21	2.80	13.13	3.12	
		8/10	1.08	2.29	.593	1.62	2.20	5.04	3.11	
		10/29	1.20	2.64	.643	1.97	2.54	6.71	3.41	3.21
14	2.25	3/26	1.48	2.78	.652	2.09	2.50	6.95	3.33	
		7/30	1.08	1.89	.548	1.27	2.40	4.54	3.57	
		12/7	1.83	3.45	.685	2.68	1.80	6.21	2.32	3.07
15	3.00	3/11	3.00	7.07	.750	5.84	2.50	17.68	3.03	
		8/13	1.00	2.03	.554	1.37	1.90	3.86	2.82	
		11/12	1.83	4.52	.839	4.02	2.40	10.85	2.70	2.85
17	3.00	4/20	2.67	6.64	.899	6.18	1.90	12.62	2.04	
		8/20	1.33	2.99	.688	2.33	1.50	4.49	1.93	
		11/12	1.92	4.78	.858	4.32	1.65	7.89	1.83	1.93

TABLE 13
Computed Sewer Flows
Site #4
Sanitary Relief Sewer-University Avenue

1982 date	Y depth of flow (ft)	$\frac{Y}{D}$	A area (ft^2)	R hydr radius (ft)	$AR^{2/3}$	Flow GPM.	Flow MGD
2/5	0.92	.18	2.40	.549	1.61	2110	3.04
2/12	1.21	.24	3.62	.708	2.87	3760	5.42
2/15	1.50	.30	4.96	.855	4.47	5860	8.44
2/19	0.88	.18	2.40	.549	1.61	2110	3.04
2/26							
3/11	1.42	.28	4.50	.807	3.90	5110	7.36
3/26	1.30						
4/20	1.50	.30	4.96	.855	4.47	5860	8.44
4/30	1.19	.24	3.62	.708	2.87	3760	5.42
5/11	0.79	.16	2.03	.493	1.27	1670	2.41
6/2	1.00	.20	2.80	.603	2.00	2620	3.78
6/17	1.00	.20	2.80	.603	2.00	2620	3.78
7/11	0.83	.17	2.21	.521	1.43	1880	2.71
7/16	0.83	.17	2.21	.521	1.43	1880	2.71
7/20	0.92	.18	2.40	.549	1.61	2110	3.04
7/23	0.92	.18	2.40	.549	1.61	2110	3.04
7/27	0.92	.18	2.40	.549	1.61	2110	3.04
7/30	0.75	.15	1.85	.465	1.11	1450	2.09
8/4	0.83	.17	2.21	.521	1.43	1880	2.71
8/10	0.92	.18	2.40	.549	1.61	2110	3.04
8/13	0.92	.18	2.40	.549	1.61	2110	3.04
8/20	1.00	.20	2.80	.603	2.00	2620	3.78
8/31	0.87	.17	2.21	.521	1.43	1880	2.71
9/9	0.75	.15	1.85	.465	1.11	1450	2.09
9/17	0.67	.13	1.50	.407	0.82	1070	1.54
9/23	1.00	.20	2.80	.603	2.00	2620	3.78
9/28	0.83	.17	2.21	.521	1.43	1880	2.71
10/8	1.00	.20	2.80	.603	2.00	2620	3.78
10/29	1.00	.20	2.80	.603	2.00	2620	3.78
11/2	1.08	.22	3.20	.656	2.42	3170	4.57
11/12	1.08	.22	3.20	.656	2.42	3170	4.57
11/18	1.08	.22	3.20	.656	2.42	3170	4.57
12/2	1.20	.24	3.62	.708	2.81	3760	5.42
12/7	1.58	.32	5.42	.901	5.06	6630	9.55

Pipe Diam = 5.0' = D
K = 2.92
Capacity = 42 M.G.D.

TABLE 13-1(cont.)
Computed Sewer Flows
Main Interceptor Extension
(Adelaide St.) Site #5

1982 date	Y depth of flow (ft)	$\frac{Y}{D}$	A area (ft^2)	R hydr radius (ft)	$AR^{2/3}$	Flow GPM.	Flow MGD
2/5	0.83	.21	1.92	.504	1.22	1460	2.10
2/12	1.83	.46	5.64	.946	5.44	6500	9.36
2/15	2.20	.55	7.08	1.050	7.36	8790	12.66
2/19	1.75	.44	5.32	.918	5.03	6000	8.64
2/26							
3/11	2.08	.52	6.60	1.024	6.71	8010	11.53
3/26	1.50	.38	4.38	.824	3.85	4600	6.62
4/20	2.00	.50	6.28	1.000	6.28	7500	10.80
4/30	0.83	.21	1.92	.504	1.22	1460	2.10
5/11	1.38	.35	3.92	.774	3.30	3940	5.67
6/2	1.41	.35	3.92	.774	3.30	3940	5.67
6/17	1.00	.25	2.46	.586	1.72	2060	2.97
7/11	0.75	.10	1.66	.461	0.99	1180	1.70
7/16	0.75	.19	1.66	4.61	0.99	1180	1.70
7/20	0.92	.23	2.18	.546	1.46	1740	2.51
7/23	0.83	.21	1.92	.504	1.22	1460	2.10
7/27	0.83	.21	1.92	.504	1.22	1460	2.10
7/30	0.92	.23	2.18	.546	1.46	1740	2.51
8/4	0.92	.23	2.18	.546	1.46	1740	2.51
8/10	0.92	.23	2.18	.546	1.46	1740	2.51
8/13	1.08	.27	2.74	.626	2.01	2400	2.46
8/20	0.75	.19	1.66	.461	0.99	1180	1.70
8/31	0.70	.18	1.54	.439	0.89	1060	1.53
9/9	0.58	.15	1.18	.372	0.61	730	1.05
9/17	0.58	.15	1.18	.372	0.61	730	1.05
9/23	0.83	.21	1.92	.504	1.22	1460	2.10
9/28	0.75	.19	1.66	.461	0.99	1180	1.70
10/8	0.75	.19	1.66	.461	0.99	1180	1.70
10/29	0.75	.19	1.66	.461	0.99	1180	1.70
11/2	0.92	.23	2.18	.546	1.46	1740	2.51
11/12	0.83	.21	1.92	.504	1.22	1460	2.10
11/18	1.08	.27	2.74	.626	2.01	2400	3.46
12/2	1.08	.27	2.74	.626	2.01	2400	3.46
12/7	2.33	.58	7.56	1.091	8.01	9570	13.79

Pipe Diam = 4.0' = D
K = 2.66
Capacity = 22 M.G.D.

TABLE 13 (cont.)
Computed Sewer Flows
Site #6
Normal Valley Sewer
(Wariner St)

1982 date	Y depth of flow (ft)	$\frac{Y}{D}$	A area (ft^2)	R hydr radius (ft)	$AR^{2/3}$	Flow GPM.	Flow MGD
2/5	0.67	.13	1.5	.407	.824	1310	1.89
2/12							
2/15	1.00	.20	2.8	.603	1.999	3190	4.59
2/19	1.14	.23	3.41	.682	2.643	4210	6.06
2/26							
3/11	1.25	.25	3.84	.733	3.122	4970	7.16
3/26	0.88	.18	2.40	.549	1.608	2560	3.69
4/20	1.13	.23	3.41	.682	2.643	4210	6.06
4/30	0.90	.18	2.40	.549	1.608	2560	3.69
5/11	0.50	.10	1.02	.318	0.475	760	1.09
6/2	0.70	.14	1.67	.436	0.960	1530	2.20
6/17	0.75	.15	1.85	.465	1.110	1770	2.55
7/11	0.58	.12	1.34	.377	0.699	1110	1.60
7/16	0.67	.13	1.50	.408	0.824	1210	1.89
7/20	0.58	.12	1.34	.377	0.699	1110	1.60
7/23	0.67	.13	1.50	.407	0.824	1310	1.89
7/27	0.58	.12	1.34	.377	0.699	1110	1.60
7/30	0.58	.12	1.34	.377	0.699	1110	1.60
8/4	0.50	.10	1.02	3.18	0.475	760	1.09
8/10	0.58	.12	1.34	.377	0.699	1110	1.60
8/13	0.58	.12	1.34	.377	0.699	1110	1.60
8/20	0.67	.13	1.50	.407	0.824	1310	1.89
8/31	0.83	.17	2.21	.521	1.430	22 80	3.28
9/9	0.83	.17	2.21	.521	1.430	22 80	3.28
9/17	0.75	.15	1.85	.465	1.110	1770	2.55
9/23	0.75	.15	1.85	.465	1.110	1770	2.55
9/28	0.66	.13	1.50	.407	0.824	1310	1.89
10/8	0.75	.15	1.85	.465	1.110	1770	2.55
10/29	0.92	.18	2.40	.549	1.608	2560	3.69
11/2							
11/12	0.92	.18	2.40	.549	1.608	2560	3.69
11/18	0.83	.17	2.21	.521	1.430	2280	3.28
12/2	0.92	.18	2.40	.549	1.608	2560	3.69
12/7	1.42	.28	4.50	.807	3.900	6210	8.95

Pipe Diam = 5.0'
K = 3.55
Capacity = 51 M.G.D.

TABLE 13 (cont.)
Computed Sewer Flows
Site #10
West Branch Sewer
(Hovey Ave)

1982 date	Y depth of flow (ft)	$\frac{Y}{D}$	A area (ft^2)	R hydr radius (ft)	$AR^{2/3}$	Flow GPM.	Flow MGD
2/5	0.33	.12	.40	.207	.14	320	.46
2/12	1.83	.67	4.23	.802	3.65	8450	12.17
2/15	0.50	.18	.73	.302	.33	760	1.09
2/19	0.50	.18	.73	.302	.33	760	1.09
2/26							
3/11	0.86	.31	1.58	.483	.97	2250	3.24
3/26	0.49	.18	.73	.302	.33	760	1.09
4/20	0.71	.26	1.23	.417	.69	2080	3.00
4/30	0.54	.20	.85	.332	.41	950	1.37
5/11	0.40	.15	.56	.255	.23	530	.76
6/2							
6/17	0.58	.21	.91	.346	.45	1040	1.50
7/11	0.17	.06	.15	.107	.03	70	.10
7/16	0.38	.14	.51	.240	.20	460	.66
7/20	0.42	.15	.56	.255	.23	530	.76
7/23	0.42	.15	.56	.255	.23	530	.76
7/27	0.42	.15	.56	.255	.23	530	.76
7/30	0.50	.18	.73	.302	.33	760	1.09
8/4	0.33	.12	.40	.207	.14	320	.46
8/10	0.42	.15	.56	.255	.23	530	.76
8/13	0.50	.18	.73	.302	.33	760	1.09
8/20	0.33	.12	.40	.207	.14	320	.46
8/31	0.46	.17	.67	.287	.29	670	.96
9/9	0.33	.12	.40	.207	.14	320	.46
9/17	0.25	.09	.26	.158	.08	180	.26
9/23	0.42	.15	.56	.255	.23	530	.96
9/28	0.25	.09	.26	.158	.08	180	.26
10/8	0.42	.15	.56	.255	.23	530	.76
10/29							
11/2	0.33	.12	.40	.207	.14	320	.46
11/12	0.58	.21	.90	.346	.44	1020	1.47
11/18	0.33	.12	.40	.207	.14	320	.46
12/2	0.42	.15	.56	.255	.23	530	.76
12/7	0.42	.15	.56	.255	.23	530	.76

Pipe Diam = 2.75'
K = 5.16
Capacity = 15 M.G.D.

TABLE 13 (cont.)
Computed Sewer Flows
Site #12
Old Main Interceptor
(Cottage Ave)

1982 date	Y depth of flow (ft)	$\frac{Y}{D}$	A area (ft^2)	R hydr radius (ft)	$AR^{2/3}$	Flow GPM.	Flow MGD
2/5	1.85	.82	3.49	.685	2.712	2670	3.85
2/12							
2/15							
2/19							
2/26							
3/11	2.25	1.00	3.97	.563	2.708	2660	3.83
3/26	2.25	1.00	3.97	.563	2.708	2660	3.83
4/20	2.25	1.00	3.97	.563	2.708	3100	(4.47)
4/30	2.25	1.00	3.97	.563	2.708	2660	3.83
5/11	1.71	.76	3.24	.681	2.508	2460	3.54
6/2	2.25	1.00	3.97	.563	2.708	2660	3.83
6/17	2.25	1.00	3.97	.563	2.708	2660	3.83
7/11	2.25	1.00	3.97	.563	2.708	2660	3.83
7/16	1.58	.70	2.97	.666	2.266	2230	3.21
7/20	1.83	.81	3.45	.685	2.681	2630	3.79
7/23	1.67	.74	3.15	.676	2.426	2000	(2.88)
7/27	1.67	.74	3.15	.676	2.426	2150	(3.10)
7/30	1.58	.70	2.97	.666	2.266	2230	3.21
8/4	1.67	.74	3.15	.676	2.426	2100	(3.03)
8/10	1.83	.81	3.45	.685	2.681	2000	(2.88)
8/13	1.75	.78	3.33	.683	2.581	2200	(3.17)
8/20	1.58	.70	2.97	.666	2.266	2380	3.43
8/31	1.42	.63	2.64	.639	1.959	1700	(2.45)
9/9	1.33	.59	2.44	.619	1.771	1740	2.51
9/17	1.50	.67	2.83	.656	2.137	1600	(2.31)
9/23	1.58	.70	2.97	.666	2.266	1900	(2.74)
9/28	1.08	.48	1.89	.548	1.266	1240	1.79
10/8	1.50	.67	2.83	.656	2.137	2100	3.03
10/29	1.42	.63	2.64	.639	1.959	1325	(1.92)
11/2	1.83	.81	3.45	.685	2.681	2630	3.79
11/12	2.00	.89	3.73	.674	2.868	2800	(4.03)
11/18	1.58	.70	2.97	.666	2.266	1950	(2.81)
12/2	2.00	.89	3.73	.674	2.868	2250	(3.96)
12/7	2.25	1.00	3.97	.563	2.708	3400	(4.90)

Pipe Diam = 2.25'
K = 2.19
Capacity = 3.8 M.G.D.

TABLE 13 (cont.)
Computed Sewer Flows
Site #13
New Main Interceptor
(Cottage Ave)

1982 date	Y depth of flow (ft)	$\frac{Y}{D}$	A area (ft^2)	R hydr radius (ft)	$AR^{2/3}$	Flow GPM.	Flow MGD
2/5	1.33	.44	3.00	.688	2.34	3370	4.86
2/12							
2/15							
2/19	1.88	.63	4.69	.852	4.22	6080	8.76
2/26							
3/11	3.00	1.00	7.07	.750	5.83	8600	(12.39)
3/26	1.60	.53	3.80	.777	3.21	5000	(7.20)
4/20	1.88	.63	4.69	.852	4.22	6000	(8.65)
4/30	1.33	.44	3.00	.688	2.34	3400	(4.90)
5/11	1.08	.36	2.29	.593	1.62	2330	3.36
6/2	1.08	.36	2.29	.593	1.62	2330	3.36
6/17	1.17	.39	2.55	.631	1.88	2700	3.89
7/11	1.08	.36	2.29	.593	1.62	2330	3.36
7/16	1.08	.36	2.29	.593	1.62	2330	3.36
7/20	0.92	.31	1.87	.527	1.22	1760	2.54
7/23	1.08	.36	2.29	.593	1.62	2150	(3.10)
7/27	0.83	.28	1.62	.484	1.00	1440	2.07
7/30	1.00	.33	2.03	.554	1.37	2050	(2.95)
8/4	0.92	.31	1.87	.527	1.22	1760	2.54
8/10	1.08	.36	2.29	.593	1.62	2250	(3.24)
8/13	1.00	.33	2.03	.554	1.37	1800	(2.59)
8/20	1.17	.39	2.55	.631	1.88	2710	3.90
8/31	1.20	.40	2.64	.643	1.97	2840	4.09
9/9	0.92	.31	1.87	.527	1.22	1760	2.54
9/17	1.17	.39	2.55	.631	1.88	2710	3.90
9/23	1.00	.33	2.03	.554	1.37	2200	(3.17)
9/28	0.83	.28	1.62	.484	1.00	1440	2.07
10/8	1.25	.42	2.82	.666	2.15	3100	4.47
10/29	1.20	.40	2.64	.643	1.97	3000	(4.32)
11/2	1.42	.47	3.26	.720	2.62	3770	5.43
11/12	1.83	.61	4.52	.839	4.02	5790	8.34
11/18	1.42	.47	3.26	.720	2.62	3770	5.43
12/2	1.70	.57	4.16	.811	3.62	5220	7.52
12/7	3.00	1.00	7.07	.750	5.83	8400	12.10

Pipe Diam = 3.0'
K = 3.21
Capacity = 12.2 M.G.D.

TABLE 13 (cont.)
Computed Sewer Flows
Site # 14
Old Main Interceptor
(O'Neil Park)

1982 date	Y depth of flow (ft)	$\frac{Y}{D}$	A area (ft^2)	R hydr radius (ft)	$R^{2/3}$	$AR^{2/3}$	Flow CFS	Flow GPM	Flow MGD
2/5	1.25	.56	2.29	.60	.711	1.63	5.00	2240	3.23
2/12									
2/15	1.50	.67	2.83	.66	.758	2.15	6.60	2400	(3.46)
2/19	1.52	.67	2.83	.66	.758	2.15	6.60	1960	4.26
2/26	1.17	.52	2.09	.58	.695	1.45	4.45	2000	2.88
3/11	1.33	.59	2.44	.62	.727	1.77	5.43	2950	(4.25)
3/26	1.48	.66	2.78	.65	.750	2.09	6.42	3050	(4.39)
4/20	1.50	.67	2.83	.66	.758	2.15	6.60	3100	(4.46)
4/30	1.17	.52	2.09	.58	.695	1.45	4.45	2100	(3.02)
5/11	1.29	.57	2.34	.61	.719	1.68	5.16	2320	3.34
6/2	1.50	.67	2.83	.66	.758	2.15	6.60	2960	4.26
6/17	0.92	.41	1.53	.49	.621	.95	2.92	1550	(2.23)
7/11	0.92	.41	1.53	.49	.621	.95	2.92	1700	(2.45)
7/16	1.08	.48	1.89	.55	.671	1.27	3.90	1750	(2.52)
7/20	1.17	.52	2.09	.58	.695	1.45	4.45	2350	(3.38)
7/23	1.17	.52	2.09	.58	.695	1.45	4.45	2200	(3.17)
7/27	1.17	.52	2.09	.58	.695	1.45	4.45	2200	(3.17)
7/30	1.08	.48	1.89	.55	.671	1.27	3.90	2100	(3.02)
8/4	1.08	.48	1.89	.55	.671	1.27	3.90	1900	(2.74)
8/10	0.96	.43	1.63	.51	.638	1.04	3.19	1400	(2.02)
8/13	1.08	.48	1.89	.55	.671	1.27	3.90	2100	(3.02)
8/20	1.08	.48	1.89	.55	.671	1.27	3.90	1750	(2.52)
8/31	1.20	.53	2.14	.58	.695	1.49	4.57	2050	(2.95)
9/9	1.10	.49	1.94	.56	.679	1.32	4.05	1820	2.62
9/17	1.17	.52	2.09	.58	.695	1.45	4.45	2000	(2.88)
9/23									
9/28	0.66	.29	0.96	.37	.515	0.49	1.50	940	(1.35)
10/8	1.00	.44	1.68	.52	.647	1.09	3.35	1650	(2.38)
10/29	0.75	.33	1.14	.42	.561	0.64	1.96	1100	(1.58)
11/2	1.17	.52	2.09	.58	.695	1.45	4.45	2200	(3.17)
11/12	1.00	.44	1.68	.52	.647	1.09	3.35	1550	(2.23)
11/18	1.00	.44	1.68	.52	.647	1.09	3.35	1750	(2.52)
12/2	1.08	.48	1.89	.55	.671	1.27	3.90	1980	(2.85)
12/7	1.83	.81	3.45	.68	.773	2.67	8.20	2800	(4.03)

Pipe Diam = 2.25
K = 3.07
Capacity = 5.6 M.G.D.

TABLE 13 (cont.)
Computed Sewer Flows
Site #15
New Main Interceptor
(O'Neil Park)

1982 date	Y depth of flow (ft)	$\frac{Y}{D}$	A area (ft^2)	R hydr radius (ft)	$R^{2/3}$	$AR^{2/3}$	Flow CFS	Flow GPM	Flow MGD
2/5	1.35	.45	3.09	.70	.788	2.43	6.93	3110	4.48
2/12									
2/15	2.20	.73	5.53	.90	.932	5.15	14.68	6590	9.49
2/19	2.98	.99	7.06	.80	.862	6.09	17.36	7790	11.22
2/26	2.04	.68	5.12	.88	.918	4.70	13.40	6000	8.64
3/11	3.00	1.0	7.07	.75	.825	5.83	16.62	8400	(12.10)
3/26	2.00	.67	5.03	.88	.918	4.62	13.17	5100	(7.34)
4/20	2.00	.67	5.03	.88	.918	4.62	13.17	6100	(8.78)
4/30	1.35	.45	3.09	.70	.788	2.43	6.93	3110	4.48
5/11	1.21	.40	2.64	.64	.743	1.96	5.59	2510	3.61
6/2	1.50	.50	3.53	.75	.825	2.91	8.29	3720	5.36
6/17	1.58	.53	3.80	.78	.847	3.22	9 .18	3900	(5.62)
7/11	1.33	.44	3.00	.69	.781	2.34	6.67	2990	4.31
7/16	1.08	.36	2.29	.59	.703	1.61	4.59	2150	(3.10)
7/20	1.33	.44	3.00	.69	.781	2.34	6.67	2900	(4.18)
7/23	1.17	.39	2.55	.63	.735	1.89	5.33	2300	(3.31)
7/27	1.08	.36	2.29	.59	.703	1.61	4.59	1800	(2.59)
7/30	1.08	.36	2.29	.59	.703	1.61	4.59	2000	(2.88)
8/4	1,08	.36	2.29	.59	.703	1.61	4.59	2050	(2.95)
8/10	1.17	.39	2.55	.63	.735	1.87	5.33	2300	(3.31)
8/13	1.00	.33	2.03	.55	.671	1.36	3.88	1750	(2.52)
8/20	1.00	.33	2.03	.55	.671	1.36	3.88	1750	(2.52)
8/31	1.20	.40	2.64	.64	.743	1.96	5.59	2500	(3.60)
9/9	1.00	.33	2.03	.55	.671	1.36	3.88	1740	2.51
9/17									
9/23	1.20	.40	2.64	.64	.743	1.96	5.59	2510	3.61
9/28	0.66	.22	1.23	.39	.534	0.66	1 .88	840	1.21
10/8	1.25	.43	2.82	.67	.766	2.16	6.16	2760	3.97
10/29	1.33	.44	3.00	.69	.781	2.34	6.67	2800	(4.03)
11/2	1.25	.43	2.82	.67	.766	2.16	6.16	2760	3.97
11/12	1.83	.61	4.52	.84	.890	4.02	11.46	4800	(6.91)
11/18	1.42	.47	3.26	.72	.803	2.62	7.47	3350	4.82
12/2	1.83	.61	4.52	.84	.890	4.02	11.46	5140	7.40
12/7	3.00	1.0	7.07	.75	.825	5.83	16.62	7460	10.74

Pipe Diam = 3.0'
K = 2.85
Capacity = 10.1 M.G.D.

TABLE 13 (cont.)
Computed Sewer Flows
Site #17
Old Main Interceptor
(Caroline St.)

1982 date	Y depth of flow (ft)	$\frac{Y}{D}$	A area (ft^2)	R hydr radius (ft)	$R^{2/3}$	$AR^{2/3}$	Flow CFS	Flow GPM	Flow MGD
2/5									
2/12									
2/15	3.00	1.00	7.07	.75	.825	5.83	11.25	5100	(7.34)
2/19	2.84	.95	6.94	.86	.904	6.27	12.10	5430	7.82
2/26	2.10	.70	5.28	.89	.925	4.88	9.42	4230	6.09
3/11	3.00	1.00	7.07	.75	.825	5.83	11.25	7500	(10.80)
3/26	2.08	.69	5.20	.86	.904	4.70	9.07	4050	(5.83)
4/20	2.67	.89	6.64	.90	.932	6.19	11.95	5800	(8.35)
4/30	1.50	.50	3.53	.75	.825	2.91	5.62	2650	(3.82)
5/11	1.38	.46	3.17	.71	.796	2.52	4.86	2180	3.14
6/2	1.67	.56	4.07	.81	.869	3.54	6.83	2500	(3.60)
6/17	1.50	.50	3.53	.75	.825	2.91	5.62	2400	(3.46)
7/11	1.50	.50	3.53	.75	.825	2.91	5.62	2450	(3.53)
7/16	1.25	.42	2.82	.67	.766	2.16	4.17	1950	(2.81)
7/20	1.33	.44	3.00	.69	.781	2.34	4.52	2150	(3.10)
7/23	1.38	.46	3.17	.71	.796	2.52	4.86	2450	(3.53)
7/27	1.33	.44	3.00	.69	.781	2.34	4.52	2200	(3.17)
7/30	1.25	.42	2.82	.67	.766	2.16	4.17	1950	(2.81)
8/4	1.25	.42	2.82	.67	.766	2.16	4.17	2000	(2.88)
8/10	1.63	.54	3.89	.79	.855	3.33	6.43	2150	(3.10)
8/13	1.50	.50	3.53	.75	.825	2.91	5.62	2400	(3.46)
8/20	1.33	.44	3.00	.69	.781	2.34	4.52	2050	(2.95)
8/31	1.42	.47	3.26	.74	.818	2.67	5.15	2000	(2.88)
9/9	1.25	.42	2.82	.67	.766	2.16	4.17	1800	(2.59)
9/17	1.00	.33	2.03	.55	.671	1.36	2.62	1200	(1.73)
9/23	1.33	.44	3.00	.69	.781	2.34	4.52	2025	(2.92)
9/28	1.00	.33	2.03	.55	.671	1.36	2.62	1375	(1.98)
10/8	1.17	.39	2.55	.63	.735	1.87	3.65	1850	(2.66)
10/29	1.30	.43	2.91	.68	.733	2.13	4.11	1950	(2.81)
11/2	1.67	.56	4.07	.80	.862	3.51	6.77	3050	(4.39)
11/12	1.92	.64	4.78	.86	.904	4.32	8.34	3300	(4.75)
11/18	1.42	.47	3.26	.72	.803	2.62	5.06	2150	(3.10)
12/2	1.83	.61	4.51	.84	.894	4.03	7.78	3150	(4.54)
12/7	3.00	1.00	7.07	.75	.825	5.83	11.25	6500	(9.36)

Pipe Diam = 3.0
K = 1.93
Capacity = 7.4 M.G.D.

computed from Q = AV). With "K" determined for a site, it is not necessary to measure velocity of flow to determine the flow in the pipe.

Table14 shows the measured flows in the sewers at the treatment plant. Site #22, the new Highland Park sewer is not included, because the location of the manhole in which the velocity and depth measurements were made was too close to the plant influent channel, which caused the backwater profile to affect velocity readings. In 1983, the measurement site was moved farther upstream in this sewer.

TABLE 14

Sewer Flow Measurements
At Sewage Treatment Plant
(M.G.D.)

1982 Date	Site #18 old main interceptor at STP (D=4.25')	Site #19 new main interceptor at STP (D=3.00')	Site #20 west san. sewer at STP (D=3.0')	Site #23 old highland park sewer at STP (D=2.0')
2/5	----	----	----	----
2/12	7.87	6.20	----	0.45
2/15	----	----	----	----
2/19	----	----	----	----
2/26	12.69	7.78	1.17	0.82
3/11	22.80	9.22	----	1.51
3/26	12.22	7.78	0.84	0.86
4/20	15.03	8.79	0.89	0.72
4/30	5.48	----	0.65	0.39
5/11	----	----	----	----
6/2	7.26	----	0.37	0.41
6/17	7.98	----	0.66	----
7/11	5.92	----	----	----
7/16	6.10	5.55	0.54	0.27
7/20	5.36	----	----	----
7/23	5.92	5.55	0.47	0.30
7/27	6.25	5.12	0.37	0.22
7/30	5.67	5.33	0.53	0.19
8/4	4.93	4.68	0.52	0.32
8/10	----	----	----	0.56
8/13	5.31	5.48	0.84	0.52
8/20	4.18	4.90	0.42	0.17
8/31	3.20	----	0.46	0.36
9/9	3.71	4.76	0.39	0.23
9/17	5.54	5.33	0.26	----
9/23	4.23	5.69	0.35	0.19
9/28	2.64	5.55	0.29	0.19
10/8	4.00	5.33	0.50	0.28
10/29	4.44	5.19	0.30	0.19
11/2	5.71	6.92	0.46	0.23
11/12	8.04	8.07	0.30	0.25
11/18	4.96	6.34	0.32	0.18
12/2	5.14	8.21	1.10	0.18
12/7	14.57	8.36	0.92	0.98

7.3 Dry Weather Flow Measurements in Sewers

During the period of July, August and September 1982, flows received at the STP were relatively low. There were some rains during that period, however very few overflows from the sewers occurred, and there were no overflows on any of the dates that sewer flow measurements were taken.

An analysis of the sewer flow depth measurements for July through September, 1982 was done to provide information on what percentage of the interceptor sewer capacities is being used during a dry weather flow period. The results of this analysis are shown in Table 15.

There were 15 dates during the three month period in which the depths of flow in the sewers were measured. Based on an average of all the measurements in each of the sewers during dry weather, it was found that at 14 of the 23 sewer locations the flow used less than 10% of the sewer capacity. (sites 1 through 9, 16, 20, 21, and 23.) The old main 27" interceptor sewer at Cottage, and the new main 36" interceptor at the STP were the only sewers that flow at full capacity during dry weather. The new Highland Park 48" sewer at the STP was found to flow at an average of 21% of full capacity. This is not an accurate flow because the depth in the sewer at the measurement location is subject to downstream control by the water surface elevation in the STP inlet channel. The measurement site has been recently moved farther away from the inlet channel, and the flow depths in the Highland Park Sewer have been found to be less.

The old main interceptor (51") averaged only 45% of its full capacity, while the new 36" main interceptor averaged over 100% of full capacity. These two interceptors are parallel to each other and both discharge into a common junction box at the STP. The invert elevation of the 36" sewer is 0.8' lower than the invert of the 51" sewer. As can be seen in Table , the 36" sewer depth averaged 2.83' while the depth in the 51" sewer averaged 2.00'. Taking into account the $\pm$ 0.8' difference in the invert elevations the water surface elevations of these two interceptors was about the same.

TABLE 15

Dry Weather Flows in Sewers
July, Aug., Sept. 1982

Site #	Location	Pipe Diam (D) (FT)	Depth range Hi-low (FT)	Depth average Y (FT)	average Y/D	average % of full cap. used	Max Y/D	Max. % of full cap. used
1	East San. Relief (Ewing Park)	3.0	.41-.25	.32	.11	2%	.14	3%
2	San. Relief (Rosney)	4.0	.83-.42	.55	.14	4	.21	9
3	San. Relief (IWU)	5.0	.92-.50	.75	.15	4	.18	6
4	San. Relief (University Ave)	5.0	1.0-.75	.86	.17	5	.20	8
5	Int. Extension (Adelaid	4.0	1.08-.58	.81	.20	8	.27	15
6	Normal Valley (Wariner)	5.0	.83-.50	.65	.13	3	.17	5
7	Normal Valley Upstream fr. site 8	5.0	.92-.67	.75	.15	4	.18	6
8	Normal Valley East of Adelaide St	5.0	1.0-.67	.76	.15	4	.20	8
9	Adelaid St Sewer	2.0	.20-.12	.17	.09	1	.10	2
10	West Branch Sewer (Hovey)	2.75	.50-.17	.37	.13	3	.18	6
11	West Branch 15" sewer	1.25	.79-.13	.41	.33	23	.63	73
12	Old Main 27" Int. (Cottage)	2.25	1.83-1.08	1.58	.70	86	.81	100
13	New Main 36" Int. (Cottage)	3.0	1.17-0.83	1.02	.34	24	.39	32
14	Old Main 27" Int. (O'Neil Park)	2.25	1.20-0.66	1.07	.48	46	.53	55
15	New Main 36" Int. (O'Neil Park)	3.0	1.33-.66	1.10	.37	29	.44	40
16	Far West Sewer (Market St)	3.0	.50-.17	.38	.13	3	.17	5
17	Old Int. (Caroline St)	3.0	1.63-1.00	1.30	.43	38	.54	56
18	Old Int. (STP)	4.25	2.40-1.25	2.00	.47	45	.56	60
19	New Int. (STP)	3.0	3.0-2.25	2.83	.94	100+	1.0	100
20	Far West Sewer (STP)	3.0	.42-.25	.31	.10	2	.14	4
21	Wood St Sewer (STP)	4.50	.19-.13	.16	.04	1	.04	1
22	New Highland Park (STP)	4.0	1.83-.10	1.27	.32	21	.46	44
23	Old Highland Park (STP)	2.0	.42-.17	.29	.15	4	.21	10

*Depth in Highland Park 48" sewer is increased by downstream backwater.

ATTACHMENT 4A

ORDINANCE NO. 547

AN ORDINANCE ENACTING A GENERAL WASTE CONTROL PROGRAM REGULATING THE USE OF THE PUBLIC TREATMENT WORKS AND PUBLIC AND PRIVATE SEWERS AND DRAINS IN THE BLOOMINGTON & NORMAL SANITARY DISTRICT

Bloomington & Normal Sanitary District
R. R. 7, West Oakland Avenue Road
Bloomington, Illinois 61701
309-827-4396

ORDINANCE NO. 547

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ORDINANCE NO. 547

AN ORDINANCE ENACTING A GENERAL WASTE CONTROL PROGRAM REGULATING USE OF THE TREATMENT WORKS AND PUBLIC AND PRIVATE SEWERS AND DRAINS, AND PROVIDING PENALTIES FOR VIOLATIONS THEREOF IN THE BLOOMINGTON AND NORMAL SANITARY DISTRICT

WHEREAS, the Bloomington & Normal Sanitary District has heretofore constructed sewage works for collection and treatment of sanitary sewage and non-domestic wastes produced within the District; and

WHEREAS, the purposes of the sewage works constructed and operated by the Bloomington & Normal Sanitary District are saving and preserving the water supplied to the inhabitants and protecting the natural waters from pollution by the sanitary sewage and non-domestic wastes produced within the District; and these purposes can be accomplished only by proper control of the design, construction and use of the sewers and sewer systems connected into the sewage works of the District; and

WHEREAS, the Board of Trustees of the Bloomington & Normal Sanitary District passed an Ordinance on January 9, 1979 relating to sewers and sewer systems and has amended that Ordinance and other Ordinances from time to time; and

WHEREAS, the said Ordinance passed on January 9, 1979 and other Ordinances now have to be comprehensively amended to meet the requirements of the Federal Water Pollution Control Act of 1972 (P.L. 92-500) and the Clean Water Act of 1977 (P.L. 95-217) and the rules and regulations of the United States Environmental Protection Agency promulgated pursuant thereto; and

WHEREAS, federal requirements for acceptance of a P.L. 92-500 grant for improving the quality of effluent discharges from waste treatment plans require the enactment of regulatory provisions; and

WHEREAS, the Board of Trustees of the Bloomington & Normal Sanitary District has determined that the Sections of this Ordinance provide a just regulation of public waste treatment and collection facilities, including pretreatment standards, and comply with applicable Federal Regulations.

NOW, THEREFORE, BE IT ORDAINED by the Board of Trustees of the Bloomington & Normal Sanitary District of McLean County, Illinois, as follows:

ARTICLE I

GENERAL PROVISIONS

SECTION 1. AUTHORITY

A. The Articles of this Ordinance are enacted by the Board of Trustees pursuant to the requirements of Title III of the Clean Water Act Amendments (33 USC, 1311 et seq.) and regulations promulgated thereunder, and the Illinois Environmental Act (Ch. 111½, Ill. Rev. Stat. 1983, Sec. 1001, et seq.), and in accordance with the Sanitary District Act of 1917 (Ch. 42, Ill. Rev. Stat. 1983 Sec. 298.99, et seq.).

SECTION 2. GENERAL PURPOSES

A. The general purposes of this Ordinance are to provide for the making and continuing of connections into the sewage works of the District; authorize the making and maintenance of such connections upon certain conditions, including permission thereto; providing for the making of rules and regulations in connection with the making and maintenance of such connections and enforcements thereto; regulating the use of municipal and private sewers and drains, individual wastewater disposal, the installation, connection, and disconnection of building sewers, the discharge of water and waste in the public sewer system; providing for penalties for violation therefore; and providing for termination of sewer service and of permits issued by the District pursuant to the provisions hereof.

B. The intent of this Ordinance is to prevent the introduction of pollutants to the wastewater disposal system which will interfere with the operation of the system or the use of the disposal of sludge; to prevent the introduction of pollutants into the wastewater disposal system which will pass through the system inadequately treated into the receiving waters or the atmosphere and otherwise being incompatible with the system; and to improve the opportunity to recycle and reclaim wastewater and sludge from the system.

SECTION 3. CONFIDENTIAL INFORMATION

A. Information and data relating to an Industrial User obtained from reports, questionnaires, permit applications, permits and monitoring programs and from inspections shall be available to the public or other governmental agency without restrict unless the User specifically requests, and is able to demonstrate to the satisfaction of the District that the release of such information would divulge information, processes or methods of production entitled to protection as trade secrets of the User.

B. When requested by the person furnishing a report, and until such time as the Board determines that the requested information is not entitled to confidential treatment, the portions of a report which might disclose trade secrets or secret processes shall not be made available for inspection by the public, but shall be made available upon written request to governmental agencies for uses related to this Ordinance, the National Pollutant Discharge Elimination System (NPDES) Permit, and for use by the State or any stage agency in judicial review or enforcement proceedings involving the person furnishing the report.

C. The wastewater constituents and characteristics will not be recognized as confidential information.

D. Information accepted by the District as confidential shall not be transmitted to the general public by the District until and unless a 30-day notification is given to the User.

E. The District shall implement measures to prevent the negligent release of confidential information; however, the District and the Executive Director shall not be held legally responsible for release of information if they have acted in good faith.

SECTION 4. RECORDS RETENTION

A. Users and the District shall maintain records of all information resulting from any monitoring activities required by this Ordinance, and in the case of Industrial Users, shall include:

1) The date, exact place, method, and time of sampling and the names of the person or persons taking the samples;
2) The dates analyses were performed;
3) Who performed the analyses;
4) The analytical techniques/methods used; and
5) The results of such analyses.

B. The District and Industrial users shall maintain such records for a minimum of three (3) years. This period of retention shall be extended during the course of any unresolved litigation regarding the discharge of pollutants by the Industrial User or operation of the District pretreatment program or when requested by the Regional Administrator or the Director of IEPA.

ARTICLE II

DEFINITIONS

SECTION 1. TECHNICAL TERMS

A. Technical terms used in this Ordinance but not included in the Definition of Terms are used in accordance with the Third Edition of "Glossary, Water and Wastewater Control Engineering", copyright 1981.

SECTION 2. ABBREVIATIONS

A. The following abbreviations shall have the designated meanings:

BOD	Biochemical Oxygen Demand
CFR	Code of Federal Regulations
COD	Chemical Oxygen Demand
FOG	Fats, Oils and Grease
IEPA	Illinois Environmental Protection Agency
mg/l	Milligrams per liter
NCPS	National Categorical Pretreatment Standards
NPDES	National Pollutant Discharge Elimination System
POTW	Publicly Owned Treatment Works
PSES	Pretreatment Standards for Existing Sources
PSNS	Pretreatment Standards for New Sources
RCRA	Resource Conservation and Recovery Act
SIC	Standard Industrial Classification
SWDA	Solid Waste Disposal Act, 42 USC 6901 et. seq.
TSS	Total Suspended Solids
TTO	Total Toxic Organics
USC	United States Code
USEPA	United States Environmental Protection Agency

SECTION 3. "Act" shall mean the Federal Water Pollution Control Act 33 USC 1251 et. seq., also known as PL 92-500.

SECTION 4. "Accidental Discharge" shall mean the unplanned release of substances either directly or indirectly in such magnitude to cause substantial effects on receiving systems or treatment processes. Release is the result of accident, acts of nature or operational malfunctions.

SECTION 5. "Administrator" shall mean the Regional Administrator of Region V of the U.S. Environmental Protection Agency or Director in an NPDES State with an approved state pretreatment program.

SECTION 6. "Applicable Pretreatment Standards" shall mean, for any specified pollutant, District prohibitive discharge standards, District's specific limitations on discharge, the State of Illinois Pretreatment Standards or the National Categorical Pretreatment Standards (when effective), whichever standard is more stringent.

SECTION 7. "Approval Authority" shall mean the Administrator.

SECTION 8. "Authority" shall mean the Bloomington & Normal Sanitary District.

SECTION 9. "Authorized Representative" shall mean (i) a principal executive officer of at least the level of vice president, if the Industrial User is a corporation; (ii) a general partner or proprietor if the Industrial User is a partnerhip or proprietorship, respectively; (iii) a duly authorized representative of the individual designated above. A person is a duly authorized representative only if the authorization is made in writing to the District by a person described above.

SECTION 10. "Baseline Report" shall mean that report required by 40 CFR Section 403.12 b(1-7).

SECTION 11. "Biochemical Oxygen Demand (BOD)" shall mean the quantity of oxygen, expressed in mg/l, utilized in the biochemical oxidation of organic matter under standard laboratory procedures as described in Standard Methods.

SECTION 12. "Board of Trustees" or "Board" shall mean the Board of Trustees of the Bloomington & Normal Sanitary District.

SECTION 13. "Building Sewer Line" shall mean the sewer which transports the wastewater from a discharger's facility to the public sanitary sewer system.

SECTION 14. "Chemical Oxygen Demand (COD)" shall mean the quantity of oxygen consumed from a chemical oxidant (standard potassium dichromate solution) under standard laboratory procedures as described in Standard Methods.

SECTION 15. "Combined Waste Stream Formula" shall mean the formula as found in 40 CFR Section 403.6 (e)(1)(i).

SECTION 16. "Composite Sample" shall mean a sample of wastewater based on a flow proportional or time proportional method.

SECTION 17. "Cooling Water" shall mean the water discharged from any use such as air conditioning, cooling or refrigeration, or to which the only pollutant added is heat.

SECTION 18. "Compatible Pollutant" shall mean biochemical oxygen demand, chemical oxygen demand, FOG, suspended solids, pH and fecal coliform bacteria; plus any additional pollutants identified in the District's POTW NPDES permit, where the POTW treats such pollutants and, in fact, does treat such pollutants to the degrees required by the POTW's NPDES permit.

SECTION 19. "Consistent POTW Treatment Works Removal", "Pollutant Removal" or "Removal" shall mean reduction in the amount of a pollutant or alteration of the nature of a pollutant in the influent of the POTW to a less incompatible or harmless state in the effluent. Consistent District removal efficiency shall be the difference between the average concentration of the pollutant in the influent of the treatment plant and the average concentration of the pollutant in the effluent of the treatment plant divided by the average concentration of the pollutant in the influent.

SECTION 20. "Control Authority" shall mean USEPA until IEPA has an approved pretreatment program, at which time IEPA shall be the control authority, provided that the District will be the control authority when the submission of its pretreatment program under 40 CFR 403.11 has been approved as provided in said section.

SECTION 21. "Discharge" shall mean the discharge of treated or untreated wastewater to the District POTW.

SECTION 22. "District" or "Sanitary District" shall mean the Bloomington & Normal Sanitary District.

SECTION 23. "District Engineer" shall mean the Chief Engineer of the Sanitary District registered as a Professional Engineer by the State of Illinois.

SECTION 24. "Executive Director" shall mean the Chief Administrator of the Sanitary District.

SECTION 25. "Existing Source" shall mean any building, structure, facility or installation from which there is or may be a discharge, the operation of which commenced prior to the promulgation of the Pretreatment Standards under Section 307(c) of the Act which are applicable to such sources.

SECTION 26. "Fecal Coliform" shall mean any number of organisms common to the intestinal tract of man and animals whose presence in sanitary sewage is an indicator of pollution.

SECTION 27. "Fats, Oil, or grease (FOG)" shall mean any hydrocarbons, fatty acids, soaps, fats, waxes, oils, and any other material that is extracted by freon solvent.

SECTION 28. "Flow" shall mean volume of wastewater.

SECTION 29. "Garbage" shall mean solid wastes from the domestic and commercial preparation, cooking and dispensing of food, and from the commercial handling, storage and sale of produce.

SECTION 30. "Grab Sample" shall mean a sample which is taken from a waste stream on a one-time basis with no regard to the flow in the waste stream and without consideration of time.

SECTION 31. "General Pretreatment Regulations" shall mean General Pretreatment Regulations for Existing and New Sources, 40 CFR part 403, as amended.

SECTION 32. "Incompatible Pollutant" shall mean all pollutants other than compatible pollutants as defined in Section 18 of this Article.

SECTION 33. "Industrial user" shall mean a manufacturing or process facility which is engaged in a productive or profit-making venture, or is engaged in the purchase or sale of goods, transaction of business or who otherwise renders services to the public, but shall not include wastewater hauler.

SECTION 34. "Interference" shall mean an inhibition or disruption of the POTW, its treatment processes or operations, or its sludge processes, use or disposal which is a cause of or significantly contributes to either a violation of any requirements of the POTW's NPDES Permit (including an increase in the magnitude or duration of a violation) or to the prevention of sewage sludge use or disposal by the POTW in accordance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or Local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II more commonly referred to as the Resource Conservation and Recovery Act (RCRA) and including State regulations contained in any State sludge management plan prepared pursuant to Subtitle D or the SWDA), the Clean Air Act, and the Toxic Substances Control Act.

An Industrial User significantly contributes to such a permit violation or prevention of sludge use or disposal in accordance with above-cited authorities whenever such User:

1. Discharges a daily pollutant loading in excess of that allowed by permit with the POTW or be Federal, State or Local law;

2. Discharges wastewater which substantially differs in nature or constituents from the User's average discharge;

   or

3. Knows or has reason to know that its discharge, alone or in conjunction with discharges from other sources, would result

in a POTW permit violation or prevent sewage sludge use or disposal in accordance with the above-cited authorities as they apply to the POTW's selected method of sludge management.

SECTION 35. "Mass Limitation" shall mean limits imposed upon a discharger based upon volumes or concentrations that are converted to weight units.

SECTION 36. "Monthly Average" shall mean the numerical average of all daily composite samples taken during a calendar month. A monthly average must be based upon at least four daily composite samples.

SECTION 37. "Multiple Family Sewer Connection" shall mean a sanitary sewer connecting a dwelling structure containing two or more dwelling units or apartments, consisting of any combination of the following:

(a) One bedroom or efficiency or single room dwelling units.

(b) Two bedroom dwelling units.

(c) Three or more bedroom dwelling units.

SECTION 38. "National Categorical Pretreatment Standard" shall mean any regulation containing pollutant discharge limits promulgated by the USEPA in accordance with Section 307(b) and (c) of the Act, and 40 CFR Section 403.5 which applies to industrial users.

SECTION 39. "National Pollutant Discharge Elimination System Permit (NPDES Permit)" shall mean a permit issued under the National Pollutant Discharge Elimination System for Discharge of Wastewaters to the Navigable Waters of the United States pursuant to the Act.

SECTION 40. "New Source" shall mean any building, structure, facility, or installation from which there is or may be a discharge of pollutants, the construction of which commenced after promulgation of Pretreatment Standards under Section 307(c) of the Act which will be applicable to such source if such Standards are thereafter promulgated in accordance with that Section.

SECTION 41. "Pass Through" shall mean the discharge of pollutants through the POTW into navigable waters in quantities or concentrations which are a cause of or significantly contribute to a violation of any requirements of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation). An Industrial user significantly contributes to such permit violation where it:

1. Discharges a daily pollutant loading in excess of that allowed by permit with the POTW or by Federal, State or Local law.

2. Discharges wastewater which substantially differs in nature and constituents from the User's average discharge.

3. Knows or has reason to know that its discharge, alone or in conjunction with discharges from other sources, would result in a permit violation;

   or

4. Knows or has reason to know that the POTW is, for any reason, violating its final effluent limitations in its permit and that such Industrial User's discharge either alone or in conjunction with discharges from other sources, increases the magnitude or duration of the POTW's violations.

SECTION 42. "Person" shall mean any individual, firm, company, association, society, municipal, private or public corporation, institution, enterprise, governmental agency, or any other entity.

SECTION 43. "pH" shall mean the intensity of the acid or base condition of a solution, calculated by taking the logarithm of the reciprocal of the hydrogen ion concentration.

SECTION 44. "Pollutant" shall mean any dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discharged equipment, rock, sand cellar dirt and industrial, municipal, and agricultural waste discharged into water.

SECTION 45. "Pretreatment" shall mean the reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater to a less harmful state prior to or in lieu of discharging or otherwise introducing such pollutants into a POTW.

SECTION 46. "Pretreatment Requirements" shall mean any substantive or procedural requirement related to pretreatment, other than a National Categorical Pretreatment Standard, imposed on an industrial user.

SECTION 47. "Prohibitive Discharge Standard" shall mean any regulation developed under the authority of Section 307(b) of the Act and 40 CFR, Section 403.5.

SECTION 48. "Publicly Owned Treatment Works (POTW)" shall mean a treatment works as defined by Section 212 of the Act, owned by the District. This definition includes any interceptor sewers that convey wastewater to the POTW treatment plant regardless of ownership, but does not include pipes, sewers or other conveyances not connected to a facility providing treatment. For the purposes of this ordinance, POTW shall also include any sewers that convey wastewaters to the POTW from persons outside the District who are by contract or agreement with the District, Users of the District's POTW.

SECTION 49. "Qualified Professional" shall mean an individual with working knowledge of facility processes and wastewater discharge.

SECTION 50. "Residential User" shall mean a person who discharges exclusively domestic waste from a single or multi-family residence.

SECTION 51. "RCRA" shall mean Resource Conservation and Recovery Act, Public Law 94-482 including all subsequent amendments and applicable regulations promulgated thereto.

SECTION 52. "Sanitary Sewer" shall mean a sewer which carries sanitary and industrial wastewater, and to which storm, surface and groundwater are not intentionally admitted.

SECTION 53. "Sewer Extensions" shall mean sanitary sewer greater than six inches in diameter or which is designed to serve more than one building.

SECTION 54. "Shall" is mandatory. "May" is permissive.

SECTION 55. "Significant Industrial User" shall mean any Industrial User of the District's wastewater disposal system who (i) has a discharge flow of 50,000 gallons or more per average work day; or (ii) has a discharge flow greater than 5% of the flow in the District's wastewater treatment system; or (iii) has in its wastewater incompatible pollutants as defined pursuant to Section 307 of the Act or State Statutes and Rules; or (iv) is found by the District, IEPA or USEPA to have significant impact, either singly or in combination with other contributing industries, on the wastewater treatment system, the quality of sludge, the system's effluent quality, or air emissions generated by the system; or (v) is subject to one or more National Categorical Pretreatment Standards.

SECTION 56. "Significant Violation" shall mean a violation of this Ordinance which remains uncorrected 45 days after notification of non-compliance; which is part of a pattern of non-compliance over a 12-month period; which involves failure to accurately report non-compliance or which resulted in the District exercising its emergency authority under Article X, Sections 4.A.(2) and 5.B.

SECTION 57. "Sludge" shall mean the settleable solids separated from the liquids during the wastewater treatment processes.

SECTION 58. "Slug" shall mean any discharge of water or wastewater which in concentration of any given pollutant, as measured by a grab sample, exceeds more than five (5) times the specific limit concentrations as given in Article IV of this Ordinance, or any pollutant, including oxygen demanding pollutants (BOD, etc.), released in a discharge at a flow rate and/or pollutant concentration which will cause interference with the POTW.

SECTION 59. "Standard Methods" shall mean the laboratory procedures set forth in the latest edition, at the time of analysis, of "Standard Methods for the Examination of Water and Wastewater" prepared and published jointly by the American Public Health Association, the American Water Works Association, and the Water Pollution Control Federation, and any other procedures recognized by the USEPA and IEPA.

SECTION 60. "TOSCA" shall mean Toxic Substance Control Act referring to Public Law 94-469 including all subsequent amendments and applicable regulations promulgated thereto.

SECTION 61. "Total Suspended Solids (TSS)" shall mean total suspended matter, expressed in milligrams per liter, that either floats on the surface of, or is in suspension in water, wastewater or other liquids and is removable by laboratory filtration using a Reeve Angel Type 934A or 984H glass fiber filter disc as prescribed in Standard Methods.

SECTION 62. "Total Toxic Organics" shall mean the summation of all quantified values greater than 0.01 milligrams per liter for the toxic organics as specified in the applicable regulation.

SECTION 63. "United States Environmental Protection Agency" or "USEPA" shall include the Administrator or other duly authorized official of said Agency, as appropriate.

SECTION 64. "Unpolluted Water" shall mean water of quality equal to or better than the IEPA effluent criteria in effect, or water that would not cause violation of receiving water quality standards and would not be benefited by discharge to the sanitary sewers and wastewater treatment facilities provided.

SECTION 65. "Upset" shall mean an exceptional incident in which there is unintentional and temporary noncompliance with applicable Pretreatment Standards because of factors beyond the reasonable control of the Industrial User. An Upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

SECTION 66. "User" shall mean any person who contributes, causes or permits the contribution of wastewater into the District's POTW.

SECTION 67. "Wastewater" shall mean the combination of the liquid and water carried wastes from residences, commercial buildings, industrial plants and institutions including polluted cooling water.

A. Sanitary Wastewater shall mean the combination of liquid and water-carried wastes discharged from toilet and other sanitary plumbing facilities.

B. Industrial Wastewater shall mean a combination of liquid and water-carried waste, discharged from any industrial establishment and resulting from any trade or process carried on in that establishment including the wastewater from pretreatment facilities and polluted cooling water.

C. Combined Wastewater shall mean wastewater including sanitary wastewater, industrial wastewater, storm water, infiltration and inflow carried to the POTW treatment facilities by a sewer.

SECTION 68. "Wastewater Hauler" shall mean any person, partnership or corporation engaged in transporting sanitary wastewater as a commercial venture.

SECTION 69. "Waters of the State of Illinois" shall mean all streams, lakes, ponds, marshes, watercourses, waterways, wells, springs, reservoirs, aquifers, irrigation systems, drainage systems and all other bodies or accumulations of water, surface or underground, natural or artificial, public or private, which are contained within, flow through, or border upon the State of Illinois or any portion thereof.

ARTICLE III

USE OF PUBLIC AND DISTRICT SEWERS

SECTION 1. CONDITIONS FOR DISCHARGE TO THE DISTRICT SEWERS

A. Public wastewater collection facilities are required to be used for deposit of human commercial or industrial liquid wastes that do not meet IEPA NPDES standards for discharge to surface waters.

B. Except as provided in this Ordinance, no person shall connect or cause to be connected any building or facility on property or any part thereof to any sewer unless the entire property shall first be situated within the corporate limits of the District.

C. It shall be unlawful for any person to deposit or discharge, or to cause to be deposited or discharged, to any wastewater collection facilities, any solid, liquid or gaseous waste unless through a connection approved by the District.

D. Any person owning improved property within the District, which abuts any street, alleyway, or right-of-way in which a public sewer is located, shall if the improvements are used or are intended to be used for any type of human use or employment and if the sewer is within three hundred (300) feet of the nearest property line of the property, at his expense, install therein, suitable toilet and waste disposal facilities and within ninety (90) days after such sewer is in service connect such facilities to the sewer in accordance with District ordinance; provided, however, that in the event compliance with this section causes severe economic hardship to said person, he may apply to the District for exemption from this section. Such applications shall state in detail the circumstances which are claimed to cause such economic hardship. Such exemptions shall only be granted to residential Users, shall not apply to other Users, and shall be granted only for such times as the demonstrated hardship exists.

E. Such person as described in this Article III, Section 1(C) and 1(D) shall not avoid connection to such sewer by reason of actual distance from a building or structure to the connection point of such sewer.

SECTION 2. SEWER CONNECTION PERMIT

A. A permit shall be obtained from the District to uncover or make any connection with or opening into, or alter, disturb or extend any sanitary sewer or appurtenances tributary to the facilities of the District except for the municipalities,

sanitary districts and public utilities for the purposes of operation, maintenance and repair. A District permit shall not be valid until all other permits required by this Section are obtained. A District permit, once issued, is applicable to only the property or site specified in the permit, and is not transferable to any other property or site.

B. A permit from the Illinois Environmental Protection Agency shall be obtained for any sanitary sewer connection which will or can serve more than one building, or for one building or building addition within which fifteen (15) or more residents may reside, or which will contribute a flow to the sewers of 1500 or more gallons a day.

C. A permit shall be obtained from the municipality, being either the Town of Normal or the City of Bloomington, within whose corporate limits the work will be performed.

D. A District permit to allow a new building sewer service line to be connected to any District sewer or sewer tributary to a District sewer shall not be issued unless it can be demonstrated that the downstream District sewage facilities including sewers, pump stations, and wastewater treatment works, have adequate reserve capacity to transport and treat the additional wastewater to be discharged from the building sewer service lines.

E. A sewer connection permit shall only be issued and a sewer connection allowed providing the plans and specifications and details of construction meet all the requirements of this ordinance and all other applicable ordinances of the District, the Town of Normal and the City of Bloomington.

F. The District connection permit shall not be issued until the District's Connection Fee as set forth in AN ORDINANCE ESTABLISHING THE FEES AND CHARGES OF THE BLOOMINGTON AND NORMAL SANITARY DISTRICT has been paid.

G. A permit shall not be required for the rearranging of facilities within a building providing that the sewage exits the building through the same sewer connections.

SECTION 3. SEWER CONSTRUCTION PERMIT APPLICATIONS

A. The application for any permit required by Article III, Section 2A above shall be made only on the forms prescribed and furnished by the District. The application shall consist of the following:

1. Completed District Application Form.
2. Check payable to the District for the permit fee.
3. A copy of the IEPA Permit, is required; and a copy of the permit from the municipality; and
4. In addition, in the case of a single-family residential application:

(a) A sketch or plot plan showing the street name on which the residence faces, the nearest cross street and name, location of the house, sanitary sewer and proposed sewer service.

5. Or, in addition, in the case of a multi-family residential application:

   (a) Two copies of plot plan drawn to scale, showing the property lines and dimensions, the street and street name on which the building faces, the nearest cross street and name; the location of the building, the sanitary sewer and the proposed sewer service; and an arrow indicating the North direction of the drawing.

   (b) Two sets of floor plans and the plumbing plans.

6. Or, in addition, in the case of a non-residential application:

   (a) Two copies of the plot plan drawn to scale, showing the property lines and dimensions; the street and street name on which the building faces; the nearest cross street and name; the location of the building, the sanitary sewer, the proposed sewer service, the sampling manhole, the water main, the proposed water service, storm sewers, inlets, catch basins, proposed storm drains and appurtenances and an arrow indicating the North direction of the drawing. If the building for which application is being made is part of a development involving several buildings, the applicant shall furnish two copies of the total development plan showing the information required above.

   (b) Two sets of the floor plans and the plumbing plans.

   (c) Industrial waste information as may be required by the Executive Director.

SECTION 4. CONSTRUCTION STANDARDS

A. The size, slope, alignment, materials of construction of a sewer, and the methods to be used in excavating, placing of the pipe, jointing, testing and backfilling the trench, shall all conform to the requirements of the District and of the municipality in which the work is to be done. The materials and procedures set forth in the latest editions of Illinois Plumbing Code, appropriate sections of the specifications of the American Society of Testing Materials, Water Pollution Control Federal Manual of Practice No. 9, and Standard Specifications for Water and Sewer Main Construction in Illinois shall apply. In cases of conflict between standards, the more stringent shall apply.

B. Connections with any District Sewer shall be made only at manholes or such other junctions as may be provided or designated by the District and then only in such manner as directed by the Executive Director and no such connection shall be made or connecting sewers constructed, except by skilled and responsible sewer builders and drain layers.

C. No connections shall be made of roof downspouts, exterior foundation drains, areaway drains, or other sources of surface runoff or groundwater to a building sewer or building drain which, in turn, is connected directly or indirectly to a District Sewer.

D. All excavation shall remain open until the work has been inspected and approved, at which time the excavations shall be backfilled and the site of the work restored to a condition equal to or better than that which existed prior to the commencement of said work.

E. Sewer connections from buildings having holding tanks such as septic tanks, cesspools, and grease traps in residential buildings shall be made in such a manner that these devices are isolated from the line of waste flow and upon completion of construction shall be pumped out by a septic hauler, and filled with compacted granular material.

F. Grease, oil and sand interceptors shall be provided when, in the opinion of the Executive Director, they are necessary for the proper handling of liquid wastes containing grease in excessive amounts, or any flammable wastes, sand or other harmful ingredients; except that such interceptors shall not be required for private living quarters or dwelling units. All interceptors shall be of a type and capacity approved by the Executive Director and shall be readily and easily accessible for cleaning and inspection.

SECTION 5. REQUIRED INSPECTIONS

A. Upon receiving a connection permit from the District, together with a permit from IEPA and, where applicable, from the municipality within whose bounds the connection is to be made, the applicant may proceed to make the connection to the sanitary sewer.

B. The municipality within whose boundaries the work is being done shall be responsible for the inspection and approval of the work. The District reserves the right to also inspect any such work.

C. When the proposed work does not fall within the boundaries of a municipality, the District shall inspect and, when the work is satisfactorily completed, approve the said work. Where the District has sole responsibility, the Contractor or other entity performing the work shall post a bond with the District in the amount of $25,000.00 guaranteeing that all of the work shall be in compliance with the requirements of the District. Each contractor shall carry such insurance as is deemed necessary from time to time by the District to protect it against claims, causes of actions, or any act of any permittee.

D. The applicant shall notify the District and the municipality responsible for any required inspections at least twenty-four (24) hours prior to the commencement of the work to be done.

E. Any sewer builder or drain layer who shall neglect, refuse or fail to correct any defect or fault in any of his work done under any permit from the District, shall not be permitted to do any further or additional work upon any sewer or appurtenance connecting with or designed to connect with or directly or indirectly discharge into any District Sewer, excepting sewers built or being built by the City of Bloomington or Town of Normal, until such defects or faults have been corrected in a manner satisfactory to the District Engineer; and any and all then existing District permits in favor of such sewer builder or drain layer shall be suspended until any such defects or faults are so corrected.

ARTICLE IV

GENERAL DISCHARGE REGULATIONS

SECTION 1. DISCHARGES SUBJECT TO GENERAL REGULATIONS

A. No person shall discharge wastes to District sewers without first having complied with Article III of this Ordinance.

B. All non-residential waste discharges to District sewers shall comply with the General Prohibitions and Specific Limits of this Article of this ordinance except that some non-residential dischargers may be subject to National Categorical Pretreatment Standards (NCPS) who must also comply with the provisions of Article V of this ordinance.

SECTION 2. GENERAL WASTE DISCHARGE PROHIBITIONS

A. Where conflicting requirements of applicable federal, state or local governments governing waste discharges exist, the most stringent shall apply.

B. No user shall increase the use of potable or process water in any way, nor mix separate waste streams for the sole purpose of diluting a discharge as a partial or complete substitute for adequate treatment, in order to achieve compliance with standards as set forth in this ordinance.

C. No person shall discharge or cause to be discharged any stormwater, foundation drainwater, groundwater, roof runoff, surface drainage, cooling waters, or any other unpolluted water to any sanitary sewer.

D. No user shall contribute or cause to be contributed, directly or indirectly, any pollutant or wastewater which will pass through or interfere with the operation or performance of the POTW. The following general prohibitions shall apply to all users of District's POTW whether or not a user is subject to National Categorical Pretreatment Standards or any other national, state or local pretreatment standards of requirements. A user may not contribute the following substances to District's POTW:

(1) Any liquids, solids or gases which by reason of their nature or quantity are, or may be, sufficient either alone or by interaction with other substances to cause fire or explosion or be injurious or hazardous in any other way to the POTW or to the operation of the POTW. At no time shall two successive readings on a meter capable of reading L.E.L. (lower explosive limit) at the point of discharge of the building's sewer line to the

municipal sewer, or at the point of discharge into the POTW, interceptor sewer, or at any point in the POTW treatment works be more than five percent (5%) nor any single reading greater than ten percent (10%). Materials in this subsection include, but are not limited to, gasoline, kerosene, naphtha, benzene, toluene, xylene, ethers, alcohols, ketones, aldehydes, peroxides, chlorates, perchlorates, bromates, polychlorinated biphenyls, carbides, hydrides, stoddard solvents, and sulfides.

(2) Solid or viscous substances which may cause obstruction to the flow in a sewer or other interference with the operation of the wastewater treatment facilities such as, but not limited to: grease, garbage with particles greater than one-half inch (1/2") in any dimension, animal guts or tissues, paunch manure, bones, hair, hides or fleshings, entrails, whole blood, feathers, ashes, cinders, sand, spent lime, stone or marble dust, metal, glass, straw, shavings, grass clippings, rags, spent grains, spent hops, waste paper, wood, plastics, tar, asphalt residues from refining or processing of fuel or lubricating oil, mud or glass grinding or polishing wastes, or tumbling and de-burring stones.

(3) Any wastewater having a pH less than 5.0, unless more strictly limited elsewhere in this ordinance.

(4) Any wastewater containing incompatible pollutants in sufficient quantity, either singly or by interaction with other pollutants, to injure or interfere with any wastewater treatment process, constitute a hazard to humans or animals, create an incompatible effect in the receiving water of the POTW, exceed the limitation set forth in a National Categorical Pretreatment Standard (when effective) or in Section 3 of this Article IV or create a public nuisance. An incompatible pollutant shall include, but not be limited to, any pollutant identified pursuant to Section 307(a) of the Act.

(5) Any noxious or malodorous liquids, gases, or solids which either singly or by interaction with other wastewaters are sufficient to create a public nuisance or hazard to life, or which are sufficient to prevent entry into sewers for their maintenance and repair.

(6) In no case shall a substance discharged to the POTW cause the POTW to be in a non-compliance with sludge use or disposal criteria, guidelines or regulations developed under Section 405 of the Act; any criteria guidelines or regulations affecting sludge use or disposal developed pursuant to the RCRA, SWDA, the Clean

Water Act, the Toxic Substances Control Act (TOSCA), or State criteria applicable to the sludge management method being used by the District.

(7) Any substance which will cause the POTW to violate its NPDES Permit or the receiving water quality standards.

(8) Any wastewater having a temperature at the point of discharge to the POTW which will inhibit biological activity in the POTW treatment plant resulting in interference; in no case shall wastewater be introduced to the POTW which exceeds 65°C (157°F) at the point of discharge or which exceeds 40°C (104°F) at the POTW treatment plant.

(9) Any pollutants, including compatible pollutants released at a flow or pollutant concentration which a user knows or has reason to know will cause interference to the POTW. In no case shall a slug measured at the point of discharge to the POTW have a flow rate or contain concentrations of pollutants that exceed more than five (5) times the average twenty-four (24) hour concentrations, or 24-hour flow during normal operation; provided, however, that a user subject to National Categorical Pretreatment Standards shall comply with such standards in addition to this subsection D (9).

(10) Any wastewater containing any radioactive wastes or isotopes of such halflife or concentration as may exceed limits established by state or federal regulations.

(11) Any wastewater containing BOD, total solids, or suspended solids of such character and quantity that unusual attention or expense is required to handle such materials at the sewage treatment plant; provided, however, that a user may be permitted by specific, written agreement with the District, which agreement to discharge such BOD or TSS may provide for special charges, payments or provisions for treating and testing equipment.

(12) Ammonia nitrogen in amounts that would cause District to fail to comply with regulations of IEPA.

(13) Mercury in amounts that would exceed the requirements of Section 304.126 of Title 35: Environmental Pollution, Subtitle C, Water Pollution, Chapter 1, Pollution Control Board, as amended.

(14) Any liquids, solids or semi-solids which are controlled by any applicable federal, state or local hazardous waste disposal laws without written permission of the Executive Director.

E. Compliance with the provisions of this Section 2 shall be required on the effective date of this Ordinance.

SECTION 3. SPECIFIC DISCHARGE LIMITATIONS

A. Discharges from each separate discharge of a User, as measured under the provisions of this Ordinance, shall not contain in excess of the following concentrations based upon a 24-hour composite sample. Multiple industrial wastewater discharges from a permitted facility may be combined by flow-weighted averages to determine compliance with the following limitations for a 24-hour composite sample.

Material	Concentration Limit, mg/l
Silver	2.92
Arsenic	1.20
Barium	62.0
Cadmium	0.29
Cyanide	1.20
Chromium (hexavalent)	2.16
Chromium	8.83
Copper	3.0
Iron	72.0
Iron (dissolved)	18.0
Lead	1.20
Manganese	18.8
Nickel	4.0
Selenium	0.46
Zinc	8.21
pH	6-9
Phenols	2.13

B. Wastes containing BOD levels in excess of 200 mg/l and TSS in excess of 250 mg/l will be subject to surcharges according to the provisions of AN ORDINANCE ESTABLISHING THE FEES AND CHARGES OF THE BLOOMINGTON & NORMAL SANITARY DISTRICT. Wastes high in BOD and TSS may be rejected or pretreatment may be required in accordance with the provisions of Article IV, Section 2 of this Ordinance.

C. Compliance with the provisions of Section 3A of this Article shall be required within 12 months after the effective date of this Ordinance.

D. As waste loads, plant processes, stream conditions change or regulations change, the District may amend Section 3A of this Article from time to time as may be necessary to meet the intent of this Ordinance as specified in Article I, Section 2B.

SECTION 4. EXCESSIVE DISCHARGES

A. No user shall increase the use of process water or, in any way, attempt to dilute a discharge as a partial or complete substitute for adequate pretreatment to achieve compliance with the limitations contained in an applicable National Categorical Pretreatment Standards (NCPS), or in any other pollutant-specific limitations developed by the District.

SECTION 5. SPILL CONTAINMENT

A. Each Industrial User having the ability to cause interference with the POTW treatment plant or, or to create a hazardous condition to exist in the POTW, or to violate the regulatory provisions of this Ordinance shall provide protection from accidental discharge to the POTW of prohibited materials or other substances regulated by this Ordinance. Facilities to prevent accidental discharge of prohibited materials shall be provided and maintained at the owner of user's own cost and expense.

B. All industrial users whose wastewater includes or could include compatible or incompatible pollutants in amounts great enough to cause interference with the POTW must have detailed plans on file at the District showing facilities and operating procedures to provide protection from accidental discharge. No user who begins contributing to or could contribute such pollutants to the POTW after the effective date of this Ordinance shall be permitted to introduce such pollutants into the POTW until accidental discharge facilities and procedures, as appropriate, have been approved by the District and installed by the industrial user. Review and approval of such plans and operating procedures shall not relieve the industrial user from the responsibility to modify its facility as necessary to meet the requirements of this Ordinance.

C. In the case of an accidental or deliberate discharge of compatible or incompatible pollutants which may cause interference at the POTW or will pass through the POTW or violate requirements of this Ordinance, it shall be the responsibility of the industrial user to immediately telephone and notify the District of the incident. The notification shall include name of caller, location and time of discharge, type of wastewater, concentration and volume.

D. Within fifteen (15) days following such an accidental or deliberate discharge, the industrial user shall submit to the District a detailed written report describing the cause of the discharge and the measures to be taken by the user to prevent similar future occurrences. Follow-up reports may be required by the District as needed. Such report, or reports, shall not relieve the industrial user of any expense, loss,

damage or other liability which may be incurred as a result of damage to the POTW, fish kills, or any other damage to person or proeprty; nor shall such report relieve the user of any fines, civil penalties, or other liability which may be imposed by this Ordinance or otherwise. Failure to report accidental or deliberate discharges may, in addition to any other remedies available to the District, result in the revocation of the discharger's wastewater discharge permit.

E. The industrial user shall control production or all discharges to the extent necessary to maintain compliance with all applicable regulations upon reduction, loss, or failure of its treatment facility until the facility is restored or an alternative method of treatment is provided. This requirement applies in the situation where, among other things, the primary source of power of the treatment facility is reduced, lost or fails.

F. A notice in English and the language of common use shall be permanently posted on the user's bulletin board or other prominent place advising employees whom to call in the event of a discharge of prohibitive material. Employers shall insure that all employees who are in a position to cause, discover, or observe such an accidental discharge are advised of the emergency notification procedures.

SECTION 6. VARIANCES

A. To the extent consistent with the applicable provisions of the Act and the Illinois Environmental Protection Act (Ch. 111 1/2, Ill. Rev. Stat. 1983, Secs. 1001, et seq.), the Board may grant individual variances beyond the limitations prescribed in Article IV, Sec. 3 of this Ordinance, provided that the Petitioner has demonstrated that failure to receive a variance would work an arbitrary or unreasonable hardship on the Petitioner and provided further that Petitioner has demonstrated that Petitioner will be in compliance by the end of the variance period granted. The burden of showing such arbitrary and unreasonable hardship shall be on petitioner who shall, before such variance is granted, show such arbitrary and unreasonable hardship to the Board by clear and convincing proof. In no case shall the Board grant any variance whose terms might or could cause "Interference" or "Pass Through" as such terms are defined in this Ordinance.

B. In granting a variance, the Board may impose such conditions, exceptions, time limitations, duration and other limitations as the policies of this Ordinance, the Illinois Environmental Protection Act and the Act may require, including limitations that will assure that Petitioner will be in compliance by the end of the variance period. Any variance granted by the Board shall not exceed two (2) years and shall be granted

upon the condition that the person who receives such variance shall make such periodic progress reports as the Board shall specify. Such variance may be extended twice for up to two years each time by affirmative action of the Board, but only if satisfactory progress has been shown. However, no petitioner shall receive any variances, including any extension, exceeding a combined total of five years for any specific pollutant.

C. Any person seeking a variance shall do so by filing a petition for variance with the District Director on forms provided by the District. Within 21 days of receipt of the petition, notice of the petition shall be published in a newspaper of local circulation once a week for three weeks.

D. The District shall specify information required to be submitted by the Petitioner. To enable the District to rule on the petition for variance, the following information, where applicable, shall be included in the petition:

(1) A clear and complete statement of the precise extent of the relief sought, including specific identification of the particular provisions of the ordinance from which the variance is sought.

(2) Data describing the nature and extent of the present failure to meet the numerical standards or particular provisions from which the variance is sought and a factual statement why compliance with the ordinances was not or cannot be achieved by the requried compliance date.

(3) A detailed description of the existing and proposed equipment or proposed method of control to be undertaken to achieve full compliance with the ordinance, including a time schedule for the implementation of all phases of the control program from initiation of design to program completion and the estimated costs involved for each phase and the total cost to achieve compliance.

(4) Past efforts to achieve compliance including costs incurred, results achieved and permit status.

(5) A discussion of the availability of alternate methods of compliance, the extent that such methods were studies, and the comparative factors leading to the selection of the control program proposed to achieve compliance.

(6) A concise factual statement of the reasons the petitioner believes that compliance with the particular provisions of the ordinance would impose an arbitrary or unreasonable hardhip; and

(7) Such other information as required by the District.

E. The District Director shall investigate such petition, consider the views of persons who might be adversely affected by the granting of a variance and make a report to the Board of the disposition of the petition. If the Board in its discretion concludes that a hearing would be advisable or if the District Director or any other person files a written objection to the granting of such variance within fifteen (15) days from the date of publication of the petition in the newspaper, then a hearing shall be held and the burden of proof shall be on the Petitioner. Such hearing shall be conducted in the same manner specified in Article X Sections B.2. through B.3.

F. If the limits of a variance are exceeded or if any terms of a variance are violated by the person granted a variance, a violation of this ordinance is deemed to have occurred and the variance may be revoked on thirty (30) days notice.

ARTICLE V

NATIONAL CATEGORICAL PRETREATMENT STANDARDS

SECTION 1. INCORPORATION OF NATIONAL STANDARDS

A. Upon the promulgation of the National Categorical pretreatment Standard (NCPS) for a particular user, the said standard, if more stringent than the limitations imposed under this Ordinance for sources in that category, shall, when effective, immediately supersede the limitations and conditions imposed under this Ordinance. The District shall notify all known affected users of the applicable reporting requirements under 40 CFR Section 403.12.

SECTION 2. FINAL NATIONAL CATEGORICAL PRETREATMENT STANDARDS

A. Job shop and independent printed circuit board manufacturers regulated by the electroplating point source category (40 CFR Part 413), as amended, have been given a compliance date of April 27, 1984. Integrated electroplating facilities regulated by the electroplating point source category, as amended, have been given a compliance date of June 30, 1984. The limitations for this point source category are found in Appendix A of the Ordinance.

B. Industrial users regulated by the metal finishing point source category (40 CFR Part 433) have been given a compliance date of February 15, 1986. The limitations for this point source category are found in Appendix B of this Ordinance.

C. Additional Appendices containing limitations for other industrial categories may be added to this ordinance by amendment as they are finalized by USEPA and/or as they apply to District industrial users.

ARTICLE VI

DISCHARGE PERMITS

SECTION 1. PROHIBITION OF DISCHARGES WITHOUT PERMITS

A. It shall be unlawful for any significant industrial user to discharge wastewater to the District's POTW without or contrary to the conditions of a permit issued by the District Board in accordance with the provisions of this Ordinance.

B. It shall also be unlawful for any significant industrial user who has been issued a General Discharge Permit to continue to discharge wastes to the POTW without meeting the requirements of the permit and of this Ordinance.

C. The District Executive Director shall send written notification to industrial users existing at the effective date of this ordinance and discharging wastes to District sewers that permits shall be required for continued discharging of wastes to sewers. Industrial users so notified shall obtain permits.

SECTION 2: GENERAL DISCHARGE PERMITS

A. All significant industrial users proposing to connect to or to contribute to the POTW shall obtain a General Wastewater Discharge Permit before connecting to or contributing to the POTW. All existing significant industrial users connected to or contributing to the POTW shall obtain a General Wastewater Discharge Permit within 180 days after receiving notification that they must apply for a permit. Application for the General Discharge Permit shall be made on a form prescribed and furnished by the District and shall be accompanied by the fee as set forth in AN ORDINANCE ESTABLISHING THE FEES AND CHARGES OF THE BLOOMINGTON & NORMAL SANITARY DISTRICT.

B. Existing industrial users shall apply for a Discharge Permit within 90 days after receiving notification that permits are required. Proposed new users shall apply at least 90 days prior to discharging to the POTW.

C. In support of the application for a General Discharge Permit, the user shall submit, in units and terms appropriate for evaluation, the following information:

(1) Name, address, location and SIC number according to the Standard Industrial Classification Manual, Bureau of the Budget, 1972, as amended;

(2) Wastewater constituents and characteristics including but not limited to, those set forth in Article IV, Section 3 of this Ordinance as determined by a reliable analytical laboratory; sampling and analysis shall be performed in accordance with Standard Methods;

(3) Time and duration of discharge;

(4) Average and maximum wastewater flow rates, including monthly and seasonal variations, if any;

(5) Site plans showing all pipe sizes, manholes and location of sanitary and storm sewers leaving the building or premises, together with all connections to lateral sanitary and storm sewers.

(6) Listing of each process activity.

(7) Line diagram and basic information, including capacity, of existing or proposed spill containment areas and installation.

(8) Total number of employees and hours of operation of a plant.

(9) Proposed or actual hours of operation of any pretreatment system and the name of the IEPA certified pretreatment operator.

(10) Name of authorized representative of the industrial user.

(11) User's source of intake water together with the types of usage and disposal sources of water and the estimated volumes in each category.

(12) Listing of raw materials and chemicals that are used in the manufacturing process and are capable of being discharged into the POTW.

(13) Description of sludge handling quantities and procedures if sludges are generated in waste pretreatment processes.

(14) Brief description of types and volumes of toxic and hazardous wastes generated in manufacturing and how they are disposed of. Cite disposal permit numbers. Describe methods to prevent spills to sewers of these materials.

(15) If additional user operation and maintenance or pretreatment techniques or installations will be required to meet waste discharge standards, the shortest schedule by which the user will provide such additional pretreatment. The completion date in this schedule shall not be later than the compliance date established for the discharge standard.

(a) The schedule shall show the calendar dates for the commencement and completion of major events leading to the construction and operation of additional pretreatment required for the user to meet the applicable pretreatment standards (e.g., hiring an engineer, completing preliminary plans, completing final plans, executing contract for major components, commencing construction, completing construction, etc.) No time increment between events shall exceed nine (9) months.

(b) No later than 14 days following each date in the schedule and the final date for compliance, the user shall submit a progress report to the District including, as a minimum, whether or not it complied with the increment of progress to be met on such date and, if not, the date on which it expects to comply with this increment of progress, the reason for delay, and the steps being taken by the user to return the construction to the schedule established. In no event shall more than nine (9) months elapse between such progress reports to the District.

(16) Any other information as may be deemed by the Executive Director to be necessary to evaluate the permit application.

D. Industrial users subject to National Categorical Pretreatment Standards shall also comply with Section 3 of this Article.

SECTION 3. ADDITIONAL REQUIREMENTS FOR USERS SUBJECT TO NATIONAL CATEGORICAL PRETREATMENT STANDARDS

A. Industrial users applying for General Discharge Permits who are also subject to National Categorical Pretreatment Standards shall comply with the procedures of Section 2 of this Article. In addition, such users shall also provide the information and comply with the procedures specified in Section 3 of this Article.

B. If an Industrial User not subject to National Categorical Pretreatment Standards (NCPS) has been issued a General Discharge Permit by the District and later becomes subject to

a NCPS, that user shall apply for a modification to the General Discharge Permit within 180 days of the effective date of the NCPS. The application for modification shall include all information and procedures required by Section 3 of this Article.

C. The Industrial User subject to a National Categorical Pretreatment Standard shall submit, in units and terms specified in the application, the following information:

(1) Name and address of the facility including the name of the operator and owners.

(2) List of any environmental control permits held by or for the facility.

(3) Brief description of the nature, average rate of production, and Standard Industrial Classification of the operation(s) carried out by such user. This description shall include a schematic process diagram indicating points of discharge to the POTW from the regulated processes.

(4) Information showing the measured average daily and maximum daily flow, in gallons per day, to the POTW from each of the following:

(a) Regulated process streams, and

(b) Other streams as necessary to allow use of the combined waste stream formula of 40 CFR Section 403.6(e).

(5) The industrial user shall identify the National Categorical Pretreatment Standards applicable to each regulated process and shall:

(a) Submit the results of sampling and analysis identifying the nature and concentration of regulated pollutants from each regulated process. Both daily maximum and average concentration shall be reported. The sample shall be representative of daily operations.

(b) Where feasible, obtain samples through the flow-proportional composite sampling techniques specified in the applicable National Categorical Pretreatment Standard. Where composite sampling is not feasible, a grab sample is acceptable.

(c) Where the flow of the stream being sampled is less than or equal to 250,000 gpd, the User must take three (3) samples within a two-week period. Where

the flow of the waste stream is greater than 250,000 gpd, the User must take six samples within a two-week period.

(d) Such samples shall be taken immediately downstream from pretreatment facilities if such exist or immediately downstream from the regulated process if no pretreatment exists. If other wastewaters are mixed with the regulated wastewater prior to pretreatment, in order to evaluate compliance with the National Categorical Pretreatment Standards, the industrial user shall measure the flows and concentrations necessary to allow use of the combined waste stream formula of 40 CFR Section 403.6(e). Where an alternate concentration has been calculated in accordance with 40 CFR Section 403.6(e), this adjusted limit along with supporting data shall be submitted to the District.

(e) All sampling and analyses shall be in accordance with the latest edition of Standard Methods.

(f) Submit, only with District authorization, a Supplemental Permit Application/Baseline Report which utilizes only historical data, so long as the data provides information sufficient to determine the need for industrial pretreatment measures.

(g) Provide, for each report the time, date, and place of sampling and methods of analysis and certification that such sampling and analysis is representative of normal work cycles and expected pollutant discharges to the POTW.

(6) The industrial user shall provide a statement, reviewed by an authorized representative of the industrial user and certified by an Illinois Registered Professional Engineer, indicating whether National Categorical Pretreatment Standards are being met on a consistent basis and, if not, whether additional operation and maintenance measures (O&M) or additional pretreatment is required for the user to meet the National Categorical Pretreatment Standards.

D. If additional pretreatment or O&M will be required to meet the National Categorical Pretreatment Standards, the user will provide the shortest schedule which will provide such additional pretreatment or O&M. The completion date in this schedule shall not be later than the compliance date established for the applicable National Categorical Pretreatment Standard.

(1) Where the industrial user's National Categorical Pretreatment Standard has been modified by the combined waste stream formula (40 CFR Section 403.6(e)), at the time the user applies for the Supplemental Wastewater Discharge Permit, the information required in Sections 3D(6) and E of this Article shall pertain to the modified limits.

(2) If the National Categorical Pretreatment Standard for the industrial user is modified after the application for a Supplemental Wastewater Discharge Permit is submitted, the user shall make any necessary amendments to information provided as a response to Sections 3D(6) and E of this Article and submit them to the District within 60 days after the modified limit is approved.

E. The following conditions shall apply to any schedule submitted in response to Section 3D, Article VI of this Ordinance.

(1) The schedule shall contain calendar dates for the commencement and completion of major events leading to the construction and operation of additional pretreatment required for the user to meet the applicable National Categorical Pretreatment Standards (e.g., hiring an engineer completing preliminary plans, completing final plans, executing contract for major components, commencing construction, completing construction, etc.) No time increment in the schedule shall exceed nine (9) months.

(2) Not later than 14 days following each date in the schedule and the final date for compliance, the user shall submit a progress report to the District including, at a minimum, whether or not it complied with the increment of progress to be met on such date and, if not, the date on which it expects to comply with this increment of progress, the reason for delay, and the steps being taken by the industrial user to return the construction to the schedule established. In no event shall more than nine (9) months elapse between such progress reports to the District.

SECTION 4. REVIEW OF GENERAL DISCHARGE PERMIT APPLICATIONS

A. The District will evaluate the data furnished by the user and may require additional information from the user. After evaluation of the data furnished, the District may issue a General Wastewater Discharge Permit.

B. Permits to users Subject to National Categorical Standards

(1) General industrial wastewater discharge permits issued to an industrial user which has processes regulated by National Categorical Pretreatment Standards shall include the limits on average and daily maximum pollutant concentrations from the applicable National Categorical Pretreatment Standard.

(2) Where the National Categorical Preteatment Standards are modified by the combined waste stream formula (40 CFR Section 403.6(e)) of the General Pretreatment Regulations, the limits as modified shall be made a part of the Supplemental Wastewater Discharge Permit.

(3) Where an industrial user has manufacturing processes which are regulated by more than one National Categorical Pretreatment Standard at the same permitted discharge location, the limitation in the Wastewater Discharge Permit shall be adjusted consistent with USEPA guidelines and regulations.

SECTION 5. PERMIT CONDITIONS

A. Discharge permits shall be expressly subject to all provisions of this Ordinance and all other applicable regulations, user charges, and fees established by the District. General Permits shall contain the following:

(1) Limits on the average and maximum wastewater constituents and characteristics;

(2) Limits on average and maximum rate and time of discharge or requirements for flow regulation and equalization for each separate discharge of a user;

(3) Requirements for installation and operation of inspection, sampling, and monitoring facilities;

(4) Specifications for monitoring programs which may include sampling locations, frequency of sampling, number, types and standards for tests and reporting schedule;

(5) Compliance schedule, if necessary;

(6) Requirements for submission of technical reports or discharge reports;

(7) Requirements to retain for a minimum of three years any records of monitoring activities and results relating to wastewater discharge and for affording District access to said records;

(8) Requirements for advanced notification of the District of any new introduction of wastewater constituents or any substantial change in the volume or character of the wastewater constituents being introduced into the wastewater treatment system.

(9) Requirements for notification of slug discharges as defined in this Ordinance.

(10) Other conditions as deemed appropriate by the District to ensure compliance with this Ordinance.

B. In the event the type, quality, or volume of wastewater from the property for which a discahrge permit was previously granted is expected to materially and substantially change as determined by the District, the person previously granted such permit shall give thirty (30) days notice in writing to the District and shall make a new application to the District prior to said change, in the same manner and form as originally made, provided that information previously submitted and unchanged need not be resubmitted by permittee. No permittee shall materially and substantially change the type, quality or volume of its wastewater beyond that allowed by its permit without prior approval of the Distrct.

C. Permits shall be issued for a specified time period, not to exceed five (5) years. The Permittee shall file an application for renewal of its permit at least 90 days prior to expiration of the user's permit. The user shall apply, on a form provided by the District, for reissuance of the Permit. The terms and conditions of the permit may be subject to modification by the District during the term of the permit. The user shall be informed of any proposed changes in his permit at least 30 days prior to the effective date of change. Where any changes are made in user's permit, a reasonable time shall be given to achieve compliance.

D. Wastewater discharge permits are issued to a specific user for the process activity specified in the permit. A Wastewater Discharge Permit shall not be assigned, transferred or sold to a new owner or new user in different premises or to a new or change operation in the same or different premises without the approval of the District. If the premises are sold or otherwise transferred by the permittee to a new owner who will maintain the operation in the same premises, then the permit held by the seller shall be reissued by the District to the new owner as a temporary permit; provided that the new owner shall immediately apply for a new permit in accordance with this Ordinance and further provided that the temporary permit shall only be effective for ninety (90) days after the date of sale or transfer. The District shall have the same remedies for violation of temporary permits as it has for violation of other discharge permits.

SECTION 6. PRETREATMENT FACILITY CONSTRUCTION PERMIT AND INSPECTION

A. If pretreatment and/or equalization of the waste flow is required to meet limitations of this Ordinance, a permit by the District to construct the facilities necessary for treatment of the wastes shall also be required. A user's application for a permit to construct such facilities shall include the following:

(1) Summary of design information used to select and size the processes to be constructed.

(2) Schematic diagram of the proposed treatment processes showing flow rates and pollutant loadings.

(3) Description of sludge disposal scheme.

(4) Copy of IEPA permit to construct and operate proposed facilities.

(5) Municipal or county building permit copy.

(6) Two (2) copies of plans and specifications.

(7) A check for the construction permit review fee set forth in AN ORDINANCE ESTABLISHING THE FEES AND CHARGES OF THE BLOOMINGTON & NORMAL SANITARY DISTRICT.

B. A permit to construct the facilities shall be issued if the facilities proposed are shown to bring the user's waste stream into compliance with this Ordinance and if the design meets all other applicable codes, ordinances and laws.

C. The industrial user shall notify the District when construction begins. The District shall inspect the work for conformance with the approved plans. The construction must also pass required municipal or county building inspections.

SECTION 7. DENIAL OF PERMITS AND APPEALS

A. No discharge or facility construction permit shall be issued by the Executive Director to any person whose discharge of material to sewers, whether shown upon his application or determined after inspection and testing conducted by the District, is not in conformity with all applicable ordinances, and regulations or whose application is incomplete or does not comply with the requirements of this Ordinance. The Executive Director shall state the reason or reasons for denial in writing, which shall be mailed or personally delivered to the applicant within five (5) days after denial.

B. If the application is denied by the Executive Director, the user may obtain review of the denial by the Board of Trustees, provided that the user shall give written notice of this request therefore, within thirty (30) days after receipt of such denial. The Board shall review the permit application, the written denial and such other evidence and matters as the applicant and Executive Director shall present. The decision of the Board shall be final.

SECTION 8. REPORTING REQUIREMENTS

A. Date of Compliance Report

Within 90 days following the date for final compliance with applicable pretreatment standards, or in the case of a new source, within 45 days following commencement of the introduction of wastewater into the POTW, any user subject to pretreatment standards shall submit to the District a report, on forms provided by the District, indicating the nature and concentration of all pollutants in the discharge from the regulated process which are limited by pretreatment standards and the average and maximum daily flow for these process units in the user facility which are limited by such pretreatment standards. The report shall state whether the applicable pretreatment standards are being met on a consistent basis and, if not, what additional user operation and maintenance or pretreatment techniques or installations are necessary to bring the user into compliance with the applicable pretreatment standards. This statement shall be signed by an authorized representative of the industrial user, and certified to by an Illinois Registered Professional Engineer.

B. Periodic Reports of Continued Compliance

(1) Any user subject to an applicable pretreatment standard, after the compliance date of such applicable pretreatment standard or, in the case of a new source, after discharge of wastewater to the POTW begins, shall submit to the District on or before the 20th day of the months of July and January, for the preceeding two calendar quarters, a certified report indicating the nature and concentration of pollutants in the effluent which are limited by such applicable pretreatment standards. In addition, this report shall include a record of measured or estimated average and maximum daily flows for the reporting period.

(2) At the discretion of the Executive Director, this report shall also include concentrations of BOD/COD/TSS or other pollutants specified by District. Permittee shall sample and analyze its wastewater for BOD/COD/TSS or other pollutants at the discretion of the Executive Director as set forth in the permit issued to permittee.

(3) At the discretion of the Executive Director and in consideration of such factors as a local high or low flow rate, holidays, budget cycles, the Executive Director may agree to alter the months during which the above reports are submitted.

(4) All measurements, tests, and analyses of the characteristics of wastewater to which reference is made in this Section shall be determined in accordance with Standard Methods and shall be performed at the expense of the industrial user.

SECTION 9. DISTRICT COMPLIANCE MONITORING

A. The District may inspect the facilities of Users to ascertain whether the purposes of this Ordinance are being met and if all requirements of the Ordinance are being complied with. Persons or occupants of premises in which a discharge source or treatment system is located or in which records are kept shall allow the Distraict or its representative ready access upon presentation of credentials at reasonable times to all parts of said premises for the purposes of inspection, sampling, examination and photocopying of records required to be kept by this Ordinance and in the performance of any of their duties. The District shall have the right to set upon the User's property such devices as are necessary to conduct sampling, monitoring and metering operations. Where a User has security measures in force which would require suitable identification necessary arrangements with their security guards so that upon presentation of suitable identification, personnel from the District shall be permitted to enter immediately for the purposes of performing their specific responsibilities. Such arrangements shall be made by Users with their security guards within 30 days of the passage of this Ordinance.

B. The District may sample either routinely or on a random basis any non-residential user's discharge for compliance with the limits specified in this Ordinance or in a user's discharge permit. Any sample taken by the District for analysis will be split with the user if so requested by the user.

C. Each user sampled by the District for compliance shall pay for the cost of sampling and analysis according to the ORDINANCE ESTABLISHING THE FEES AND CHARGES OF THE BLOOMINGTON & NORMAL SANITARY DISTRICT.

ARTICLE VII

REQUIRED MONITORING FACILITIES

A. All non-residential dischargers shall provide a suitable control manhole accessible by the District for observation, sampling and measurement of wastes. If the process is controlled by a national categorcial pretreatment standard, such control manholes shall be provided at the end of a process wherein noncompatible pollutants are used, produced, or treated.

B. Such control manhole shall be accessible and safely located and shall be constructed in accordance with plans approved by the District. Each manhole shall be situated on the discharger's premises. Where such a manhole location would be impactical or cause undue hardship on the discharger, the District may concur with the manhole being constructed in the public street or sidewalk area providing that the manhole is located so that it shall not be obstructed by landscaping or parked vehicles. In those cases where a sampling manhole must be in a parking lot, a permanent barricade, such as a vertical pipe, shall be placed around the manhole to prevent vehicles from driving or parking over the manhole cover.

C. The sampling manhole shall be located on the sewer connection pipe at a point where there are no changes in grade or alignment for at least 15 pipe diameters upstream and downstream from the manhole.1 The grade (slope) of the pipe shall not exceed 1% (1 foot per 100 feet) through the manhole and for a distance of 15 pipe diameters upstream and downstream from the manhole.

D. There shall be ample room in or near such sampling manhole to allow accurate sampling and preparation of samples for analysis. The manhole shall be installed by the discharger at his own expense, and shall be maintained so as to be safe and accessible to the District at all times.

E. All dischargers directed by the Executive Director to do so, shall install an open channel flow measuring device in said manhole. The user shall complete installation of the flume or similar device within 90 days after being directed to provide such device by the District.

F. The District may, at its option, based on the water usage and/or waste loadings, require the discharger to install a device with a recording and totalizing register for measurement of the liquid quantity. This equipment shall be installed and maintained by the discharger at his own expense. The discharger shall be required to calibrate and

maintain the equipment in accordance with the manufacturer's recommended procedures and frequencies and shall further document this information in a log which shall be available for inspection by District personnel.

G. In the event that waste loads cannot be accurately evaluated by time composite samples, the District shall require a flow proportional automatic sampler to be installed and maintained at the discharger's expense.

ARTICLE VIII

WASTEWATER HAULERS

SECTION 1.

A. Any person, firm or corporation may discharge septic tank or other wastes into the treatment facilties of the District provided they comply fully with the provisions of this Ordinance.

B. Any violation of of this ordinance by a wastehauler shall be justification for the Executive Director to immediately bar that hauler from dumping wastes to the District POTW for a period of time as may be determined by the Executive Director.

SECTION 2. DUMPING FEES

A. Fees for dumping wastes are contained in AN ORDINANCE ESTABLISHING THE FEES AND CHARGES OF THE BLOOMINGTON & NORMAL SANITARY DISTRICT.

SECTION 3. WASTE DUMPING RULES

A. No person, firm or corporation shall dispose of any septic tank wastes upon any property of the District other than that property designated by the District from time to time.

B. Disposal shall be limited to wastes from a septic tank, chemical toilet, or any other watertight enclosure used for storage and decomposition of human excrement and/or domestic wastes.

C. Routine disposal shall be permitted daily at the Treatment Plant between the hours of 8:00 a.m. and 3:00 p.m. Emergency dumping will be permitted between the hours of 3:00 p.m. and 11:30 p.m. daily if the hauler first telephones the District an hour in advance of arrival. These hours may be adjusted from time to time by the Executive Director.

D. All trucks which are licensed by the District shall be painted as follows:

(1) Owner's name, address, and phone number

(2) Liquid capacity

E. For each load disposed of at the District Plant, the truck driver shall deliver to the operational office in the building designated on the permit, a signed, numbered ticket showing the identification number, liquid capacity of the load, time of arrival and departure, origin of the load, along with the telephone number of the originating source. The driver shall not unload until obtaining approval by District operating personnel.

F. District operating personnel may require the load be dumped over a period of a half-hour or more, depending upon the flow and characteristics of the incoming sewage at the Plant.

G. A sample may be taken by the District personnel of each truckload of waste delivered to the District Plant, and shall be analyzed by the District for compliance with this ordinance.

H. Persons disposing of waste at the District shall be responsible for cleaning up all the spills and replacing the manhole covers at the end of the unloading process.

I. All wastes dumped at the District's Treatment Plant shall comply with the provisions of Articles IV and V of this ordinance.

J. The District reserves the right to reject any wastes delivered to the facilities of the District which the District believes may have an adverse effect on the treatment works and/or processes.

SECTION 4. INSURANCE

A. A Certificate of Insurance shall be filed with the Executive Director by each permit holder. After approval of the Certificate, the septic tank waste hauler shall be permitted to discharge at the designated location. No one shall be allowed on the site without a valid Certificate of Insurance. The District shall be a named insured on any such policies. The Certificate of Insurance shall include the coverage for general liability, automobile liability and workman's compensation in amounts specified from time to time by the Executive Director.

ARTICLE IX

PROTECTION OF SEWAGE WORKS, EMPLOYEES AND AGENTS

SECTION 1. CESSATION OF DISCHARGES DUE TO TREATMENT PLANT MALFUNCTION

A. The Executive Director or his designated representative, shall have the authority to order an immediate halt to any discharge of waste to the POTW when because of upset or failure of District treatment works equipment and/or processes, in his opinion, the continuation of such discharge would cause risk to the life and limb of employees, risk of damage to the treatment works or endangerment to public health or welfare and/or the environment.

B. Following such action to order cessation of a discharge because of a disaster, the Executive Director shall immediately inform the President of the Board of Trustees and shall provide a written report of the facts to the Board within 48 hours of the decision.

C. The user so ordered to cease discharge under the provisions of this Section will be allowed to recontinue discharging when the Executive Director has determined that the threats to the POTW or public health or welfare or environment caused by the malfunction no longer exist.

D. An order to cease discharging may be transmitted to a user by telephone or hand-delivered letter to any supervisory level employee of the user. Any telephone communication of such an order shall be confirmed by hand-delivered letter within one hour after telephone communication.

ARTICLE X

ENFORCEMENT

SECTION 1. PUBLIC NOTIFICATION OF SIGNIFICANT VIOLATORS

The District shall annually publish in the Daily Pantagraph newspaper a list of industrial users who committed significant violations of any pretreatment requirement or standard during the previous 12 months. The notification shall also summarize any enforcement actions taken against users during the same 12 months.

SECTION 2. COMPULSORY COMPLIANCE PROCEDURES

A. Notice of Violation and Compliance Meeting

Should a violation of this Ordinance by a user occur, the District shall notify the offending user, in writing, through a "Notice of Violation" as to the particulars of such violation or violations and set a time and place for a meeting (hereinafter called a "Compliance Meeting") to be attended by representatives of the District and the user. The purpose of such a meeting shall be to establish such procedures, investigations, studies and compliance measures as the District deems necessary and desirable to control and prevent violation of this Ordinance. The user shall cooperate fully with the District in making such investigations and studies and shall bear the cost of such studies and investigations.

B. Compliance Directive

(1) Following the completion of any procedures, investigations or studies as described in Section 2A above, the District may issue a Compliance Directive, directing and requiring the user to take such action as may be required to control and prevent violations of the Ordinance.

(2) If the District has sufficient information at the time of the Compliance Meeting to determine necessary and desirable compliance measures, it may, at the time of the Compliance Meeting, issue a Compliance Directive, directing and requiring the user to take such action, including pretreatment, without further investigation or study.

(3) Failure to comply with the Compliance Directive of the District shall be deemed a violation of the provisions of this Ordinance and may be grounds for revocation of the user's wastewater discharge permit and grounds for such other actions as may be authorized for violation of this Ordinance.

C. Any action to be performed by the District pursuant to this Section may be performed by the Executive Director.

SECTION 3. REVOCATION OF PERMITS

A. Conditions for Revocation

Any user who violates this Ordinance, its permit, the Illinois Environmental Protection Act or the Federal Act, or regulations promulgated under either act, or any of the following, is subject to having its permit revoked in accordance with the procedures of this Section.

(1) Failure of a user to factually report the wastewater constituents and characteristics of its discharge as determined by the user's or District's analysis;

(2) Failure of the user to report significant changes in process activity or wastewater constituents and characteristics;

(3) Refusal of reasonable access to the user's premises by District representatives for the purpose of inspection or monitoring; or

(4) Tampering with, disrupting, or destroying District equipment;

(5) Failure to report an accidental discharge of a pollutant;

(6) Failure to report an upset of user's treatment facilities;

(7) Violations of conditions of the permit.

B. Procedures for Revocation

(1) The Board may order any user who causes or allows any action which is subject to revocation under Section 3A above to show cause before the Board why its permit should not be revoked. A notice shall be served on the user specifying the time and place of a hearing to be held by the Board regarding the violation, the reasons why the action is to be taken, the proposed action, and directing the user to show cause before the Board why its permit should not be revoked. The notice of the hearing shall be served personally or by registered or certified mail, return receipt requested, at least 10 days before the hearing. Service may be made on any agent or officer of a corporation.

(2) The Board may itself conduct the hearing and take the evidence, or may designate any of its members or its Executive Director or its attorney to:

(a) Issue in the name of the Board notices of hearings requesting the attendance and testimony of witnesses and the production of evidence relevant to any matter involved in such hearing;

(b) Take the evidence;

(c) Transmit a report of the evidence and hearing, including transcripts and other evidence, together with recommendations to the Board for action thereon.

(3) At any hearing held pursuant to this Ordinance, testimony taken must be under oath and recorded stenographically. The transcript, so recorded, will be made available to any member of the public or any party to the hearing upon payment of the usual copying charges therefore.

(4) After the Board has reviewed the evidence, it may issue an order to the user responsible for the discharge directing either a) that the discharge permit be revoked and the service be disconnected or b) that following a specified time, the permit shall be revoked and sewer service discontinued unless adequate treatment facilities, devices or other related appurtenances have been installed and operated properly to comply with the discharge permit or c) direct the user to cease the unauthorized discharge effective after a specified period of time or d) that such other relief as deemed necessary by the Board to abate the discharge be granted. Further orders and directives as are necessary may be issued.

(5) Following an order of revocation, the user shall cease discharging to the District's POTW. Failure to do so shall be evidence of continuing harm to the District and provide grounds for the granting of injunctive relief or temporary restraining orders.

SECTION 4. IMMEDIATE DISCONNECTION

A. The Executive Director may issue an order to a user to immediately cease discharging all or part of the user's waste stream under any of the following conditions:

(1) When treatment plant process malfunction has occurred and cessation is ordered under the provisions of Article IX, Section 3 of this Ordinance; or,

(2) When it is discovered that a user is discharging materials of a type and quantity which, in the Executive Director's opinion, present an imminent threat to the public health or damage to the environment or interference with the operation of the POTW; or,

(3) Whenever a user's General Wastewater Discharge Permit is revoked.

B. The Executive Director shall have the authority, after informal notice to the user, to immediately and effectively halt or prevent any discharge of pollutants to the POTW that reasonably appears to present an imminent endangerment to the health or welfare of persons. When the Executive Director determines that such an emergency situation exists, he shall issue an oral order (followed immediately by a written order) to the user stating the problem and requiring immediate cessation of the discharge. The Executive Director's actions may include disconnection of wastewater collection service. The Executive Director shall obtain the concurrence of the District's attorney before initiating action. Methods of informal notice shall include, but not be limited to, personal telephone calls, letters, hand-delivered messages or notices posted at the user's premises or point of discharge.

C. Any user ordered to cease discharging or to disconnect under the provisions of this Section or Section 3 of Article IX of this Ordinance shall immediately stop or eliminate the offending discharge. If the user fails to comply with the order, the Executive Director shall take such steps as deemed necessary, including immediate severance of the sewer connection, to prevent or minimize damage to the POTW system or damage to any individuals. The Executive Director shall reinstate the Wastewater Discharge Permit and/or the wastewater treatment service upon proof of the elimination of the non-complying discharge.

SECTION 5. INJUNCTIVE RELIEF

A. The District may institute a civil action for an injunction to restrain violations of this Ordinance.

B. The District may, upon discovering an ongoing or potential discharge of pollutants to the District POTW which reasonably appears to present an imminent danger to the health or welfare of persons, seek and obtain from the Circuit Court of McLean County, a temporary restraining order or preliminary injunction to halt or prohibit such discharge.

SECTION 6. ADDITIONAL REMEDIES

A. In addition to remedies available to the District set forth elsewhere in this Ordinance, if the District is fined by the State of Illinois or USEPA for violation of the District NPDES Permit or violation of water quality standards as the result of a discharge of pollutants, then the fine, including all District legal, sampling, analytical testing costs and any other related costs shall be charged to the responsible user. Such charge shall be in addition to, and not in lieu of, any other remedies the District may have under this Ordinance, statutes, regulations, at law or in equity.

B. If the discharge from any user causes a deposit, obstruction, or damage to any of the District wastewater facilities, the Executive Director shall cause the deposit or obstruction to be promptly removed or cause the damage to be promptly repaired. The cost for such work, including materials, labor, and supervision, shall be borne by the person causing such deposit, obstruction, or damage.

C. The remedies provided in this ordinance shall not be exclusive and the District may seek whatever other remedies are authorized by statute, at law or in equity against any person violating the provisions of this Ordinance.

SECTION 7. PENALTIES AND COSTS

A. Any user who is found to have violated an order of the Board or who has failed to comply with any provision of this Ordinance and the orders, rules and regulations and permits issued hereunder, shall be fined in an amount not less than $50.00 nor more than $10,000.00 for each violation in accordance with the terms and provisions of the Sanitary District Act of 1917 (Ill. Rev. Stat. Ch. 42, Sec. 305.1). For the purpose of this Section, each day in which any such violation shall occur, shall be deemed a separate violation, and a separate violation shall be deemed to have occurred for each constituent which has limitations listed in this Ordinance found to exceed the limits established in this Ordinance during any such day. In addition to the penalties provided herein, the District may recover reasonable attorney's fees, court costs, court reporter fees and other expenses of litigation by appropriate suit at law against the person found to have violated this Ordinance or the orders, rules, regulations and permits issued hereunder.

B. Any person who fails to submit reports or information required by this Ordinance or who knowingly makes any false statements, representation or certification in any application, record, report, plan or other document filed or re-

quired to be maintained pursuant to this Ordinance or Wastewater Discharge Permit, or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required under this Ordinance, shall be subject to the penalties and costs provided in Section 7A and shall, in addition, be guilty of a misdemeanor and upon conviction, may be punished by (1) a fine of not more than $1,000.00, or (2) incarceration in a penal institution other than a penitentiary for a period not to exceed three (3) months, or both.

ARTICLE XI

ORDINANCE VALIDITY

SECTION 1. SEVERABILITY

A. If any provision, paragraph, word, section, or chapter of this Ordinance is invalidated by any court of competent jurisdiction, the remaining provisions, paragraphs, words, sections, and chapters shall not be affected and shall continue in full force and effect.

SECTION 2. CONFLICT

A. All other ordinances and parts of other ordinances inconsistent or conflicting with any part of this Ordinance are hereby repealed to the extent of such inconsistency or conflict.

B. Ordinances No. 466 and amending Ordinances No. 479, No. 511, No. 512, No. 514 and No. 543 are hereby repealed.

SECTION 3. FORMER OFFENSES

This Ordinance shall not be construed or held to repeal a former Ordinance whether such former Ordinance is expressly repealed or not, as to any offense committed against such former Ordinance or as to any act done, any penalty, forfeiture or punishment so incurred, or any right accrued or claim arising under the former Ordinance, or in any way whatsoever to affect any such offense or act so committed or so done, or any penalty, forfeiture or punishment so incurred or any right accrued or claim arising before this Ordinance takes effect, save only that proceedings thereafter shall conform to the Ordinance in force at the time of such proceeding, so far as practicable. Nothing contained in this Ordinance shall be construed as abating any action now pending.

SECTION 4. ORDINANCE IN FORCE

A. Upon passage of this Ordinance, the Clerk of the Board hereby is directed to file a certified copy thereof in the office of the Recorder of Deeds of McLean County, Illinois.

B. Upon its passage, approval and publication as required by law, this Ordinance shall thereafter be in full force and effect on and after FEBRUARY 4, 1985.

Passed and approved this 14th day of January, 1985.

President, Board of Trustees
Bloomington & Normal Sanitary District
of McLean County, Illinois

ATTEST:

Clerk

I, James R. Pemberton, the duly elected, qualified and acting Clerk of the Board of Trustees of Bloomington & Normal Sanitary District, and in said capacity the keeper of the records, do hereby certify that the foregoing is a true and complete copy of the original Ordinance No. 547 passed by the Board of Trustees of the Bloomington & Normal Sanitary District at a regular meeting held on the 14th day of January, 1985, the vote on the passage of the Ordinance having been taken by Ayes and Nays and all of the Trustees having voted favorably thereon, and the vote having been entered on the journal of the proceedings of said Board of Trustees.

Witness my hand and the seal of the Bloomington & Normal Sanitary District this 14th day of January, 1985.

James R. Pemberton

Clerk of Board of Trustees
Bloomington & Normal Sanitary District

(SEAL)

ORDINANCE NO. 547

APPENDIX A

A. ELECTROPLATING POINT SOURCE CATEGORY (40 CFR PART 413)

1. The Pretreatment Standards for Existing Sources for the following subparts of 40 CFR 412 are set forth below.

Subpart A: Electroplating of Common Metals Subcategory
Subpart D: Anodizing Subcategory
Subpart E: Coatings Subcategory
Subpart F: Chemical Etching and Milling Subcategory
Subpart G: Electroless Plating Subcategory
Subpart H: Printed Circuit Board Subcategory

POLLUTANT OR POLLUTANT PROPERTY	PSES FOR FACILITIES DISCHARGING GREATER THAN 10,000 GALLONS PER DAY (mg/1) 1-DAY MAXIMUM	4-DAY AVERAGE	PSES FOR FACILITIES DISCHARGING LESS THAN 10,000 GALLONS PER DAY (mg/1) 1-DAY MAXIMUM	4-DAY AVERAGE
Cyanide (Total)	1.9	1.0	---	---
Cyanide (Amenable)	---	---	5.0	2.7
Copper	4.5	2.7	---	---
Nickel	4.1	2.6	---	---
Chromium	7.0	4.0	---	---
Zinc	4.2	2.6	---	---
Lead	0.6	0.4	0.6	0.4
Cadmium	1.2	0.7	1.2	0.7
Total Metals	10.5	6.8	---	---
Total Toxic Organics (TTO)	2.3	---	4.57	---

2. The Pretreatment Standards for Existing Standards for Subpart B (Electroplating Precious Metals) are the same as in the table above, except that Pretreatment Standards for Existing Standards for silver is added as follows:

Subpart B": means Electroplating of Precious Metals Subcategory

POLLUTANT OR POLLUTANT PROPERTY	PSES FOR FACILITIES DISCHARGING GREATER THAN 10,000 GALLONS PER DAY (mg/1) 1-DAY MAXIMUM	4-DAY AVERAGE	PSES FOR FACILITIES DISCHARGING LESS THAN 10,000 GALLONS PER DAY (mg/1) 1-DAY MAXIMUM	4-DAY AVERAGE
Silver	1.2	0.7	---	---

ORDINANCE NO. 547

APPENDIX B

A. METAL FINISHING POINT SOURCE CATEGORY (40 CFR PART 433)

1. Pretreatment Standards for Existing Sources are as follows:

PSES FOR ALL PLANTS (433.15)

POLLUTANT OR POLLUTANT PROPERTY	MAXIMUM FOR ANY 1-DAY (mg/l)	MONTHLY AVERAGE SHALL NOT EXCEED (mg/l)
Cadmium (Total)	0.69	0.26
Chromium (Total)	2.77	1.71
Copper (Total)	3.38	2.07
Lead (Total)	0.69	0.43
Nickel (Total)	3.98	2.38
Silver (Total)	0.43	0.24
Zinc (Total)	2.61	1.48
Cyanide (Total)	1.20	0.65
Total Toxic Organics (TTO)	4.57(1)	---
Total Toxic Organics (TTO)	2.13(2)	---

(1) Interim standard effective June 30, 1984 until February 14, 1986.

(2) Final standard effective February 15, 1986.

2. Pretreatment Standards for New Sources are the same as the table above except as follows:

PSES FOR ALL PLANTS (433.17)

POLLUTANT OR POLLUTANT PROPERTY	MAXIMUM FOR ANY 1-DAY (mg/l)	MONTHLY AVERAGE SHALL NOT EXCEED (mg/l)
Cadmium (Total)	0.11	0.07
Total Toxic Organics (TTO)	2.13	---

ATTACHMENT 4B

BLOOMINGTON NORMAL SANITARY DISTRICT
INDUSTRIAL PRETREATMENT PROGRAM
ENFORCEMENT MANAGEMENT SYSTEM
JULY, 1989

ENFORCEMENT PROCEDURES

The Sanitary District is responsible for enforcing its General Pretreatment Program Ordinance and its Wastewater Discharge Permits issued under the General Pretreatment Program Ordinance. Any violations of the Discharge Permits or the General Pretreatment Program Ordinance will be evaluated to determine an appropriate response by the Sanitary District. There are three possible levels of response available to the Sanitary District -- no response, an informal response, or a formal response. The Enforcement Response Guide set forth in the Appendix to the EMS is to be used to provide guidance in determining the appropriate response to either a major or minor violation. Each violation will be reviewed by the Sanitary District on a case-by-case basis and the Sanitary District will respond accordingly. The responses set forth in the Enforcement Response Guide will be utilized whenever applicable; however, these responses are not required.

The terms major and minor violations are used in the Response Guide to describe violations of effluent limits, sampling, monitoring, and reporting requirements. Major violations are violations which exceed the limits frequently and/or by a large quantity, impede the determination of compliance status, have the potential to cause or may have actually caused adverse environmental effects and /or health problems, or interfered with the treatment capability of the Wastewater Treatment Facilities. The following major violations constitute Significant Noncompliance. Violatons that constitute major violations include but are not limited to the following criteria. Actions taken in response to these violations will be based on the guidelines established in the Appendix.

1. Violations of Wastewater Discharge Limits:

   a. Sixty-six percent or more of the measurments exceed the same daily maximum limit or the same monthly average limit, all in a six month period.

   b. Thirty-three percent or more of the measurements exceed the same daily maximum limit or the same monthly average limit by more than the following:

      Conventional pollutants - Pollutant limit times 1.4 (BOD, TSS, fats, oil and grease)

      Other pollutants - Pollutant limit times 1.2

   c. Any other violation or violations of an effluent limit (monthly average or daily maximum) that the Sanitary District believes caused, along or in combination with other discharges, interference or pass-through as defined by the ordinance; or endangered the health of the sewage treatment personnel or the public.

d. Any discharge of a pollutant which has caused imminent danger to human health/welfare or the environment and resulted in the Sanitary District using emergency authority to halt or prevent such a discharge.

2. Violations of a Wastewater Dischage Permit for starting construction, completing construction, and attaining final compliance by 90 days or more after the schedule date.

3. Failure to provide reports for compliance schedules, self-monitoring data, or categorical standards (base-line monitoring reports, 90-day compliance reports, and periodic reports) within 30 days from the due date.

4. Failure to accurately report noncompliance.

5. Any other violation or group of violations which the Sanitary District considers to be significant.

INFORMAL RESPONSE

In response to a minor violation an informal response may be appropriate. An informal response also may be used as the initial method of correcting a major violation. An informal response includes but is not limited to one or more of the following actions:

1. Informal notice to the industry.

2. Informal meeting with an industrial representative.

3. Notice of Violation (NOV).

4. A notice or meeting to show cause.

Each of these actions are defined as follows:

Informal Notice To Industrial User

Informal notice will consist of a telephone call or letter to an appropriate industrial official. The call or letter will be used to notify officials of a minor violation and to seek an explanation, suggest the exercise of due care, and/or notify the industry that subsequent violations of the same type may be dealt with more severely. Informal notices will be used to correct minor, inadvertent noncompliance and to demonstrate that the Sanitary District will note and follow-up all instances of noncompliance.

Informal Meeting

If a telephone call or letter does not produce compliance or an adequate explanation of the reason for the noncompliance, a meeting between the Sanitary District and the industrial user will be scheduled. At the meeting the Sanitary District will discuss the importance of maintaining compliance and determine the reason for noncompliance. The Sanitary District will record all informal contacts, notices, and meetings with industrial representatives.

The Executive Director of the Sanitary District will be responsible for the overall program implementation and will delegate responsibility and authority for program administration to the District staff as deemed appropriate.

The Sanitary District will track and determine industrial user noncompliance. The staff will prepare a summary noncompliance report listing the discharger and the violation. The Manager of Industrial Waste Control will review the summary noncompliance report and develop and recommend the actions to be taken in response to the noncompliance. The responses set forth in the Enforcement Response Guide (see Appendix) will be used as guidance in determining the appropriate response. The recommended actions will be reviewed by the Director before initiated.

The industrial tracking system used by the Sanitary District will be manual. Separate files will be maintained for each industry, and the file information will be reviewed when the industrial monitoring reports are submitted to determine compliance. A separate Critical Dates file will be established listing compliance schedule dates, reporting dates and other important milestones. These Critical Dates will be listed chronologically with the affected industry identified. The file will be reviewed weekly to assure that the established deadlines are being met. Any violation is reviewed by the Assistant Director for an appropriate response.

Notice of Violation

A notice of violation (NOV) is a written notification to the industrial user. The notification sets forth the particular actions of the industrial user that give rise to the violation. The NOV will set a time and place for a compliance meeting. The purpose of this meeting is to establish the procedures and investigations the Sanitary District determines are necessary to prevent violations of the Ordinance. A Compliance Directive may be issued by the Sanitary District requiring the user to take actions to prevent violations of the Ordinance. Failure to comply with the Compliance Directive shall be deemed to be a violation of the Ordinance and may be grounds for the revocation of the user's wastewater discharge permit.

Notice of Meeting to Show Cause

A user who violates the Ordinance may be subject to revocation of the discharge permit. Prior to revocation, the user will be allowed to show cause why its permit should not be revoked. The user shall be served notice specifying the time and place of a hearing. At the hearing, the proposed action to be taken by the Sanitary District and the reasons for revocation of the permit will be discussed. After the hearing, an order will be issued by the Sanitary District stating whether the user's permit will be revoked or whether other relief is deemed necessary to abate the discharge violation.

APPENDIX

BLOOMINGTON NORMAL SANITARY DISTRICT
ENFORCEMENT RESPONSE GUIDE

SAMPLING, MONITORING, AND REPORTING

NONCOMPLIANCE	CIRCUMSTANCES*	RANGE OF RESPONSE*
Failure to sample, monitor or report.	Isolated or infrequent.	Phone call, letter or NOV. If no response is received, issue a Compliance Directive (CD).
Failure to sample, monitor, report or notify.	Industry does not respond to letters, does not follow through on verbal or written agreement, or frequent violation - SNC.	CD or judicial action including penalties if no response is received.
Failure to notify of effluent limit violation or slug discharge.	Isolated or infrequent. No known effects.	Phone call, letter or NOV. If no response within 10 days, issue a CD.
Failure to notify of effluent limit violation or slug discharge.	Frequent or continued violation - SNC.	Show cause meeting, CD or judicial actions including penalties.
Failure to notify of effluent limit violation or slug discharge.	Known environmental or POTW damage results -	Judicial action and penalties.
Minor sampling, monitoring or reporting deficiencies.	Isolated or infrequent.	Phone call or letter. Corrections to be made on next submittal.
Major or gross sampling, monitoring or reporting deficiencies.	Isolated or infrequent.	Letter or NOV. Corrections to be made on the next submittal.
Major or gross reporting deficiencies.	Continued. Remains uncorrected 30 days or more. SNC.	CD.

BLOOMINGTON NORMAL SANITARY DISTRICT
ENFORCEMENT RESPONSE GUIDE
(continued)

COMPLIANCE SCHEDULES (Construction phases or planning)

NONCOMPLIANCE	CIRCUMSTANCES*	RANGE OF RESPONSE*
Reporting false information.	Any instance - SNC.	Judicial action with penalties, sewer ban.
Missed Interim Date.	Will not cause late final date or other interim dates.	Letter or NOV.
Missed Interim Date.	Will result in other missed interim dates. Violation for good or valid cause.	Letter, NOV or CD.
Missed Interim Date.	Will result in other missed interim dates. No good or valid cause - SNC.	NOV, CD or judicial action including penalty.
Missed Final Date.	Violation due to force majeure (strike, act of God, etc.).	Contact permittee and require documentation of good or valid cause; show cause.
Missed Final Date.	90 days or more outstanding. Failure or refusal to comply without good or valid cause.	CD or judicial action, including penalty.
Failure to install monitoring equipment.	Continued - SNC.	CD to begin monitoring.

BLOOMINGTON NORMAL SANITARY DISTRICT
ENFORCEMENT RESPONSE GUIDE
(continued)

EFFLUENT LIMITS

NONCOMPLIANCE	CIRCUMSTANCES*	RANGE OF RESPONSE*
Exceeding Final Limits (categorical local or prohibited).	Infrequent or isolated minor violation.	Call or letter.
Exceeding Final Limits.	Infrequent or isolated major violations.	NOV, CD.
Exceeding Final Limits.	Violation(s) which are SNC.	CD or judicial action including penalty.
Exceeding Interim Limits.	Without known damages.	Call, letter or NOV.
Exceeding Interim Limits.	Results in known environmental or POTW damage - SNC.	CD or judicial action including penalty.
Reported Slug Load.	Isolated without known damage.	Show-cause or CD.
Reported Slug Load.	Isolated with known interference, pass through or damage - SNC.	CD or judicial action including penalty.
Reported Slug Load.	Recurring - SNC.	Judicial action including penalty.
Discharge without a permit or approval.	One time without known environmental or POTW damage.	CD.
Discharge without a permit or approval.	One time which results in environmental damage or continuing violation - SNC.	CD or judicial action and penalty.
Discharge without a permit or approval.	Continuing violation with known environmental or POTW damage - SNC.	Judicial action and penalty. Disconnect from sewer.

BLOOMINGTON NORMAL SANITARY DISTRICT
ENFORCEMENT RESPONSE GUIDE
(continued)

EFFLUENT LIMITS (continued)

NONCOMPLIANCE DETECTED THROUGH INSPECTIONS OR FIELD INVESTIGATIONS	CIRCUMSTANCES*	RANGE OF RESPONSE*
Minor violation of analytical procedures.	Any instance.	Call or letter.
Major violation of analytical procedures.	No evidence of intent.	Call, letter or NOV.
Major violation of analytical procedures.	Evidence of negligence or intent.	CD or judicial action and penalty.
Minor violation of permit condition.	No evidence of negligence or intent.	Call or letter. Immediate correction required.
Minor violation of permit condition.	Evidence of negligence or intent - SNC.	CD or judicial action and penalty. Sewer ban.

SNC - This denotes that the circumstances of a particular violation are sever enough to meet the criteria specified for Significant Noncompliance (SNC).

NOV - Notice of Violation.

CD - Compliance Directive.

* - Subject to the administrative discretion of the Executive Director of the Sanitary District.

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