Report

Combined Sewer Overflow Long Term Control Plan

Fox River Water Reclamation District, Elgin, IL

February 2010

STRAND
ASSOCIATES, INC.®
ENGINEERS

910 West Wingra Drive
Madison, WI 53715
Phone: 608-251-4843
Fax: 608-251-8655

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February 26, 2010

Mr. Bruce J. Yurdin, Acting Manager
Field Operations Section
Illinois Environmental Protection Agency (IEPA)
Bureau of Water
Division of Water Pollution Control
1021 North Grand Avenue East
Springfield, IL 62706

Re: Fox River Water Reclamation District (FRWRD)
Combined Sewer Overflow Long Term Control Plan
NPDES Permit No. IL0028657–South WWTF

Dear Mr. Yurdin:

On behalf of the FRWRD, enclosed for your review are four copies of the FRWRD Combined Sewer Overflow Long Term Control Plan (LTCP) as required in Special Condition Ten of NPDES Permit No. IL0028657. This LTCP is required to be submitted by March 1, 2010.

If you have any questions, please call.

Sincerely,

STRAND ASSOCIATES, INC.

Troy W. Stinson

Troy W. Stinson, P.E.

Enclosures

c/enc: Robert Trueblood, General Manager, FRWRD
Rick Manner, P.E., Asst. General Manager, FRWRD
Board of Trustees (5), FRWRD

Report for

Fox River Water Reclamation District, Elgin, Illinois

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Prepared by:

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SECTION 1
PURPOSE OF THE PLAN

This section provides an introduction, outlines the Illinois-specific, federal and National Pollutant Discharge Elimination System (NPDES) permit requirements for this Long Term Control Plan (LTCP) and provides a list of abbreviations to aid the reader. For ease of regulatory review, Appendix K includes the completed 86-item checklist, and footnotes throughout the report identify locations in the report where specific checklist items are addressed.

1.01 INTRODUCTION

This report was prepared for the Fox River Water Reclamation District (FRWRD)[1] and consists of FRWRD's LTCP as required to be submitted pursuant to its current NPDES permit. The LTCP will address both discharges from the Treated Combined Sewage Outfall A01 at the Albin D. Pagorski (South) Regional Wastewater Treatment Facility (SWWTF) and the present Combined Sewer Overflow (CSO) Outfall 004 at Pumping Station 31 (PS 31) on Lower Wellington Avenue.[2] This LTCP is somewhat unique because of the interrelationship of FRWRD and the City of Elgin. By way of background, the Illinois Pollution Control Board (IPCB) Water Pollution Regulations define the term Combined Sewer Systems (CSS) as systems that were designed and constructed to receive both wastewater and land runoff (35 Ill. Admin. Code Subtitle C, Chapter I, Part 301.255). Separate sanitary sewer systems are defined as sanitary sewers that convey wastewater with incidental land runoff (Code Part 301.375). Historically, CSS were wastewater collection systems designed to transport sanitary sewage (consisting of domestic, commercial, and industrial wastewater) and stormwater (surface drainage from rainfall and snowmelt) in a single pipe to a wastewater treatment facility (WWTF).

The City of Elgin owns the CSS that discharges flow to the SWWTF which is owned and operated by FRWRD[3] as part of its total wastewater treatment system. FRWRD owns and operates 12 pumping stations and three WWTFs and treats domestic and industrial wastewater that originate in the City of Elgin, Village of South Elgin, and portions of the Villages of Streamwood, Hoffman Estates, Bartlett, West Dundee, South Barrington and Sleepy Hollow. FRWRD owns Pump ing Station 32 (PS 32) on National Street and PS 31 that provide service to the City of Elgin's CSS. Historically both were permitted CSOs. FRWRD now owns and operates only one permitted CSO Outfall 004 at PS 31, which serves a portion of the City of Elgin.

FRWRD receives flows from Elgin's city-owned sewer system that was in large part originally designed and constructed to be a CSS. Over the years the City of Elgin has carried out some construction projects intended to partially separate these CSS. Also newer system areas were constructed as separate sanitary sewers. Therefore, FRWRD is the recipient of wet weather flows from the City of Elgin that result in the need for the existing Treated Combined Sewage Outfall A01 at the SWWTF and untreated CSO at PS 31. FRWRD does not own any combined sewers. Accordingly, some sections of this LTCP are somewhat abbreviated throughout because they are not relevant to FRWRD, which does not own or operate the contributory CSS. As required by its own separate NPDES permit, the City of Elgin has prepared its own LTCP to address their existing permitted CSOs.

[1] Checklist Question 2.
[2] Checklist Question 6.
[3] Checklist Question 3.

The actual ownership of the CSS is the City of Elgin FRWRD does not own any combined sewers. Therefore, FRWRD arguably should not have to prepare a LTCP because the City of Elgin's submitted LTCP proposes that it will continue with its separation projects that will result in the total elimination of CSOs. FRWRD is submitting this LTCP based upon the assumption that flows from the City of Elgin CSS will remain the same. This is because the City of Elgin's proposed LTCP has not been approved nor fully implemented (which may result in the need to transfer either less or more flow to FRWRD's interceptor sewers). Because of the uncertainty of future hydraulic impacts resulting from changes that will occur upstream of CSO 004, FRWRD must reserve the right to amend this LTCP as the City of Elgin's LTCP is evaluated, and ultimately implemented, and the exact impact is known.

1.02 ILLINOIS-SPECIFIC REQUIREMENTS FOR CSO ABATEMENT

Illinois has had a set of regulatory requirements applicable to CSOs. These requirements were codified by the IPCB in 35 Ill. Admin. Code Subtitle C, Chapter I, Part 306 (Code) which in pertinent part requires that:

> "All combined sewer overflows and treatment plant bypasses shall be given sufficient treatment to prevent pollution, or the violation of applicable Water Quality Standards (WQS) unless an exception has been granted by the IPCB."
>
> Sufficient treatment shall consist of the following:
>
> 1. "All dry weather flows, and the first flush of storm flows as determined by the Illinois Environmental Protection Agency (IEPA), shall meet effluent standards consistent with the definition of secondary treatment."
>
> 2. "Additional flows, as determined by IEPA but not less than ten times average dry weather flow for the design year, shall receive a minimum of primary treatment and disinfection."
>
> 3. "Flows in excess of ten times average dry weather flow shall be treated, in whole or in part, to the extent necessary to prevent accumulations of sludge deposits, floating debris and solids, and the depression of oxygen levels."

Historically Part 306 allowed a CSO community to file a petition with the IPCB for an exception to these requirements. An evaluation of receiving stream ratios, known stream uses, land use, accessibility, frequency and extent of overflow events, inspections of unnatural bottom deposits, odors, unnatural floating material or color, stream morphology, and results of stream chemical analyses was required to be part of any petition for such an exception.

The City of Elgin and the Sanitary District of Elgin, which was the predecessor to the FRWRD, availed themselves of this process and worked with the IEPA. After reaching agreement with the IEPA, a joint petition was filed before the IPCB seeking an exception to Part 306. This petition was docket PCB 85-222. On June 10, 1987, the IPCB granted an exception to the City of Elgin and Sanitary District of Elgin with respect to items 1 and 2 noted above (see Appendix A). This relief remains in effect today and is incorporated in Special Condition 12(1)(a) of the FRWRD NPDES permit.

From a state perspective, this LTCP will document compliance with this IPCB order granting the exception to Part 306 of the Code.

1.03 FEDERAL CSO FRAMEWORK

The United States Environmental Protection Agency (USEPA) issued a National Combined Sewer Overflow Control Strategy on April 10, 1989 (*54 Federal Register 37370*). This strategy reaffirmed that CSOs are point source discharges of pollutants subject to the NPDES requirements and to the Clean Water Act (CWA) requirements. The National CSO Strategy set forth three objectives:

1. Ensure that if CSOs occur, they are a result of wet weather.

2. Bring all wet weather CSO discharge points into compliance with the technology-based and water quality-based requirements of the CWA.

3. Minimize the impacts of CSOs on water quality, aquatic biota, and human health.

Additionally, the National CSO Control Strategy charged the states with developing statewide permitting strategies designed to reduce, eliminate, or control CSOs.

On April 19, 1994 (*59 Federal Register 18688),* the USEPA announced the development of a CSO Control Policy. The CSO Control Policy contains a process for developing appropriate site-specific NPDES permit requirements for all CSSs that overflow because of wet weather events. The CSO Policy also announced an enforcement initiative that required immediate elimination of overflows that occur in dry weather and ensured that the remaining CWA requirements are complied with as soon as possible.

The CSO Control Policy contains the following four key principles to ensure CSO controls are cost-effective and meet the CWA requirements:

1. Provide clear levels of control that would be presumed to meet appropriate health and environmental objectives.

2. Provide sufficient flexibility to municipalities, especially those that are financially disadvantaged, to consider the site-specific nature of CSOs and to determine the most cost-effective means of reducing pollutants and meeting CWA objectives.

3. Allow a phased approach for implementing CSO controls by considering a community's financial capability to pay for CSO controls.

4. Review and revise, as appropriate, WQS and their implementing protocols when developing CSO LTCPs to reflect site-specific wet weather impacts of CSOs.

These principles are embodied within two components of the CSO Policy. The first component required implementation of the Nine Minimum Controls (NMCs) described as follows:

1. Proper operation and regular maintenance programs for the sewer system and the CSOs.

2. Maximum use of the collection system for storage.

3. Review and modification of pretreatment requirements to assure CSO impacts are minimized.

4. Maximization of flow to the publicly owned treatment works for treatment.

5. Prohibition of CSOs during dry weather.

6. Control of solid and floatable materials in CSOs.

7. Pollution prevention.

8. Public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts.

9. Monitoring to effectively characterize CSO impacts and the efficacy of CSO controls.

The second component of the CSO Policy is a requirement to develop an LTCP that allows two clear levels of control alternatives (the Presumptive Approach and the Demonstrative Approach).

The Presumptive Approach is based upon meeting one of the following criteria:

1. No more than an average of four overflow events a typical year, provided that the state regulatory authority may allow up to two additional overflow events a year. For the purpose of this criterion, the CSO Policy defines an overflow event as one or more overflows from a CSS as a result of a precipitation event that does not receive the minimum treatment specified as:

    a. Primary clarification (or equivalent) for the removal of floatables and settleable solids.

    b. Solids and floatables disposal.

    c. Disinfection of the effluent, if necessary, to meet WQS and protect human health, including removal of harmful disinfection chemical residuals where necessary to meet WQS.

2. The elimination or capture for treatment (as treatment is defined above) of no less than 85 percent by volume of the combined sewage collected in the CSS during precipitation events on a system-wide, annual average basis.

As an alternative to the Presumptive Approach, the Demonstrative Approach may show that the selected CSO controls, when implemented, will be adequate to comply with the water-quality based CWA requirements.

From the national perspective, this LTCP will determine the optimal solution matrix for the level of CSO control envisioned in the CSO Policy.

1.04 FRWRD NPDES PERMIT REQUIREMENTS

As contemplated in the CSO Control Policy, the IEPA issued an NPDES permit to FRWRD (IL 0028657) effective on March 1, 2007. This NPDES permit required FRWRD to prepare, and submit for approval, a CSO LTCP consistent with the Illinois CSO requirements, the exceptions described above, and the CSO Control Policy. This LTCP must be submitted to IEPA before March 1, 2010 (see Appendix B). This permit also sets forth the NMC requirements listed above with which FRWRD is in full compliance.

1.05 DEFINITIONS

BOD	biochemical oxygen demand
CSO	combined sewer overflow
CSS	combined sewer system
CWA	Clean Water Act
DAF	design average flow
DMF	design maximum flow
DO	dissolved oxygen
FoxDB	Fox River database
FRWRD	Fox River Water Reclamation District
FRSG	Fox River Study Group
gpm	gallons per minute
IAC	Illinois Administrative Code
IDNR	Illinois Department of Natural Resources
IEPA	Illinois Environmental Protection Agency
INHS	Illinois Natural History Survey
IPCB	Illinois Pollution Control Board
ISWS	Illinois State Water Survey
LTCP	Long Term Control Plan
mgd	million gallons per day
mil gal	million gallons
mL	milliliters
NMC	nine minimum controls
NPDES	National Pollutant Discharge Elimination System
NWWTF	North Wastewater Treatment Facility
PN	public notification
PS	pumping station
QAPP	Quality Assurance Project Plan
SWWTF	South Wastewater Treatment Facility

TDML	total maximum daily load
TSS	total suspended solids
UAA	Use Attainability Analysis
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WQS	Water Quality Standards
WWTF	wastewater treatment facility
WWWTF	West Wastewater Treatment Facility

SECTION 2
DESCRIPTION OF COMBINED SEWER SYSTEM

FRWRD provides wastewater treatment services to portions of multiple municipalities in northern Illinois including the City of Elgin, South Elgin, Sleepy Hollow, Streamwood, Hoffman Estates, West Dundee, South Barrington, and Bartlett, with a service population of about 180,000 people.[1] FRWRD owns and maintains 12 pumping stations and three WWTFs in order to provide service to these communities. The three WWTFs are the SWWTF, the North Wastewater Treatment Facility (NWWTF), and the West Wastewater Treatment Facility (WWWTF). The SWWTF's NPDES permit contains the requirement to perform this LTCP regarding Overflow 004 and a permitted Treated Combined Sewage Outfall A01 discharge at the SWWTF. FRWRD owns PS 32 on National Street and PS 31 on Lower Wellington Avenue that provide service to the City of Elgin's CSS. PS 32 pumps to PS 31 and PS 31 pumps combined wastewater to the SWWTF. The City of Elgin owns and operates approximately 3,090 acres of CSS. The City of Elgin's CSS has nine CSOs, owned by the City of Elgin, on the Fox River.[2] FRWRD owns and maintains one CSO at PS 31 (Overflow 004). The overflow at the National Street Pumping Station 32 (Overflow 009) was unused, sealed, and abandoned several years ago. It is no longer a permitted discharge point. A map showing the locations of these overflows is included in Appendix C.[3]

This section provides a brief description of the City of Elgin's CSS, FRWRD's PS 31, PS 32, and the SWWTF. Also included is a discussion on the Fox River Water Quality and Sensitive Areas Analysis.

2.01 SEWER SYSTEM DESCRIPTION[4]

A. City of Elgin's Combined Sewer System

According to the City of Elgin's LTCP, the sewer system upstream of PS 31 is approximately 3,090 acres servicing the City of Elgin.[1,5] The area is comprised of 15 sewer basins of which 11 are combined. The other four basins have either been separated or were constructed as separate systems. The City of Elgin has stated it is actively working toward separating the remaining basins and is in various stages of completion. By way of an Intergovernmental Agreement, FRWRD owns and maintains the diversion structures that are a part of the City of Elgin's Overflows, whereas the City of Elgin owns the pipes upstream and downstream of the diversion structures.

In general the collection system flows from the outer boundaries toward the river where it collects in a series of interceptors. Eventually the interceptors flow into one or both pumping stations. Most of the flow from the northern half of the service area flows to PS 32 located on the east side of the Fox River just south of the National Street Bridge. The flow in the pump station is then lifted via a short force main to a 36-inch gravity sewer. This 36-inch gravity sewer as well as three other sewers flow into PS 31. The total combined flow from the service area is then pumped to the SWWTF. During wet weather events, if the inflow into the combined sewer and ultimately the inflow into PS 31 exceed the capacity of the pumps and force main, an overflow occurs at CSO 004.

[1] Checklist Question 4.
[2] Checklist Question 16.
[3] Checklist Questions 5 and 7.
[4] Checklist Question 9.
[5] Checklist Question 8.

B. CSO Occurrences

In 2006, 2007, 2008 and 2009 there were 22, 19, 19 and 13 events, respectively, in which an overflow was recorded at PS 31 (CSO 004). The CSO occurrences at PS 31 are described in detail in Section 3. Please refer to the City of Elgin's LTCP for CSO occurrences at its permitted CSOs.

C. Significant Industrial Users

In accordance with the November 30, 2001, Phase 1 report submitted by FRWRD to IEPA (Appendix D), there are no significant sources of nondomestic flow within the CSS.[6] That report concluded there is only one significant industrial user in the CSS, and that user was a food processor which had little potential for discharge of hazardous materials. That significant industrial user has since closed. There are no significant sources of nondomestic flow within the CSS. FRWRD is a fully delegated pretreatment authority. FRWRD regularly reviews, permits, and monitors the flow from all nondomestic dischargers within the entire CSS basin. No new sources of hazardous materials in the sewer system have moved into the basin.

2.02 PUMPING STATION DESCRIPTIONS

Refer to Figure 2.02-1 for the locations of PS 31, PS 32, and the SWWTF. Since the subject of this LTCP is FRWRD's CSO 004 at PS 31 and the Treated Combined Sewage Outfall A01 at the SWWTF, only the FRWRD-owned facilities will be described below. For an in-depth description of the City of Elgin's CSS, the individual basins (including the names, locations, and boundaries) and overflow locations, refer to the City of Elgin LTCP.

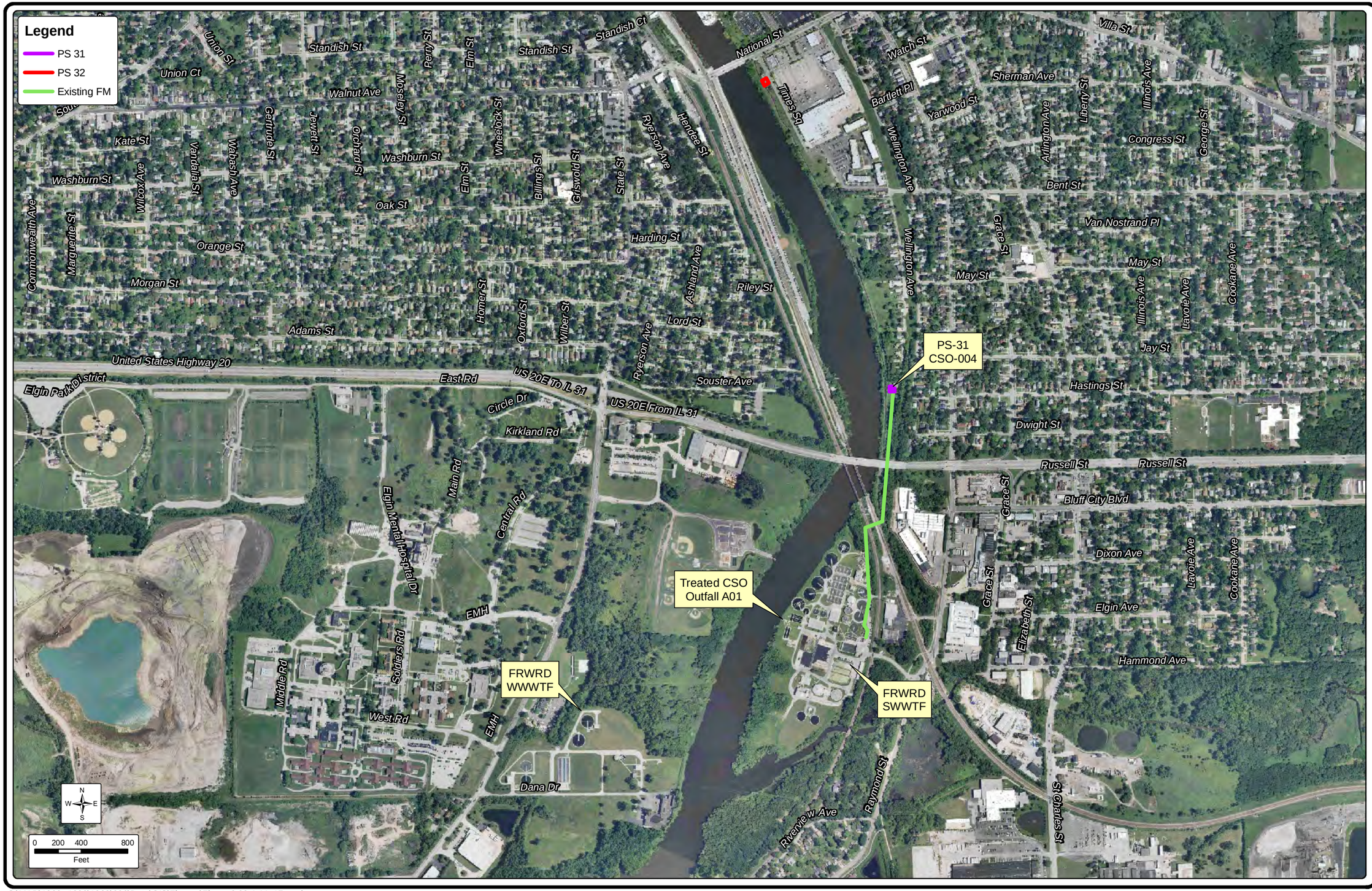
A. National Street Pumping Station 32 (PS 32)

PS 32 is located on the east bank of the Fox River just south of the National Street Bridge. This is the first of two pumping stations servicing the CSS owned by the City of Elgin. This pumping station was first constructed in 1926 and has three pumps. This pumping station collects the flow from the northern half of the CSS service area via three influent sewers. The largest influent sewer is the East Side Interceptor. In addition, a small 10-inch siphon transporting flows from a small basin on the west side of the river and a 15-inch collector sewer servicing the National Street Basin 008 on the east side also feed the pumping station. The three inputs combine in a wet well at PS 32. The contents of the wet well are then lifted via a short force main. The force main empties into a 36-inch interceptor that flows by gravity into PS 31.

B. Lower Wellington Avenue Pumping Station 31 (PS 31)

PS 31 is located on the east bank of the Fox River on Lower Wellington Avenue just north of US Highway 20. This is the second pumping station servicing the City of Elgin's CSS. This pumping station was also constructed in 1926. It contains three pumps that discharge to the SWWTF. The maximum capacity of this pumping station and force main is listed as 13.4 million gallons per day (mgd) although flows have sometimes approached 15 mgd according to weekly circle chart flow meter recordings. By

[6] Checklist Question 15.



FOX RIVER WATER RECLAMATION DISTRICT FACILITIES

COMBINED SEWER OVERFLOW LONG TERM CONTROL PLAN
FOX RIVER WATER RECLAMATION DISTRICT
ELGIN, ILLINOIS

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FIGURE 2.02-1
1922.006

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the IPCB Order, FRWRD must transmit at least 13 mgd of instantaneous flow before CSO discharges to the river occur. There are two additional pumps in PS 31 that can transport flow to the river during CSO events. Each overflow pump has a capacity of 6,500 gpm. It is rare that both of the overflow pumps are active simultaneously.

There are four major inputs into PS 31 (1) the pumped flow from PS 32 , (2) the flow from the Lord Street Interceptor, (3) the flow from the Wellington Avenue Interceptor, and (4) the flow from the Bluff City Interceptor. Under normal conditions, the contents of the influent sewers combine in the wet well and are pumped via force main to the SWWTF owned and operated by FRWRD. However, when the influent flows to the pumping station exceed the pumping capacity and when all practicable storage capacity in the sewers have been used, the level in the wet well will rise and trigger a CSO overflow pump. This overflow pump will discharge to the Fox River via CSO 004.

2.03 SOUTH WASTEWATER TREATMENT FACILITY (SWWTF)

The SWWTF is the largest of the three WWTFs owned by FRWRD. This WWTF is located on the east bank of the Fox River on Purify Drive just south of the US Highway 20 Bridge. The existing SWWTF (NPDES Permit IL 0028657) consists of influent pumping, comminution, grit removal, primary clarification, activated sludge aeration, clarification, disinfection, dechlorination, solids processing, and excess flow facilities. The SWWTF is rated for 25 mgd design average flow (DAF), 50 mgd design maximum flow (DMF). Combined sewage treatment facilities are not to be utilized until the main treatment facility is receiving its maximum practicable flow. The annual average flow has ranged from 15.7 mgd to 19.5 mgd since 2003. Plant personnel report that the plant operates well, even under extended periods at its full rated capacity of 50 mgd and has received flows up to 70 mgd when utilizing provisions for treated combined sewage flow. Table 2.03-1 summarizes the estimated capacities for the treatment processes at the SWWTF.[7]

A schematic flow diagram of the SWWTF is shown in Appendix E, and the December 16, 2009, IEPA Compliance Evaluation Inspection Report is included in Appendix F. After all combined sewage flow has received grit removal and primary treatment, treated combined sewage flow, which is beyond the capacity of the biological system, is disinfected prior to combining with the flow through biological treatment and discharged. During storms, operators regularly check the sludge blanket levels in the secondary clarifiers and only initiate excess flow treatment when the blanket is threatening to be washed out. Subsequent, follow-up checks of blanket elevations are used to minimize excess flow rates, and discontinue excess flow treatment, as soon as practicable.

[7] Checklist Question 10.

Process	
Grit Removal	
Number	4
Size, Tanks No. 1 and 2	18 ft by 26 ft by 13 ft SWD
Size, Tanks No. 2 and 3	18 ft by 30 ft by 13 ft SWD
Total Volume	196,000 gal
Capacity (@ 3 min HRT)	94 mgd
Primary Clarification	
Number	8
Type	4 rectangular, 4 circular
Total Area	33,400 sq ft
Capacity at 1,800 gpd/sq ft	60 mgd
Aeration	
Units	10 @ 60 ft by 60 ft by 20 ft
Total Volume	720,000 cu ft (5.4 million gallons)
Detention Time (@ 25 mgd DAF)	5.2 hrs
Detention Time (@ 50 mgd DMF)	2.6 hrs
BOD Loading at 16,500 lbs/day	23 lb BOD/day-1,000 cu ft
Final Clarification	
Units	6 @ 110-foot-diameter
Total Area	57,000 sq ft
Capacity at 1,000 gpd/sf	57 mgd
Disinfection	
Units	4
Total Volume	707,000 gallons
Detention Time (@ 50 mgd DMF)	20 minutes
Capacity at 15 min HRT	68 mgd

Table 2.03-1 SWWTF Estimated Process Capacities

2.04 WATER QUALITY STANDARDS REVIEW

A. Introduction

The State of Illinois has adopted WQS and sets corresponding wastewater treatment plant effluent limits. The WQS have three component; (1) designated uses, (2) water quality criteria to support those uses, and (3) an antidegradation policy. In Illinois, almost all waters including the Fox River are designed as General Use.[8] General Use waters must support aquatic life and primary contact recreation.

General Use water quality standards that are potentially relevant to the PS 31 CSO 004 and CSO A01 include the following:

"1. Fecal Coliform

Title 35 Part 302 of the IAC states the following:

During the months May through October, based on a minimum of five samples taken over not more than a 30 day period, fecal coliform shall not exceed a geometric mean of 200 per 100 ml, nor shall more than 10% of the samples during any 30 day period exceed 400 per 100 ml in protected waters. Protected waters are defined as waters which, due to natural characteristics, aesthetic value or environmental significance, are deserving of protection from pathogenic organisms. Protected waters will meet one or both of the following conditions:

1) presently support or have the physical characteristics to support primary contact;
2) flow through or adjacent to parks or residential areas.

2. DO

DO standards are contained in IAC Title 35 Part 302. For the segment of the Fox River into which FRWRD's WWTFs and its CSO discharge, the following standards apply:

The DO concentration in the main body of all streams and in the entire water column of unstratified lakes and reservoirs must not be less than the following:

1) During the period of March through July,
    A) 5.0 mg/L at any time; and
    B) 6.0 mg/L as a daily mean averaged over 7 days.
2) During the period of August through February,
    A) 3.5 mg/L at any time;
    B) 4.0 mg/L as a daily minimum averaged over 7 days; and
    C) 5.5 mg/L as a daily mean averaged over 30 days.

3. pH

The IAC Title 35 Part 302 states the pH shall be within the range of 6.5 to 9.0 except for natural causes.

[8] Checklist Question 20.

4. Total Ammonia Nitrogen

Total ammonia nitrogen standards are dependent on the season, the receiving stream pH and temperature, and the presence or absence of early life stages of aquatic life. The ammonia standard calculations are listed in Subsection 302.212 of the IAC.

5. Offensive Conditions

IAC Title 35 Part 302 includes a narrative standard related to offensive conditions, stating that waters of the State shall be free from sludge or bottom deposits, floating debris, visible oil, odor, plant or algal growth, color or turbidity of other than natural origin."

B. Integrated Water Quality Reporting by the State[9]

The CWA Section 305(b) requires states to assess the water quality of surface waters and report to USEPA every two years the degree to which water quality standards are being met. After comparing water quality criteria to designated uses, the states classify their waters into the following levels of attainment:

1. Fully Supporting–These waters meet the WQS.

2. Threatened–These waters currently meet WQS but water quality may degrade in the near future unless strict intervention is implemented (antidegradation policy applies).

3. Partially Supporting–These waters meet WQS most of the time but exhibit occasional excursions such as those encountered during wet weather. These waters are therefore impaired under current law.

4. Not Supporting–These waters do not meet WQS and are impaired.

Under Section 303(d), the CWA includes a second reporting requirement. States must provide a prioritized list of all impaired waters for restoration purposes. A 303(d) list must identify potential pollutants and potential contributors of the identified pollutants. For waters that appear on a 303(d) list, the state (or other party) must develop a total maximum daily load (TMDL) or equivalent. A TMDL is a calculation of the amount of a particular pollutant a body of water can receive and still meet WQS. A TMDL is the sum of all available loads of a single pollutant from all contributing point and nonpoint sources. A TMDL must include a margin of safety and recognize seasonal variations. A TMDL also allocates load reductions between point and nonpoint sources that are necessary to restore the 303(d) listed water into compliance with WQS.

The State of Illinois addresses 305(b) and 303(d) requirements through its Integrated Report that is published every other year. The most recent Integrated Report was published in 2008.

[9] Checklist Question 17.

The 2006 and 2008 Integrated Reports indicate the Fox River in the vicinity of FRWRD's CSO is impaired and is on the 303(d) list.[10] Pertinent 303(d) list information for the two segments of the Fox River in the vicinity of FRWRD's operations is summarized in Table 2.04-1. Fox River segment DT-18 is the segment into which the City of Elgin and FRWRD CSOs discharge as well as FRWRD's three WWTFs. Fox River segment DT-09 is immediately downstream of segment DT-18. The 2006 and 2008 303(d) lists were both included in Table 2.04-1 because the 2008 list was not fully approved by the USEPA. Exceptions to the USEPA approval are shown in the table footnotes.

Also shown in Table 2.04-1 is pertinent 303(d) list information for Tyler Creek that enters Fox River segment DT-18 south of I-90 and north of FRWRD's NWWTF. Poplar Creek is also shown, which enters the Fox River where segment DT-18 ends and segment DT-09 begins just south of the FRWRD's WWWTF discharge. There are no CSOs that discharge into Tyler or Poplar Creeks.

Most noteworthy in Table 2.04-1 is that the IEPA identified fecal coliform bacteria as a pollutant impairing the primary contact recreational use for Tyler Creek, Poplar Creek, and for Fox River segment DT-09. For segment DT-09 only, the IEPA identified CSOs as a contributor of fecal coliform. Fox River segment DT-18 was not assessed by the IEPA for primary contact recreation and fecal coliform is not a listed cause of impairment for this segment. This indicates the IEPA does not believe DT-18 is a "protected water" or that primary contact recreation occurs in this reach.

C. Exceptions

PCB 85-222 grants an exception to FRWRD and the City of Elgin for certain CSO regulations [Illinois Administrative Code (IAC) 306.305(a) first flush treatment requirements and IAC 306.305(b)] on the basis of minimal impact to the Fox River.[11] This Order is still in effect and it specifies the minimum amount of flow FRWRD must convey to the SWWTF before its CSO 004 is activated. Additional discussion is provided in Section 1 and a copy of PCB 85-222 is in Appendix A.

[10] Checklist Question 21.
[11] Checklist Question 19.

TABLE 2.04-1

INFORMATION FROM THE ILLINOIS 2006 AND 2008 303(d) LISTS[12]

Waterway, Segment	2006 303(d) Pollutant	2006 303(d) Potential Source	2008 303(d) Changes
Fox River DT-18 (within the City of Elgin, includes CSO discharge points)–not assessed for primary contact recreation	Total Nitrogen (TN)	Contaminated sediments.	See note 1.
	DO	CSOs, impacts from hydrostructure flow regulation/modification.	See note 2.
	Sedimentation/Siltation	CSOs, impacts from impacts from hydrostructure flow regulation/modification.	No change.
	Total Suspended Solids (TSS)	CSOs, urban runoff/storm sewers.	No change.
Fox River DT-09 (downstream of all CSOs, WWTFs, and the Poplar Creek confluence)	DO	CSOs, dam or impoundment, impacts from hydrostructure flow regulation/modification.	See note 2.
	pH	Dam or impoundment, impacts from hydrostructure flow regulation/modification.	No change.
	Phosphorus (P) (Total)	Municipal point sources.	No change.
	Sedimentation/Siltation	Dam or impoundment, impacts from impacts from hydrostructure flow regulation/modification.	No change.
	Total dissolved solids (TDS)	CSOs, municipal point sources, urban runoff/storm sewers.	See note 3.
	TSS	CSOs, urban runoff/storm sewers.	No change.
	Fecal Coliform	CSOs, urban runoff/storm sewers.	No change.
Tyler Creek DTZP-02 (does not include any CSOs; this is a tributary creek upstream of CSOs)	Fecal Coliform	Runoff from forest/grassland/parkland, urban runoff/storm sewers.	No change.
Poplar Creek DTG-02 – assessed portion (does not include any CSOs; this is a tributary creek that enters the Fox River downstream of CSOs)	Chloride	Highway/road/bridge runoff, urban runoff/storm sewers.	No change.
	DO	Urban runoff/storm sewers.	IEPA delisted DO because the stream now meets the WQS.
	Sedimentation/Siltation	Urban runoff/storm sewers.	No change.
	TDS	Highway/road/bridge runoff, urban runoff/storm sewers.	See note 3.
	TSS	Urban runoff/storm sewers.	No change.
	Fecal Coliform	Source unknown.	No change.
	pH (2008 list only)		Added to the 2008 list.

Note 1: The IEPA proposed delisting TN because there is no associated WQS and the initial listing was flawed. USEPA disagreed.

Note 2: The IEPA proposed delisting DO as a “pollutant” potential cause of impairment; however, the IEPA and USEPA recognize the DO WQS is not being met. The USEPA has asked that DO be placed back on the 2010 303(d) list even if the cause of DO WQS excursion is unknown.

Note 3: The IEPA has proposed delisting TDS because of a change in the WQS; the USEPA is reviewing.

[12] Checklist Question 18.

C. Previous Water Quality Assessments Related to CSOs

The FRWRD and City of Elgin commissioned a study in the 1970s and 1980s to evaluate the impact of their CSOs on Fox River water quality. These studies are summarized in the report titled *Analysis and Evaluation of Combined Sewer Overflows–Sanitary District of Elgin, Illinois, and City of Elgin, Illinois*, by Donohue & Associates, Inc., September 1982. The scope included continuous monitoring of dissolved oxygen (DO) in the Fox River at several stations up- and downstream of the CSOs during the summer of 1981. The report states the "…data indicates that there are periodic violations of dissolved oxygen standards. However, the violations could not be directly or indirectly attributed to CSOs. Rather, they appear to be caused by nightly algal respiration combined with high water temperature. Equivalent respiration effects were observed at all monitoring points, including locations upstream as well as downstream of the CSOs. During rainfall events some depression of dissolved oxygen levels was also noted. However, as with respiration, the effect was generally equal at all monitoring points." The greatest DO sags were observed upstream of the CSOs.

The study also included metering and sampling of some of the CSO discharges and a first flush analysis.[13] A calibrated model was used to project the impact of the CSOs on the Fox River. The study projected that the CSOs would have a minimal impact on the Fox River, with less than a 0.5 percent contribution to biochemical oxygen demand (BOD), ammonia, nitrate, and phosphorus annual loadings. Capture of first flush was projected to decrease this impact even further.

This study along with the IEPA's testimony that they "could not find any direct attributable impact in the Fox River due to the CSOs" led to the IPCB adoption of Order PCB 85-222, granting exceptions to the FRWRD for certain CSO regulations as discussed previously.

D. Ongoing Water Quality Assessments and Modeling[14]

1. Water Quality Assessments

The FRWRD is a founding member of and major contributor to the Fox River Study Group (FRSG). This is a consortium of stakeholders interested in water quality issues affecting the Fox River. The FRSG has been collecting water quality data for a number of years and has contracted with the Illinois State Water Survey (ISWS) to develop a robust water quality model to understand fate and transport of pollutants in the river and many of its tributaries. Because the Fox River is impaired by a number of pollutants, it is anticipated the FRSG model will be utilized to develop appropriate discharge limits for the WWTFs. It is a stated goal of the FRSG to use the modeling to develop site-specific WQS if appropriate.

As part of its contract services to the FRSG, the ISWS published a March 2004 summary report titled *Fox River Watershed Investigation–Stratton Dam to the Illinois River: Water Quality Issues and Data Report to the Fox River Study Group, Inc*. The report is currently available through the FRSG Internet site links. The report summarizes Fox River watershed water quality data collected from 1998 to 2002 by various agencies and stored in the Fox River database (FoxDB).

[13] Checklist Question 30.
[14] Checklist Questions 70 and 71.

The report was reviewed for information on water quality upstream (Station 24–Algonquin) and downstream (Station 26–South Elgin) of Elgin, and in nearby tributaries (Station 268 on Tyler Creek, on the north side of Elgin and Stations 25 and 615 on Poplar Creek, between Elgin and South Elgin). Sampling station locations are shown in Figure 2.04-1. The probability of compliance with the fecal coliform standard of 400/100 milliliters (mL) was evaluated in the report, and the results for the nearby stations are summarized in Table 2.04-2.

Station	Location	Compliance (%)	Number of Samples	Maximum value (#/100 mL)
24	Algonquin	>90	34	4,000
268	Tyler Creek	73	22	1,340
25	Poplar Creek (US 20)	52	14	TNTC
615	Poplar Creek (Raymond Street)	58	22	2,340
26	South Elgin	62	162	TNTC

Note: From ISWS March 2004 report. TNTC = too numerous to count

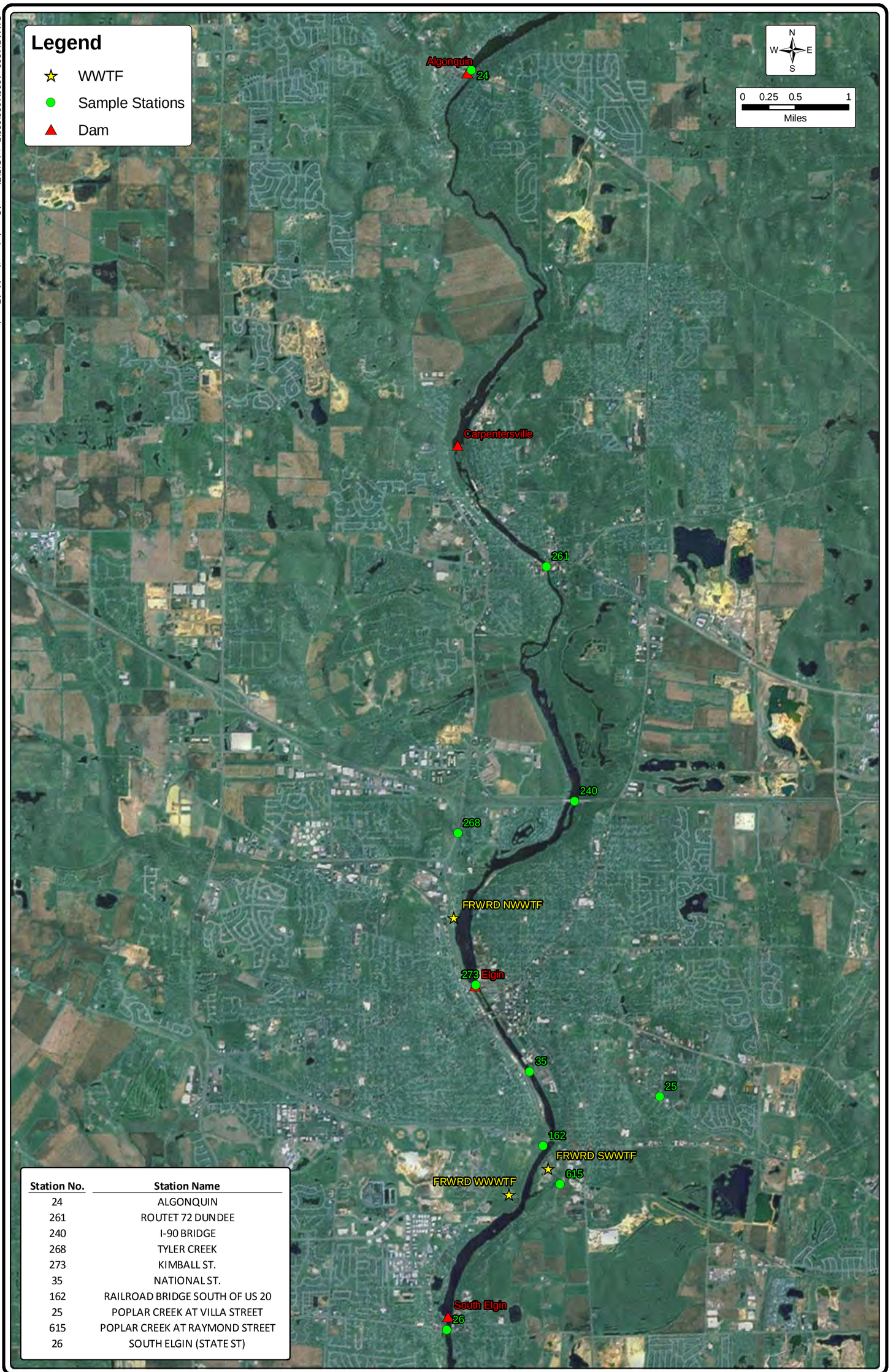
Table 2.04-2 Summary of Probability of Compliance with Fecal Coliform Standard, 1998-2002

As noted in the report, the IAC requires that the 400/100 mL WQS can be exceeded by no more than 10 percent of the total samples collected at a station for any 30-day period. The above analysis was conducted for the entire dataset rather than only those samples collected in a 30-day period and is therefore just an approximation of the probability of meeting the WQS. Compliance with the 200/100 mL geometric means WQS could not be evaluated because there were an insufficient number of samples within the required time period (a minimum of five samples are required within 30 days). The results indicate better water quality at Algonquin as compared to the stations that are farther downstream in the watershed. The Poplar Creek results had the lowest probability of compliance with the WQS, followed by the South Elgin results. The South Elgin station is downstream of Tyler and Poplar Creeks.

It is important to note the samples evaluated as part of the March 2004 study were collected on a predetermined schedule regardless of weather conditions. A wet weather sampling program would have different results than those shown in Table 2.04-2; the fecal coliform concentrations would be higher overall and the percent compliance lower because of fecal coliform runoff from multiple sources, such as pets and wildlife, in the watershed. This would be true at all sample stations.

Fecal coliform water quality data collected by the FRSG were extracted from the FoxDB and compared to available United States Geological Survey (USGS) stream flow and Tyler Creek station rainfall data to see if fecal coliform concentrations tended to increase during wet weather. Data from the current FoxDB, updated in November 2008, were reviewed. We were not able to find any FRSG data in the database for stations 25 and 615 or any recent data collected by any agency for these two stations. The results of FRSG monitoring for the other three stations (24, 268, and 26) did not show a strong correlation between fecal coliform and

S:\MAD\1900--1999\1922\006\Data\GIS\Figures\Sample Location 11x17.mxd



Station No.	Station Name
24	ALGONQUIN
261	ROUTET 72 DUNDEE
240	I-90 BRIDGE
268	TYLER CREEK
273	KIMBALL ST.
35	NATIONAL ST.
162	RAILROAD BRIDGE SOUTH OF US 20
25	POPLAR CREEK AT VILLA STREET
615	POPLAR CREEK AT RAYMOND STREET
26	SOUTH ELGIN (STATE ST)

FIGURE 2.04-1
1922.006

STRAND ASSOCIATES, INC. ENGINEERS

SAMPLE STATION LOCATIONS

COMBINED SEWER OVERFLOW LONG TERM CONTROL PLAN
FOX RIVER WATER RECLAMATION DISTRICT
ELGIN, ILLINOIS

flow or rainfall. As for the 1998-2002 sample results analyzed by the ISWS, the FRSG samples were collected on a predetermined schedule regardless of weather conditions.

The FRWRD conducted surface water fecal coliform sampling in the Elgin area on a predetermined schedule from 1991 through 2002. After August 1998 the sampling protocol changed from collecting at various stations to only collecting at one station upstream of all FRWRD and CSO discharges and one station downstream of all FRWRD and CSO discharges. The May through October sample results were extracted from the FoxDB and are summarized in Table 2.04-3.

For the period from 1991 through August 1998, the highest average concentrations were at the sample stations at Dundee (Route 72), Tyler Creek, and Poplar Creek where there is no influence from CSOs and at the National Street Bridge in Elgin. The highest geometric means (using all the data in the respective datasets) were at Tyler Creek and Poplar Creek, where they exceeded the 200/100 mL standard. For the Fox River, geometric means were highest at National Street and the railroad bridge south of US 20 and lowest at the I-90 and Kimball Street stations.

The averages for the I-90 and South Elgin stations were significantly lower after August 1998 compared to before; however, the geometric means were relatively close. This indicates a higher number of “too numerous to count” or high concentrations in the August 1998 and earlier samples compared to the more recent samples.

All sample stations had a 10 percent or greater exceedance of the 400/100 mL standard when evaluating all the May through October data, with the highest percent exceedances occurring in the tributaries.

There is no clear correlation between the FRWRD sample results and the Elgin and FRWRD CSO locations; the upstream Dundee station and the tributaries had some of the highest fecal coliform concentrations. The South Elgin station is downstream of all the CSOs and downstream of Tyler and Poplar Creeks in a well-mixed location (below the dam) and did not have higher concentrations than the Dundee station. The lower concentrations at the I-90 and Kimball Street stations are unexpected and could be a result of dilution with groundwater and relatively clean runoff. The CSO 004 location is between National Street (Station 35) and the railroad bridge south of US 20 (Station 162), and the results from these two locations do not indicate any increase in fecal coliform concentrations as a result of FRWRD’s CSO.

Load-duration curves were plotted for each Fox River sample station and are presented in Appendix G. Daily flows at the USGS gauging station at Algonquin on the day each sample was collected were used for this analysis. The horizontal axis of each load-duration curve represents the percent of time the flow in the dataset exceeded the flow that was observed on the day of the sample. Therefore, values close to 0 percent on this axis represent the highest river flows, while those close to 100 percent represent the lowest flows. These curves allow a review of whether standards excursions tend to occur during low or high flow (dry or wet weather). The curves do not show a tendency for increased excursions during higher stream flows. It appears there are both dry and wet weather sources of fecal coliform loading to area surface waters.

	Station 261	Station 240	Station 268	Station 273	Station 35	Station 162	Station 615	Station 26
	Rt. 72 Dundee	I-90 Bridge	Tyler Creek	Kimball Street	National Street	US 20 RR Bridge	Poplar Creek	South Elgin
Number of Samples	47	193	125	123	141	132	124	195
1991-Aug. 1998 Average	21,732	7,265	24,642	8,457	28,711	7,904	17,065	7,565
Geometric Mean	177	75	284	95	186	187	420	169
Sept. 1998-2002 Average	NS	207	NS	NS	NS	NS	NS	425
Geometric Mean	NS	101	NS	NS	NS	NS	NS	88
Percent over 400/100 mL	19%	10%	40%	13%	21%	27%	56%	19%

Note: Results are in #/100 mL and include May through October samples only.
NS = not sampled

Table 2.04-3 Summary of FRWRD Fecal Coliform Data

The FRWRD fecal coliform results were also reviewed to find dates when the sampling occurred on the same day that a CSO 004 event occurred. There were some inherent limitations to this analysis. The time of sample collection was not standardized. CSO event dates were provided by FRWRD along with the duration of the CSO but not the time of the CSO. Therefore, it cannot be easily determined whether the sampling on these dates occurred prior to, during, or after the CSO event. However, it was expected that if there was a significant impact from overflows, that effect would be noticeable in distinctly higher data seen when sampling events did coincide with overflow events.

The sampling results for these dates are shown in Table 2.04-4. For the majority of the sampling events, fecal coliform concentrations at the railroad bridge station downstream of FRWRD's CSO were lower than the National Street concentrations upstream of FRWRD's CSO. Also, WQS violations occurred both up- and downstream of the Elgin and FRWRD CSOs and in Tyler and Poplar Creeks. Therefore, the results indicate the CSO by itself did not cause WQS violations.

Date	Algonquin Discharge (cfs)	PS 31 CSO Discharge Time (min)	Fecal Coliform Results (#/100 mL)							
			Station 261 - Dundee	Station 240 - I-90 Bridge	Station 268 - Tyler Creek	Station 273 - Kimball Street	Station 35 - National Street	Station 162 - US 20 RR Bridge	Station 615 - Poplar Creek	Station 26 - South Elgin
10/29/1991	424	25	24	360	140	132	184	184	504	164
7/14/1992	372	79	130	20	510	10	220	940	1460	18
8/25/1992	257	11	170	120	730	90	390	260	1540	280
9/8/1992	672	12	50	20	1080	180	360	330	680	630
6/30/1993	471	253	30	20	420	40	110	30	20	340
7/17/1996	4410	295	x	70	20	10	10	30	270	60
5/7/1997	267	72	x	110	350	30	220	90	490	130
9/30/1998	2050	17	x	260	1180	200	200	500	680	100
5/12/1999	398	9	x	1250	x	x	x	x	x	100
6/9/1999	569	10	x	20	x	x	x	x	x	100
5/17/2000	231	8	x	190	x	x	x	x	x	110
6/14/2000	1280	14	x	0	x	x	x	x	x	0
9/19/2001	308	328	x	140	x	x	x	x	x	40
10/24/2001	323	79	x	80	x	x	x	x	x	120

Note: Results are in #/100 mL and include May through October samples only.
x = not sampled

Table 2.04-4 Summary of FRWRD Fecal Coliform Data on PS 31 CSO Event Dates

2. Water Quality Modeling

The FRWRD's NPDES permit contains the following statement under CSO special condition 12:

> "The IEPA recognizes the FRSG is currently working on funding mechanisms to gather data and to develop and calibrate a model to determine appropriate limitations and permit requirements for dischargers to the Fox River. The implementation schedule for the LTCP shall give priority to controlling, treating, or eliminating CSOs which discharge into areas where primary contact activities occur and to other areas that may be considered sensitive pursuant to Section II.C.3 of the federal CSO control policy. The LTCP implementation schedule may also allow the Permittee to verify by appropriate methods, including use of the FRSG developed model after it is calibrated, and to ensure that the selected CSO control alternatives are adequate to meet water quality standards and to protect the designated uses in the receiving waters…."

Although significant progress has been made, the FRSG has not yet completed the water quality modeling required to assist FRWRD with evaluating the impact of its CSO or its proposed CSO abatement program on Fox River water quality. The ISWS is under contract to develop the models and has stated the models may be available around 2011.

Unless total elimination of FRWRD's CSO is performed, the CSO abatement program, even when fully implemented, will still contribute some fecal coliform bacteria to the river during some wet weather events. However, the CSO loadings may not be high enough to measurably or

definitively contribute to WQS violations, based on a review of the data presented here. Furthermore, Elgin's CSO abatement program (and possibly FRWRD's) will take many years to implement and the CSOs will contribute fecal coliform to the river in the interim. Therefore, CSOs will likely contribute to WQS violations in the future unless the WQS are changed.

Even if both Elgin and FRWRD completely eliminate all their CSOs, it is likely the fecal coliform WQS will be violated during wet weather. This is supported by the observation that the FRWRD data collected upstream of the CSOs (Dundee/Route 72 or I-90) is not noticeably better than the data downstream (South Elgin). In addition, two major nearby tributaries, Tyler Creek and Poplar Creek, have frequent fecal coliform WQS violations and are listed as impaired for fecal coliform even though there are no CSOs discharging to these creeks. It is apparent there are enough sources of fecal coliform in the watershed to cause WQS violations without the CSOs.

E. Future Use Attainability Analysis

A Use Attainability Analysis (UAA) is a structured scientific assessment of the physical, chemical, biological, and socioeconomic factors affecting attainment of a designated use.

The CWA allows states the flexibility to revise WQS. However, if a lesser level of protection is sought by the state, the CWA requires development of a UAA to support such a request. The CWA states very clearly that a use that existed on or after November 28, 1975, cannot be degraded and must be met at all times and all places in the water. As a consequence of the City of Elgin's and FRWRD's CSO abatement program, no existing use will be degraded.

There are a number of mechanisms available to revise WQS, each requiring a UAA for support. The most common are as follows:

1. Development of site-specific criteria.

2. Modification of a designated use to include a partial use reflecting situations where certain events (e.g., wet weather) preclude the designated use (e.g., primary contact recreation) from occurring.

3. Modifications of a designated use to define the use with greater specificity (e.g., CSO-impacted waters and warm water fishery in place of general aquatic life protection).

As noted previously, WQS for fecal coliform bacteria will likely be violated after full implementation of the City of Elgin and FRWRD CSO abatement programs, even if CSOs are completely eliminated. The FRWRD reserves the right to perform a UAA in support of a request to modify WQS to reflect wet weather, urbanized effects upon the Fox River.

2.05 SENSITIVE AREA ANALYSIS[15]

The USEPA and IEPA have requirements for CSO LTCPs that mandate elimination, relocation, or treatment of CSO discharges into sensitive areas as being the highest priority in the development of the CSO control alternatives.

FRWRD's NPDES Permit issued on March 1, 2007, requires FRWRD to provide sufficient information to IEPA for the agency to determine whether CSO 004 discharges into a sensitive area pursuant to Section II.C.3 of the CSO Control Policy of 1994. The Policy defines a sensitive area as any water likely to be impacted by a CSO discharge that meets one or more of the following criteria:

A. Designated as an Outstanding National or State Resource Water.
B. Found to contain shellfish beds.
C. Found to contain threatened or endangered aquatic species or their habitat.
D. Within the protection area for a drinking water intake structure.
E. Used for primary contact recreation.

The sensitive area determinations contained in this section of the LTCP address the NPDES requirement. Each of the criteria will be addressed separately.

A. Designated as an Outstanding National or State Resource Water

The Fox River in the vicinity of Elgin is not identified by federal or state regulators as Outstanding Resource Waters. Therefore, CSO 004 does not discharge into a sensitive area based upon this criterion.

B. Found To Contain Shellfish Beds

We contacted the Illinois Natural History Survey (INHS) regarding shellfish beds downstream of the CSO. A count in 1999 at the State Street Bridge in South Elgin found no live mussels. A printout of the INHS report is included in Appendix H. The INHS also reported a 1996 survey at the Tyler Creek confluence with Fox River, upstream of the CSOs, found only one species of mussels and only one live mussel. A count in 1994 at the Elgin Yacht Club indicated no live mussels. Earlier counts in the 1930s and 1950s in the Elgin area found at least one species of live mussels in Elgin; this location was likely upstream of CSO 004.

The IDNR was also contacted about threatened and endangered (T&E) shellfish. The results are reported in Section 2.05 C.

At this time it appears CSO 004 does not discharge into a sensitive area based upon this criterion.

[15] Checklist Question 24.

C. Found To Contain Threatened or Endangered Aquatic Species or Habitat

We conducted an EcoCAT search for T&E aquatic species in the vicinity of CSO 004. No T&E aquatic species were found and a copy of the report and follow-up consultation with IDNR is included in Appendix H. At this time it appears CSO 004 does not discharge into a sensitive area based on this criterion.

D. Within the Protection Area for a Drinking Water Intake Structure

In FRWRD's 1996 CSO Operational Plan, it was determined that CSO 004 does not discharge into a drinking water protection zone; that remains the case today. Therefore, CSO 004 does not discharge into a sensitive area based upon this criterion.

E. Used For Primary Contact Recreation

The Fox River is a General Use Stream. As such, water quality criteria were established to support primary contact recreation. However, Title 35 Part 302.202 states that Primary Contact Use is protected for all General Use waters whose **physical configuration** permits such use. The SWWTF Treated Combined Sewage Outfall A01 and PS-31 CSO 004 discharges are located between the upstream Kimball Street dam and the downstream State Street dam in the Village of South Elgin. The overflow is about halfway between these dams, which are located about 3 river miles from one another. There is no formal public beach between these two dams. There is one recently installed public boat access in this stretch of the river immediately opposite the SWWTF. Plant personnel have not observed swimming or water skiing in the area because the Fox River is shallow at this location. Therefore, CSO 004 does not discharge into a sensitive area based on this criterion.

SECTION 3
FLOW MONITORING, MODELING, AND ANALYSIS

This section summarizes the results of the flow monitoring program at PS 31, develops benchmark dry weather flows and develops a model to project peak wet weather flows and storage volumes that would occur during different design storm events and recurrence intervals.

3.01 PUMPING STATION 31 METERING AND OVERFLOW DATA

A. Dry Weather Flows[1]

Analysis of PS 31 flow records from 2005 through 2009 were used to determine the dry weather flow from PS 31. The annual average daily flow during this period ranged from 3.94 mgd in 2005 to 5.04 mgd in 2008, which was a much wetter year. The three-month average low flow in 2005 was 3.36 mgd. Table 3.01-1 summarizes the monthly average flow from PS 31 during 2005. Of this dry weather flow received at PS 31, approximately half of the area that is tributary to PS 31 is a combined sewer area. Therefore, it is projected that 1.68 mgd (3.36 mgd/2) of dry weather flow is from the CSS. This is consistent with the 1987 data upon which the exception was granted in the PCB 85-222 Order of the IPCB that referenced a 1.6 mgd dry weather contribution from the CSO area. This appears reasonable as the service area and population served by PS 31 was generally established before 1950 and has not changed substantially since the 1987 report.

Month	Monthly Average Flow (mgd)	CSS** Monthly Average Flow (mgd)
January	4.55	2.28
February	4.96	2.48
March	4.29	2.15
April	4.39	2.20
May	4.19	2.10
June	3.51	1.76
July	3.46*	1.73*
August	3.66	1.83
September	3.77	1.89
October	3.16*	1.58*
November	3.89	1.95
December	3.46*	1.73*
Annual Average	**3.94**	**1.97**

Notes: * Indicates one of three low–flow months
** Flow x 0.5

Table 3.01-1 PS 31 Monthly Average Daily Flows (Year 2005)

As discussed previously in Section 1.02, the IAC requires: “Additional flows, as determined by IEPA but not less than ten times average dry weather flow for the design year, shall receive a minimum of primary treatment and disinfection.” Based on the more recent dry weather flow data, this would correspond to a flow rate of 16.8 mgd (10 x 1.68 mgd). The PCB 85-222 Order provides

[1] Checklist Question 11 and 12.

an exception to this requirement that requires PS 31 to pump a minimum flow rate of 13 mgd to the SWWTF. However, the IPCB Order does require the minimum flow rate to increase to 16.5 mgd if the force main and associated structures are replaced. Any alternatives evaluated in Section 4 that require replacement of the force main would require pumping a minimum flow of 16.5 mgd to the SWWTF.

B. Pumping Station 31 Overflow Summary[2]

The data evaluated includes PS 31 overflow pump discharge information from 2006 through August of 2009. The volumes of discharge to the river that are listed throughout this report should be considered the maximum values that occurred. Their magnitude is based upon the runtime of the pumps going to the river, which is precisely recorded, multiplied by 100 percent of the rated capacity of the pumps. The pumps are so infrequently used that they have remained in adequate working order for over 40 years. Using 100 percent of their rated capacity is considered to be a conservative assumption because of the age of the pumps that likely pump less than their rated capacity.

Rainfall data from the Tyler Creek USGS rain gauge in South Elgin was also obtained for the analysis. Using the rainfall data and the overflow pumping information the following observations were made:

1. Year 2006

a. There were 28 days (22 events) in which an overflow was recorded for a total overflow volume of approximately 9.3 million gallons.

b. The maximum volume discharged to the river occurred on July 19 when a volume of 2.1 million gallons were discharged to the river. However, this was a very unusual event as FRWRD lost both sources of power at PS 31 for several hours during the storm, which caused the overflow.

c. The rainfall that preceded the July 19 overflow event had a peak 1-hour rainfall of 0.36 inches, which equates to a recurrence interval of less than 2 months, and a peak 24-hour rainfall of 1.07 inches, which equates to a recurrence interval of less than 2 months.

d. The event with the maximum 1-hour rainfall occurred on May 28, when 0.91 inches of rain fell in an hour, which equates to about a 5-month storm. The resulting overflow volume was 0.48 million gallons.

e. The event with the maximum 24-hour rainfall occurred on June 10 when 1.97 inches of rain fell in 24 hours, which represents a 5.5-month recurrence interval. The resulting overflow volume was 1.7 million gallons.

[2] Checklist Questions 13, 29, and 31.

2. Year 2007

   a. There were 29 days (19 events) in which an overflow occurred for a total overflow volume of approximately 43.8 million gallons. Of this volume, 40.3 million gallons (92 percent of the annual total) occurred during a series of storm events between August 19 and August 30.

   b. The maximum volume discharged to the river occurred on August 24 when 7.1 million gallons overflowed. This was one day in a series of 11 consecutive days in which an overflow was recorded between August 19 and August 30. The largest 1-hour rainfall amount on August 24 was 0.94 inches representing a recurrence interval of approximately 5.6 months. The largest 24-hour rainfall amount was 3.2 inches, which is a 2-5 year recurrence interval.

   c. On August 18 and 19 there was a large rainfall event that generated areawide flooding and high river elevations. These storms raised river elevations and impacted the August 24 overflow event. The maximum 1-hour rainfall amount was 1.9 inches, which is approximately 6.5-year recurrence interval. That same rainfall event yielded a 51.5-year recurrence interval storm over 24 hours or 6.46 inches over 24 hours. This rainfall event occurred four days after the previous rainfall event on August 14. The overflow volume that occurred on August 19 was 2.7 million gallons followed by 3.9 million gallons on August 20. Since this rainfall event occurred a few days after the previous event, the volumes produced by this earlier event are more representative to the system's reaction to a large rain event rather than the maximum volume that occurred on August 24. Obviously, this series of events represents a very extreme case of rainfall and any long-term control alternative will most likely not require this level of control.

3. Year 2008

   a. There were 21 days (19 events) in which an overflow occurred during 2008 resulting in an overflow volume of approximately 11.9 million gallons.

   b. The maximum volume discharged to the river occurred on September 13 when a volume of 2.7 million gallons overflowed. The maximum 1-hour rainfall preceding the September 13 overflow event was 1.1 inches or a 9-month recurrence interval. The maximum 24-hour rainfall period was 5.69 inches representing a recurrence interval of 29 years. Both of these represent the maximum 1- and 24-hour rainfalls observed in 2008.

4. Year 2009

   a. There were 14 days (13 events) in which an overflow occurred during 2009 resulting in a total overflow volume of approximately 4.0 million gallons.

b. The maximum volume discharged to the river occurred on June 19 when a volume of 1.5 million gallons overflowed to the river. The maximum 1-hour rainfall for that event was 0.96 inches representing a 6-month recurrence interval; this also represented the maximum 1-hour peak rainfall observed through August 2009. The maximum 24-hour rainfall amount was 2.02 inches or a 6-month recurrence interval. The maximum 24-hour rainfall occurred on August 27. The resulting overflow volume was 0.94 million gallons.

Summary

The overall four-year dataset contains 92 days (73 events) in which an overflow occurred for a total volume of approximately 69 million gallons. Approximately 40 million gallons of this amount was attributed to the August 2007 storm events which included a 50+ year storm.

The dataset was evaluated, including the August 2007 data, and a good correlation could not be found between rainfall intensity, duration or rainfall recurrence interval, and overflow volume at PS 31.[3] This could be attributed to many compounding variables such as soil permeability, antecedent moisture conditions, snow melt, and diurnal fluctuations in sewage flow. An analysis of this system is less likely to have a simple cause-and-effect relationship because of several additional factors including inlet constraints into the CSS, capacity constraints conveying flow to PS 31, ongoing separation projects at some of the upstream sewers, and CSO overflows occurring upstream in the system.

C. Wet Weather Flows

Wet weather flows were modeled to project both wet weather flows for conveyance alternatives and storage volume projections for a variety of recurrence intervals.

The existing peak hourly flows received at PS 31 were estimated based on completing a partial duration analysis on the existing dataset. This requires performing a frequency interval analysis of the historical, estimated, peak flows to PS 31. This analysis determines the probability of occurrence of a specified influent flow rate at PS 31 based on historical flow data. The flow data is ranked from lowest to highest to determine the recurrence interval of the data. One advantage to this method is that it does not rely on rainfall intensity and depth for a given storm event. As stated previously, this methodology was used because no direct correlation could be developed between rainfall intensity and overflow rate at PS 31 (CSO 004). The method does however need a rather robust dataset. Consequently, the last six years' pump output data was used in the analysis.

The monthly return interval is developed as the predicted number of months between observations of a given flow. The historical data indicates the majority of the time the overflow pump did not run for an extended period (less than one hour). Therefore, the peak hourly overflow to the river was estimated based on the capacity of the overflow pump multiplied by the percentage of time the pump was on compared to the total off/on cycle time of the overflow pump. The total projected peak flow to PS 31 was then calculated by adding the PS 31 pump metered output to the projected peak overflow rate. Please refer to Appendix I for the peak flow conveyance model output and data summary.[3]

[3] Checklist Question 27 and 28.

3.02 CONVEYANCE FLOW MODEL PROJECTIONS[4]

A. Current Peak Hourly Flow Received by PS 31

There are four major inputs into PS 31 (Wellington Avenue), (1) the pumped flow from PS 32 (which flows by interceptor to PS 31), (2) the flow from the Lord Street Interceptor, (3) the flow from the Wellington Avenue Interceptor, and (4) the flow from the Bluff City Interceptor. Under normal conditions, the contents of the influent sewers combine in the wet well and are pumped via force main to the SWWTF. PS 31 contains three pumps that pump to the SWWTF; two smaller pumps and a larger pump. The levels reached within the wet well determine the pumping combinations required to handle influent flows. There are five pumping combinations starting with one small pump running, followed by two small pumps running, followed by the one large pump running, then the large pump and one small pump, and finally all three pumps running at the same time. The maximum capacity of this pumping station and force main is listed as 13.4[5] mgd although flows sometimes approach 15 mgd according to circle chart flow meter recordings. There are only five flow rates produced at PS 31 because the pumps are constant speed.

When the influent flows to PS 31 exceed the pumping capacity, the level in the wet well will rise and trigger an overflow pump rated at 6,500 gpm. There are two overflow pumps that can discharge to the Fox River through permitted CSO 004. It is very rare for more than one overflow pump to be on at a time. Typically, one pump is on for a few minutes before the wet well is drawn down to cycle off again. Flows from PS 31 to the SWWTF are metered and recorded on a weekly circular chart recorder. Overflow pump runtime is also recorded by FRWRD; consequently, estimated overflow volume was obtained by multiplying the overflow pump rated capacity by the overflow pump runtime. As noted above, because of pumps' age, the data presented is likely the worst-case scenario in terms of volume reaching the river.

Influent flow into PS 31 is not metered; however, influent peak flows were projected based on the calculated sum of the overflow pump output and metered PS 31 pump output to the SWWTF. Historical peak hourly flow data from 2004-2009 were used to estimate the recurrence interval of various peak hourly flows received at PS 31. The occurrence frequency of peak hourly flow was then plotted and logarithmic trend lines were fit to the data as shown in Figure 3.02-1. The data show an inflection point around an inflow of 20 mgd. This is likely because CSS tend to reach a maximum value as they become inlet constrained. In addition, overflows located within the City of Elgin become active. This phenomenon can be seen by looking at the figure as the trend line tends to flatten out at the higher flow rates.

Although over 2,190 daily influent flow rates were used in the partial duration analysis, only the occurrence frequency from every 1 mgd flow increment was plotted in the figure. The first trend line represents all flows below 20 mgd. The R^2 value for the first trend line is 0.946 representing a fairly good correlation. The trend line representing the higher flow rates has an R^2 value of 0.972 representing an even better correlation. The peak hourly flow for several occurrences a year and recurrence intervals is shown in Table 3.02-1.[6]

[4] Checklist Questions 32, 40, 42, and 43.
[5] Checklist Question 14.
[6] Checklist Question 41.

Occurrences per Year (#)	Recurrence Interval (time)	PS 31 Influent Peak Hourly Estimated Flow Rate (mgd)
24	2 x month	13.3
12	1 month	18.8
4	3 months	22.0
1	1 year	24.6
0.1	10 years	28.8
0.02	50 years	31.8

Table 3.02-1 PS 31 Peak Hourly Flow Recurrence Intervals

This analysis would suggest that in order to produce less than four overflow events a year at PS 31 (CSO 004), 22.0 mgd of flow would need to be conveyed for treatment. If less than one overflow event a year is desired, then 24.6 mgd of flow would need to be conveyed for treatment.

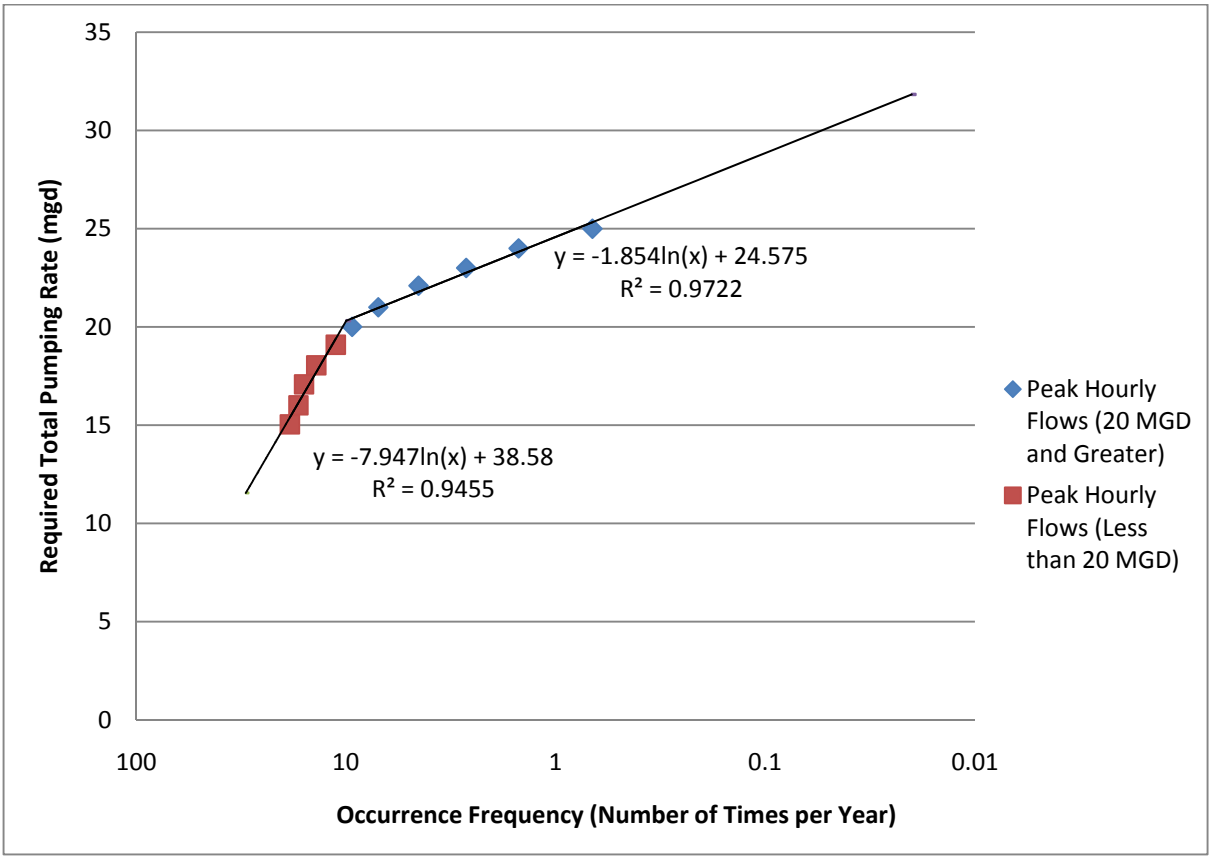


Figure 3.02-1 Regression Analysis of Historical Peak Hourly Flows at PS 31

B. Future Peak Hourly Flow Received by PS 31

The PS 31 tributary area has been fully developed for several decades and limited opportunity exists for additional flow sources. Where redevelopment has occurred, the local sewers are reconstructed and separated to the extent that is practical. In addition, while there has been a

recent trend to rebuild residential development in the urban center, this is generally returning a population base that was previously there. All redevelopments are built with high-efficiency fixtures. Also industrial flow that was previously in the CSS basin has disappeared and green-space areas are being added. These changes are expected to result in maintaining comparable sanitary sewage flows and reducing stormwater flows in the CSS.

The City of Elgin has put considerable efforts into improving the water quality of the Fox River in the Elgin service area and in particular in the urban center that corresponds with the CSS area. Over the past decade a large amount of the high impact combined sewer areas have had storm sewers installed and are now considered partially separated combined sewer areas. In addition, the City of Elgin has developed an LTCP recommending the continued separation of the remaining combined sewer areas over the next 35 years. These changes are also expected to result in maintaining current sanitary sewage flows and reducing stormwater flows in the CSS.

FRWRD is submitting this LTCP based upon the assumption that flows from the City of Elgin CSS will remain the same. This is because the City of Elgin's proposed LTCP has not been approved nor fully implemented (which may result in the need to transfer either less or more flow to FRWRD's interceptor sewers). Because of the uncertainty of future hydraulic impacts resulting from changes that will occur upstream of CSO 004, FRWRD must reserve the right to amend this LTCP as the City of Elgin's LTCP is evaluated, and ultimately implemented, and the exact impact is known.

3.03 STORAGE VOLUME MODEL PROJECTIONS

One alternative being evaluated to reduce the number of overflows from CSO 004 at PS 31 is providing an off-line, surface storage facility. Wet weather flow would be diverted into a holding tank or pond to later be bled back into the system once there is adequate conveyance and treatment capacity at the WWTF. The amount of storage required will be determined ultimately by the level of control desired. The storage requirements were determined using a partial duration analysis based on the last six years of overflow data. As a conservative assumption, the storage volumes presented in the section assume that PS 31 pumping capacity to the SWWTF for treatment remains the same (13 mgd).

A. Model Development

The overflow data gathered by FRWRD contains the day in which the overflow occurred and the projected overflow volume pumped during that day. Over the dataset, a range of volumes were selected and the number of times the pumped volume exceeded, each selected volume was determined. Based on how many times certain volumes were exceeded a recurrence interval can be determined based on the occurrences over the total dataset. For example, if there is four year's worth of data and 5 million gallons were pumped four times over those four years, then the yearly recurrence interval for 5 million gallons is once a year based on four observations over four years. The data points were graphed with volume on the y-axis and recurrence interval on a log x-axis and fit with a logarithmic trend line.

The data collected by FRWRD is presented in 24-hour pumping volume. However, as observed throughout the dataset, a rain event could last more than 24 hours and cause overflow pumping in consecutive days. As a result, the data analysis was conducted based on the existing data using 24-, 48-, and 72-hour overflow storage.

B. Storage Volume Model Results

The storage alternatives are based on the premise that adequate volume will be provided to capture and store the overflow volume for the entire duration of the event. Once there is capacity in the conveyance system and at the SWWTF, it is then diverted back into the system for treatment if there is not another consecutive storm event. The two criteria that dictate storage volume are the level of control (e.g., 3-month, 1-year, 10-year) and the duration of the storm to be managed (e.g., 24-hour, 48-hour, 72-hour). The R^2 value for the 24-, 48-, and 72-hour storage models was 0.959, 0.959, and 0.979, respectively, suggesting the trend lines provide a good correlation between the required storage volume and the occurrence frequency. These trend lines are used to interpolate/extrapolate the storage required to reach the desired level of control. Figure 3.03-1 shows the 24-hour storage volume model.

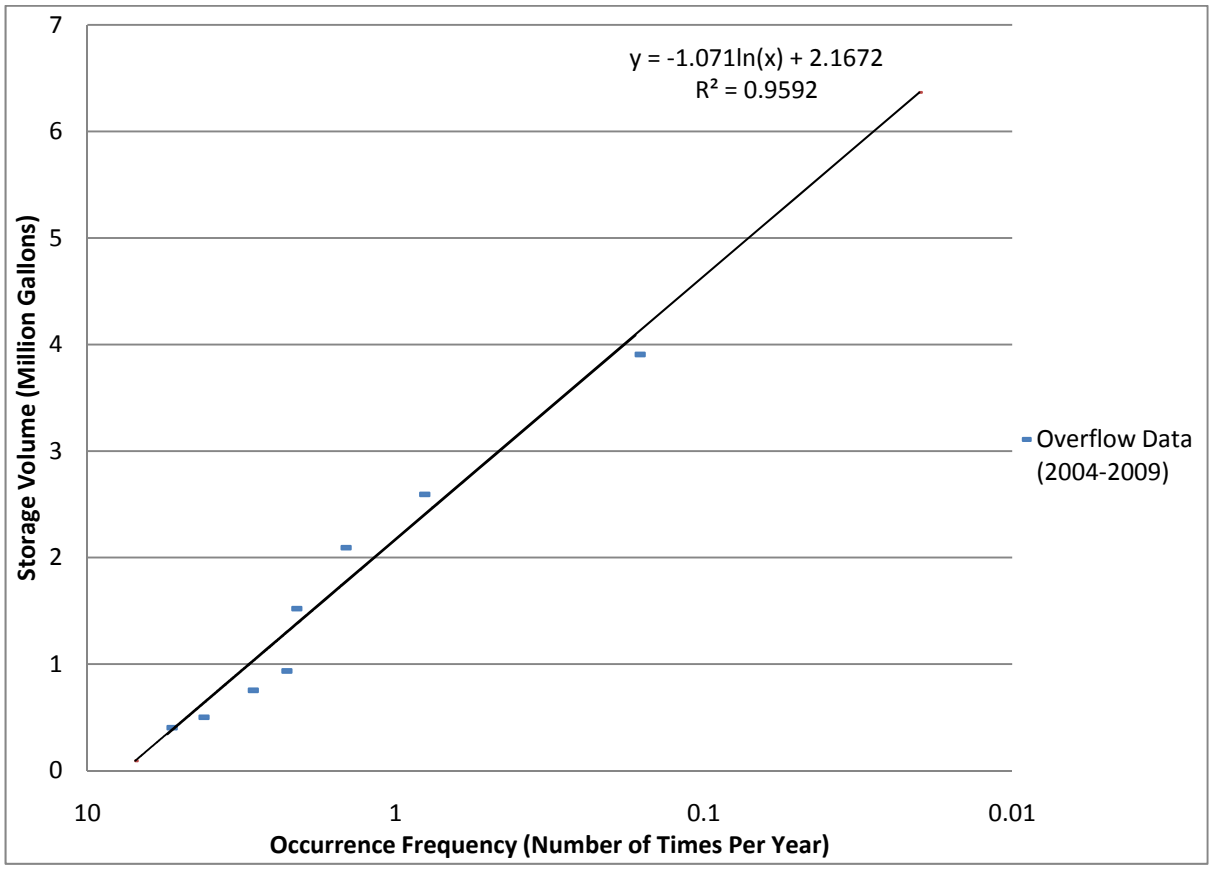


Figure 3.03-1 Regression Analysis of 24-Hour Storage Requirements at PS 31

The model was developed for the 48- and 72-hour storage scenario as well and they can be found in Figures 3.03-2 and 3.03-3, respectively.

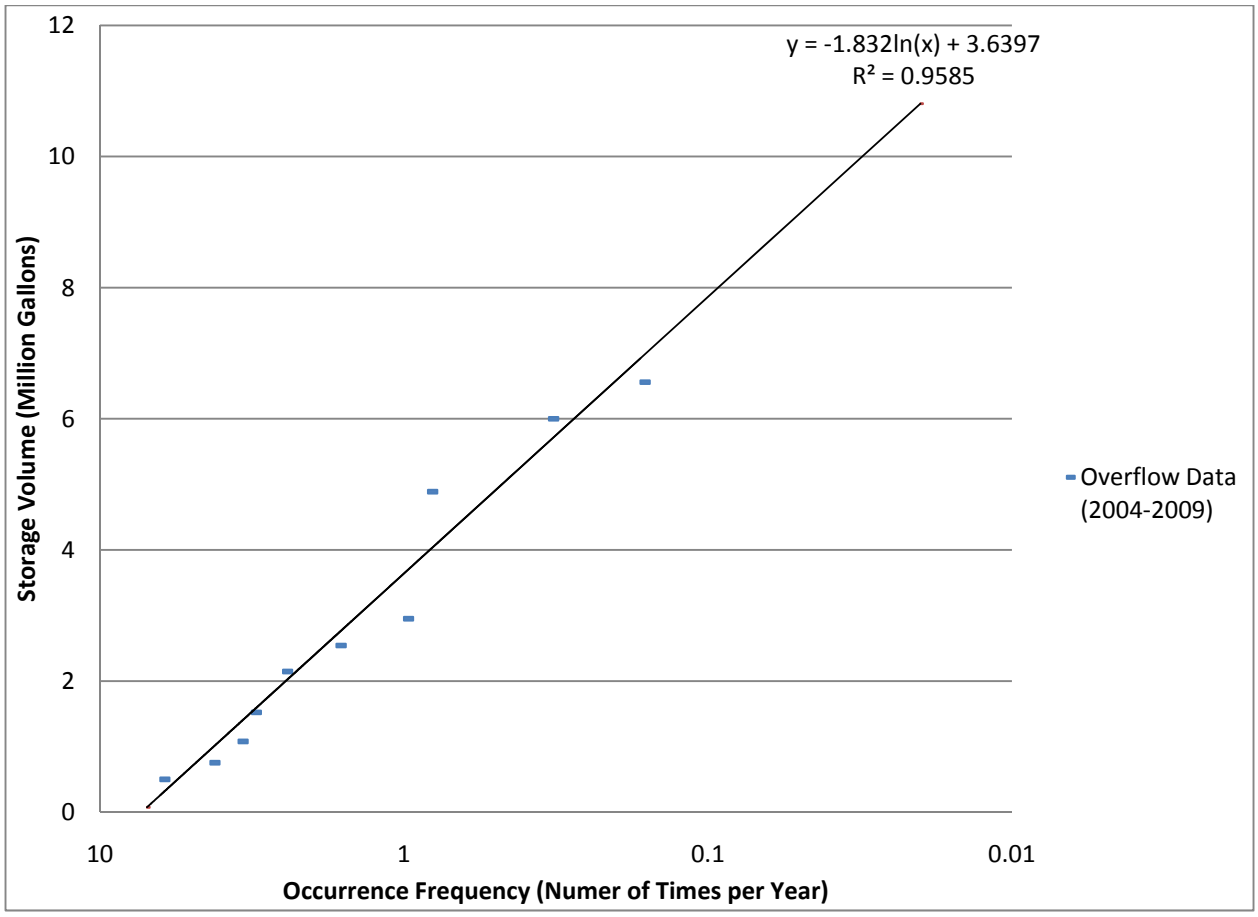


Figure 3.03-2 Regression Analysis of 48-Hour Storage Requirements at PS 31

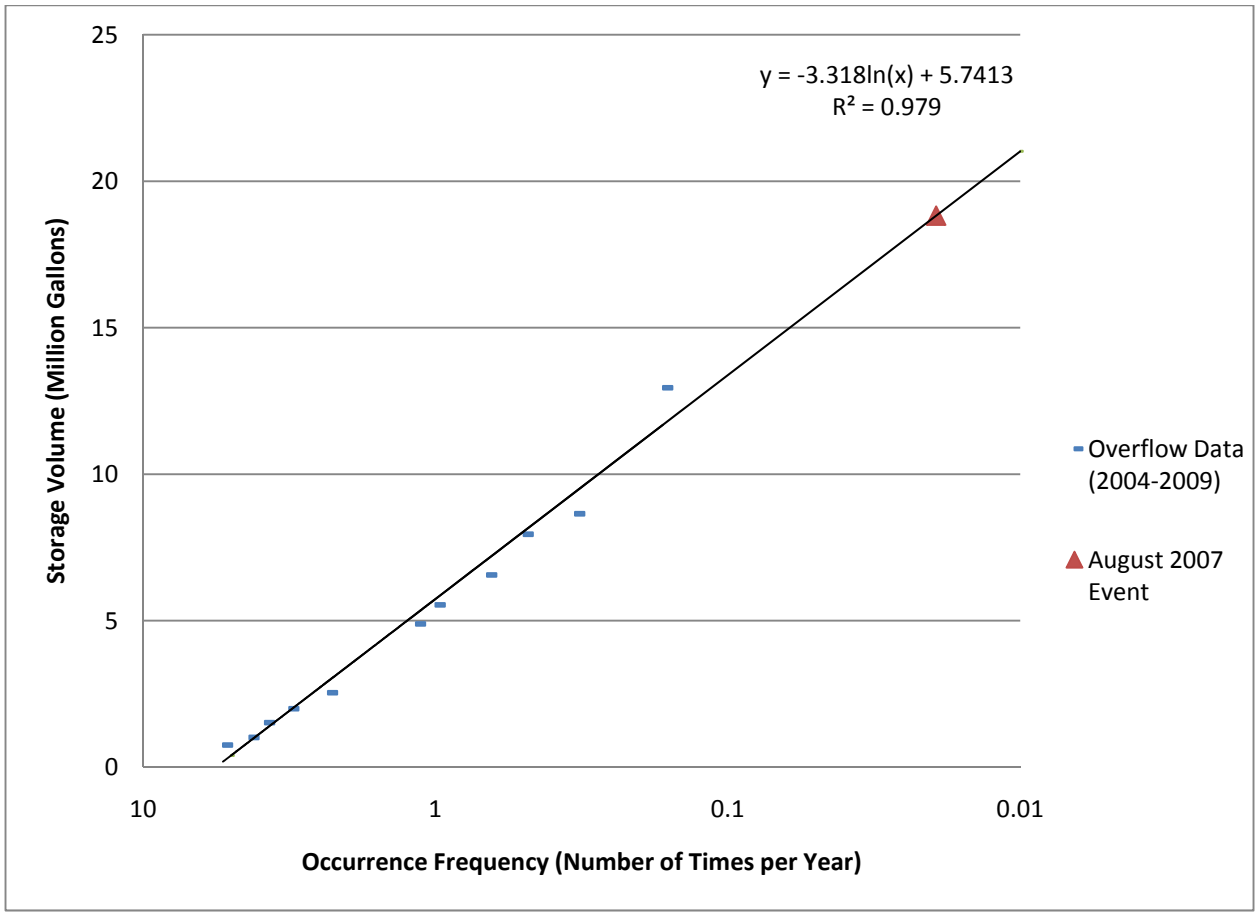


Figure 3.03-3 Regression Analysis of 72-Hour Storage Requirements at PS 31

Table 3.01-1 shows the model-projected total CSO volumes at the combinations of level of control and duration. The control volume for each level of control is dictated by the storm duration generating the largest CSO volume.

Duration (hours)	Storage Volume (million gallons)		
	10-year	1-year	3-month
24-Hour	4.6	2.2	0.7
48-Hour	7.9	3.6	1.1
72-Hour	13.4	5.7	1.1

Table 3.03-1 Storage Volumes for PS 31 (CSO 004)

The 72-hour storage option will be used for the alternative analysis as it generates the largest CSO volume of the three storm durations evaluated. As stated previously in this report, the City of Elgin experienced a very rare and extreme rainfall event in August 2007. The maximum 24-hour amount

of rainfall was 6.46 inches of rain representing approximately a 50-year rainfall event. For example, the required 72-hour storage volume during this event was 18.8 million gallons and that was the maximum amount of storage required for a 72-hour period during the 6 years worth of data analyzed. To check the predictability of the model, this overflow volume representing an overflow frequency of .02 (50-year event) and a storage volume requirement of 18.8 million gallons was plotted. According to Figure 3.03-3, this point lies extremely close to the model prediction, reinforcing the idea that the model is an acceptable representation of the system response.

Refer to Appendix I for the full model development. As previously stated in this section, this data is based on the current conditions found within the system. Once the City of Elgin LTCP has been fully implemented, it is expected the projected storage volumes will change. Based upon the information that is currently available, the information presented here represents the worst-case scenario for developing the alternatives analysis.

3.04 FIRST FLUSH REQUIREMENTS

First flush is generally defined as the volume of combined sewage in a CSS that has a higher concentration of pollutants than typical wastewater because of settled solids in the sewer being resuspended in the high flows of the storm event. IAC Part 375.402 states that the first flush volume must be provided full treatment. The design storm for first flush treatment is a 1.2-in/hour intensity storm with a 60-minute duration. A 1.2-in/hour event is equivalent to a 1-year storm in Illinois. The PCB 85-222 Order grants an exception to this first flush requirement. The Order states: “as it relates to first flush of storm flows would produce minimal impact on the receiving stream.”

SECTION 4
FACILITIES FOR CSO MANAGEMENT

The CSO Control Policy requires FRWRD to explore various levels of control and, based upon cost-benefit analyses of the control alternatives, identify the optimal CSO abatement strategy to be fully implemented. The controls to be analyzed may range from "No Action" to "Total Sewer Separation." The CSO Control Policy recognizes the site-specific impact of CSO discharges to receiving waters and the economic impact associated with CSO control. Accordingly, it affords FRWRD flexibility in meeting the requirements of the CWA. This section evaluates a series of alternatives to alleviate CSO occurrences. Alternatives evaluated for CSO abatement at PS 31 (CSO 004) include no action at this time, storage, increasing the wet weather flow transported to the SWWTF via expanding the pump station, or eliminating the pump station by constructing a new gravity interceptor that will discharge into the north end of SWWTF.[1]

4.01 ALTERNATIVE NO. 1–NO ACTION[2]

There is both a technical basis and a legal basis for FRWRD to consider this option. FRWRD must simultaneously meet the Illinois state-specific wet weather treatment requirements as defined in 35 Ill. Adm. Code Subtitle C, Chapter I, Part 306 and the requirements imposed by the national CSO Control Policy. If it can be demonstrated that both state and federal CSO abatement criteria are currently being met, FRWRD is in compliance with those regulatory mandates as set forth below.

A. Illinois State-Specific Wet Weather Treatment Requirements

The City of Elgin and the Sanitary District of Elgin (now FRWRD) petitioned the IPCB for an exception to the state's combined sewer overflow regulations. The Board's CSO regulations are contained in 35 Ill. Adm. Code, Part 306, as amended in R-81-17, 51 PCB 383 on March 24, 1983. Sections pertinent to the petition are 306.305, and provides as follows:

> *"all combined sewer overflows and treatment plant bypasses shall be given sufficient treatment to prevent pollution, or the violation of applicable water standards unless an exception has been granted by the Board. Sufficient treatment shall consist of the following:*
>
> > *(a) All dry weather flows, and the first flush of storm flows as determined by the Agency, shall meet effluent standards consistent with the definition of secondary treatment.*
> >
> > *(b) Additional flows, as determined by IEPA but not less than ten times average dry weather flow for the design year, shall receive a minimum of primary treatment and disinfection.*
> >
> > *(c) Flows in excess of those described in subsection (b) shall be treated, in whole or in part, to the extent necessary to prevent accumulations of sludge deposits, floating debris and the depression of oxygen levels.*

[1] Checklist Questions 49, 51, and 53.
[2] Checklist Question 54.

On June 10, 1987, under PCB 85-222, the Board granted an exception to Elgin and the FRWRD to 35 Ill. Adm. Code 306.305 (a) as it relates to first flush of storm flows, and to 35 Ill. Adm. Code 306.305 (b) as it related to providing primary treatment and disinfection to ten times average daily design flow (see Appendix A). On page 9 of the NPDES Permit No. IL 0028657 issued to FRWRD in March of 2007, the PCB 85-222 exception is incorporated into the permit conditions (see Appendix B).

Based upon the previous showing in the exception proceeding the overflows from PS 31 CSO 004 do not result in a violation of the third requirement. Also the Treated Combined Sewage Discharge Outfall A01 receives secondary treatment during most storms, and at least primary treatment and disinfection at all times. Given that the Fox River consistently exceeds the fecal coliform water quality standards upstream of any of the Elgin CSOs, the CSO discharges from this outfall do not cause a water quality exceedance as well. Therefore, it is concluded that FRWRD is in full compliance with the Illinois state-specific CSO regulations.

B. Federal CSO Control Policy Requirements:

The CSO Policy provides two clear levels of control alternatives (the Presumptive Approach and the Demonstrative Approach) that may be utilized to bring CSOs into compliance with the objectives of the CWA.

The Presumptive Approach is based upon FRWRD meeting one of the following criteria:

1. No more than an average of four overflow events a year, provided that the state regulatory authority may allow up to two additional overflow events a year. For the purpose of this criterion, the CSO Policy defines an overflow event as one or more overflows from a CSS as a result of a precipitation event that does not receive the minimum treatment specified as:

    a. Primary clarification (or equivalent) for the removal of floatables and settleable solids.

    b. Solids and floatables disposal.

    c. Disinfection of the effluent, if necessary, to meet WQS and protect human health, including removal of harmful disinfection chemical residuals where necessary to meet WQS.

2. The elimination or capture for treatment (as treatment is defined above) of no less than 85 percent by volume of the combined sewage collected in the CSS during precipitation events on a systemwide, annual average basis.

Table 4.01-1 was prepared to address the 85 percent capture criterion of the Presumptive Approach. The table shows the percent capture of CSS flows on an annual basis over the last six years. The percent capture is defined as the fraction of the calculated annual runoff volume being treated at the SWWTF versus the amount of overflow volume discharged to the river at PS-31 CSO 004.

Year	(A) PS-31 Average Daily Flow (mgd)	(B) PS-31 Dry Weather Flow[1] (mgd)	(C) Calculated Annual Runoff Volume[2] (mil gal)	(D) Overflow Volume[3] (mil gal)	(E) Total Wet Weather Volume[4] (mil gal)	(F) Percent Capture[5] (%)	Annual Rainfall[6] (inches)
2004	4.55	3.36	434	17	451	96.3	36.4
2005	3.94	3.36	212	3.3	215	98.5	22.9
2006	4.24	3.36	321	9.5	331	97.1	42.1
2007	4.74	3.36	504	44	548	92.0	46.3
2008	5.04	3.36	613	12	625	98.1	48.9
2009	4.83	3.36	537	4.0	541	99.3	45.1
Avg.	**4.56**	**3.36**	**437**	**15**	**452**	**96.7**	**40.3**
PCB 85-222	**--**	**--**	**476**	**15**	**491**	**97.0**	**31.8**

Notes:
1 Refer to Section 3.01 for Dry Weather Flow determination.
2 Column C = (Column A – Column B) * 365 days.
3 Refer to Section 3 regarding Overflow Volumes at PS-31.
4 Column E = Column C + Column D.
5 Column F = 1- (Column D/Column E).
6 Data Obtained from ISWS Elgin Station 112736.

Table 4.01-1 Percent Capture at PS 31 (CSO 004)

As shown in Table 4.01-1, approximately 3.3 to 44 million gallons of combined sewerage was discharged annually into the Fox River at the PS-31 CSO 004 discharge location owned and operated by FRWRD. All remaining flows were conveyed to the SWWTF where they received either secondary treatment or primary treatment plus disinfection in accordance with the discharge limits prescribed in the NPDES Permit. Therefore, FRWRD has treated 96.7 percent of the average annual wet weather flows captured by the CSS, which exceeds the 85 percent capture/treat threshold.[3]

The PCB 85-222 record compares favorably with these results. Page 9 of PCB 85-222 references the average annual rainfall in the CSS to be 31.82 inches a year. This resulted in 476 million gallons of wet weather induced flow captured by the CSS and available for treatment at the existing SWWTF. As also shown in Table 4.04-1, this results in an average percent capture of 97.0 percent.

Further, FRWRD has been informed that the City of Elgin's LTCP provides for separation of the combined sewers tributary to FRWRD's only untreated CSO discharge location. Should the City of Elgin's CSO abatement program be fully implemented, FRWRD could conceivably no longer be receiving wastewater flows that contribute to an untreated discharge at Outfall 004.

Given the fact FRWRD currently meets the second criterion of the Presumptive Approach, and given the City of Elgin has submitted its LTCP in which it states its intention to eliminate CSOs by conducting

[3] Checklist Question 50.

separation of its CSS, it is concluded that FRWRD is now in full compliance with the National CSO Control Policy.

4.02 ALTERNATIVE NO. 2–UPGRADE PS 31 AND CONVEY TO SWWTF

This alternative involves upgrading PS 31, the associated force main, and wet weather improvements to the SWWTF. See Figure 4.02-1 for an overall map of the proposed upgrades.

A. Upgrading PS 31

The necessary upgrades to PS 31 are dependent on the desired level of control. Section 3 of this report presented a flow model describing the pumping requirements for the different control levels. See Table 4.02-1 for various pumping rates for different control levels. To provide the pumping upgrades, the existing pumps will need to be removed, including the current bypass pumps in order to reuse the existing building. The bypass pumped overflow will be replaced with a gravity overflow.

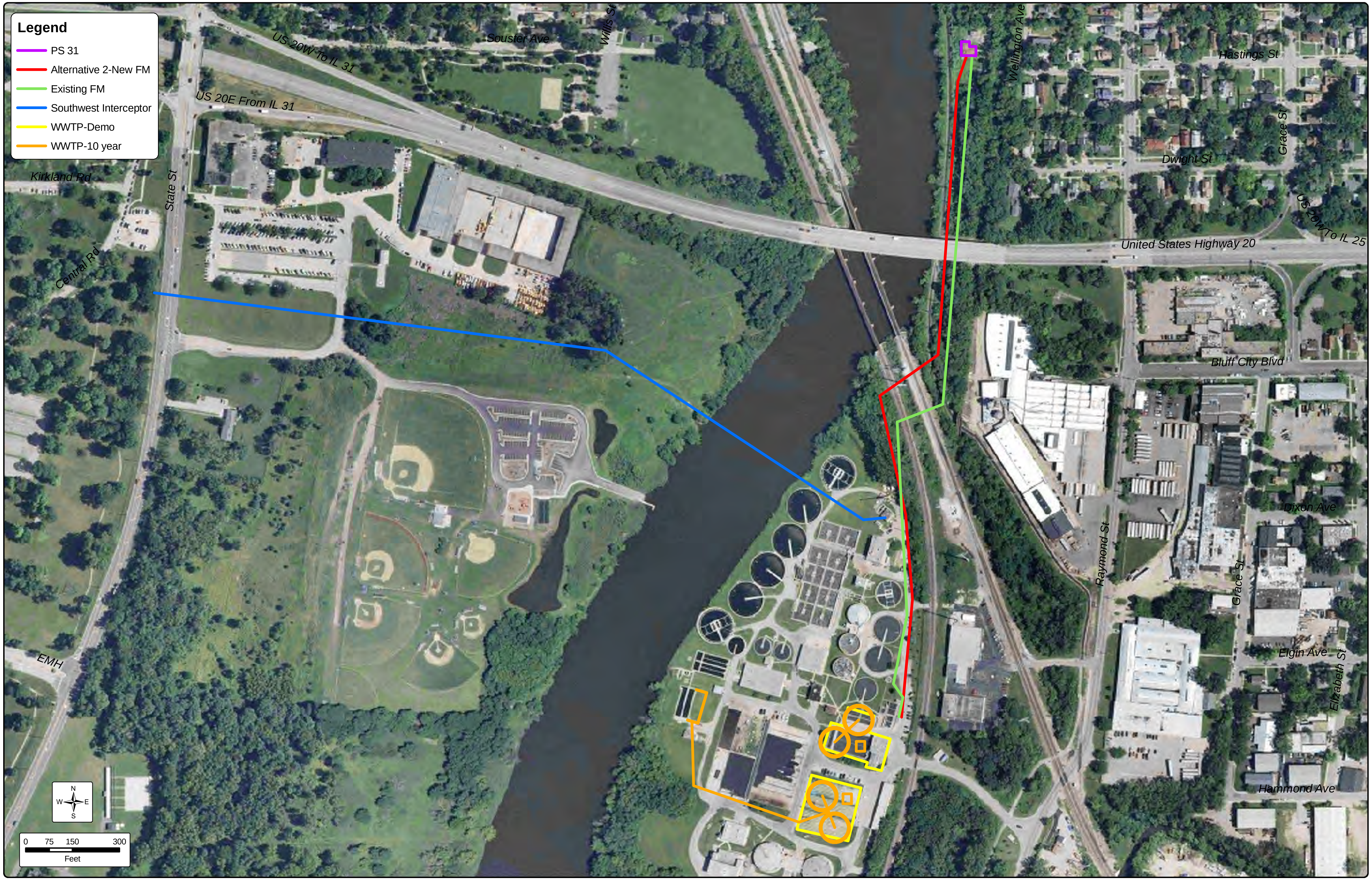
Occurrences per Year (#)	Recurrence Interval (time)	PS 31 Influent Peak Hourly Estimated Flow Rate (mgd)
24	2 x month	13.3
12	1 month	18.8
4	3 months	22
1	1 year	24.6
0.1	10 years	28.8
0.02	50 years	31.8

Table 4.02-1 Required Pumping Upgrades at PS 31

In addition to upgrading the pumping capacity at PS 31, new screening equipment will be installed at PS 31 to replace the existing screens. Because the mechanical screens are located before PS 31 and CSO 004, a flow rate of 30 mgd was used to size the screens for all levels of control.

B. New Force Main

The current force main transporting pumped flows from PS 31 to the SWWTF was constructed in the 1920s and has likely reached the end of its service life. In addition, the current FM is too small for the increased pumping rates and pressures required to reduce the amount of overflows at PS 31. Therefore, it likely will need to be replaced. The size of the new force main is dependent on pumping rates. Table 4.02-2 lists the force main size based on the level of control and pumping rates developed by the flow model in Section 3.



ALTERNATIVE 2
UPGRADING PS 31

COMBINED SEWER OVERFLOW LONG TERM CONTROL PLAN
FOX RIVER WATER RECLAMATION DISTRICT
ELGIN, ILLINOIS

FIGURE 4.02-1
1922.006

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Occurrences per Year (#)	Recurrence Interval (time)	Peak Hourly Flow (mgd)	Force Main Diameter (in)
24	2 x month	13.3	24
12	1 month	18.8	30
4	3 months	22	30
1	1 year	24.6	30
0.1	10 years	28.8	36
0.02	50 years	31.8	36

Table 4.02-2 Force Main Diameter for Varying Flowrates

The new force main route can be seen on Figure 4.02-1. The proposed route is to the west of the current force main along the existing bike path located along the bank of the Fox River.

C. Upgrades to SWWTF[4]

The current SWWTF is not equipped to handle the additional flow conveyed from an expanded PS 31. Consequently upgrades to the SWWTF are required. This alternative requires increased primary clarification and additional chlorine contact tanks. There is little room for expansion on the current SWWTF site. Therefore, some of the current facilities will need to be demolished.

FRWRD is currently considering the construction of a new administration and lab building off-site at the WWWTF. This alternative proposes that the current administration building be demolished to provide space for the new facilities. In addition, the SWWTF currently has four irregularly shaped rectangular primary clarifiers. These four rectangular primary clarifiers are of limited value currently in their configuration and will be replaced with new round primary clarifiers. The four rectangular primary clarifiers have a current capacity of approximately 26.5 mgd. The new primary clarifiers provided with this alternative will have a capacity of 26.5 mgd plus the additional flow transported to the treatment plant.

Finally, additional chlorine contact tanks will be provided for the additional flow to plant. There is enough space near the Chlorine Contact Tank 4 to provide the required additional tank volume.

D. Opinion of Probable Cost

Refer to Table 4.02-3 for a breakdown of costs for three levels of control, four overflows per year, one overflow a year, and one overflow every ten years. The associated costs are the upgrades to PS 31, a new force main, site demolition, new grit facilities, new primary clarification, and new chlorine contact tanks. A detailed breakdown of each cost component and a description of the assumptions can be found in Appendix J.

[4] Checklist Question 57.

Construction Item	4 Occurrences per Year	1 Occurrence per Year	1 Occurrence per 10 Years
Capital Costs[1]			
Screening Upgrades	$360,000	$360,000	$360,000
PS 31 Upgrades	1,400,000	1,450,000	1,500,000
Conveyance	840,000	840,000	1,010,000
Demolition	250,000	250,000	250,000
Primary Clarification	4,910,000	5,110,000	5,310,000
Sludge Pumping	1,040,000	1,040,000	1,040,000
Chlorine Contact	250,000	280,000	310,000
Electrical	2,510,000	2,660,000	2,900,000
Site Work	410,000	430,000	460,000
Piping/Mechanical	1,300,000	1,340,000	1,380,000
Subtotal	**$13,270,000**	**$13,760,000**	**$14,520,000**
Contractor General Conditions	1,060,000	1,100,000	1,160,000
Opinion of Probable Construction Cost	**$14,330,000**	**$14,860,000**	**$15,680,000**
Contingencies and Technical Services	5,020,000	5,200,000	5,490,000
Opinion of Total Project Cost	**$19,350,000**	**$20,060,000**	**$21,170,000**
Present Worth of O&M	1,030,000	1,090,000	1,180,000
Present Worth of Replacement Costs	1,570,000	1,650,000	1,780,000
Less Present Worth of Salvage	(1,880,000)	(1,950,000)	(2,070,000)
Total Present Worth[2]	**$20,070,000**	**$20,850,000**	**$22,060,000**

Notes:
[1] All Costs are in 1st Quarter 2010 dollars
[2] Present worth is based on projections and costs for 20 years at a discount rate of 6 percent.

Table 4.02-3 Opinion of Probable Cost for Upgrading PS 31

4.03 ALTERNATIVE NO. 3–REMOVE P3 31 AND CONVEY TO SWWTF VIA GRAVITY INTERCEPTOR

This alternative involves eliminating PS 31 and the associated force main by constructing a gravity sewer to the SWWTF and wet weather improvements to the SWWTF. See Figure 4.03-1 for an overall layout of this alternative.

A. New Gravity Interceptor

Operating and maintaining facilities off-site is more expensive from an operation and maintenance perspective than maintaining on-site facilities. This particular alternative will eliminate an aging component of the FRWRD off-site facilities and replace it on-site for easier managing. The required size of interceptor is dependent on the level of control desired, ranging from 42 inches to control to four overflows a year up to 48 inches to control to one overflow every ten years.

Currently the three input sewers to PS 31 all flow into one manhole just west of the current screening building. The proposed gravity interceptor will flow south along the current bike path from this manhole down to the SWWTF. The overflow will remain; however, rather than being pumped, it will be a gravity overflow.

Legend

- PS 31
- Alternative 3-New Interceptor
- Alternative 3-New PS and FM
- Existing FM
- Southwest Interceptor
- WWTP-Demo
- WWTP-10 year

Souster Ave
Wills St
US 20W To IL 31
US 20E From IL 31
Wellington Ave
Hastings St
Grace St
Dwight St
US 20W To IL 25
Kirkland Rd
State St
Central Rd
United States Highway 20
Bluff City Blvd
Dixon Ave
Raymond St
Grace St
Elgin Ave
Elizabeth St
Hammond Ave
EMH

N
W E
S

0 75 150 300
Feet

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ALTERNATIVE 3
UPGRADING PS 31 AND FORCE MAIN

COMBINED SEWER OVERFLOW LONG TERM CONTROL PLAN
FOX RIVER WATER RECLAMATION DISTRICT
ELGIN, ILLINOIS

STRAND ASSOCIATES, INC®
ENGINEERS

FIGURE 4.03-1
1922.006

B. New Influent Pumping Station

This alternative also provides a new pumping station with influent screening on-site at the SWWTF. The station is sized based on the flows developed by the flow model in Section 3. A new force main is included between the new pumping station and the grit facilities.

C. Upgrades to the SWWTF

The required updates to the SWWTF are similar to those included in Alternative No. 2. Updated primary clarification and additional chlorine contact tanks are provided.

D. Opinion of Probable Cost

Refer to Table 4.03-1 for a summary of probable costs for Alternative No. 3. The associated costs include the installation of a new gravity sewer, the new on-site pumping station, updated primary clarification, and new chlorine contact tanks. Appendix J provides a detailed cost breakdown of this alternative.

Construction Item	4 Occurrences per Year	1 Occurrence per Year	1 Occurrence per 10 Years
Capital Costs[1]			
Conveyance	$1,250,000	$1,250,000	$1,470,000
Demolition	250,000	250,000	250,000
Influent Pumping Station	2,480,000	2,540,000	2,600,000
Influent Screening Equipment	360,000	360,000	360,000
Primary Clarification	4,910,000	5,110,000	5,310,000
Sludge Pumping	1,040,000	1,040,000	1,040,000
Chlorine Contact	250,000	280,000	310,000
Electrical	2,510,000	2,660,000	2,900,000
Site Work	470,000	490,000	520,000
Piping/Mechanical	1,300,000	1,340,000	1,380,000
Subtotal	**$14,820,000**	**$15,320,000**	**$16,140,000**
Contractor General Conditions	1,190,000	1,230,000	1,290,000
Opinion of Probable Construction Cost	**$16,010,000**	**$16,550,000**	**$17,430,000**
Contingencies and Technical Services	5,600,000	5,790,000	6,100,000
Opinion of Total Project Cost	**$21,610,000**	**$22,340,000**	**$23,530,000**
Present Worth of O&M	870,000	940,000	1,020,000
Present Worth of Replacement Costs	1,570,000	1,650,000	1,780,000
Less Present Worth of Salvage	(2,180,000)	(2,230,000)	(2,360,000)
Total Present Worth[2]	**$21,870,000**	**$22,700,000**	**$23,970,000**

Notes:
[1] All Costs are in 1st Quarter 2010 dollars
[2] Present worth is based on projections and costs for 20 years at a discount rate of 6 percent.

Table 4.03-1 Opinion of Probable Cost for Replacing PS 31 and 24-Inch Interceptor

4.04 ALTERNATIVE NO. 4–OFF-LINE SURFACE STORAGE

This alternative involves storage of wet weather flows for discharge to the conveyance and treatment systems during nonpeak flow periods to eliminate or reduce CSOs. Off-line surface storage is where a portion of flows are diverted from the CSS into aboveground tanks or ponds to be released back to the CSS when flows have receded. This alternative requires upgraded bypass pumping capabilities at PS 31, a new force main for conveyance of CSO to an in-ground storage facility, and a new discharge pipe to transport stored flows back into the conveyance system at the end of the overflow event.

A. Storage Sites

Storage volumes were developed previously in Section 3 based on data collected over the past six years. The amount of storage required varies based on the level of control desired. In order to control overflows to four overflows a year, 1.1 million gallons of storage would be required. For one overflow a year and one overflow every ten years, 5.7 and 13 million gallons of storage is required, respectively.

Storage alternatives require parcels of land to house such facilities. There were three potential sites evaluated. None are currently owned or controlled by FRWRD. This presents an additional complication for the feasibility of this alternative.

The first potential site is located on the west side of the river just north of U.S. Route 20. This site is potentially big enough for each level of control. However, this alternative requires a nearby interceptor to empty the tank. The nearest interceptor with adequate capacity is located south of U.S. Route 20. In addition, this piece of land is currently an actively used park in a residential neighborhood. Installing partially aboveground storage tanks that would be 15 to 20 feet above grade would not be in keeping with the neighborhood and would likely generate intense opposition from the residents. Therefore, this parcel of land is considered unfavorable.

Another potential storage site is located on the east side of the Fox River near PS 31. An old abandoned railroad runs south to north across Wellington Avenue from PS 31. Potentially, this corridor could be used for storage. The storage facility would be located near the pumping station resulting in much less conveyance costs because it would not require a Fox River crossing. In addition, it would be easy to empty the storage facility back into the system. This site is unfavorable however for a variety of reasons. First, this site has limited width to it. As a result, the storage tank would have to be either extremely long, extremely deep, or a combination of both. With the proximity to the river, a deep tank requires large amounts of concrete to avoid the risk of floating with high groundwater levels because pressure relief valves in a storage tank may not be desirable to maintain the tank empty when not in use. Secondly, this site is located near a residential area. A partially aboveground storage tank would most likely be required because of the concerns previously mentioned and it would be aesthetically unpleasing to the neighborhood. Finally, this site is limited in size making it difficult to provide adequate storage for the higher levels of control.

The final site is located on the west side of the Fox River south of US 20. This site is large enough for all levels of control, it is located near an interceptor with capacity to handle the stored volume at the end of an overflow event, and it has favorable site grading conditions to minimize excavation costs. This

location was chosen as the most favorable storage location. The storage tank could be constructed such that it is half buried. When it is completed, the top of the tank could be used for recreation purposes, if desired. Refer to Figures 4.04-1 through 4.04-3 for preliminary site plans of the storage alternatives based on various levels of control.

B. Upgraded Bypass Pumping

Since the selected storage site is located on the west side of the Fox River, new conveyance will be required to transport the overflow volumes to the storage facility. In addition, the bypass pumping capabilities of PS 31 will have to be upgraded to provide enough flow relief to prevent flooding at the station and provide enough head to transport it to the storage facility.

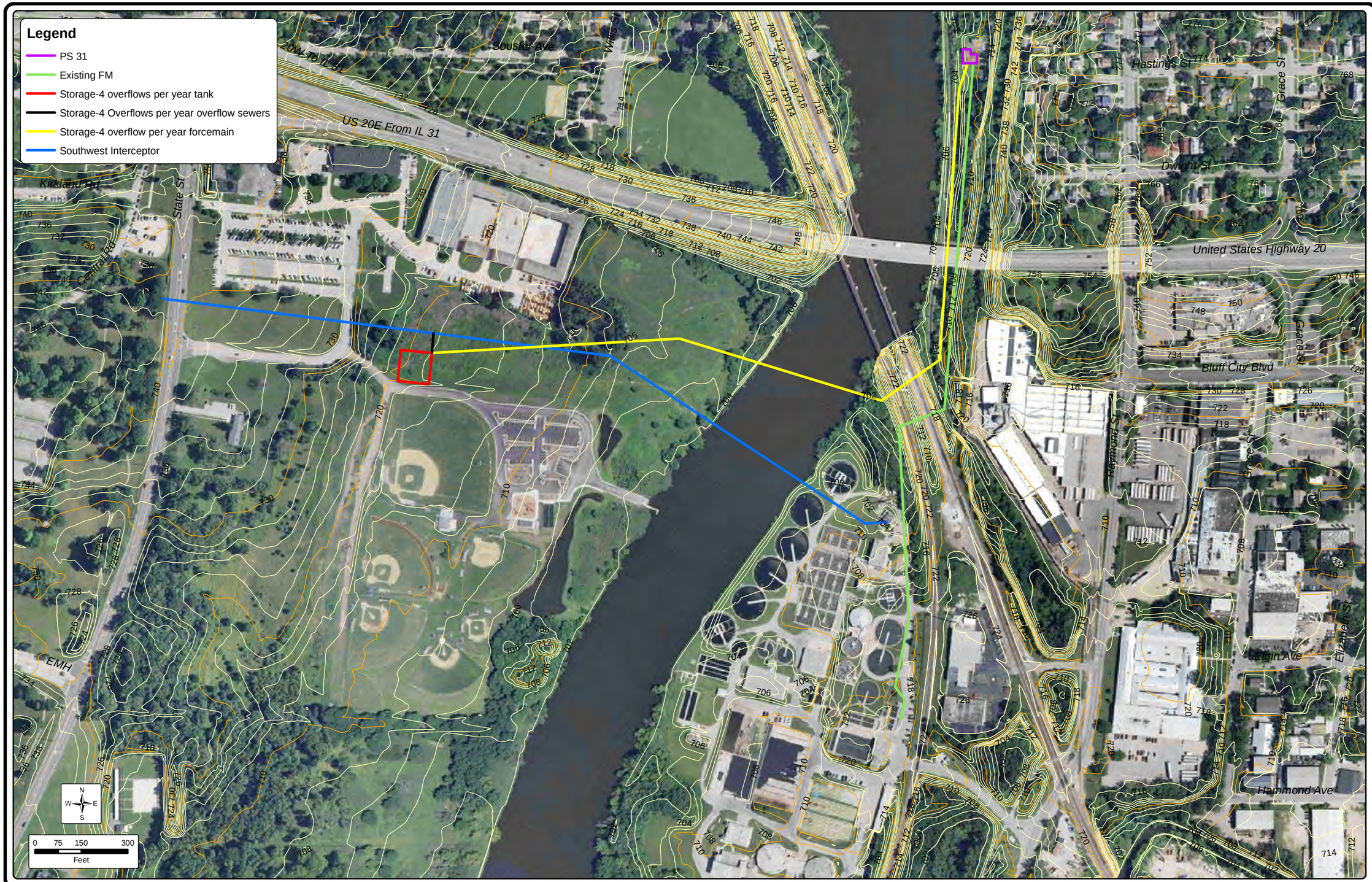
Once again, the pumping requirements are based on the desired level of control. Additionally, the pumping requirements control the size of force main. The flow model developed and presented in Section 3 was used to develop pumping rates required for the bypass pumping. According to the flow model, the pumping requirements to control to the four overflow a year, one overflow a year, and one overflow for ten years are 22, 24.6, and 28.8 mgd, respectively. The bypass requirements were calculated assuming a PS 31 capacity of 13 mgd. The resulting overflow pumping rates are 9, 11.6, and 15.8 mgd, respectively, for the three levels of control.

In addition to the upgraded bypass pumping, the costs include replacing the existing pumps down to the SWWTF and the 24 inch force main since they have both reached their design lives.

C. Opinion of Probable Cost

Refer to Table 4.04-1 for the opinion of probable cost for three levels of control. There are costs associated with the upgrade including bypass pumping and a new force main for transporting the overflows to the storage tank. Additionally, the southwest interceptor runs through the proposed storage site and may have to be relocated for the one overflow a year and one overflow every ten years levels of control. The cost of this relocation is included; however, during a detailed design this could possibly be avoided.

A detailed breakdown of each cost component and a description of the assumptions can be found in Appendix J.



ALTERNATIVE 4-STORAGE
4 OVERFLOWS PER YEAR

COMBINED SEWER OVERFLOW LONG TERM CONTROL PLAN
FOX RIVER WATER RECLAMATION DISTRICT
ELGIN, ILLINOIS

STRAND ASSOCIATES, INC.®
ENGINEERS

FIGURE 4.04-1
1922.006

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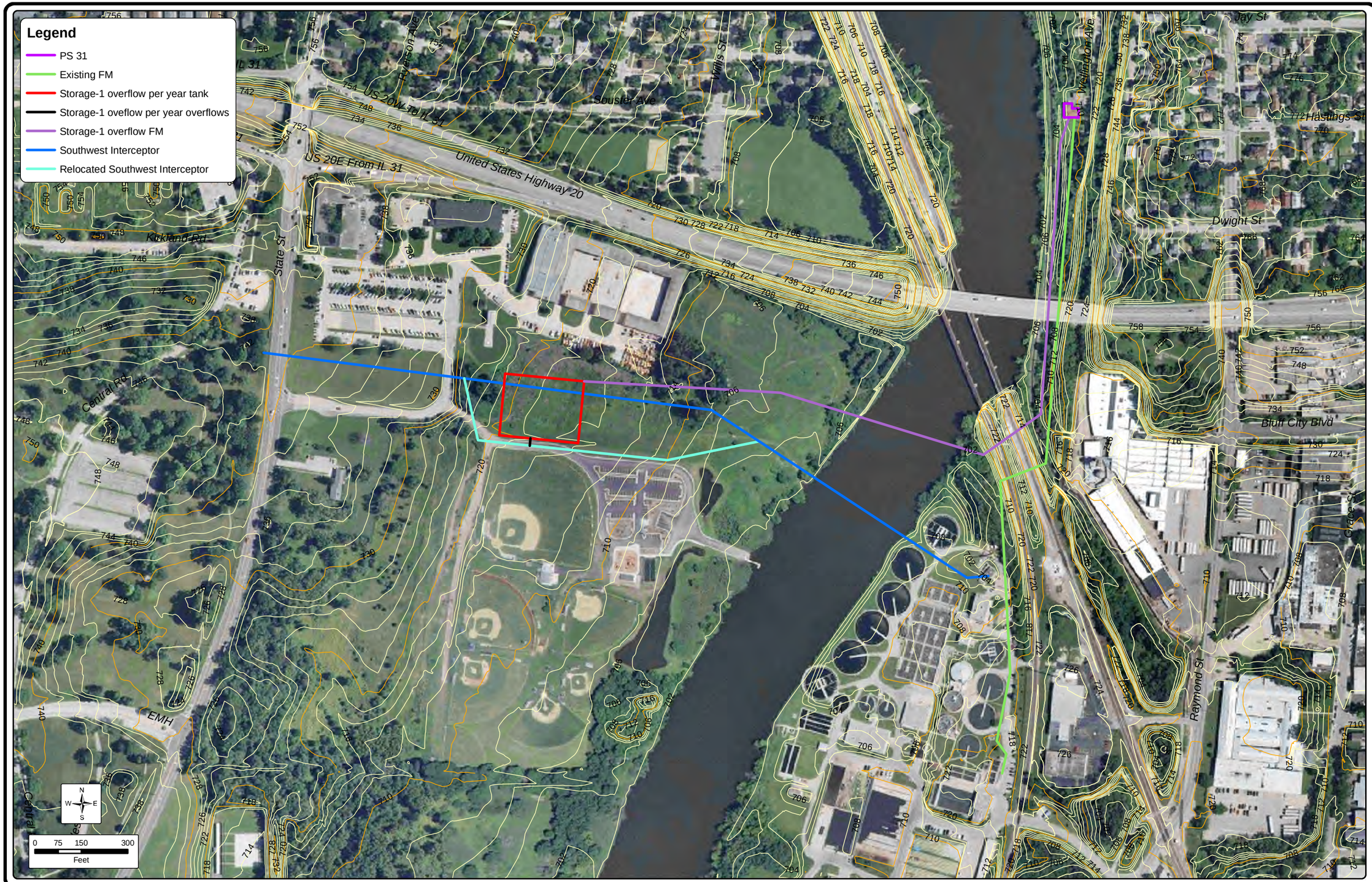

ALTERNATIVE 4-STORAGE
1 OVERFLOW PER YEAR

COMBINED SEWER OVERFLOW LONG TERM CONTROL PLAN
FOX RIVER WATER RECLAMATION DISTRICT
ELGIN, ILLINOIS

STRAND ASSOCIATES, INC.®
ENGINEERS

FIGURE 4.04-2
1922.006

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Legend

- PS 31
- Existing FM
- Storage-10 year oveflows
- Storage-10 year Tank
- Storage-10 yr FM
- Southwest Interceptor
- Relocated Southwest Interceptor

US 20W To IL 31
Souster Ave
Willis St
US 20E From IL 31
State St
Central Rd
Hastings St
Grace St
Dwight St
United States Highway 20
Bluff City Blvd
Naperville St
Elizabeth St
Elgin Ave
Hammond Ave
EMH

N W E S

0 75 150 300
Feet

ALTERNATIVE 4-STORAGE
1 OVERFLOW PER 10 YEARS

COMBINED SEWER OVERFLOW LONG TERM CONTROL PLAN
FOX RIVER WATER RECLAMATION DISTRICT
ELGIN, ILLINOIS

STRAND ASSOCIATES, INC®
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FIGURE 4.04-3
1922.006

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Construction Item	4 Occurrences per Year	1 Occurrence per Year	1 Occurrence per 10 Years
Capital Costs[1]			
Conveyance	$2,100,000	$2,220,000	$2,330,000
Storage Facilities	1,600,000	6,280,000	13,280,000
Upgraded Pumping	1,550,000	1,600,000	1,650,000
Upgraded Screening	360,000	360,000	360,000
Land Acquisition	50,000	80,000	150,000
Electrical/Mechanical	1,560,000	1,870,000	2,240,000
Site Work	720,000	1,240,000	2,000,000
Subtotal	**$7,940,000**	**$13,650,000**	**$22,010,000**
Contractor General Conditions	640,000	1,090,000	1,760,000
Opinion of Probable Construction Cost	**$8,580,000**	**$14,740,000**	**$23,770,000**
Contingencies and Technical Services	3,000,000	5,160,000	8,320,000
Opinion of Total Project Cost	**$11,580,000**	**$19,900,000**	**$32,090,000**
Present Worth of O&M	880,000	1,280,000	1,720,000
Present Worth of Replacement Costs	1,130,000	1,410,000	1,760,000
Less Present Worth of Salvage	(1,220,000)	(2,050,000)	(3,340,000)
Total Present Worth[2]	**$12,370,000**	**$20,540,000**	**$32,230,000**

Notes:
[1] All costs are in 1st Quarter 2010 dollars.
[2] Present worth is based on projections and costs for 20 years at a discount rate of 6 percent.

Table 4.04-1 Opinion of Probable Cost for Storage

4.05 RECOMMENDED ALTERNATIVE

Alternative Nos. 2, 3, and 4 rely on the current flow rates to PS 31 remaining the same for the sizing of the improvements to be accurate. If the flows decline radically, FRWRD would be wasting resources. If the flows increase radically, the solution would be undersized and the result could be that the CSO control would not be sufficient. With the substantial costs for any of these alternatives, the disadvantage of this uncertainty is heightened.

While Alternative 1 is termed No Action, this is not an accurate term. In fact, the City and FRWRD have been working to control and improve the CSS and CSO system for more than 30 years. The regulatory framework of the IEPA and PCB 85-222 Order have directed their efforts prior to the more recent USEPA CSO mandates. Overall, both entities continue to work to improve the CSS and the CSO situation.

The City of Elgin's improvements have focused on the CSS that it owns. Already, a significant portion of the east half of the CSS system had storm sewers installed or contracts awarded for installation. Opportunities to accelerate its separation program are being investigated. Lining of sanitary and combined sewers is continuing. Additional sources of I/I are continuously being investigated and addressed.

FRWRD has worked to improve the operation of the diversion structures, PS 31, and the treated CSO at the SWWTF that it owns, and overall, these efforts seem to have been successful. The first eight months of 2009, which was the end of statistical analysis for this report, show a total of

14 overflow events and a total volume overflowing to the river of only 4 million gallons. The remainder of the year had only two other events, totaling only 20 minutes of discharge, so the 8-month total was very close to the annual total. This makes the 2009 annual overflow volume and frequency the second lowest number of events and volume of overflows in the past several years. The only lower year was 2005, which was a drought year. Since 2009 was actually an abnormally wet year, this result shows significant progress.[5]

The recommended alternative in this LTCP is Alternative No. 1–No Action. Given the substantial progress made to date, and the fact that FRWRD currently meets the second criterion of the Presumptive Approach, and given the City of Elgin intends to eliminate CSOs by conducting separation of its CSS, it is concluded that FRWRD is now in full compliance with the National CSO Control Policy including the Nine Minimum Controls.[5] It is also concluded that with the continuation of the current control efforts, FRWRD is in full compliance with the Illinois state-specific combined sewer overflow regulations.[6]

As discussed in Section 1, the actual owner of the CSS is the City of Elgin; FRWRD does not own any combined sewers. Therefore, FRWRD arguably should not have to prepare a LTCP because the City of Elgin's submitted LTCP proposes that it will continue with its separation projects that will result in the total elimination of CSOs. Additionally, the City of Elgin and FRWRD will continue to work together regarding methods to accelerate the CSS separation.

4.06 FINANCIAL CAPABILITY ASSESSMENT

Financial capability is a factor affecting FRWRD's CSO LTCP. According to USEPA, the ability of a municipality to finance the final recommendations of the LTCP, in conjunction with the financial requirements for the continuing operation and maintenance of the existing infrastructure plus planned new facilities not directly related to CSO controls, should be considered. The recommended alternative in this LTCP is Alternative No. 1–No Action. Therefore, a financial capability assessment was not required and therefore not performed.

4.07 IMPLEMENTATION SCHEDULE

The National CSO Control Policy requires that an implementation schedule be provided in the LTCP. The recommended alternative in this LTCP is Alternative No. 1–No Action. FRWRD is submitting this LTCP based upon the expectation that because of the continued CSS separation by the City of Elgin, stormwater flows from the City of Elgin CSS will be reduced, resulting in reduced intensity and frequency of CSO events. Eventually the complete elimination of CSO events could be anticipated. Because the City of Elgin's proposed LTCP has not been approved and has not been fully implemented, the schedule of these reductions is unknown.

[5] Checklist Questions 33, 56, and 76.
[6] Checklist Question 55.

4.08 POSTCONSTRUCTION MONITORING PLAN[7]

Postconstruction monitoring will be required of FRWRD during CSO events unless FRWRD completely eliminates CSO 004. The FRWRD's SWWTF NPDES permit requires a postconstruction compliance monitoring program to be included with the LTCP. Because the FRWRD has chosen Alternative No. 1–No Action, discussed in Section 4.01, the FRWRD will not be constructing anything new as part of this LTCP. The FRWRD will continue its coordinated monthly sampling with the FRSG and will coordinate sampling with the City of Elgin to monitor fecal coliform levels in the Fox River. For purposes of this LTCP, the FRWRD will refer to this monitoring as its "postconstruction monitoring program."

The City of Elgin's draft LTCP indicates the City will conduct a monitoring program during and after its LTCP implementation to assess the effectiveness of its CSO abatement program. The draft LTCP states in part that the "…primary goal of this program will be to compare samples during all phases of sewer separation construction to analyze the water quality into the Fox River."

There are City of Elgin CSO discharges immediately upstream, downstream, and across the river from CSO 004. Because of the proximity of these CSOs, it is not possible to isolate the effects of controls at CSO 004 on the water quality of the Fox River. Instead, the FRWRD intends to continue to participate in the study of the effectiveness of the CSO controls in the Elgin area by monitoring the DT-09 segment of the Fox River that encompasses CSO 004 as well as all of Elgin's CSOs. The FRWRD intends to coordinate this monitoring with the City of Elgin and the FRSG.

A. Periodic Sampling Locations

As noted previously, the FRSG conducts monthly monitoring in the Elgin area and has contracted with the ISWS to prepare water quality models. The FRSG has established monitoring locations upstream and downstream of the City of Elgin and FRWRD CSO outfalls as shown in Figure 2.04-1. The FRSG downstream sampling location is sufficiently downstream of the CSO outfalls and the South Elgin dam to allow good mixing and representative sampling. This location would show the influence of all the City and FRWRD CSOs on water quality as well as the influence of stormwater and area tributaries on Fox River water quality.

The nearest sampling station upstream of the City of Elgin's CSOs is at the I-90 bridge. This is the preferred location for postconstruction monitoring because of the amount of historical data available and its location.

The FRSG has been monitoring the river at the South Elgin dam location for temperature, pH, DO, conductivity, BOD, TSS, ammonia, nitrates, fecal coliform, phosphorous, dissolved phosphorous, TKN, and chlorophyll since 2002 and has no plans to discontinue these efforts. Sample collection and laboratory analysis will be conducted according to the IEPA-approved FRSG Quality Assurance Project Plan (QAPP)

[7] Checklist Questions 70, 85, and 86.

B. Event Sampling

Event sampling will be targeted directly at the two CSO discharges owned by the FRWRD. Event sampling of FRWRD's SWWTF CSO treatment (excess flow) outfall will be conducted in accordance with the NPDES permit.

Event sampling at CSO 004 will be attempted by FRWRD staff whenever flow is discharged. Because this is an off-site, unmanned location, discharges often occur with little forewarning and last for only a few minutes. Because the flow rate is highly variable, it will be impossible to be certain that a sample is collected from every event. The samples will be timed composite samples. Automatic sampling equipment will be deployed and maintained. It is expected that a high percentage of overflow events will be captured.

Any valid samples will be analyzed by the FRWRD's laboratory for BOD, TSS, and fecal coliform. Instantaneous pH and DO data will be attempted to be collected using a field probe.

Sampling will commence upon the IEPA's approval of this CSO LTCP and will continue during and after implementation of the FRWRD's LTCP.

C. Potential Modifications to Postconstruction Sample Locations

The periodic sampling is currently coordinated with FRSG sampling. If the FRSG sampling program is modified, FRWRD may need to initiate independent CSO Postconstruction monitoring, or may modify the monitoring to continue to cooperate with FRSG. In addition, the FRWRD may wish to coordinate its sampling program with the City of Elgin or other communities once the City's LTCP is approved or other sampling opportunities arise. Any modifications will be reviewed with IEPA staff prior to implementation.

SECTION 5
PUBLIC PARTICIPATION

5.01 INTRODUCTION

The National CSO Control Policy requires that the public, including ratepayers, industrial users of the CSS, persons near impacted waters, and persons who use the impacted waters, be informed about CSOs and be given an opportunity to participate in the decision-making regarding the LTCP.

5.02 PUBLIC NOTIFICATION

Special Condition 12, Paragraph 12 of the NPDES permit requires that a public notification (PN) program be developed that actively informs the public of occurrences of CSOs.

The FRWRD has a sign at both discharge points to the river to notify interested parties. In addition, the FRWRD's Web site has information about CSOs and provides a daily notification of the occurrences of a CSO 004 discharge.

5.03 PUBLIC MEETINGS[1]

The NPDES Permit required FRWRD to conduct a Pollution Prevention Plan, Operation and Maintenance Plan, and Public Notification program meeting and submit a meeting summary. That meeting was jointly held with the City of Elgin in 2007. The meeting included an overview of both CSO systems.

The drafting of this LTCP has been the subject of multiple public meetings of the FRWRD Board of Trustees. The minutes of those meetings are available at the District's Web site (www.frwrd.com). The submitted LTCP will be reviewed at the Board of Trustees Meeting on March 8, 2010. The LTCP will be made available at the FRWRD Web site.

This LTCP will be presented to the FRSG on April 8, 2010. The FRSG includes municipalities in the watershed, environmental groups, the Fox River Ecosystem Partnership, the IEPA, and the Illinois State Water Survey as a contractor. Individual organizations that participate in the FRSG and the Fox River Ecosystems Partnership will be offered the opportunity to review the Plan in one-on-one meetings if they wish additional details. Any data collected concerning the CSOs that will be of assistance to the FRSG will be provided in terms of maintaining and improving its model of the watershed.

The FRWRD will also hold an additional meeting for the general public in May of 2010. The meeting will include a detailed review of the LTCP and the options evaluated. This meeting will be publicly noticed in the (Elgin) Courier News FRWRD will post the meeting notice on its web site. Additional notices will be provided where interested parties may take notice of it. FRWRD anticipates sending invitations to the following organizations:

1. IEPA
2. USEPA Region 5
3. FRSG
4. City of Elgin
5. Village of South Elgin
6. Fox River Ecosystem Partnership

FRWRD requests IEPA identify any other interested parties that would be included in the invitation list. Sign-in sheets, copies of slides presented, the record of public comments and questions, and record of changes made in response to the public comments will be provided to IEPA after the meeting.

[1] Checklist Questions 73, 74, and 75.

APPENDIX A
ILLINOIS POLLUTION CONTROL BOARD EXCEPTION (PCB 85-222)

ILLINOIS POLLUTION CONTROL BOARD
June 10, 1987

IN THE MATTER OF:	)	
	)	
JOINT PETITION OF THE SANITARY DISTRICT OF ELGIN AND THE CITY OF ELGIN, ILLINOIS AND THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY FOR EXCEPTION TO THE COMBINED SEWER OVERFLOW REGULATIONS	)	PCB 85-222

MR. LYLE C. BROWN, SCHNELL, RICHARDS, BROWN, RITT, FREEMAN & DALTON, P.C., APPEARED ON BEHALF OF THE SANITARY DISTRICT OF ELGIN AND THE CITY OF ELGIN; AND

MS. HEIDI HANSON APPEARED FOR THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY.

OPINION AND ORDER OF THE BOARD (by R.C. Flemal):

This matter comes before the Board on the December 30, 1985, joint petition of the Sanitary District of Elgin ("Sanitary District") and the City of Elgin ("City") (hereinafter collectively referred to as "Elgin") and the Illinois Environmental Protection Agency ("Agency") for exception to 35 Ill. Adm. Code 306.305 (a) and (b) to relieve Elgin from the requirement to construct and operate certain combined sewer overflow (CSO) transport and treatment facilities.

For the reasons described below, the Board finds that Petitioners have made the showings requisite for granting the relief requested. The relief will accordingly be granted, subject to conditions as stipulated to by Petitioners and consistent with the Board's rules and regulations.

CSO REGULATIONS

The Board's CSO regulations are contained in 35 Ill. Adm. Code Subtitle C, Chapter I, Part 306. They were amended in R81-17, 51 PCB 383, March 24, 1983. Sections pertinent to the instant matter are Sections 306.305 and 306.361(a). Section 306.305 provides as follows:

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

Sufficient treatment shall consist of the following:

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

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

c) Flows in excess of those described in subsection (b) shall be treated, in whole or in part, to the extent necessary to prevent accumulations of sludge deposits, floating debris and solids in accordance with 35 Ill. Adm. Code 302.203, and to prevent depression of oxygen levels; or

d) Compliance with a treatment program authorized by the Board in an exception granted pursuant to Subpart D.

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

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

Pursuant to 306.361(a) Elgin and the Agency assert that overflows from its combined storm and sanitary sewer system have minimal impact on the water quality of, and do not restrict the use of, the Fox River (the receiving stream).

SUPPORT DOCUMENTS

Petitioners have presented several documents in support of their petition. Included among these are three analyses and evaluations of the Elgin CSO's, the first prepared in 1975 (Ex. A), the second in 1982 (Ex. B), and the most recent in 1985 (Ex. C). Petitioners have also provided various overflow inspection reports (Ex. F, J, and K), monitoring results (Ex. F and G), copies of the Sanitary District's pretreatment ordinance (Ex. H)

and the City's zoning ordinances (Response[1], August 1, 1986), and responses to various interrogatories posed by both the Agency (Ex. D and E) and the Board (Responses, July 21, July 28, October 1, October 6, and November 24, 1986, and March 25, 1987[2]).

The Agency asserts that it has been working with Elgin on this matter since 1975 consistent with the Board's determination that "the essential element" in the CSO exception procedure "is to attempt to establish a partnership between the discharger seeking relief and the Agency". Agency Response, March 25, 1987, at 3, quoting 46 PCB 76. The Agency further quotes the Board, noting the Board's statement that "in cooperation, the two are are to develop the necessary data concerning a) what level of CSO control is environmentally necessary, and b) what control strategies, including but not limited to retention and treatment, are economically and technically feasible". Id. The Agency believes that present joint petition is based on these factors as required by the Board. Agency Response, March 25, 1987, at 3.

BACKGROUND

The Sanitary District includes the municipal boundaries of the City of Elgin and the Village of South Elgin. According to the 1980 census, the total population of the Sanitary District was 73,000. The City's population was approximately 67,000; the population of South Elgin was approximately 6,000.

Elgin is served by three treatment plants: the main plant, a 25 million gallon per day (MGD) facility; the west plant, a 1.5 MGD facility; and the north plant, which is being expanded to a 5.75 MGD facility. Only 25% of the City of Elgin is served by combined sewers; the remaining portion is served by separate sanitary sewers. All the combined sewers are tributary to the main plant. There are no combined sewers in South Elgin. R. at 14.

The main plant has an average design capacity of 25 MGD and a peak design flow capacity of 50 MGD. However, the plant receives and treats an average dry weather flow (ADWF) of only 14 MGD. This consists of 11 MGD from Elgin and South Elgin, including 1.6 MGD from the CSO area, and 3 MGD from Streamwood by

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[1] Date of Response to Interrogatories (hereinafter "Response") is the date of filing with the Board.

[2] The March 25, 1987, Response is a group response which includes individual responses of the Sanitary District, Donohue and Associates, Inc. ("Donohue") on behalf of the Sanitary District, and the Agency.

contract with the Metropolitan Sanitary District of Greater Chicago. Sanitary District Response, March 25, 1987.

The system has 16 permitted combined sewer overflows. Agency Response, March 25, 1987, at 1. However, two of these outfalls have not been operated in a number of years and have been isolated by a manually operated valve. A third "outfall" does not discharge directly to the river, but instead feeds into sewers tributary to another CSO basin. Consequently, only 13 overflows are actually operational. All CSO discharges are directly into the Fox River. Ex. C at 1.

The Sanitary District owns the three wastewater treatment plants, ten pumping stations, 33 miles of gravity interceptor sewer, six miles of force main, and the diversion structures on the combined sewer system. The City owns all the combined sewers, all the storm sewers, and all the lateral sewers in the system. R. at 17.

There are three "wet industries" tributary to the combined sewer system: Elgin Diamond Products, Shedd's Food Products, and Williams Manufacturing. Contaminants from these industries include: cadmium, cyanide, arsenic, lead, copper, mercury, nickel, selenium, silver, zinc, tetrachloride, toluline (sic), 1,2-dichloroethane, and vegetable oil. Elgin has a pretreatment ordinance with which these industries are in compliance except for Shedd's. However, Shedd's was expected to achieve compliance by January 1986. Ex. D at 2-3.

DOCUMENTATION OF MINIMAL IMPACT

Section 306.361(a) requires that Petitioners seeking a CSO exception on the basis of minimal discharge impact, as is the case here, make a number of showings. Pursuant thereto, Petitioners provide the following information and observations:

Receiving Stream Ratios

Elgin asserts that the flow in the Fox River provides substantial dilution potential for its CSO discharges. The drainage area of the Fox River at Elgin is approximately 1,450 square miles and the average flow is approximately 800 cfs or 1,240 MGD; the 10-year, seven-day low flow is approximately 62 cfs or 95.6 MGD.

No actual measurements of CSO discharges have been made. Instead, various modeling and simulation studies have been undertaken to estimate the parameters of the CSO discharges. Among the results are that the simulated total annual overflow is estimated at 140.6 MG. Ex. B at II-17 and II-19. Similarly, 686 MGD would be expected for the theoretical "maximum 30 minute

discharge" rate of a two-year storm, producing a volume of 10.58 MG during the same time frame. Ex. B at III-6.

First flush[3] for a one-year storm is further estimated to be 7 MG and to typically occur within the first thirty minutes of the rainfall. First flush for a two-year storm is also estimated to be approximately 11 MG and first flush for a 25-year storm to be approximately 21 MG. R. at 57-8.

Petitioners also discuss receiving stream ratios in terms of average annual pollutant loadings. Thus, it is estimated that the Elgin CSO discharges comprise 0.4% of the annual BOD loadings on the Fox River at Elgin, 0.3% of the phosphorus loadings, and 0.1% of both the ammonia nitrogen and nitrate nitrogen loadings. R. at 39; Ex. B at I-7. It is estimated that a program of full first flush capture would reduce the BOD, phosphorus, and ammonia nitrogen loadings to approximately 0.24%, 0.16%, and 0.07%, repectively. Id. at I-8; R. at 54. An additional program of expanded primary treatment could further reduce the BOD loadings to 0.21%, but would have no additional effect on lowering of the phosphorus or ammonia nitrogen loadings. Id.

Known Stream Uses

Stream uses of the Fox River in the immediate vicinity of Elgin are contended to be comparatively limited, as least

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[3] The Board notes that throughout much of the record there is the underlying assumption that first flush is equal to 2.5 times ADWF. Thus, for example, reference to a treatment goal of 12.5 ADWF is based on the assumption that this includes treatment of both first flush and an additional 10 times ADWF, pursuant to Section 306.305. A specific example is provided in Elgin's Response of July 21, 1986, at 2:

> Section 306.305 indicates that flows up to 2.5 times the average dry weather flow receive full treatment, that the first flush receive full treatment, and additional flows from 2.5 to 12.5 times the average dry weather flow receive primary treatment. (Emphasis in original).

As the Agency notes (Agency Response, March 25, 1987, at 2-3), the equation of 2.5xAWDF with first flush derives from a now superseded Agency guideline for estimating first flush. Nevertheless, because much of the record in the Elgin CSO preceeding was accumulated during the period when the 2.5xADWF guideline was in use, many references to it remain and its use has persisted even though the guideline has been superseded.

relative to other reaches of the river. In part this is related to limited accessibility (see below) and the urban character of the stream side area. It is also noted that the Fox River in the Elgin area is unsuitable for power boat usage due to the presence of several dams which lack lifts and the shallowness of the river. R. at 43. It is further contended that other stream uses, such as swimming and canoeing, are limited.

Elgin does use the Fox River above the CSO area for its drinking water supply. However, no other downstream municipalities in close proximity to the discharges do.

The contended limited use of the Fox River in the immediate vicinity of Elgin apparently contrasts with the greater use in the less urban and less controlled sections of the river, both upstream and downstream of Elgin. The Board notes in this context that the upstream reaches includes the Fox-Chain-of-Lakes and the downstream area includes many reaches of highly scenic, recreational, and aquatic habitat value.

Accessibility to Stream Side Land Use Activities

Stream side access to the Fox River in the vicinity of the CSO outfalls is limited. Most of the near stream side land use is commercial or industrial. Ex. C. Additionally, through major portions of the CSO reach railroad lines, one on each side of the river approximately 15 feet from the river bank, restrict public access. R. at 78. Also, there are no public launching ramps for boats or other significant public access points, and there are no beaches anywhere within the Kane County reach of the Fox River. R. at 43; Ex. C. at 9.

The main exception is the Douglas Avenue Basin, where one outfall is in a residential area and one outfall is by a city park and the city library and civic center. Ex. C. at 6. Most of the undeveloped land is stated to be unsuitable for future development because of its topography, proximity to the railroad, or limited access.

Frequency and Extent of Overflow Events

There have been no actual measurements made of the frequency of overflows from the combined sewers in Elgin. Ex. D at 4. However, Elgin asserts that all rainfalls in excess of 0.04 inches per hour presently produce some type of overflow event in the Elgin system. R. at 44. Such rainfall events occur on the average for 182 hours each year, based on climatic records. Ex. A at Figure 2. Due to variation in conditions at the time of actual individual rainfalls, Elgin estimates that the corresponding number of hours during which CSO events occur could range from 109 hours to 273 hours per year. Donohue Response, March 25, 1987, at 6.

Inspections of Outfalls (Bottom Deposits, Odors, etc.)

Twelve of the CSO outfalls were inspected by Sanitary District consultants in May 1985 after an extended dry period and in June 1985 following a 0.65 inch rainfall. Ex. C at 14-22. Nine of the CSO outfalls were inspected by the Agency in May 1986 after an extremely wet weekend which followed an extended dry period. During this inspection no outfalls were observed to be discharging. Ex. K. The results of the inspections were essentially consistent: in all cases it was stated that there was no sludge, sewage debris, septic odor, floating material, or color. Ex. C at 14-17; R. at 45-46, 102-103.

Elgin has also conducted some limited sampling of bottom deposits upstream and downstream of the CSO outfalls. Comparison of these data for BOD and volatile solids indicates no significant differences. Ex. B at II-26; Ex. C at 21. Additionally, Elgin has examined Northeastern Illinois Planning Commission (NIPC) reports on the character of bottom deposits and benthic life of the Fox River in general. On this basis Elgin concludes that there is "no significant variation in bottom deposits or benthic life between areas upstream and downstream of Elgin." R. at 42; Ex. B at I-5.

The Agency also sampled bottom aquatic life during its May 1986 inspection. The Agency concluded that although the calculated macroinvertebrate biotic index (MBI) values for the stations were "indicative of degraded biological communities", such a situation "is not atypical of urban streams and may be partially due to scouring of the river bottom." Ex. K. With the exception of one bare area and another station with an MBI of 5.5, the MBIs for the other stations ranged from 8.6 to 11.0. An MBI between 7.5 to 10.0 is classified as a "limited aquatic resource." Two studies provided by the Agency of the Fox River area in general found that the closest MBIs upstream and downstream of Elgin were categorized as "moderate aquatic resources" with values less than 7.0.

The Agency summarizes its evaluation of the outfalls and the river by noting that "we could not identify any direct attributable impact in the Fox River due to the CSO's". R. at 105.

Stream Morphology

At Elgin the normal width of the Fox River is 200 to 300 feet and the channel depth is approximately 4 feet. Stream discharge is partially controlled by a dam located approximately six miles upstream at Algonquin. Two additional dams occur in the CSO area: the Kimball Street dam in Elgin which is upstream from the CSO outfalls and the South Elgin dam which is downstream from the CSO outfalls. Both dams slow the river flow and hold back pools. Ex. C. at 22.

Trees at various locations overhang the river and, depending on water level, have the potential to trap floating debris and to promote ice jams. However, the shorelines immediately downstream of the CSO outfalls were inspected in May and June, 1985 (see above), and no sanitary debris was observed. Ex. C. at 22.

Stream Chemical Analyses

Elgin regularly conducts monitoring of water quality, including sampling stations located within the reaches of the Fox River to which the CSOs discharge. R. at 19; Ex. G. Sampling is conducted weekly, with different parameters sampled on a four-week cycle. It is in part based on these data, and in part on data collected and modeled by NIPC, that Petitioners calculate the relative pollutant loadings of the Elgin CSO on the Fox River, as noted above.

Elgin has also gathered dissolved oxygen (DO) data specifically for its CSO analysis. These data show that DO depressions occurred during rainfall events. However, the depressions occurred both upstream and downstream of the CSO outfalls and therefore appear to be generally related to drainage rather than to an effect of the combined sewer overflows themselves. Excursions below the standard of 5 mg/l were also noted, but were unrelated to storm events. Rather, the excursions seem to be related to algae production and respiration in conjunction with warm weather temperatures. R. at 48-50; Ex. B at I-6.

EQUIVALENCY ARGUMENT

The Elgin CSO situation provides a circumstance not commonly encountered by the Board in its previous consideration of CSO matters. In the common CSO circumstance, the factor which most seriously limits ability to treat combined sewer discharges is the capacity of the treatment plant. Most plants have capacities only marginally above that necessary to handle the ADWF, and thus are not capable of providing normal treatment to the large flow volumes associated with major influxes from the storm sewer portions of the combined sewer system.

The Board's CSO regulations implicitly recognize this circumstance in requiring that certain flows above ADWF be captured for later full treatment, presumably when the plant is no longer on overload, and that other additional flows receive primary treatment (i.e., not full treatment) at a minimum.

The Elgin circumstance differs from this "norm" in that the Elgin main treatment plant, to which all the Elgin combined sewers are tributary, has a substantial capacity above ADWF. Specifically, the main plant has an average design capacity

approximately twice that of the ADWF and a peak design flow capacity approximately 3.5 times that of the ADWF. Elgin is thus able to provide full treatment, to a 5/5 BOD/TSS level, to a greater portion of the flows which exceed the ADWF than is normally the case. This level is currently 10.3 times the ADWF, all of which receives full treatment. R. at 71.

Neverthless, Elgin is limited in its ability to treat all of the flows in excess of the ADWF. This is partially related to the fact that large CSO events exceed even 10.3 times ADWF. Moreover, full treatment is also limited by conveyance capacity: the existing sewerage system is insufficient to convey to the plant the full discharge encountered at peak influx times.

Thus, Elgin is not able to capture all of the combined sewer discharge required by Section 306.305. However, it does provide a greater degree of treatment than is required by Section 306.305 to that portion which it does capture.

With the above background as perspective, and without consideration as to whether or not the showings requisite to Section 306.361(a) have been adequately made, Petitioners argue that the current system actually accomplishes removal of pollutants comparable to the minimum levels required by Section 306.305, although admittedly not by the means specified under Section 306.305. In support of this contention, the Sanitary District calculated the total annual BOD_5 discharge which would result if the treatment processes required by Section 306.305 were instituted. Based on an average annual rainfall of 31.82 inches, a total annual runoff of 476 MG would be available for treatment. According to Petitioners, institution of the treatment processes required under Section 306.305 would result in the following discharges:

Complete treatment: 238 MG x 5 mg/l	x	8.34	=	9,925 lb/year
First flush treatment:[4] 40 MG x 5 mg/l	x	8.34	=	1,668 lb/year
Primary treatment 130 MG x 30 mg/l	x	8.34	=	32,526 lb/year

[4] The Board notes that first flush is assumed to be 2.5 times ADFW. See also footnote 3.

No treatment
68 MG x 35 mg/l* x 8.34 = 19,849 lb/year
Total Annual BOD_5 Discharge = 63,968 lb/year

*Observed average concentration after first flush has subsided.

Response, July 21, 1986

Conversely, the 476 MG annual runoff currently receives the following treatment with these resulting discharges:

Complete treatment:
360 MG x 5 mg/l x 8.34 = 15,012 lb/year

No treatment
116 MG x 50 mg/l** x 8.34 = 48,372 lb year

Total Annual BOD_5 Discharge = 63,834 lb/year

**Observed average concentration over time including the quantity of BOD_2 associated with first flush.

Response, July 21, 1986

Thus the current pollutant capture capability, at least as measured by BOD_5, of the Elgin system is virtually identical to the amount required to be captured by the system were it in compliance with Section 306.305. The Agency summarizes its perspective on this matter by noting that "we are comfortable with the existing level of treatment". R. at 105. Moreover, it is noted that pollutant capture capability would increase even further should Elgin undertake replacement of the force main located between pump station #31 and the main treatment plant (see following).

PUMP STATION #31 AND ITS FORCE MAIN

Petitioners recognize that the principal conveyance limitation existing in the Elgin system is the capacity of the force main located between pump station #31 at Wellington Street and the main treatment plant. R. at 61, 106. Replacement of this force main, with some attendant modifications at either end of the force main, would allow Elgin to increase its treatment level by providing greater conveyance of combined sewer discharges to the main plant. This increased level of treatment would offer a corresponding decrease in the quantity and increase in the quality of the remaining CSO discharge.

The cost of upgrading the force main is approximately $2,000,000. Petitioners argue that this expenditure is not cost-effective at this time. Agency Response, March 25, 1987, at 2.

However, Petitioners do commit to replacement of the force main and upgrading of associated structures as a stipulated condition of the exception. These improvements would increase the minimum wet weather flow rate from 13 MGD to 16.5 MGD. Ex. I at 1 and 3; Agency Response, March 25, 1987, at 2. According to the stipulation, replacement and upgrading would occur when the force main requires replacement or the projected annual repairs exceed in expense 50% of the cost of replacement of the force main. Id. Additionally, the Agency would be able to monitor the situation though receipt of monthly summaries of all bypassing and repair and maintenance of pump station #31 and the force main. Id.

COMPLIANCE OPTIONS

Although not required pursuant to Section 306.361(a), Petitioners have provided extensive data on the costs which would be encountered were Elgin to implement system changes necessary to come into complete or partial compliance with Section 306.305. A large number of different scenarios have been developed, the principal of which are summarized below.

Complete sewer separation was estimated to cost $20,000 per acre. The total combined sewer area is 1,345 acres, which would produce a total construction cost of $26,900,000. Based on a service life of 50 years, an interest rate of 8.5 percent, and an annual operating cost of $90,000, the annualized cost for this system would be $2,416,000. Donohue Response, March 25, 1987, at 3.

Capture of the first flush, which for a one-year storm is estimated to result in a total volume of approximately 7 MG, would require enlarging the conveyance capacity of the sewer system and/or construction of holding facilities. Due to the large flow rates at which first flush occurs, Elgin believes that it is impractical to modify the conveyance capacity to allow routing of the full first flush to a central facility. Thus, holding sites have been postulated, where possible, immediately adjacent to the overflow sewers. Since all of the sites are in fully developed commercial/residential areas, construction of the holding facilities would require the acquisition and clearing of existing structures. In addition, the holding facilities would need to be below ground, covered, and equipped with pumping and cleaning and odor control devices. The construction cost for a system capable of accommodating the full first flush for a one year storm event is estimated at $18,050,000, with a total annual cost of $1,789,000. Donahue Response, March 25, 1987, at Table I.

To estimate the costs for primary treatment of 10 times ADWF, a general review of the existing diversion/interceptor

systems was conducted to determine what modifications would be necessary to collect and transport a flow of 16.5 MGD. It was determined that with one exception the interceptor sewers were adequate to transport the peak flows, but that all of the diversion structures would require modification or replacement to provide adequate diversion capacity and/or accurate flow control. The most significant restriction to transporting the required flow rate was found to be the existing pump station #31, which has a current discharge capacity to the Main Plant of approximately 13.4 MGD. Additional equipment also necessary would be primary clarifiers, a chlorine tank, and a force main. The cost estimate for this system expansion is estimated at $4,840,000. The Joint Petitioners do not consider this expenditure to be cost effective at this time, since 1) complete treatment is furnished to a significant portion of the flow which is required to receive only primary treatment, resulting in pollutant reductions equivalent to that required by Section 306.305(b) and 2) primary treatment of the remaining portion (approximately 3.1 MGD) will not result in any measurable benefit in water quality. The Sanitary District and the City have agreed, however, that should the force main need "major work" it will indeed be cost-effective to replace the force main and increase pumping capacity at that time, thus eliminating the need for an overflow from the pump station.

In addition, Elgin analyzed a number of partial solutions including separation of two of four sanitary sewer basins contributing to the combined system at a cost of $572,000. Flow in these two basins comprises the majority of the flow measured in the CSO basin to which they are tributary and this basin (Lake Street) contributes 0.56 MGD (35%) of the total dry weather flow of 1.6 MGD in the CSO area.

Information was also provided concerning the estimated cost for capturing 25, 50 and 75 percent of the first flush of the 1.2 inch per hour storm. Economies of scale dictate that the most economical partial capture system would involve full capture at certain cost-effective locations rather than partial capture at multiple locations. The three most cost-effective locations for capture of first flush, the Lord Street, Bluff City Boulevard, & Locust Street basins, would allow 79% capture of first flush and represent 77% of the full capture system cost, or $13,160,000. 50% of the first flush could be captured from the Lord Street & Bluff City Boulevard basins at a cost of $7,700,000, and 25% of first flush could be captured at the Lord Street Basin at a cost of $4,020,000. Donohue Response, March 25, 1987, at 4.

CONCLUSION

The Board determines that Petitioners have shown pursuant to 35 Ill. Adm. Code 306.361(a) that exception to 35 Ill. Adm. Code

306.305(a), as it relates to first flush of storm flows, and to 35 Ill. Adm. Code 306.305(b) would produce minimal impact on the receiving stream. Accordingly, the Board will grant the exception. The Board further will accept the conditions as agreed to by Petitioners.

ORDER

The City of Elgin and the Elgin Sanitary District are hereby granted an exception from the treatment requirements of 35 Ill. Adm. Code 306.305(a), as such provision relates to first flush of storm flows, and from 35 Ill. Adm. Code 306.305(b) for combined sewer overflows to the Fox River, subject to the following conditions:

1. The Elgin S.D. will transport maximum wet weather flow to the treatment plant via the pump station #31 and force main from Wellington Street to the treatment plant, but in no event shall the pump station and force main deliver less than 13 MGD of wet weather flow to the treatment plant prior to and during any bypassing at Wellington Street pump station #31.

2. The Elgin S.D. shall submit to the Illinois Environmental Protection Agency, with its monthly Discharge Monitoring Reports the following information:

   a. beginning and ending times (to the nearest 5 minutes) of each period of bypassing at pump station #31;

   b. average flow rate in units of MGD through the force main at station #31 for each bypassing event described above; and

   c. a summary of all repair and maintenance of the pump station #31 and the force main between Wellington Street and the treatment plant.

3. The Sanitary District of Elgin, at such time as the force main between pump station #31 and the treatment plant requires replacement, or projected annual repairs exceed in expense 50% of the cost of replacement of the force main, shall upgrade the pump station, force main and treatment plant to the extent necessary to provide a minimum of 16.5 MGD of transport, primary treatment and disinfection for flow tributary to the pump station.

4. The Sanitary District of Elgin shall continue its program of inspection and maintenance of the combined

sewer diversion structures and shall keep records of the inspections and maintenance. It shall also continue to actively enforce all provisions of its pretreatment ordinance.

5. The City of Elgin shall continue its program to reduce the quantity of inflow and infiltration and its program to replace combined sewers with separate sanitary sewers.

6. This grant of exception does not preclude the Agency from exercising its authority to require as a permit condition a) a CSO monitoring program sufficient to assess compliance with this exception and any other Board regulations, including Section 306.305(c); and b) other controls if needed for compliance, including compliance with water quality standards.

7. This grant of exception is not to be construed as affecting the enforceability of any provisions of this exception, other Board regulations, or the Act.

IT IS SO ORDERED.

Board Members Bill Forcade and J. Theodore Meyer dissented.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Opinion and Order was adopted on the 10th day of June, 1987, by a vote of 4-2.

Dorothy M. Gunn

Dorothy M. Gunn, Clerk
Illinois Pollution Control Board

APPENDIX B
EXISTING SWWTF NPDES PERMIT

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 – (217) 782-3397
JAMES R. THOMPSON CENTER, 100 WEST RANDOLPH, SUITE 11-300, CHICAGO, IL 60601 – (312) 814-6026

217/782-0610 ROD R. BLAGOJEVICH, GOVERNOR DOUGLAS P. SCOTT, DIRECTOR

January 26, 2007

FEB 15 2007

Fox River Water Reclamation District
P.O. Box 328
Elgin, Illinois 60121-0328

Re: Fox River Water Reclamation District
Fox River Water Reclamation District South STP
NPDES Permit No. IL0028657
Final Permit

Gentlemen:

Attached is the final NPDES Permit for your discharge. In response to your comment letter of December 15, 2006, please note the revisions to Special Condition 18. The Permit as issued covers discharge limitations, monitoring, and reporting requirements. Failure to meet any portion of the Permit could result in civil and/or criminal penalties. The Illinois Environmental Protection Agency is ready and willing to assist you in interpreting any of the conditions of the Permit as they relate specifically to your discharge.

The Agency has begun a program allowing the submittal of electronic Discharge Monitoring Reports (eDMRs) instead of paper Discharge Monitoring Reports (DMRs). If you are interested in eDMRs, more information can be found on the Agency website, http://epa.state.il.us/water/edmr/index.html. If your facility is not registered in the eDMR program, a supply of preprinted paper DMR Forms for your facility will be sent to you prior to the initiation of DMR reporting under the reissued permit. Additional information and instructions will accompany the preprinted DMRs upon their arrival.

The attached Permit is effective as of the date indicated on the first page of the Permit. Until the effective date of any re-issued Permit, the limitations and conditions of the previously-issued Permit remain in full effect. You have the right to appeal any condition of the Permit to the Illinois Pollution Control Board within a 35 day period following the issuance date.

Should you have questions concerning the Permit, please contact Don Neteroeyer at the telephone number indicated above.

Sincerely,

Alan Keller

Alan Keller, P.E.
Manager, Permit Section
Division of Water Pollution Control

SAK:DGN:06042602.dlk

Attachment: Final Permit

cc: Records
Compliance Assurance Section
DesPlaines Region
USEPA
NIPC
City of Elgin

NPDES Permit No. IL0028657

Illinois Environmental Protection Agency

Division of Water Pollution Control

1021 North Grand Avenue East

Post Office Box 19276

Springfield, Illinois 62794-9276

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

Reissued (NPDES) Permit

Expiration Date: February 29, 2012

Issue Date: January 26, 2007
Effective Date: March 1, 2007

Name and Address of Permittee:

Fox River Water Reclamation District
P.O. Box 328
Elgin, Illinois 60121-0328

Facility Name and Address:

Fox River Water Reclamation District South STP
Raymond Street & Purify Drive
Elgin, Illinois
(Kane County)

Receiving Waters: Fox River

In compliance with the provisions of the Illinois Environmental Protection Act, Title 35 of the Ill. Adm. Code, Subtitle C, Chapter I, and the Clean Water Act (CWA), the above-named Permittee is hereby authorized to discharge at the above location to the above-named receiving stream in accordance with the standard conditions and attachments herein.

Permittee is not authorized to discharge after the above expiration date. In order to receive authorization to discharge beyond the expiration date, the Permittee shall submit the proper application as required by the Illinois Environmental Protection Agency (IEPA) not later than 180 days prior to the expiration date.

Alan Keller

Alan Keller, P.E.
Manager, Permit Section
Division of Water Pollution Control

SAK:DGN:06042602.dlk

NPDES Permit No. IL0028657

Effluent Limitations, Monitoring, and Reporting

FINAL

Discharge Number(s) and Name(s): 001 STP Outfall

Load limits computed based on a design average flow (DAF) of 25.0 MGD (design maximum flow (DMF) of 50.0 MGD).

Excess flowfacilities (if applicable) shall not be utilized until the main treatment facility is receiving its maximum practical flow.

From the effective date of this Permit until the expiration date, the effluent of the above discharge(s) shall be monitored and limited at all times as follows:

	LOAD LIMITS lbs/day DAF (DMF)*			CONCENTRATION LIMITS MG/L				
Parameter	Monthly Average	Weekly Average	Daily Maximum	Monthly Average	Weekly Average	Daily Maximum	Sample Frequency	Sample Type
Flow (MGD)							Continuous	
$CBOD_5$**	2,085 (4,170)		4,170 (8,340)	10		20	2 Days/Week	Composite
Suspended Solids	2,502 (5,004)		5,004 (10,008)	12		24	2 Days/Week	Composite
Dissolved Oxygen***	Shall not be less than 6 mg/L						2 Days/Week	Grab
pH	Shall be in the range of 6 to 9 Standard Units						2 Days/Week	Grab
Fecal Coliform**** (may-oct)	The monthly geometric mean shall not exceed 200 per 100 mL and no more than 10% of the samples collected in a month shall exceed 400 per 100 mL						5 Days/Week	Grab
Chlorine Residual****				0.1		0.15	5 Days/Week	Grab
Ammonia Nitrogen as (N)								
March	584 (1168)		688 (1376)	2.8		3.3	2 Days/Week	Composite
Apr.-May/Sept.-Oct.	313 (626)		563 (1126)	1.5		2.7	2 Days/Week	Composite
June-August	313 (626)		605 (1209)	1.5		2.9	2 Days/Week	Composite
Nov.-Feb.	---	---	605 (1209)	---		2.9	2 Days/Week	Composite

*Load limits based on design maximum flow shall apply only when flow exceeds design average flow.
**Carbonaceous BOD_5 ($CBOD_5$) testing shall be in accordance with 40 CFR 136.
***See Special Condition 18.
****See Special Condition 8.

Flow shall be reported on the Discharge Monitoring Report (DMR) as monthly average and daily maximum.

Dissolved oxygen shall be reported on the DMR as a minimum.

pH shall be reported on the DMR as a minimum and a maximum.

Fecal Coliform shall be reported on the DMR as a geometric mean and as a percentage of the samples exceeding 400 per 100 mL.

Chlorine Residual shall be reported on the DMR as a monthly average and daily maximum.

NPDES Permit No. IL0028657

Effluent Limitations, Monitoring, and Reporting

FINAL

Discharge Number(s) and Name(s): A01 Treated Combined Sewage Outfall

Excess flow facilities shall not be utilized until the main treatment facility is receiving its maximum practical flow.

From the effective date of this Permit until the expiration date, the effluent of the above discharge(s) shall be monitored and limited at all times as follows:

		CONCENTRATION LIMITS mg/L		
Parameter		Monthly Average	Sample Frequency	Sample Type
Total Flow (MG)	See Below		Continuous When Discharging	
BOD_5		Report	Daily When Discharging	Grab
Suspended Solids		Report	Daily When Discharging	Grab
Fecal Coliform	Daily Maximum Shall Not Exceed 400 per 100 mL		Daily When Discharging	Grab
pH	Shall be in the range of 6 to 9 Standard Units		Daily When Discharging	Grab
Chlorine Residual		0.75	Daily When Discharging	Grab

Total flow in million gallons shall be reported on the Discharge Monitoring Report (DMR) in the quantity maximum column.

Report the number of days of discharge in the comments section of the DMR.

Fecal Coliform shall be reported on the DMR as daily maximum.

Chlorine Residual shall be reported on the DMR as a monthly average concentration.

pH shall be reported on the DMR as a minimum and a maximum.

BOD_5 and Suspended Solids shall be reported on the DMR as a monthly average concentration.

NPDES Permit No. IL0028657

Influent Monitoring, and Reporting

The influent to the plant shall be monitored as follows:

Parameter	Sample Frequency	Sample Type
Flow (MGD)	Continuous	
BOD_5	2 Days/Week	Composite
Suspended Solids	2 Days/Week	Composite

Influent samples shall be taken at a point representative of the influent.

Flow (MGD) shall be reported on the Discharge Monitoring Report (DMR) as monthly average and daily maximum.

BOD_5 and Suspended Solids shall be reported on the DMR as a monthly average concentration.

NPDES Permit No. IL0028657

Special Conditions

SPECIAL CONDITION 1. This Permit may be modified to include different final effluent limitations or requirements which are consistent with applicable laws, regulations, or judicial orders. The IEPA will public notice the permit modification.

SPECIAL CONDITION 2. The use or operation of this facility shall be by or under the supervision of a Certified Class 1 operator.

SPECIAL CONDITION 3. The IEPA may request in writing submittal of operational information in a specified form and at a required frequency at any time during the effective period of this Permit.

SPECIAL CONDITION 4. The IEPA may request more frequent monitoring by permit modification pursuant to 40 CFR § 122.63 and Without Public Notice in the event of operational, maintenance or other problems resulting in possible effluent deterioration.

SPECIAL CONDITION 5. The effluent, alone or in combination with other sources, shall not cause a violation of any applicable water quality standard outlined in 35 Ill. Adm. Code 302.

SPECIAL CONDITION 6. Samples taken in compliance with the effluent monitoring requirements shall be taken:

a. For Discharge Number 001 - During dry weather flows (no excess flow discharge), samples shall be taken at a point representative of the flows but prior to entry into the receiving stream. During periods of excess flow discharge, $CBOD_5$, Suspended Solids, and Ammonia Nitrogen, if Ammonia Nitrogen monitoring and sampling is required on the Effluent Limitations, Monitoring, and Reporting Page of this Permit, shall be monitored at a point representative of the discharge but prior to admixture with the excess flow. If Fecal Coliform limits are different for Discharge Numbers 001 and A01, sampling shall occur at a point representative of the discharge and prior to admixture, if hardware allows. Other parameters may be sampled after admixture but prior to entry into the receiving stream.

b. For Discharge Number A01 - Samples for all parameters shall be taken at a point representative of the discharge but prior to entry into the receiving stream. If Fecal Coliform limits are different for Discharge Numbers 001 and A01, sampling shall occur at a point representative of the discharge and prior to admixture, if hardware allows. The sampling point for other parameters may be at a point after admixture with the dry weather flows.

SPECIAL CONDITION 7. This Permit may be modified to include requirements for the Permittee on a continuing basis to evaluate and detail its efforts to effectively control sources of infiltration and inflow into the sewer system and to submit reports to the IEPA if necessary.

SPECIAL CONDITION 8 Fecal Coliform limits for discharge point 001 are effective May thru October. Sampling of Fecal Coliform is only required during this time period.

The total residual chlorine limit is applicable at all times. If the Permittee is chlorinating for any purpose during the months of November through April, sampling is required on a daily grab basis. Sampling frequency for the months of May through October shall be as indicated on effluent limitations, monitoring and reporting page of this Permit.

SPECIAL CONDITION 9

A. Publicly Owned Treatment Works (POTW) Pretreatment Program General Provisions

1. The Permittee shall implement and enforce its approved Pretreatment Program which was approved on September 3, 1985 and all approved subsequent modifications thereto. The Permittee shall maintain legal authority adequate to fully implement the Pretreatment Program in compliance with Federal (40 CFR 403), State, and local laws. The Permittee shall:

   a. Carry out independent inspection and monitoring procedures at least once per year, which will determine whether each significant industrial user (SIU) is in compliance with applicable pretreatment standards;

   b. Perform an evaluation, at least once every two (2) years, to determine whether each SIU needs a slug control plan. If needed, the SIU slug control plan shall include the items specified in 40 CFR § 403.8 (f)(2)(v);

   c. Update its inventory of Industrial Users (Ius) at least annually and as needed to ensure that all SIUs are properly identified, characterized, and categorized

d. Receive and review self monitoring and other IU reports to determine compliance with all pretreatment standards and requirements, and obtain appropriate remedies for noncompliance by any IU with any pretreatment standard and/or requirement;

e. Investigate instances of noncompliance, collect and analyze samples, and compile other information with sufficient care as to produce evidence admissible in enforcement proceedings, including judicial action;

f. Require development, as necessary, of compliance schedules by each industrial user for the installation of control technologies to meet applicable pretreatment standards; and,

g. Maintain an adequate revenue structure for continued operation of the Pretreatment Program.

2. The Permittee shall issue/reissue permits or equivalent control mechanisms to all SIUs prior to expiration of existing permits or prior to commencement of discharge in the case of new discharges. The permits at a minimum shall include the elements listed in 40 CFR § 403.8(f)(1)(iii).

3. The Permittee shall develop, maintain, and enforce, as necessary, local limits to implement the prohibitions in 40 CFR § 403.5 which prohibit the introduction of specific pollutants to the waste treatment system from any source of nondomestic discharge.

4. In addition to the general limitations expressed in Paragraph 3 above, applicable pretreatment standards must be met by all industrial users of the POTW. These limitations include specific standards for certain industrial categories as determined by Section 307(b) and (c) of the Clean Water Act, State limits, or local limits, whichever are more stringent.

5. The USEPA and IEPA individually retain the right to take legal action against any industrial user and/or the POTW for those cases where an industrial user has failed to meet an applicable pretreatment standard by the deadline date regardless of whether or not such failure has resulted in a permit violation.

6. The Permittee shall establish agreements with all contributing jurisdictions, as necessary, to enable it to fulfill its requirements with respect to all Ius discharging to its system.

7. Unless already completed, the Permittee shall within six (6) months of the effective date of this Permit submit to USEPA and IEPA a proposal to modify and update its approved Pretreatment Program to incorporate Federal revisions to the general pretreatment regulations. The proposal shall include all changes to the approved program and the sewer use ordinance which are necessary to incorporate the regulations commonly referred to as PIRT and DSS, which were effective November 16, 1988 and August 23, 1990, respectively. This includes the development of an Enforcement Response Plan (ERP) and a technical re-evaluation of the Permittee's local limits.

B. Reporting and Records Requirements

1. The Permittee shall provide an annual report briefly describing the permittee's pretreatment program activities over the previous calendar year. Permittees who operate multiple plants may provide a single report providing all plant-specific reporting requirements are met. Such report shall be submitted no later than April 28th of each year, and shall be in the format set forth in IEPA's POTW Pretreatment Report Package which contains information regarding:

a An updated listing of the Permittee's industrial users.

b A descriptive summary of the compliance activities including numbers of any major enforcement actions, (i.e., administrative orders, penalties, civil actions, etc.), and the outcome of those actions. This includes an assessment of the compliance status of the Permittee's industrial users and the effectiveness of the Permittee's Pretreatment Program in meeting its needs and objectives.

c A description of all substantive changes made to the Permittee's Pretreatment Program. Changes which are "substantial modifications" as described in 40 CFR § 403.18(c) must receive prior approval from the Approval Authority.

d Results of sampling and analysis of POTW influent, effluent, and sludge.

Special Conditions

2. The Permittee shall maintain all pretreatment data and records for a minimum of three (3) years. This period shall be extended during the course of unresolved litigation or when requested by the IEPA or the Regional Administrator of USEPA. Records shall be available to USEPA and the IEPA upon request.

3. The Permittee shall establish public participation requirements of 40 CFR 25 in implementation of its Pretreatment Program. The Permittee shall at least annually, publish the names of all IU's which were in significant noncompliance (SNC), as defined by 40 CFR § 403.8(f)(2)(vii), in the largest daily paper in the municipality in which the POTW is located or based on any more restrictive definition of SNC that the POTW may be using.

4. The Permittee shall provide written notification to the Deputy Counsel for the Division of Water Pollution Control, IEPA, 1021 North Grand Avenue East, P.O. Box 19276, Springfield, Illinois 62794-9276 within five (5) days of receiving notice that any Industrial User of its sewage treatment plant is appealing to the Circuit Court any condition imposed by the Permittee in any permit issued to the Industrial User by Permittee. A copy of the Industrial User's appeal and all other pleadings filed by all parties shall be mailed to the Deputy Counsel within five (5) days of the pleadings being filed in Circuit Court.

C. Monitoring Requirements

1. The Permittee shall monitor its influent, effluent and sludge and report concentrations of the following parameters on monitoring report forms provided by the IEPA and include them in its annual report. Samples shall be taken at quarterly intervals at the indicated detection limit or better and consist of a 24-hour composite unless otherwise specified below. Sludge samples shall be taken of final sludge and consist of a grab sample reported on a dry weight basis.

STORET CODE	PARAMETER	Minimum detection limit
01097	Antimony	0.07 mg/L
01002	Arsenic	0.05 mg/L
01007	Barium	0.5 mg/L
01012	Beryllium	0.005 mg/L
01027	Cadmium	0.001 mg/L
01032	Chromium* (hex - grab not to exceed 24 hours)	0.01 mg/L
01034	Chromium (total)	0.05 mg/L
01042	Copper	0.005 mg/L
00718	Cyanide (grab) (weak acid dissociable)	5.0 ug/L
00720	Cyanide (grab) (total)	5.0 ug/L
00951	Fluoride*	0.1 mg/L
01045	Iron (total)	0.5 mg/L
01046	Iron* (Dissolved)	0.5 mg/L
01051	Lead	0.05 mg/L
01055	Manganese	0.5 mg/L
71900	Mercury(effluent grab using USEPA Method 1631 or equivalent)***	1.0 ng/L**
01067	Nickel	0.005 mg/L
00556	Oil* (hexane soluble or equivalent) (Grab Sample only)	5.0 mg/L
32730	Phenols (grab)	0.005 mg/L
01147	Selenium	0.005 mg/L
01077	Silver (total)	0.003 mg/L
01059	Thallium	0.3 mg/L
01092	Zinc	0.025 mg/L

*Influent and effluent only
**1 ng/L = 1 part per trillion
*** Other approved methods may be used for influent (composite) and sludge

Unless otherwise indicated, concentrations refer to the total amount of the constituent present in all phases, whether solid, suspended or dissolved, elemental or combined including all oxidation states. Where constituents are commonly measured as other than total, the phase is so indicated.

Special Conditions

2. The Permittee shall conduct an analysis for the one hundred and ten (110) organic priority pollutants identified in 40 CFR 122 Appendix D, Table II as amended. This monitoring shall be done annually and reported on monitoring report forms provided by the IEPA and shall consist of the following:

   a The influent and effluent shall be sampled and analyzed for the one hundred and ten (110) organic priority pollutants. The sampling shall be done during a day when industrial discharges are expected to be occurring at normal to maximum levels.

   Samples for the analysis of acid and base/neutral extractable compounds shall be 24-hour composites.

   Five (5) grab samples shall be collected each monitoring day to be analyzed for volatile organic compounds. A single analysis for volatile pollutants (Method 624) may be run for each monitoring day by compositing equal volumes of each grab sample directly in the GC purge and trap apparatus in the laboratory, with no less than one (1) mL of each grab included in the composite.

   Wastewater samples must be handled, prepared, and analyzed by GC/MS in accordance with USEPA Methods 624 and 625 of 40 CFR 136 as amended.

   b. The sludge shall be sampled and analyzed for the one hundred and ten (110) organic priority pollutants. A sludge sample shall be collected concurrent with a wastewater sample and taken as final sludge.

   Sampling and analysis shall conform to USEPA Methods 624 and 625 unless an alternate method has been approved by IEPA.

   c Sample collection, preservation and storage shall conform to approved USEPA procedures and requirements.

3. In addition, the Permittee shall monitor any new toxic substances as defined by the Clean Water Act, as amended, following notification by the IEPA.

4. Permittee shall report any noncompliance with effluent or water quality standards in accordance with Standard Condition 12(e) of this Permit.

5. Analytical detection limits shall be in accordance with 40 CFR 136. Minimum detection limits for sludge analyses shall be in accordance with 40 CFR 503.

SPECIAL CONDITION 10. During January of each year the Permittee shall submit annual fiscal data regarding sewerage system operations to the Illinois Environmental Protection Agency/Division of Water Pollution Control/Compliance Assurance Section. The Permittee may use any fiscal year period provided the period ends within twelve (12) months of the submission date.

Submission shall be on forms provided by IEPA titled "Fiscal Report Form For NPDES Permittees".

SPECIAL CONDITION 11. The Permittee shall conduct biomonitoring of the effluent from Discharge Number(s) 001.

Biomonitoring

1. Acute Toxicity - Standard definitive acute toxicity tests shall be run on at least two trophic levels of aquatic species (fish, invertebrate) representative of the aquatic community of the receiving stream. Testing must be consistent with Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms (Fifth Ed.) EPA/821-R-02-012. Unless substitute tests are pre-approved; the following tests are required:

   a. Fish - 96 hour static LC_{50} Bioassay using fathead minnows (Pimephales promelas).

   b. Invertebrate 48-hour static LC_{50} Bioassay using Ceriodaphnia.

2. Testing Frequency - The above tests shall be conducted using 24-hour composite samples unless otherwise authorized by the IEPA. Samples must be collected in the 18th, 15th, 12th, and 9th month prior to the expiration date of this Permit.

3. Reporting - Results shall be reported according to EPA/821-R-02-012, Section 12, Report Preparation, and shall be submitted to IEPA, Bureau of Water, Compliance Assurance Section within one week of receipt from the laboratory. Reports are due to the IEPA no later than the 16th, 13th, 10th, and 7th month prior to the expiration date of this Permit.

4. Toxicity Reduction Evaluation - Should the results of the biomonitoring program identify toxicity, the IEPA may require that the Permittee prepare a plan for toxicity reduction evaluation and identification. This plan shall be developed in accordance with Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants, EPA/833B-99/002, and shall include an evaluation to determine which chemicals have a potential for being discharged in the plant wastewater, a monitoring program to determine their presence or absence and to identify other compounds which are not being removed by treatment, and other measures as appropriate. The Permittee shall submit to the IEPA its plan for toxicity reduction evaluation within ninety (90) days following notification by the IEPA. The Permittee shall implement the plan within ninety (90) days or other such date as contained in a notification letter received from the IEPA.

   The IEPA may modify this Permit during its term to incorporate additional requirements or limitations based on the results of the biomonitoring. In addition, after review of the monitoring results, the IEPA may modify this Permit to include numerical limitations for specific toxic pollutants. Modifications under this condition shall follow public notice and opportunity for hearing.

SPECIAL CONDITION 12.

AUTHORIZATION OF
COMBINED SEWER AND TREATMENT PLANT DISCHARGES

The IEPA has determined that at least a portion of the collection system consists of combined sewers. References to the collection system and the sewer system refer only to those parts of the system which are owned and operated by the Permittee unless otherwise indicated. The Permittee is authorized to discharge from the overflow(s)/bypass(es) listed below provided the diversion structure is located on a combined sewer and the following terms and conditions are met:

Discharge Number	Location	Receiving Water
004	Pump Station # 31 (Lower Wellington Avenue)	Fox River

Treatment Requirements

1. All combined sewer overflows and treatment plant bypasses shall be given sufficient treatment to prevent pollution and the violation of applicable water quality standards. Sufficient treatment shall consist of the following:

   a. Treatment as described in PCB 85-222 and dated June 10, 1987 shall be provided. The terms and conditions of this Board Order are hereby incorporated by reference as if fully set forth herein; and,

   b. Any additional treatment, necessary to comply with applicable water quality standards and the federal Clean Water Act, including any amendments made by the Wet Weather Water Quality Act of 2000.

2. All CSO discharges authorized by this Permit shall be treated, in whole or in part, to the extent necessary to prevent accumulations of sludge deposits, floating debris and solids in accordance with 35 Ill. Adm. Code 302.203 and to prevent depression of oxygen levels below the applicable water quality standards.

3. Overflows during dry weather are prohibited. Dry weather overflows shall be reported to the IEPA pursuant to Standard Condition 12(e) of this Permit (24 hour notice).

4. The collection system shall be operated to optimize transport of wastewater flows and to minimize CSO discharges.

5. The treatment system shall be operated to maximize treatment of wastewater flows.

Nine Minimum Controls

6. The Permittee shall comply with the nine minimum controls contained in the National CSO Control Policy published in the Federal Register on April 19, 1994. The nine minimum controls are:

   a. Proper operation and maintenance programs for the sewer system and the CSOs (Compliance with this Item shall be met through the requirements imposed by Paragraph 8 of this Special Condition);

b. Maximum use of the collection system for storage (Compliance with this Item shall be met through the requirements imposed by Paragraphs 1, 4, and 8 of this Special Condition);

c. Review and modification of pretreatment requirements to assure CSO impacts are minimized (Compliance with this Item shall be met through the requirements imposed by Paragraph 9 of this Special Condition);

d. Maximization of flow to the POTW for treatment (Compliance with this Item shall be met through the requirements imposed by Paragraphs 4, 5, and 8 of this Special Condition);

e. Prohibition of CSOs during dry weather (Compliance with this Item shall be met through the requirements imposed by Paragraph 3 of this Special Condition);

f. Control of solids and floatable materials in CSOs (Compliance with this Item shall be met through the requirements imposed by Paragraphs 2 and 8 of this Special Condition);

g. Pollution prevention programs which focus on source control activities (Compliance with this Item shall be met through the requirements imposed by Paragraph 6 of this Special Condition, **See Below**);

h. Public notification to ensure that citizens receive adequate information regarding CSO occurrences and CSO impacts (Compliance with this Item shall be met through the requirements imposed by Paragraphs 7 and 12 of this Special Condition); and,

i. Monitoring to characterize impacts and efficiency of CSO controls (Compliance with this Item shall be met through the requirements imposed by Paragraphs 10 and 11 of this Special Condition).

A pollution prevention plan (PPP) shall be developed by the Permittee unless one has already been prepared for this collection system. Any previously-prepared PPP shall be reviewed, and revised if necessary, by the Permittee to address the items contained in Chapter 8 of the U.S. EPA guidance document, Combined Sewer Overflows, Guidance For Nine Minimum Controls, and any items contained in previously-sent review documents from the IEPA concerning the PPP. Combined Sewer Overflows, Guidance For Nine Minimum Controls is available online at http://www.epa.gov/npdes/pubs/owm0030.pdf. The PPP (or revised PPP) shall be presented to the general public at a public information meeting conducted by the Permittee within nine (9) months of the effective date of this Permit. The Permittee shall submit documentation that the pollution prevention plan complies with the requirements of this Permit and that the public information meeting was held. Such documentation shall be submitted to the IEPA within twelve (12) months of the effective date of this Permit and shall include a summary of all significant issues raised by the public, the Permittee's response to each issue, and two (2) copies of the "CSO Pollution Prevention Plan Certification" one (1) with original signatures. This certification form is available online at http://www.epa.state.il.us/water/permits/waste-water/forms/cso-pol-prev.pdf. Following the public meeting, the Permittee shall implement the pollution prevention plan within one (1) year and shall maintain a current pollution prevention plan, updated to reflect system modifications, on file at the sewage treatment works or other acceptable location and made available to the public. The pollution prevention plan shall be submitted to the IEPA upon written request. The Permittee may coordinate the development/review of the PPP and the public meeting with the City of Elgin.

Sensitive Area Considerations

7. Pursuant to Section II.C.3 of the federal CSO Control Policy of 1994, sensitive areas are any water likely to be impacted by a CSO discharge which meet one or more of the following criteria: (1) designated as an Outstanding National Resource Water; (2) found to contain shellfish beds; (3) found to contain threatened or endangered aquatic species or their habitat; (4) used for primary contact recreation; or, (5) within the protection area for a drinking water intake structure.

Within nine (9) months of the effective date of this Permit, the Permittee shall provide information sufficient for the IEPA to make a determination pursuant to Section II.C.3 of the federal CSO Control Policy of 1994 as to which of the CSOs are authorized for discharge in this Permit discharge into Sensitive Areas. Failure to provide information sufficient for the IEPA to make this determination in the long-term control plan could result in a determination that some or all of the CSOs discharge into a sensitive area. Should the IEPA conclude that any of the CSOs listed in this Special Condition discharge to a sensitive area, the Permittee shall adress these CSOs through the long-term control plan and either relocate, control, or treat discharges from these outfalls. If none of these options are possible, the Permittee shall submit adequate justification as to why these options are not possible. Such justification shall be in accordance with Section II.C.3 of the National CSO Control Policy and shall be updated every five (5) years and submitted with the NPDES renewal application as required by the federal CSO Control Policy of 1994.

Special Conditions

Operational and Maintenance Plans

8. The IEPA reviewed and accepted a CSO operational and maintenance plan "CSO O&M plan" on August 14, 1998 prepared for this sewerage system. The Permittee shall review and revise, if needed, the CSO O&M plan to reflect system changes.

   The CSO O&M plan shall be presented to the general public at a public information meeting conducted by the Permittee within nine (9) months of the effective date of this Permit. The Permittee shall submit documentation that the CSO O&M plan complies with the requirements of this Permit and that the public information meeting was held. Such documentation shall be submitted to the IEPA within twelve (12) months of the effective date of this Permit and shall include a summary of all significant issues raised by the public, the Permittee's response to each issue, and two (2) copies of the "CSO Operational Plan Checklist and Certification", one (1) with original signatures. Copies of the "CSO Operational Plan Checklist and Certification" are available online at http://www.epa.state.il.us/water/permits/waste-water/forms/cso-checklist.pdf. Following the public meeting, the Permittee shall implement the CSO O&M plan within one (1) year and shall maintain a current CSO O&M plan, updated to reflect system modifications, on file at the sewage treatment works or other acceptable location and made available to the public. The CSO O&M plan shall be submitted to the IEPA upon written request. The Permittee may coordinate the review of the CSO O&M and the public meeting with the City of Elgin.

   The objectives of the CSO O&M plan are to reduce the total loading of pollutants and floatables entering the receiving stream and to ensure that the Permittee ultimately achieves compliance with water quality standards. These plans, tailored to the local governments's collection and waste treatment systems, shall include mechanisms and specific procedures where applicable to ensure:

   a. Collection system inspection on a scheduled basis;

   b. Sewer, catch basin, and regulator cleaning and maintenance on a scheduled basis;

   c. Inspections are made and preventive maintenance is performed on all pump/lift stations;

   d. Collection system replacement, where necessary;

   e. Detection and elimination of illegal connections;

   f. Detection, prevention, and elimination of dry weather overflows;

   g. The collection system is operated to maximize storage capacity and the combined sewer portions of the collection system are operated to delay storm entry into the system; and,

   h. The treatment and collection systems are operated to maximize treatment.

Sewer Use Ordinances

9. The Permittee, within six (6) months of the effective date of this Permit, shall review and where necessary, modify its existing sewer use ordinance to ensure it contains provisions addressing the conditions below. If no ordinance exists, such ordinance shall be developed and implemented within six (6) months from the effective date of this Permit. Upon completion of the review of the sewer use ordinance(s), the Permittee shall submit two (2) copies of a completed "Certification of Sewer Use Ordinance Review", one (1) with original signatures. Copies of this certification form can be obtained online at http://www.epa.state.il.us/water/permits/waste-water/forms/sewer-use.pdf. The Permittee shall submit copies of the sewer use ordinance(s) to the IEPA upon written request. Sewer use ordinances are to contain specific provisions to:

   a. prohibit introduction of new inflow sources to the sanitary sewer system;

   b. require that new construction tributary to the combined sewer system be designed to minimize and/or delay inflow contribution to the combined sewer system;

   c. require that inflow sources on the combined sewer system be connected to a storm sewer, within a reasonable period of time, if a storm sewer becomes available;

   d. provide that any new building domestic waste connection shall be distinct from the building inflow connection, to facilitate disconnection if a storm sewer becomes available;

e. assure that CSO impacts from non-domestic sources are minimized by determining which non-domestic discharges, if any, are tributary to CSOs and reviewing, and, if necessary, modifying the sewer use ordinance to control pollutants in these discharges; and,

f. assure that the owners of all publicly owned systems with combined sewers tributary to the Permittee's collection system have procedures in place adequate to ensure that the objectives, mechanisms, and specific procedures given in Paragraph 8 of this Special Condition are achieved.

The Permittee shall enforce the applicable sewer use ordinances.

Long-Term Control Planning and Compliance with Water Quality Standards

10. a. Pursuant to Section 301 of the federal Clean Water Act, 33 U.S.C. § 1311 and 40 CFR § 122.4, discharges from the CSOs, including the outfalls listed in this Special Condition and any other outfall listed as a "Treated Combined Sewage Outfall", shall not cause or contribute to violations of applicable water quality standards or cause use impairment in the receiving waters. In addition, discharges from CSOs shall comply with all applicable parts of 35 Ill. Adm. Code 306.305(a), (b), (c), and (d).

b. The Permittee shall develop a Long-Term CSO Control Plan (LTCP) for assuring that the discharges from the CSOs (treated or untreated) authorized in this Permit comply with Paragraph 10.a above and all applicable standards, including water quality standards. Two (2) copies of the LTCP shall be submitted to the IEPA within thirty-six (36) months of the effective date of this Permit. The LTCP shall contain all applicable elements of Paragraph 10.c below including a schedule for implementation and provisions for re-evaluating compliance with applicable standards and regulations after implementation. The LTCP shall be:

1. Consistent with Section II.C.4.a.i of the Policy; or,
2. Consistent with either Section II.C.4.a.ii, Section II.C.4.a.iii, or Section II.C.4.b of the Policy and be accompanied by data sufficient to demonstrate that the LTCP, when completely implemented, will be sufficient to meet water quality standards.

c. Pursuant to the Policy, the required components of the LTCP include the following:

1. Characterization, monitoring, and modeling of the Combined Sewer System (CSS);
2. Consideration of Sensitive Areas;
3. Evaluation of alternatives;
4. Cost/Performance considerations;
5. Revised CSO Operational Plan;
6. Maximizing treatment at the treatment plant;
7. Implementation schedule;
8. Post-Construction compliance monitoring program; and
9. Public participation.

The Permittee shall coordinate the development and implementation of the LTCP with the City of Elgin. Following submittal of the LTCP, the Permittee shall respond to any initial IEPA review letter in writing within ninety (90) days of the date of such a review letter, and within thirty (30) days of any subsequent review letter(s), if any. Implementation of the LTCP shall be as indicated by IEPA in writing or other enforceable mechanism.

d. The IEPA recognizes the Fox River Study Group (FRSG) is currently working on funding mechanisms to gather data and to develop and calibrate a model to determine appropriate limitations and permit requirements for dischargers to the Fox River. The implementation schedule for the LTCP shall give priority to controlling, treating, or eliminating CSOs which discharge into areas where primary contact activities occur and to other areas that may be considered sensitive pursuant to Section II.C.3 of the federal CSO Control Policy. The LTCP implementation schedule may also allow the Permittee to verify by appropriate methods, including use of the FRSG-developed model after it is calibrated, and to ensure that the selected CSO control alternatives are adequate to meet water quality standards and to protect the designated uses in the receiving waters. The length of the implementation schedule shall also be based upon financial considerations pursuant to Section II.C.8 of the federal CSO Control Policy and on the USEPA guidance document, *Combined Sewer Overflows--Guidance for Financial Capability Assessment and Schedule Development*. This document is available online at http://www.epa.gov/npdes/pubs/csocf.pdf. Other guidance documents can be found at http://cfpub.epa.gov/npdes/cso/guidedocs.cfm.

Monitoring, Reporting and Notification Requirements

Special Conditions

11. The Permittee shall monitor the frequency of discharge (number of discharges per month) and estimate the duration (in hours) of each discharge from each outfall listed in this Special Condition. Estimates of storm duration and total rainfall shall be provided for each storm event.

    For frequency reporting, all discharges from the same storm, or occurring within 24 hours, shall be reported as one. The date that a discharge commences shall be recorded for each outfall. Reports shall be in the form specified by the IEPA and on forms provided by the IEPA. These forms shall be submitted to the IEPA monthly with the DMRs and covering the same reporting period as the DMRs. Parameters (other than flow frequency), if required in this Permit, shall be sampled and reported as indicated in the transmittal letter for such report forms.

12. A public notification program in accordance with Section II.B.8 of the federal CSO Control Policy of 1994 shall be developed employing a process that actively informs the affected public. The program shall include at a minimum public notification of CSO occurrences and CSO impacts, with consideration given to including mass media and/or Internet notification. The Permittee shall also consider posting signs in waters likely to be impacted by CSO discharges at the point of discharge and at points where these waters are used for primary contact recreation. Provisions shall be made to include modifications of the program when necessary and notification to any additional member of the affected public. The program shall be presented to the general public at a public information meeting conducted by the Permittee. The Permittee shall conduct the public information meeting within nine (9) months of the effective date of this Permit. The Permittee shall submit documentation that the public information meeting was held, shall submit a summary of all significant issues raised by the public and the Permittee's response to each issue and shall identify any modifications to the program as a result of the public information meeting. The Permittee shall submit the public information meeting documentation to the IEPA and implement the public notification program within twelve (12) months of the effective date of this Permit. The Permittee shall submit copies of the public notification program to the IEPA upon written request. The Permittee may coordinate the development of the public notification plan and the public meeting with the City of Elgin.

13. If any of the CSO discharge points listed in this Special Condition are eliminated, or if additional CSO discharge points, not listed in this Special Condition, are discovered, the Permittee shall notify the IEPA in writing within one (1) month of the respective outfall elimination or discovery. Such notification shall be in the form of a request for the appropriate modification of this NPDES Permit.

Summary of Compliance Dates in this CSO Special Condition

14. The following summarizes the dates that submittals contained in this Special Condition are due at the IEPA (unless otherwise indicated):

Submission of CSO Monitoring Data (Paragraph 11)	15th of every month
Elimination of a CSO or Discovery of Additional CSO Locations (Paragraph 13)	1 month from discovery or elimination
Control (or Justification for No Control) of CSOs to Sensitive Areas (Paragraph 7)	9 months from IEPA notification
Certification of Sewer Use Ordinance Review (Paragraph 9)	6 months from the effective date of this Permit
Conduct Pollution Prevention, OMP, and PN Public Information Meeting (Paragraphs, 6, 8 and 12) **No Submittal Due with this Milestone**	9 months from the effective date of this Permit
Submit Pollution Prevention Certification, OMP Certification, and PN Information Meeting Summary (Paragraphs, 6, 8 and 12)	12 months from the effective date of this Permit
Submit CSO Long-Term Control Plan (Paragraph 10)	36 months from the effective date of this Permit

Special Conditions

All submittals listed in this Special Condition can be mailed to the following address:

Illinois Environmental Protection Agency
Division of Water Pollution Control
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

Attention: CSO Coordinator, Compliance Assurance Section

All submittals hand carried shall be delivered to 1021 North Grand Avenue East.

Reopening and Modifying this Permit

15. The IEPA may initiate a modification for this Permit at any time to include requirements and compliance dates which have been submitted in writing by the Permittee and approved by the IEPA, or other requirements and dates which are necessary to carry out the provisions of the Illinois Environmental Protection Act, the Clean Water Act, or regulations promulgated under those Acts. Public Notice of such modifications and opportunity for public hearing shall be provided.

Following is a list of conditions the Fox River Water Reclamation District shall comply with in accord with PCB 85-222:

16. The Fox River WRD will transport maximum wet weather flow to the treatment plant via the pump station #31 and force main from Wellington Street to the treatment plant, but in no event shall the pump station and force main deliver less than 13 MGD of wet weather flow to the treatment plant prior to and during any bypassing at Wellington Street pump station #31.

17. The Permittee shall report any overflows from pump station #31 (Outfall 004) to the IEPA's Des Plaines Field Office orally within 24 hours of overflow event and by written submission within 5 days of the overflow event. The IEPA's Des Plaines Field Office can be contacted at either the phone number or address listed below:

Illinois Environmental Protection Agency
Des Plaines Field Office
9511 West Harrison
Des Plaines, Illinois 60016
(847) 294-4000

18. The Fox River WRD shall submit to the Illinois Environmental Protection Agency, with its monthly Discharge Monitoring Reports the following information:

    a. Beginning and ending times of each period of bypassing at pump station #31;

    b. Average flow rate in units of MGD through the force main at pump station #31 for each bypassing event described above; and

    c. A summary of all repair and maintenance of the pump station #31 and the force main between Wellington Street and the treatment plant.

    d. Discharges from pump station #31 shall be identifed as outfall 004 on the Discharge Monitoring Report form.

19. The Fox River WRD shall continue its program of inspection and maintenance of the combined sewer diversion structures and shall keep records of the inspections and maintenance. It shall also continue to actively enforce all provisions of its pretreatment ordinance.

20. The IEPA may reopen this Permit to require as permit conditions a) a CSO monitoring program sufficient to assess compliance with PCB order PCB 85-222 and any other Board regulations, including Section 306.305(c); and b) or other controls if needed for compliance, including compliance with water quality standards.

SPECIAL CONDITION 13. This Permit may be modified to include alternative or additional final effluent limitations or other requirements pursuant to an approved Total Maximum Daily Load (TMDL) Study or upon completion of an alternate Fox River Water Quality Study.

NPDES Permit No. IL0028657

Special Conditions

SPECIAL CONDITION 14. For the duration of this Permit, the Permittee shall determine the quantity of sludge produced by the treatment facility in dry tons or gallons with average percent total solids analysis. The Permittee shall maintain adequate records of the quantities of sludge produced and have said records available for IEPA inspection. The Permittee shall submit to the IEPA, at a minimum, a semi-annual summary report of the quantities of sludge generated and disposed of, in units of dry tons or gallons (average total percent solids) by different disposal methods including but not limited to application on farmland, application on reclamation land, landfilling, public distribution, dedicated land disposal, sod farms, storage lagoons or any other specified disposal method. Said reports shall be submitted to the IEPA by January 31 and July 31 of each year reporting the preceding January thru June and July thru December interval of sludge disposal operations.

Duty to Mitigate. The Permittee shall take all reasonable steps to minimize any sludge use or disposal in violation of this Permit.

Sludge monitoring must be conducted according to test procedures approved under 40 CFR 136 unless otherwise specified in 40 CFR 503, unless other test procedures have been specified in this Permit.

Planned Changes. The Permittee shall give notice to the IEPA on the semi-annual report of any changes in sludge use and disposal.

The Permittee shall retain records of all sludge monitoring, and reports required by the Sludge Permit as referenced in Standard Condition 23 for a period of at least five (5) years from the date of this Permit.

If the Permittee monitors any pollutant more frequently than required by the Sludge Permit, the results of this monitoring shall be included in the reporting of data submitted to the IEPA.

Monitoring reports for sludge shall be reported on the form titled "Sludge Management Reports" to the following address:

Illinois Environmental Protection Agency
Bureau of Water
Compliance Assurance Section
Mail Code #19
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

SPECIAL CONDITION 15. The Permittee shall record monitoring results on Discharge Monitoring Report (DMR) Forms using one such form for each outfall each month.

In the event that an outfall does not discharge during a monthly reporting period, the DMR Form shall be submitted with no discharge indicated.

The Permittee may choose to submit electronic DMRs (eDMRs) instead of mailing paper DMRs to the IEPA. More information, including registration information for the eDMR program, can be obtained on the IEPA website, http://www.epa.state.il.us/water/edmr/index.html.

The completed Discharge Monitoring Report forms shall be submitted to IEPA no later than the 20th day of the following month, unless otherwise specified by the permitting authority.

Permittees not using eDMRs shall mail Discharge Monitoring Reports with an original signature to the IEPA at the following address:

Illinois Environmental Protection Agency
Division of Water Pollution Control
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

Attention: Compliance Assurance Section, Mail Code # 19

SPECIAL CONDITION 16. The provisions of 40 CFR 122.41(m) Bypass, and (n) Upset, are hereby incorporated into this permit by reference.

NPDES Permit No. IL0028657

Special Conditions

SPECIAL CONDITION 17. The Permittee has undergone a Monitoring Reduction review and the influent and effluent sample frequency has been reduced for $CBOD_5$, BOD_5, Suspended Solids, pH and Ammonia due to sustained compliance. The IEPA will require that the influent and effluent sampling frequency for these parameters be increased to 5 days per week if effluent deterioration occurs due to increased wasteload, operational, maintenance or other problems. The increased monitoring will be required Without Public Notice when a permit modification is received by the Permittee from the IEPA.

SPECIAL CONDITION 18. A dissolved oxygen limit of a minimum of 6 mg/L shall become effective two (2) years from the effective date of this Permit.

The Permittee shall construct dissolved oxygen equipment in accordance with the following schedule:

1.	Progress Report	6 months from effective date of permit
2.	Monitoring Report submitted to IEPA	12 months from effective date of permit
3.	Progress Report	18 months from effective date of permit
4.	Obtain Operational Level	24 months from effective date of permit

Compliance dates set out in this Permit may be superseded or supplemented by compliance dates in judicial orders, Illinois Pollution Control Board orders. This Permit may be modified with Public Notice, to include such revised compliance dates.

This permit may be modified by the Agency to include any modified Dissolved Oxygen limitation pursuant to final rule making by the Illinois Pollution Control Board under Docket #R04-25.

Reporting shall be submitted on the DMR's on a monthly basis.

REPORTING

The Permittee shall submit progress reports for items 1, 3 and 4 of the compliance schedule indicating: a) the date the item was completed, or b) that the item was not completed, the reasons for non-completion and the anticipated completion date to the Agency Compliance Section.

Standard Conditions

Definitions

Act means the Illinois Environmental Protection Act, 415 ILCS 5 as Amended.

Agency means the Illinois Environmental Protection Agency.

Board means the Illinois Pollution Control Board.

Clean Water Act (formerly referred to as the Federal Water Pollution Control Act) means Pub. L. 92-500, as amended. 33 U.S.C. 1251 et seq.

NPDES (National Pollutant Discharge Elimination System) means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 402, 318 and 405 of the Clean Water Act.

USEPA means the United States Environmental Protection Agency.

Daily Discharge means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurements, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

Maximum Daily Discharge Limitation (daily maximum) means the highest allowable daily discharge.

Average Monthly Discharge Limitation (30 day average) means the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

Average Weekly Discharge Limitation (7 day average) means the highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the State. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Aliquot means a sample of specified volume used to make up a total composite sample.

Grab Sample means an individual sample of at least 100 milliliters collected at a randomly-selected time over a period not exceeding 15 minutes.

24 Hour Composite Sample means a combination of at least 8 sample aliquots of at least 100 milliliters, collected at periodic intervals during the operating hours of a facility over a 24-hour period.

8 Hour Composite Sample means a combination of at least 3 sample aliquots of at least 100 milliliters, collected at periodic intervals during the operating hours of a facility over an 8-hour period.

Flow Proportional Composite Sample means a combination of sample aliquots of at least 100 milliliters collected at periodic intervals such that either the time interval between each aliquot or the volume of each aliquot is proportional to either the stream flow at the time of sampling or the total stream flow since the collection of the previous aliquot.

(1) Duty to comply. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or for denial of a permit renewal application. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

(2) Duty to reapply. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. If the permittee submits a proper application as required by the Agency no later than 180 days prior to the expiration date, this permit shall continue in full force and effect until the final Agency decision on the application has been made.

(3) Need to halt or reduce activity not a defense. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

(4) Duty to mitigate. The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

(5) Proper operation and maintenance. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up, or auxiliary facilities, or similar systems only when necessary to achieve compliance with the conditions of the permit.

(6) Duty to provide information. The permittee shall furnish to the Agency within a reasonable time, any information which the Agency may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with the permit. The permittee shall also furnish to the Agency, upon request, copies of records required to be kept by this permit.

(7) Property rights. This permit does not convey any property rights of any sort, or any exclusive privilege.

(8) Duty to provide information. The permittee shall furnish to the Agency within a reasonable time, any information which the Agency may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with the permit. The permittee shall also furnish to the Agency, upon request, copies of records required to be kept by this permit.

(9) Inspection and entry. The permittee shall allow an authorized representative of the Agency, upon the presentation of credentials and other documents as may be required by law, to:

(a) Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

(b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

(c) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

(d) Sample or monitor at reasonable times, for the purpose of assuring permit compliance, or as otherwise authorized by the Act, any substances or parameters at any location.

(10) Monitoring and records.

(a) Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

(b) The permittee shall retain records of all monitoring information, including all calibration and maintenance records, and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of this permit, measurement, report or application. This period may be extended by request of the Agency at any time.

(c) Records of monitoring information shall include:

(1) The date, exact place, and time of sampling or measurements;

(2) The individual(s) who performed the sampling or measurements;

(3) The date(s) analyses were performed;

(4) The individual(s) who performed the analyses;

(5) The analytical techniques or methods used; and

(6) The results of such analyses.

(d) Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit. Where no test procedure under 40 CFR Part 136 has been approved, the permittee must submit to the Agency a test method for approval. The permittee shall calibrate and perform maintenance procedures on all monitoring and analytical instrumentation at intervals to ensure accuracy of measurements.

(11) Signatory requirement. All applications, reports or information submitted to the Agency shall be signed and certified.

(a) Application. All permit applications shall be signed as follows:

(1) For a corporation: by a principal executive officer of at least the level of vice president or a person or position having overall responsibility for environmental matters for the corporation;

(2) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

(3) For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official.

(b) Reports. All reports required by permits, or other information requested by the Agency shall be signed by a person described in paragraph (a) or by a duly authorized representative of that person. A person is a duly authorized representative only if:

(1) The authorization is made in writing by a person described in paragraph (a) and

(2) The authorization specifies either an individual or a position responsible for the overall operation of the facility, from which the discharge originates, such as a plant manager, superintendent or person of equivalent responsibility; and

(3) The written authorization is submitted to the Agency.

(c) Changes of Authorization. If an authorization under (b) is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of (b) must be submitted to the Agency prior to or together with any reports, information, or applications to be signed by an authorized representative.

(12) Reporting requirements.

(a) Planned changes. The permittee shall give notice to the Agency as soon as possible of any planned physical alterations or additions to the permitted facility.

(b) Anticipated noncompliance. The permittee shall give advance notice to the Agency of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

(c) Compliance schedules. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

(d) Monitoring reports. Monitoring results shall be reported at the intervals specified elsewhere in this permit.

(1) Monitoring results must be reported on a Discharge Monitoring Report (DMR).

(2) If the permittee monitors any pollutant more frequently than required by the permit, using test procedures approved under 40 CFR 136 or as specified in the permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR.

(3) Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified by the Agency in the permit.

(e) Twenty-four hour reporting. The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and time; and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. The following shall be included as information which must be reported within 24 hours:

(1) Any unanticipated bypass which exceeds any effluent limitation in the permit;

(2) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Agency in the permit to be reported within 24 hours.

The Agency may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

(f) Other noncompliance. The permittee shall report all instances of noncompliance not reported under paragraphs (12)(c), (d), or (e), at the time monitoring reports are submitted. The reports shall contain the information listed in paragraph (12)(e).

(g) Other information. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application, or in any report to the Agency, it shall promptly submit such facts or information.

(13) Transfer of permits. A permit may be automatically transferred to a new permittee if:

(a) The current permittee notifies the Agency at least 30 days in advance of the proposed transfer date;

(b) The notice includes a written agreement between the existing and new permittees containing a specific date for transfer of permit responsibility, coverage and liability between the current and new permittees; and

(c) The Agency does not notify the existing permittee and the proposed new permittee of its intent to modify or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement.

(14) All manufacturing, commercial, mining, and silvicultural dischargers must notify the Agency as soon as they know or have reason to believe:

(a) That any activity has occurred or will occur which would result in the discharge of any toxic pollutant identified under Section 307 of the Clean Water Act which is not limited in the permit, if that discharge will exceed the highest of the following notification levels:

(1) One hundred micrograms per liter (100 ug/l);

(2) Two hundred micrograms per liter (200 ug/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/l) for 2,4-dinitrophenol and for 2-methyl-4,6 dinitrophenol; and one milligram per liter (1 mg/l) for antimony.

(3) Five (5) times the maximum concentration value reported for that pollutant in the NPDES permit application; or

(4) The level established by the Agency in this permit.

(b) That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant which was not reported in the NPDES permit application.

(15) All Publicly Owned Treatment Works (POTWs) must provide adequate notice to the Agency of the following:

(a) Any new introduction of pollutants into that POTW from an indirect discharger which would be subject to Sections 301 or 306 of the Clean Water Act if it were directly discharging those pollutants; and

(b) Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.

(c) For purposes of this paragraph, adequate notice shall include information on (i) the quality and quantity of effluent introduced into the POTW, and (ii) the anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

(16) If the permit is issued to a publicly owned or publicly regulated treatment works, the permittee shall require any industrial user of such treatment works to comply with federal requirements concerning:

(a) User charges pursuant to Section 204(b) of the Clean Water Act, and applicable regulations appearing in 40 CFR 35;

(b) Toxic pollutant effluent standards and pretreatment standards pursuant to Section 307 of the Clean Water Act; and

(c) Inspection, monitoring and entry pursuant to Section 308 of the Clean Water Act.

(17) If an applicable standard or limitation is promulgated under Section 301(b)(2)(C), and (D), 304(b)(2), or 307(a)(2) and that effluent standard or limitation is more stringent than any effluent limitation in the permit, or controls a pollutant not limited in the permit, the permit shall be promptly modified or revoked, and reissued to conform to that effluent standard or limitation.

(18) Any authorization to construct issued to the permittee pursuant to 35 Ill. Adm. Code 309.154 is hereby incorporated by reference as a condition of this permit.

(19) The permittee shall not make any false statement, representation or certification in any application, record, report, plan or other document submitted to the Agency or the USEPA, or required to be maintained under this permit.

(20) The Clean Water Act provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Clean Water Act is subject to a civil penalty not to exceed $10,000 per day of such violation. Any person who willfully or negligently violates permit conditions implementing Sections 301, 302, 306, 307, or 308 of the Clean Water Act is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than one year, or both.

(21) The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under permit shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

(22) The Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit shall, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

(23) Collected screening, slumes, sludges, and other solids shall be disposed of in such a manner as to prevent entry of those wastes (or runoff from the wastes) into waters of the State. The proper authorization for such disposal shall be obtained from the Agency and is incorporated as part hereof by reference.

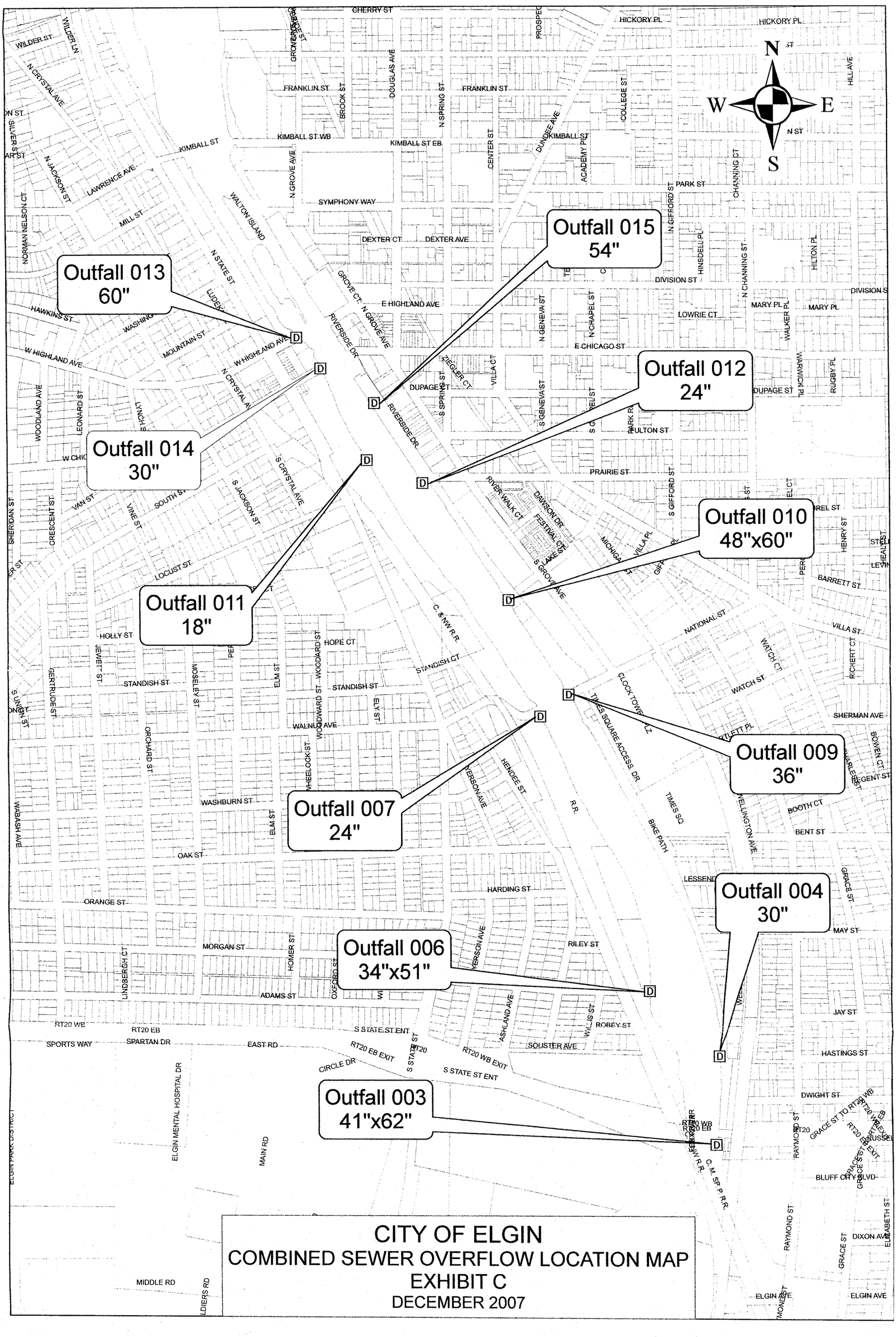
(24) In case of conflict between these standard conditions and any other condition(s) included in this permit, the other condition(s) shall govern.

(25) The permittee shall comply with, in addition to the requirements of the permit, all applicable provisions of 35 Ill. Adm. Code, Subtitle C, Subtitle D, Subtitle E, and all applicable orders of the Board.

(26) The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit is held invalid, the remaining provisions of this permit shall continue in full force and effect.

(Rev. 3-13-98)

APPENDIX C
CITY OF ELGIN COMBINED SEWER OVERFLOW LOCATION MAP



CITY OF ELGIN
COMBINED SEWER OVERFLOW LOCATION MAP
EXHIBIT C
DECEMBER 2007

APPENDIX D
FRWRD 2001 NPDES PERMIT PHASE 1 REPORT

FRWRD
FOX RIVER **WATER RECLAMATION** DISTRICT
RAYMOND STREET & PURIFY DRIVE / P.O. BOX 328, ELGIN, IL 60121-0328 / PH. (847) 742-2068 FAX (847) 742-0193

November 30, 2001

Attn: CSO Coordinator
Illinois Environmental Protection Agency
Compliance Assurance Section
Division of Water Pollution Control
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

RE: NPDES Permit IL 0028657 Phase I Report

Dear Sir or Madam,

It is my understanding that the Fox River south of the Kimball Street dam in Elgin is not considered a Sensitive Area. Therefore the CSO that is covered by this correspondence is not discharging to a Sensitive Area.

Also, enclosed for your use are 2 copies of the Fox River Water Reclamation District's Phase I report. For clarity, the item numbers are intended to correspond with Illinois Regulations Section 375.202 (a) and the text of the regulation is printed in italics at the start of each item number. As required in Section 375.202 (b), this letter is also a request for Agency participation on an advisory and review basis in a CSO impact/evaluation project.

Please contact me if you have any questions or comments.

Sincerely,
FOX RIVER WATER RECLAMATION DISTRICT

Rick Manner
District Engineer

cc Gregory Hergenroeder, General Manager
John Loete, City of Elgin

Fox River Water Reclamation District - Phase I Report

1) A MAP OF THE SEWER SYSTEM DEPICTING:
A) PORTIONS OF THE COMMUNITY SERVED BY COMBINED SEWERS AND SEPARATE SANITARY SEWERS;
B) LOCATION OF EACH OVERFLOW AND RECEIVING WATER BODY;

A map showing the CSO area is provided as **EXHIBIT A**. The only overflow owned by the FRWRD is entitled **LIFT STATION NO. 31.** It is highlight in orange on that map. The receiving body is the main trunk of the Fox River. The City of Elgin extends well beyond the limits of the this map. All portions of Elgin that are not depicted are served by separate sewer systems.

2) SIZE OF WATERSHED OF RECEIVING WATER BODY AT POINT OF EACH OVERFLOW;

(A copy of the Fox River portion of the **Illinois Water Quality Report, 1994-1995, Volume I**, is included for reference.) There are 260 square miles of Fox River Basin in Wisconsin. Approximately 1/3 of the 680 square miles of the Illinois portion of the basin is upstream of the overflow. Therefore about 500 square miles of watershed exist at the point of the overflow.

3) DRAINAGE AREA AND POPULATION TRIBUTARY TO EACH OVERFLOW;

This response relates to the Wellington Avenue Basin of **EXHIBIT A**. Table 16 on page III-6 shows this basin to encompass 81 acres. Using a conservative figure of 20 PE per acre, this results in a population estimate of 1600 people.

4) LAND USE, ZONING CLASSIFICATION AND PROJECTED GROWTH PATTERNS IN THE VICINITY OF EACH OVERFLOW USING THE FOLLOWING CLASSIFICATIONS: RESIDENTIAL, COMMERCIAL, INDUSTRIAL, RECREATIONAL, AGRICULTURAL;

In this 13 square block area there are homes, a bike trail along the river and fewer than 10 commercial buildings. There is no industrial or agricultural use. Therefore, the area is 98% residential, 1% recreational and 1% commercial. This area is a fully developed portion of Elgin with essentially no potential for growth. It is conceivable that there will be redistribution from residential to other urban uses, but there are no plans for this. The zoning is residential.

5) ACTUAL OR POTENTIAL USE OF THE AFFECTED WATERWAY FOR HUMAN CONTACT ACTIVITIES;

The Fox River is a General Use Stream. This portion of the Fox River is located between the upstream Kimball Street dam and the downstream State Street dam in the Village of South Elgin. There is approximately three river miles between these dams. The overflow is slightly less than half way between the dams. There is no formal, public beach nor public boat access between these two points. There is boat access via private homes with river frontage.

6) HISTORY OF COMPLAINTS REGARDING THE STREAM AND SURROUNDING ENVIRONMENT AND DOWNSTREAM OF OVERFLOWS;

The immediate area of the overflow is mostly urban. As noted in the **Illinois Water Quality Report**, generally, the Fox River meets overall use requirements for aquatic life, fish consumption, swimming, and drinking water use. However, the Fox River includes portions that show partial or moderate impairments. In addition, portions of the Fox are on the IEPA's TMDL listing. The causes for impairment are generally considered to be flow modification related and nutrient enhancements. The portion of the Fox where this CSO is located is not listed as a TMDL section.

7) HISTORY OF OTHER COMPLAINTS CONCERNING THE SEWER SYSTEM;

There are no routine complaints about the sewer system. Complaints are typically episodic and associated with extreme storm events, unexplained blockages (the blockage does not recur once it is discovered and cleared), power failures or equipment malfunctions.

8) DESCRIPTION OF STRUCTURAL AND PHYSICAL CONDITION OF SEWER SYSTEM INCLUDING AGE OF SYSTEM, INCIDENCE OF SEWER COLLAPSES, BOTTLENECKS IN THE SYSTEM; AND.

The Sanitary District was established near the end of the 1920's. Some of the original sewers are tributary to this system. However, due to a good maintenance program and solid construction the system does not have an atypical occurrence of sewer collapses or routine bottlenecks. The City of Elgin has a maintenance program that includes replacement of the local sewers and interceptors. Collapses and bottlenecks are rare and associated with unpredictable events, such as construction problems and unexplained blockages (the blockage does not recur once it is discovered and cleared).

9) LIST OF INDUSTRIAL AND OTHER SEWER USERS TRIBUTARY TO OVERFLOWS WHICH CONTAINS SUBSTANCES IN WASTEWATER OR STORM DRAINAGE IN CONCENTRATIONS LIKELY TO CREATE HAZARDOUS OR TOXIC CONDITIONS AT THE POINT OF COMBINED SEWER OVERFLOW.

There are no significant sources of non-domestic flow or toxins within the basin. In the flows upstream of the basin, there is one significant industrial user. That user is a food processor and has little potential for discharge of hazardous materials. The FRWRD is a fully delegated pretreatment authority and monitors the flow from that and other discharges regularly. Generally, the sewage at this pump station would be indistinguishable from domestic sewage. The NPDES permit for this overflow requires that 13 MGD of flow be transported the South Treatment Plant prior to any discharge. This is approximately 3 time the daily average flow through that pump station. As a result, the typical characteristics of any overflow would be 2/3 urban stormwater and 1/3 domestic sewage. Urban stormwater does not typically contain hazardous material.

Illinois
Environmental
Protection Agency

Bureau of Water
P.O. Box 19276
Springfield, IL 62794-9276

September 1996

IEPA/BOW/96-060a

Illinois Water Quality Report

1994 - 1995

Volume I

Illinois' Assessment
of Water Resource
Conditions

Printed on Recycled Paper

FOX RIVER BASIN

The Fox River originates in southeastern Wisconsin just west of Milwaukee and flows southward before entering Illinois in the northwest corner of Lake County (Figure 11). The Fox then flows in a general southerly direction for 115 miles until it joins the Illinois River at Ottawa. The average slope of the river in Illinois is 2.5 feet per mile.

The drainage area of the Fox River is approximately 940 square miles of which 680 miles are in Illinois. The majority of the watershed is in agricultural lands with expanding urban areas. Major population areas in the watershed are Elgin and Aurora.

A total of 806.4 stream miles in the Fox River basin were assessed for overall use support (Table 20). Assessments were based on both evaluated, 627.3 stream miles (77.8%), and monitored, 179.1 stream miles (22.2%). Since overall use support assessments were based on aquatic life use, (Table 20) the results are discussed collectively. Overall use (aquatic life use) was rated as full support on 680.6 stream miles (84.4%). Partial support with minor impairment occurred on 125.8 stream miles (15.6%). There were no miles rated as partial support with moderate impairment or nonsupport. Causes and sources resulting in less than full support within the Fox basin are summarized in Table 21.

The fish consumption use was assessed on 129.5 stream miles in the Fox River basin (Table 20). All 129.5 stream miles (100%) were rated as full use support. Of the 225.1 stream miles assessed for swimming, 96.5 (42.9%) were rated as full use support (Table 20). There were 44.82 miles rated as partial support with minor impairments and 26.94 miles rated as partial support with moderate impairments. Nonsupport ratings were assigned to 56.7 stream miles for swimming use. The swimming use did not apply to 36.5 stream miles due to disinfection exemptions. Drinking water use (PWS = public water supply) was present on 20 stream miles in the Fox River basin (Table 20). All 20 stream miles were rated as full support.

Fox River

Seventy-eight river miles on the Fox mainstem were rated as fully supporting aquatic life use. Remaining stream miles, located in Kane County from Carpentersville to Batavia, were rated as partial support/minor impairment. This area is the most urbanized portion of the basin. Nutrients, organic enrichment/DO, siltation, metals and habitat alterations were the causes of less than full support. Municipal point sources, urban runoff, flow regulation/modification, and streambank modification/destabilization were the sources of these problems.

Tributaries

Twelve of the tributaries were rated as fully supporting aquatic life use along their entire lengths (North Branch Nippersink, Nippersink, Blackberry, Mill, Waubonsee, Big Rock, Little Rock, Tyler, Somonauk, Little Indian, Indian, Boone and Buck creeks). The upper 15.9 miles of Poplar Creek were found to be in full support while the lower 1.8 miles were partial support/minor impairment. Channel modification and urban runoff were the major cause of less than full support.

Ferson and Flint creeks were rated as partial support/minor impairment. Causes of less than full use in Ferson Creek were nutrients and siltation; and causes in Flint Creek were ammonia, nutrients, organic enrichment/dissolved oxygen, chlorine and habitat modifications.

Table 20. Use Support for the Fox River Basin, 1994-1995 (miles)

Degree of Use Support	OVERALL USE			INDIVIDUAL USES			
	Evaluated	Monitored	Total	Fish Consumption	Aquatic Life	Swimming	Drinking Water
			(01)	(02)	(04)	(05)	(07)
Full	501.5	179.1	680.6	129.48	680.60	96.52	20.00
Full/Threatened							
Partial/Minor	125.8		125.8		125.8	44.82	
Partial/Moderate						26.94	
Nonsupport						56.78	
TOTAL ASSESSED	627.3	179.1	806.41	129.48	806.41	225.06	20.00
Not Applicable	--	--				31.52	2,208.18
Not Assessed	--	--	1,493.77	2,170.70	1,493.77	2,043.60	
TOTAL	627.3	--	2,300.18	2,300.18	2,300.18	2,300.18	2,300.18

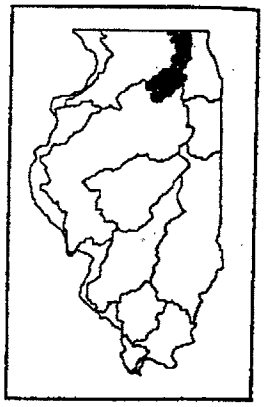


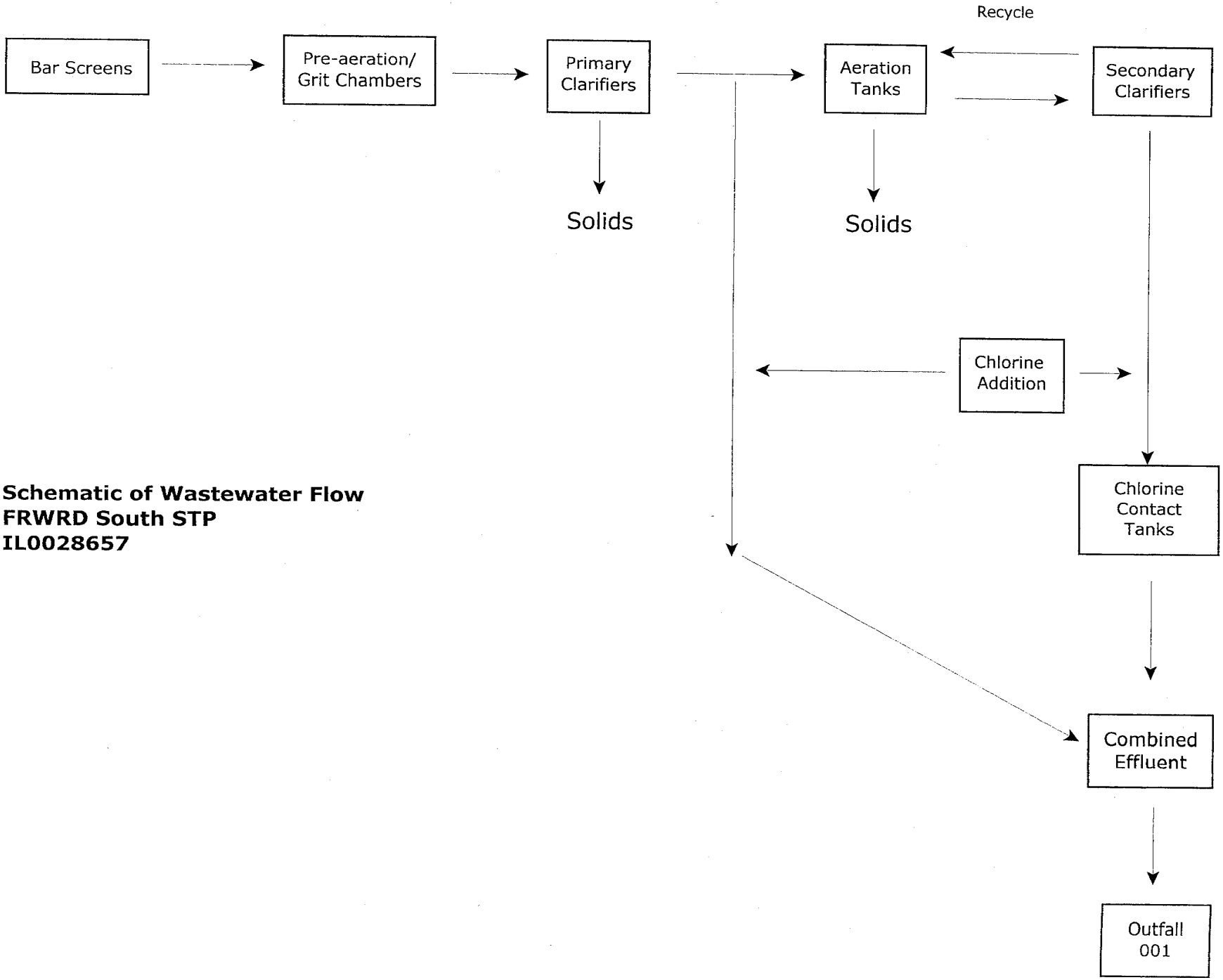
Table 21. Total Sizes of Waters Not Fully Supporting Uses Affected by Various Cause and Source Categories for the Fox River Basin, 1994-1995

CATEGORY	Major Impact	Moderate/Minor Impact
CAUSES		
Metals		10.8
Ammonia		10.5
Chlorine		10.5
Nutrients		125.8
Siltation		60.9
Organic Enrichment/DO		49.8
Other habitat alterations		51.6
Oil and grease		1.8
Suspended Solids		30.3
SOURCES		
Municipal Point Sources		66.0
Agriculture		58.4
Nonirrigated Crop Prod.		28.7
Pasture Land		19.7
Construction		32.0
Land Development		32.0
Urban Runoff		57.7
Land Disposal		30.3
On-site Wastewater systems		30.3
Hydrologic/Habitat mod.		71.3
Channelization		32.0
Dam Construction		39.3
Streambank mod./destabilization		30.5
Other		49.0
Contaminated sediments		30.3
Upstream impoundment		18.7

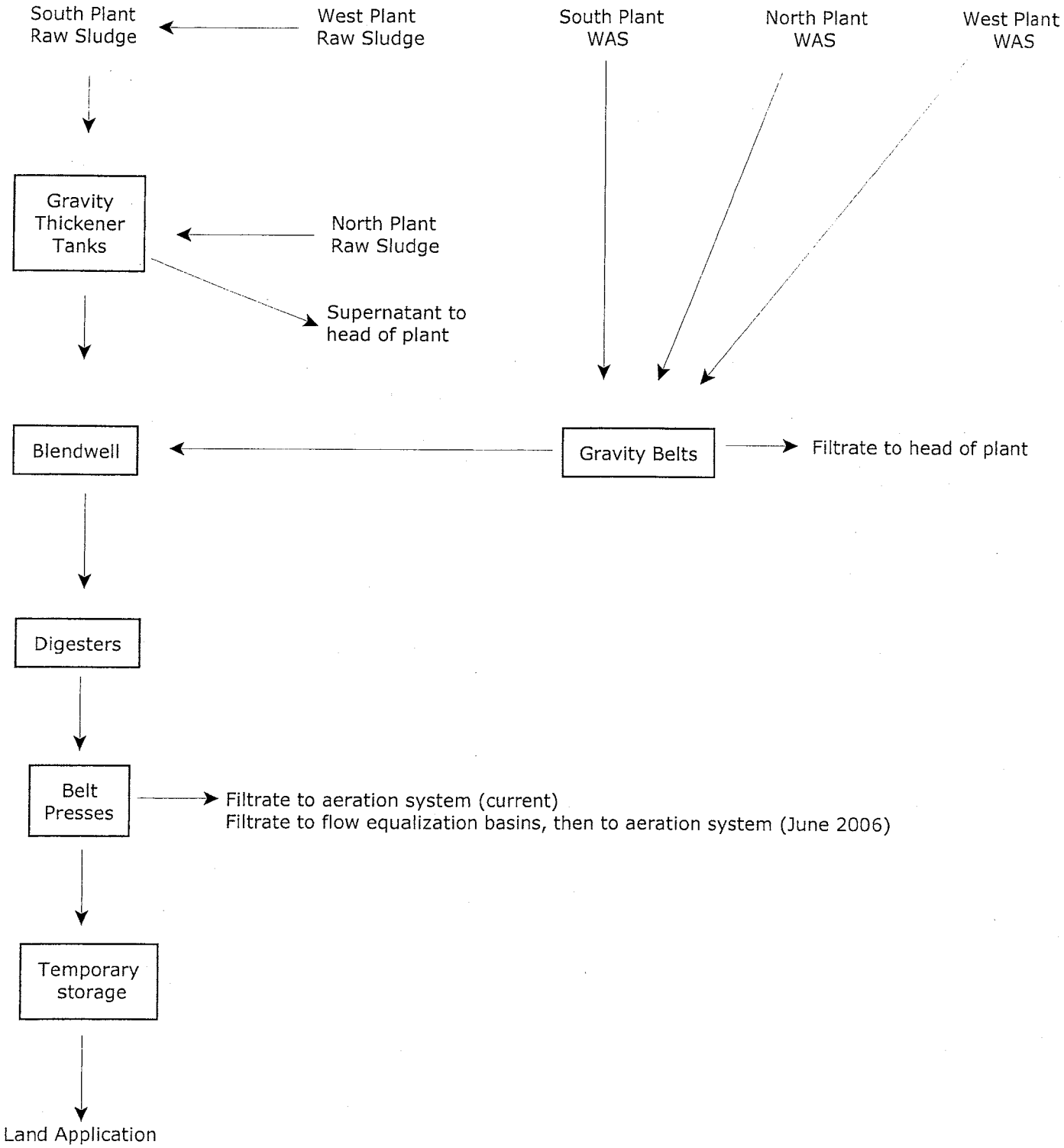
Legend for Figure 11

DT	Fox R.	DTG	Poplar Cr.
DTA	Indian Cr.	DTK	Nippersink Cr.
DTAB	Little Indian Cr.	DTKA	N. Br. Nippersink Cr.
DTB	Somonauk Cr.	DTZB	Buck Cr.
DTC	Big Rock Cr.	DTZL	Mill Cr.
DTCA	Little Rock Cr.	DTZP	Tyler Cr.
DTD	Blackberry Cr.	DTZS	Flint Cr.
DTE	Waubonsee Cr.	DTZT	Boone Cr.
DTF	Ferson Cr.		

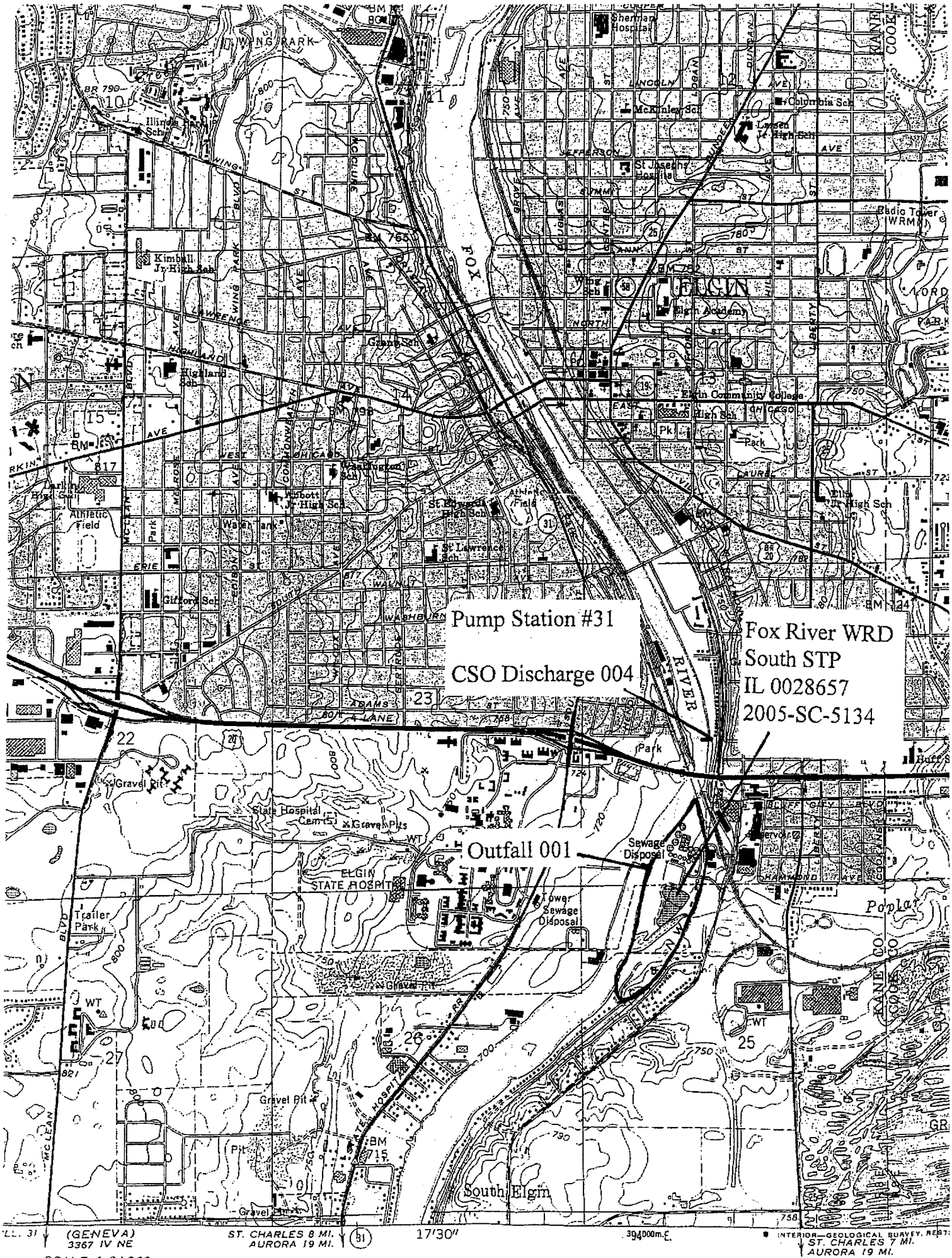
APPENDIX E
SWWTF FLOW SCHEMATIC



Schematic of Wastewater Flow
FRWRD South STP
IL0028657



Schematic of Solids Handling Process
FRWRD South STP
IL0028657, 2005-SC-5134


Pump Station #31
CSO Discharge 004
Fox River WRD
South STP
IL 0028657
2005-SC-5134
Outfall 001
South Elgin
ELGIN
FOX RIVER
(GENEVA)
3367 IV NE
ST. CHARLES 8 MI.
AURORA 19 MI.
17'30"
394000m.E.
ST. CHARLES 7 MI.
AURORA 19 MI.
SCALE 1:24 000
ROAD CLASSIFICATI

APPENDIX F
IEPA COMPLIANCE INSPECTION REPORT

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 North Grand Avenue East, P.O. Box 19276, Springfield, Illinois 62794-9276 • (217) 782-2829
James R. Thompson Center, 100 West Randolph, Suite 11-300, Chicago, IL 60601 • (312) 814-6026

PAT QUINN, GOVERNOR DOUGLAS P. SCOTT, DIRECTOR

MEMORANDUM

cc: DWPC/RU
DWPC/CAS

DATE: December 29, 2009

TO: Regional File

FROM: Enoch Mensah, Des Plaines Office

SUBJECT: Inspection Report on Fox River WRD-South
NPDES No. IL0028657

On December 16, 2009, a **Compliance Evaluation Inspection** was conducted of the subject facility. Attached is a copy of the report.

The facility appeared to be in substantial compliance at the time of the inspection.

EPA

United States Environmental Protection Agency

Water Compliance Inspection Report

Form Approved
OMB No. 2040-0057
Approval Expires 8-31-98

Section A: National Data System Coding (i.e., PCS)

Transaction Code	NPDES	yr/mo/day	Inspection Type	Inspector	Fac Type
1 N 2 5	3 I L 0 0 2 8 6 5 7 11	12 0 9 1 2 1 6 17	18 C	19 S	20 1

Remarks

21 66

Inspection Work Days	Facility Self-Monitoring Evaluation Rating	BI	QA	Reserved	
67 69	70	71 N	72 N	73 74	75 80

Section B: Facility Data

Name and Location of Facility Inspected (For industrial users discharging to POTW, also include POTW name and NPDES permit number)	Entry Time/Date	Permit Effective Date
FOX RIVER WRD-SOUTH **RAYMOND STREET & PURIFY DR.** **ELGIN, ILLINOIS 60121**	**10:00** **12/16/09**	**01/26/07**
	Exit Time/Date	Permit Expiration Date
	16-Dec-09	**02/29/12**

Name(s) of On-Site Representative(s)/Title(s)/ Phone and Fax Number(s)	Other Facility Data
Jack Russell, Chief Chemist	**847/742-2068**
Name, Address of Responsible Official/Title/Phone and Fax Number **Robert Trueblood, General Manager**	Contacted ☐ Yes ☒ No

Section C: Areas Evaluated During Inspection (Check only those areas evaluated)

X	Permit	X	Flow Measurement	X	Operation & Maintenance		CSO/SSO (Sewer Overflow)
X	Records/Reports	X	Self-Monitoring Program	X	Sludge Handling/Disposal		Pollution Prevention
X	Facility Site Review		Compliance Schedules		Pretreatment		Multimedia
X	Effluent/Receiving Waters	X	Laboratory		Storm Water		Other:

Section D: Summary of Findings/Comments (Attach additional sheets if necessary)

Generally, the facility appears to be in substantial compliance.

Name(s) and Signature(s) of Inspector(s)	Agency/Office/Phone and Fax Numbers	Date
ENOCH A. MENSAH	**IEPA/Des Plaines/(847)294-4000**	**16-Dec-09**
Signature of Management Q A Reviewer	Agency/Office/Phone and Fax Numbers	Date
	IEPA/Des Plaines/(847)294-4000	

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 North Grand Avenue East, P.O. Box 19276, Springfield, Illinois 62794-9276 • (217) 782-2829
James R. Thompson Center, 100 West Randolph, Suite 11-300, Chicago, IL 60601 • (312) 814-6026

PAT QUINN, GOVERNOR DOUGLAS P. SCOTT, DIRECTOR

INSPECTION NOTES

FACILITY NAME :	FOX RIVER WRD - SOUTH (Albin D. Pagorski WRF)
NPDES PERMIT # :	ILOO28657
BASIN CODE :	DT-089-04
INSPECTION TYPE :	CEI/O&M
DATE OF INSPECTION :	October 16, 2009
INTERVIEWED :	Jack Russell, Chief Chemist.
INSPECTED BY :	Enoch A. Mensah, EPE

GENERAL INFORMATION

RESPONSIBLE OFFICIALS:

Robert Trueblood, General Manager. Tel. # 847/742-2068
Jack Russell, Chief Chemist. Fax. # 847/742-0193

MAILING ADDRESS:

Fox River WRD
P.O. Box 328
Elgin, Illinois 60121

PLANT LOCATION:

The Fox River WRD-South Plant (Albin D. Pagorski Water Reclamation Facility) is located at Raymond Street & Purify Drive in Elgin.

PLANT PERSONNEL AND CERTIFICATION:

A list of plant personnel and their certification status is available at the facility.

RECEIVING WATERS:

The Fox River is the receiving waters and is classified as general use.

NPDES PERMIT REQUIREMENTS:

Issue Date:	01/26/07
Effective Date:	03/01/07
Expiration Date:	02/29/12

Parameter		Concentration Limits (mg/l) Mon. Avg.	Da. Max.
CBOD		10	20
TSS		12	24
Chlorine Residual		0.1	0.15
Fecal Coliform	Monthly geometric mean shall not exceed 200 per 100ml. (No more than 10% of the samples taken during the month shall exceed 400 per 100 ml.)		
Ammonia Nitrogen	March	2.8	3.3
	April-May	1.5	2.7
	June-Aug.	1.5	2.9
	Sept.-Oct.	1.5	2.7
	Nov.-Feb.	---	2.9

See the permit for other effluent limitations, monitoring, and reporting requirements for the permit.

PLANT DESCRIPTION:

The treatment plant consists of a comminutor, an aerated grit chamber, eight primary clarifiers, ten aeration tanks, six secondary clarifiers, chlorine contact tanks, gravity thickener, five anaerobic digesters, sludge filter press and drying beds. The aeration tanks have flexibility to be operated in three modes-conventional, step feed or contact stabilization, although it is mostly operated in the conventional mode. Flow pattern of the aeration tanks can be either two 5-tank trains or one 10-tank train. Waste activated sludge is thickened by belt thickeners before mixing with primary sludge and then digested anaerobically. Digested sludge is disposed by land application. There are 16 sand drying beds, which are primarily used for temporary storage prior to disposal. The facility also has three co-generation facilities fueled by natural gas or digester gas to provide additional energy for peak shaving. See attachment for detailed description of each process unit.

PLANT CAPACITY:

The facility serves a total population of approx. 180,000 (Elgin-100,000, South Elgin-20,000, and MWRDGC service area-60,000). The MWRDGC service area includes parts of Streamwood, Bartlett, Hoffman Estates, and South Barrington. The plant is designed to handle an average flow of 25 MGD and a maximum flow of 50 MGD. See the attached DMR summary.

LIFT STATIONS:

The facility is served by twelve (12) lift stations, which are maintained by the FRWRD.

COLLECTION SYSTEM:

The collection system consists of separate and combined sewers with combined sewers present in the older section of Elgin. Lift station #31, located on Wellington Street and serves the combined sewers, must pump no less than 13 MG of wet weather flow prior to any bypassing (CSO). Flows in excess of 50 MGD bypass secondary treatment, then get chlorinated prior to combining with fully treated flows prior to discharging at outfall 001. It should be noted that the city of Elgin is in the process of separating the combined sewers.

WASTE WATER TREATMENT

PRIMARY CLARIFIERS

Purpose

The primary clarifiers remove the larger suspended solids and floating material from the comminuted and degritted wastewater before discharge to the secondary treatment units. This reduces the load on the biological treatment units. The clarifiers can remove approximately 60% of the suspended solids and approximately 30% of the BOD_5 from the wastewater.

Description

There are eight (8) primary clarifiers as follows:

Four (4) rectangular primary clarifiers.

	PRIMARY CLARIFIER NO.1	PRIMARY CLARIFIER NO.2	PRIMARY CLARIFIER NO. 3	PRIMARY CLARIFIER NO. 4
Location	West of Lab Building	West of Lab Building	West of Preaeration and Grit Tanks No. 1 and No. 2	West of Preaeration and Grit Tanks No. 1 and No. 2
Type	Converted Imhoff Tank by Walker Process	Converted Imhoff Tank by Walker Process	- - -	- - -
Length	128' – 7"	128' – 7"	92' – 0"	92' – 0"
Width	34' – 3"	34' – 3"	16' – 0"	16' – 0"
Depth	10' – 3"	10' – 3"	11' – 0"	11' – 0"
Surface Area	4404 sq. ft.	4404 sq. ft.	1472 sq. ft.	1472 sq. ft.
Volume	45,141 cu. ft. 337,700 gal.	45,141 cu. ft. 337,700 gal.	16,192 cu. ft. 121,124 gal.	16,192 cu. ft. 121,124 gal.

*Average Flow	3.8 MGD	3.8 MGD	1.2 MGD	1.2 MGD
*Maximum Flow	7.7 MGD	7.7 MGD	2.3 MGD	2.3 MGD
*Average Flow Detention Time	2 hr.	2 hr.	2 hr. 25 min.	2 hr. 25 min.
*Maximum Flow Detention Time	1 hr.	1 hr.	1 hr. 16 min.	1 hr. 16 min.
*Percentage of Total Flow	15.2%	15.2%	4.8%	4.8%

Four (4) circular primary clarifiers.

	PRIMARY CLARIFIER NO.5	PRIMARY CLARIFIER NO.6	PRIMARY CLARIFIER NO. 7	PRIMARY CLARIFIER NO. 8
Location	East of Anaerobic Digesters	East of Anaerobic Digesters	East of Anaerobic Digesters	
Manufacturer	Walker Process	Walker Process	Walker Process	- - -
Diameter	68' – 0"	80' – 0"	80' – 0"	80' – 0"
Depth	12' – 0"	11' – 0"	11' – 0"	10 – 0"
Surface Area	3632 sq. ft.	5026 sq. ft.	5026 sq. ft.	.5026 sq. ft.
Volume	43,584 cu. ft. 326,050 gal.	55,286 cu. ft. 413,595 gal.	55,286 cu. ft. 413,595 gal.	50,260 cu. ft. 375,945 gal.
*Average Flow	2.9 MGD	4.0 MGD	4.0 MGD	1.2 MGD
*Maximum Flow	5.9 MGD	8.1 MGD	8.1 MGD	2.3 MGD
*Average Flow Detention Time	2 hrs. 40 min	2 hrs. 30 min.	2 hrs. 30 min.	2 hrs. 30 min.
*Maximum Flow Detention Time	1 hr. 20 min.	1 hr. 10 min.	1 hr. 10 min.	1 hr. 10 min.
*Percentage of Total Flow	11.6%	16.0%	16.0%	16.0

*NOTE: Based on two conditions:

1. All slide gates in the grit tank effluent division box are open.
2. Stop plate must be in position #17 to divert grit tank #1 and one-third of grit tank #2 to primaries #1 and #2.

Operation and Controls

The comminuted and degritted wastewater from the grit chamber flows to the primary clarifiers. The grit tank effluent division box divides approximately 70 percent of the total flow, under normal operating conditions, proportionally between primary clarifiers 3, 4, 5, 6, 7, and 8. Under normal operation, the remaining 30 percent (approximate) of the total flow is routed to primary clarifiers No. 1 and No. 2. A series of stop plates in the effluent channel from grit tanks No. 1 and No. 2 control the flow to primary clarifiers No. 1 and No. 2.

AERATION TANKS

Purpose

The aeration tanks provide the location for biological treatment of the wastewater. In the tanks, wastewater is mixed and aerated in order to produce a favorable environment for microorganism growth. The microorganisms in the tanks break down organics and convert ammonia to nitrates.

Description

Aeration Tanks

There are ten (10) aeration tanks. The tanks have the following characteristics:

Dimensions:	60 x 60 x 20 (ft.)
Volume (each):	72,000 cubic feet
	540,000 gallons

Operation and Controls

The aeration tanks are designed to permit the use of either of three (3) variations of activated sludge process. The flow pattern can be established as either a 1 or 2 train process.

SECONDARY CLARIFIERS

Description

There are six (6) secondary clarifiers. Each clarifier has a diameter of 110 feet with a sludge collector by Walker Process for clarifiers #1, 2, 3, and 4. Clarifiers #5 and 6 are peripheral feed clarifiers by Lakeside.

Surface area (each clarifier) – approximately 9,500 sq. ft.
Total surface area – approximately 57,000 sq. ft.
Overflow rate – an average of 440 GPD/sq. ft. at design flow.

Operation and Controls

Secondary clarifiers 1, 2, 3 and 4 operate on the following basis:

1. Mixed liquor enters the clarifiers at the bottom of the influent column.
2. The mixed liquor flows through an inlet opening in the influent column and upward into the influent well.
3. The influent well helps to evenly distribute the flow throughout the tank. This results in more efficient settling.
4. The liquid flows radially towards the peripheral effluent weir.
5. The activated sludge solids settle to the bottom of the clarifiers.
   a. As the center cage and sludge collection arms rotate, the settled solids are raked inward by the scrapers.
   b. The scrapers direct the solids to the suction nozzles.
   c. The sludge flows by gravity through the suction headers to the return sludge pump influent chamber.

d. The sludge withdrawal rate is varied by operating the telescoping valves.

6. The liquid portion of the flow passes over the weir into the effluent trough. From the effluent trough, the liquid continues on to the chlorine contact tanks.

CHLORINE CONTACT TANKS

Purpose

The chlorine contact tanks provide the detention time, which is necessary for the disinfection of the secondary effluent.

Description

There are four (4) chlorine contact tanks located between the secondary clarifier and the Fox River. The characteristics of the tanks are as follows:

	Chlorine Contact Tanks No. 1 & No. 2	Chlorine Contact Tank No. 3	Chlorine Contact Tank No. 4
Dimensions	104' x 27' x 8'	50' diameter – 7' deep	40' x 100' x 8' – 6"
Volume	23,150 cu. ft. 173,000 gals.	14,250 cu. ft. 107,000 gals..	34,000 cu. ft. 254,000 gals.
Detention Time	40 min. @ 7 MGD 24 min. @ 13 MGD	80 min. @ 2 MGD 40 min. @ 4 MGD	30 min. @ 9 MGD 15 min. @ 20 MGD

The Chlorine contact tanks contain sludge collector mechanisms for use should the tanks have an accumulation of sludge.

Operation and Controls

Under normal operating conditions, all the Chlorine Contact Tanks will be used.

The Chlorine Contact Tanks operate in the following manner:

1. Effluent from the secondary clarifiers enter the chlorine contact influent division chamber where chlorine is injected.
2. The chlorinated liquid is then directed to the contact tanks by means of sluice gates that can be used to proportion the flow.
3. The chlorinated liquid flows through the contact tanks through a series of baffles that mix the chlorine and liquid thoroughly.
4. The flow rate through the tanks is very slow. This gives the chlorine enough time to disinfect the liquid.
5. The effluent flows over a weir and into the effluent trough. From there it is directed to the outfall chamber where it is de-chlorinated using sodium bisulfite before being discharged into the Fox River.

- Note that the facility now uses sodium hypochlorite instead of chlorine.

NPDES PERMIT COMPLIANCE

PERMITS:

The NPDES permit for this facility is IL 0028657. In addition, the facility also has land application of sewage sludge permit #2005-SC-5134. The sludge permit was issued on 09/20/05 for a period of five years.

RECORDS AND REPORTS:

Record keeping at the facility appears to be satisfactory. Adequate records are kept of all activities performed at the plant. Laboratory analyses, sampling dates, and bench sheet records are all well organized and complete. Chain of custody information is very complete; it specifies time and type of sampling, and type of preservation if necessary. Also, all sample bottles are tagged with the proper labels. Random inspection and cross checking of bench sheet records with DMR data showed consistency in recording and reporting of values.

LABORATORY:

Generally, all NPDES regulated parameters are run at the onsite lab under the supervision of Jack Russell, the district chemist, and the latest edition of Standard Methods and 40 CFR 136 guidelines are followed. The inspection of lab records was focused mainly on areas of technique and record keeping, and the observations are listed below:

Fecal Coliform:

1. Fecal Coliform count based on the membrane filter method is used, and the culture dishes used are very tight fitting plastic dishes. Two samples of 100ml and 10ml are run, and the 100ml count is reported if it's not TNTC.

2. All prepared cultures are inverted and placed in the heat sink immediately after filtration as recommended.

3. Incubation period is 24 hours at a temperature of 44.5°C.

4. The apparatus used is rinsed with distilled water, and autoclaving is performed at 250°F as recommended for proper sterilization.

BOD:

1. Initial Dissolved Oxygen (DO) readings on BODs are generally below 9 ppm as recommended.

2. Final DO reading of sample is kept in the range of 1.5 – 7mg/l, which meets the recommended 1 mg/l minimum.

3. The total DO depletion during 5 days is kept in the range of 2.5 - 4.5, which meets the recommended 2 mg/l minimum.

4. The DO depletion in the BOD dilution water blank is less than 0.2 as recommended.

5. BOD incubation temperatures are maintained at 20°C, and a daily log is kept.

6. Glucose-Glutamic Acid test for the dilution water sample is performed regularly to test the dilution water sample quality as recommended by Standard Methods.

7. Nitrification is inhibited by adding trichloro-methyl-pyridine (TCMP); therefore, results are reported as CBOD.

TSS:

1. The oven temperature is consistently kept between 103 - 105°C, and a daily log is always kept.

2. The lab scales are calibrated as required, and the proper weighing techniques are followed.

Quality control at the lab is generally good. The facility normally runs duplicate and spiked samples at least 20 % of the time. The facility participates in the USEPA annual DMR-QA studies and performs quite well. The bench sheet data is extensive, and it includes all the necessary calculations and dilutions used to support the DMR data.

FLOW MEASURING:

Flow measuring at the plant appears to be adequate. The facility has a Parshall Flume fitted with an ultrasonic flow meter, which is calibrated monthly. Flow at the time of the inspection was 17 MGD.

SELF MONITORING:

The self monitoring program appears to be adequate. Records show that samples are properly collected and analyzed within the required time frame. Because the facility is manned 24 hours a day, 7 days a week, samples collected are analyzed immediately. Automatic composite samplers are used to collect 24-hour composites of both influent and effluent, and the samples are properly refrigerated at 4°C (39.2°F) while being collected. Analyses for TSS, Ammonia, pH, CBOD and Fecal Coliform are performed according to permit requirements while the semi annual monitoring of metals is performed quarterly. DMR review over the twelve-month reporting period shows that the facility has generally operated within the permit requirements.

OPERATION AND MAINTENANCE:

Inspection of maintenance records indicates that routine maintenance and testing work are performed at the plant daily, monthly or periodically as required or needed. The facility depends on a dual feed power and the co-generation facility for stand-by power. The dual feed system is capable of running the entire plant, but the co-generation can be used mainly for peak shaving during high energy demands. The three co-generation facilities provide a total power of 720 KW. A comprehensive O&M manual is available and accessible to all operators.

PERFORMANCE AND PROCESS CONTROL EVALUATION:

Process control records inspected at the plant indicates that the performance of the plant is very closely monitored through the testing of various parameters such as DO, MLSS, e.t.c., and the proper adjustments are made when necessary. Microscopic analyses are also performed as needed.

SLUDGE HANDLING:

Primary Sludge is pumped to a gravity thickener. After thickening, it is mixed with waste activated sludge in a blendwell. The sludge is then digested by single stage anaerobic digestion and sent to the filter presses, and the filter cake is stored prior to disposal. The facility considered producing class A sludge, but in order to do that, it had to replace the heat exchanger with one powerful enough to create a thermophilic condition in the digester. For a thermophilic condition, sludge has to be retained for at least 24 hours at approximately 135°F and then lowered to 98°F (mesophilic state). Finally, the permittee decided to just settle with class B sludge. The facility also has a permit to receive and handle primary sludge pumped from the West Plant.

PRETREATMENT:

The facility has a formal pretreatment program, which is run to incorporate all three plants (North, South, and West), and the records are kept at the South plant Twenty five percent of flows to the facility are from industries, but there has not been any interference.

FACILITY SITE REVIEW:

The treatment units were inspected during the visit and the following were noted:

At the time of the inspection, the comminutor, and the aerated grit chamber appeared to be operating properly. All four rectangular and four circular primary clarifiers were in use, and flow distribution over the weirs appeared to be even with no noticeable solids carried over the weirs. All ten aeration tanks were in service, and they appeared to be operating with no dead spots. All the six secondary clarifiers were in operation and appeared to be operating properly. The weirs were very clean, and flow appeared to be very evenly distributed. No bulking conditions were noticed. Each of the six clarifiers is fitted with four scum collectors and a dual arm; this is double what is normally observed on clarifiers.

PERFORMANCE LIMITING FACTORS:

None noted at the time of the inspection. The facility appeared to be producing good quality effluent.

SUMMARY:

The Fox River WRD-South Plant has consistently complied with the requirements of the NPDES permit. DMR review over the reporting period showed that all regulated parameters tested for were generally within the permit limits.

Calculations made to cross check the DMR parameters and other process control information indicated that the calculated values generally agreed with the reported parameters. The permittee has consistently met all the effluent standards. The inspection of the lab records did not reveal any apparent flaws; it was noted that the facility made every effort to follow the guidelines indicated in Standard Methods and 40 CFR 136. On the whole, the facility is found to be in apparent compliance. It should also be noted that the name of the plant has been changed to **Albin D. Pagorski Water Reclamation Facility,** and the permittee has sent a notification to the agency regarding the change.

South Plant

Modification Date:

Draft Permit 30-day public notice period ended Dec. 10, 2009.

NPDES Permit No. IL0028657

Effluent Limitations, Monitoring, and Reporting

FINAL

Discharge Number(s) and Name(s): 001 STP Outfall

Load limits computed based on a design average flow (DAF) of 25.0 MGD (design maximum flow (DMF) of 50.0 MGD).

Excess flow facilities (if applicable) shall not be utilized until the main treatment facility is receiving its maximum practical flow.

From the modification date of this Permit until the expiration date, the effluent of the above discharge(s) shall be monitored and limited at all times as follows:

	LOAD LIMITS lbs/day DAF (DMF)*			CONCENTRATION LIMITS MG/L				
Parameter	Monthly Average	Weekly Average	Daily Maximum	Monthly Average	Weekly Average	Daily Maximum	Sample Frequency	Sample Type
Flow (MGD)							Continuous	
$CBOD_5$**	2,085 (4,170)		4,170 (8,340)	10		20	2 Days/Week	Composite
Suspended Solids	2,502 (5,004)		5,004 (10,008)	12		24	2 Days/Week	Composite
pH	Shall be in the range of 6 to 9 Standard Units						2 Days/Week	Grab
Fecal Coliform***	The monthly geometric mean shall not exceed 200 per 100 mL and no more than 10% of the samples collected in a month shall exceed 400 per 100 mL						5 Days/Week	Grab
Chlorine Residual***				0.1		0.15	5 Days/Week	Grab
Ammonia Nitrogen as (N)								
March	584 (1168)		688 (1376)	2.8		3.3	2 Days/Week	Composite
Apr.-May/Sept.-Oct.	313 (626)		563 (1126)	1.5		2.7	2 Days/Week	Composite
June-August	313 (626)		605 (1209)	1.5		2.9	2 Days/Week	Composite
Nov.-Feb.	--- ---		605 (1209)	---		2.9	2 Days/Week	Composite
				Monthly Average not less than	Weekly Average not less than	Daily Minimum		
Dissolved Oxygen								
March-July				N.A.	6.0	5.0	2 Days/Week	Grab
August-February				5.5	4.0	3.5	2 Days/Week	Grab

*Load limits based on design maximum flow shall apply only when flow exceeds design average flow.
**Carbonaceous BOD_5 ($CBOD_5$) testing shall be in accordance with 40 CFR 136.
***See Special Condition 8.

Flow shall be reported on the Discharge Monitoring Report (DMR) as monthly average and daily maximum.

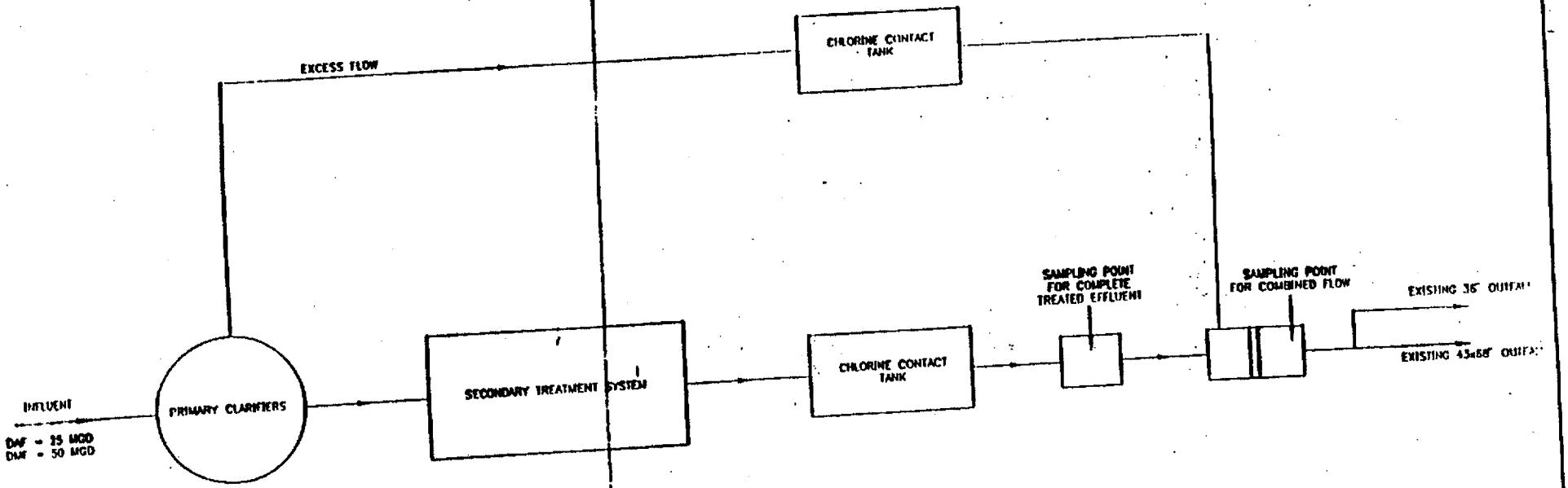
Dissolved oxygen shall be reported on the DMR as a minimum.

pH shall be reported on the DMR as a minimum and a maximum.

Fecal Coliform shall be reported on the DMR as a geometric mean and as a percentage of the samples exceeding 400 per 100 mL.

Chlorine Residual shall be reported on the DMR as a monthly average and daily maximum.

...ING REGION



0165-98

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JAN 23 1998

Environmental Protection Agency
ROW-PERMIT LOG IN

REV. NO	DATE	DESCRIPTION

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Baxter & Woodman

FOX RIVER WATER RECLAMATION DISTRICT
SOUTH REGIONAL WASTEWATER TREATMENT PLANT

OUTFALL SEWER MODIFICATIONS

DESIGNED BY	SCALE
CSL	NONE
DRAWN BY	PROJECT NO
JCD	97934.5
CHECKED BY	
CSL	
DATE	
1-21-98	

1 OF 3

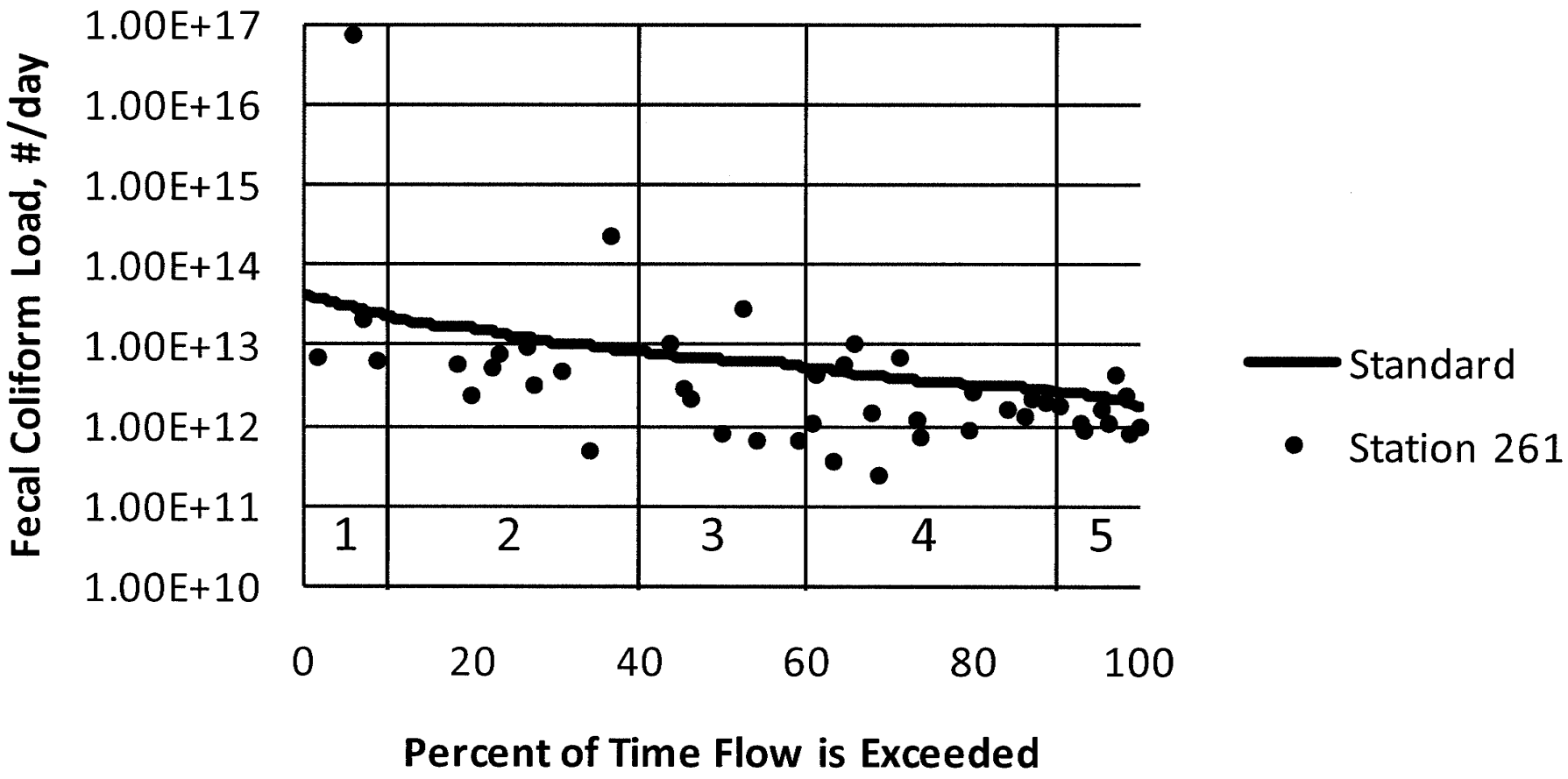
PROCFLOW.DWG 21-JAN-98 13:53 BY: ROE (12_c2)
COPYRIGHT © 1998, BY BAXTER & WOODMAN, INC.

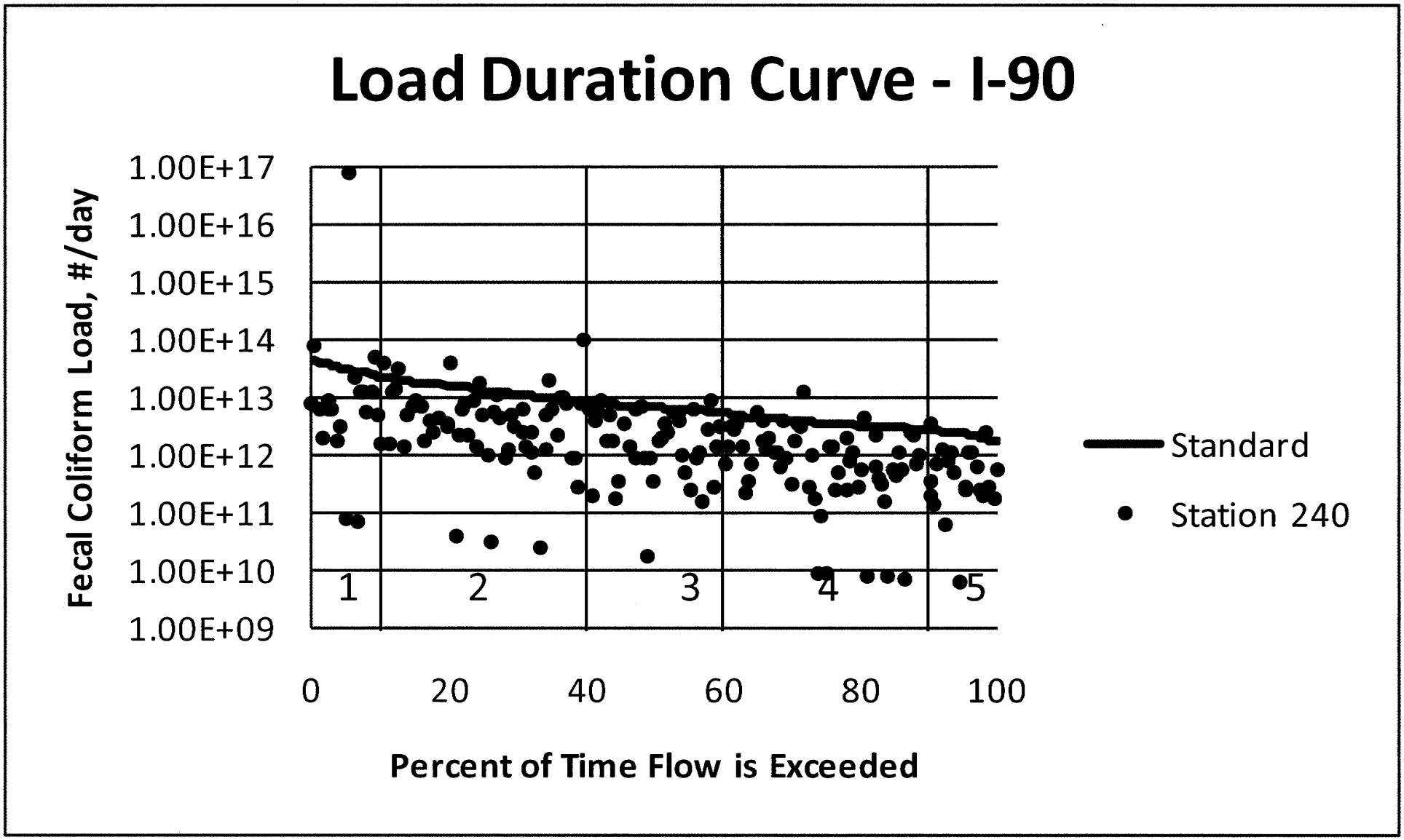
APPENDIX G
FOX RIVER LOAD DURATION CURVES

KEY FOR LOAD DURATION CURVES:

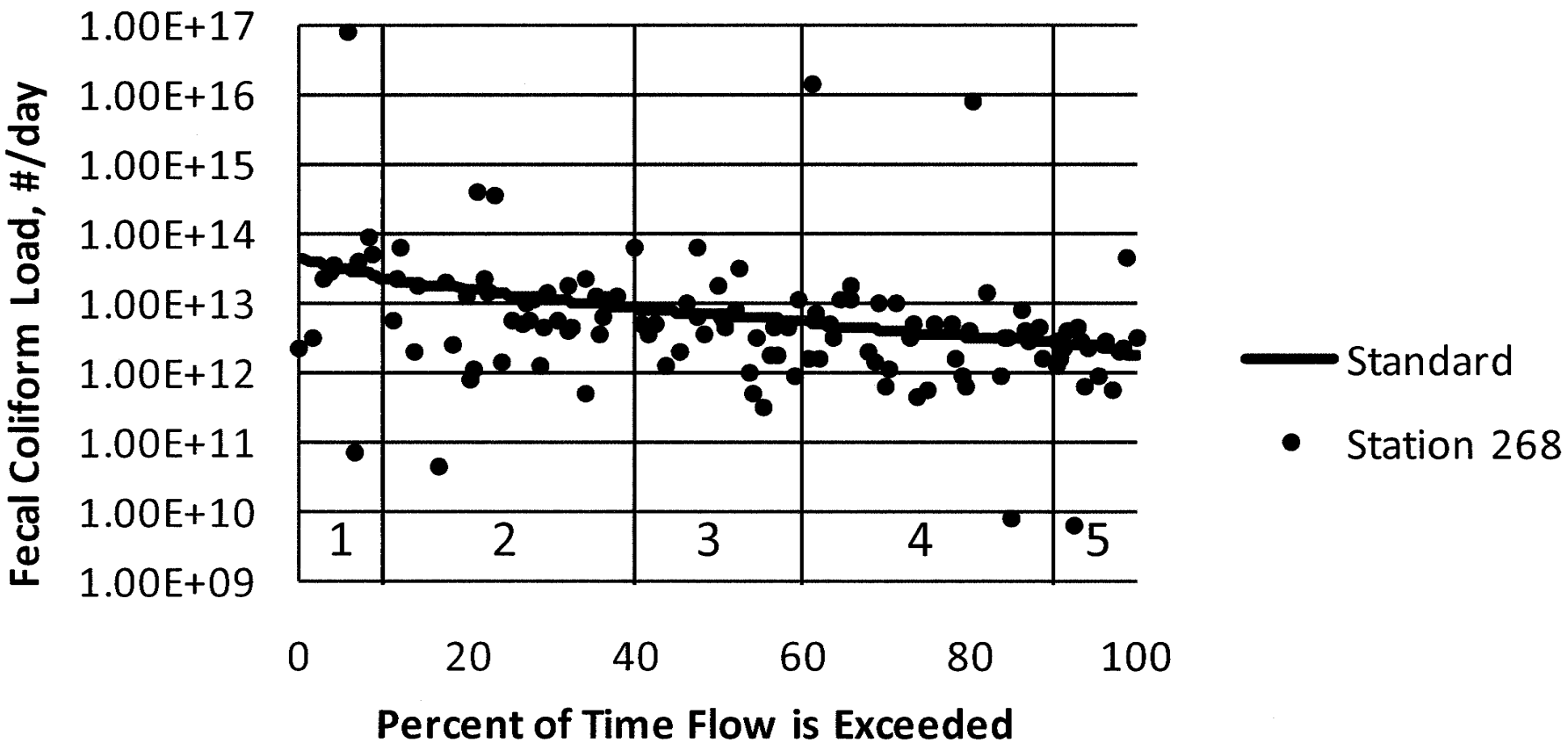
1 – High Flows:	0-10% Flow Interval
2 – Moderate to High Flows:	10-40% Flow Interval
3 – Moderate Flows:	40-60% Flow Interval
4 – Low to Moderate Flows:	60-90% Flow Interval
5 – Low Flows:	90-100% Flow Interval

Load Duration Curve - Dundee



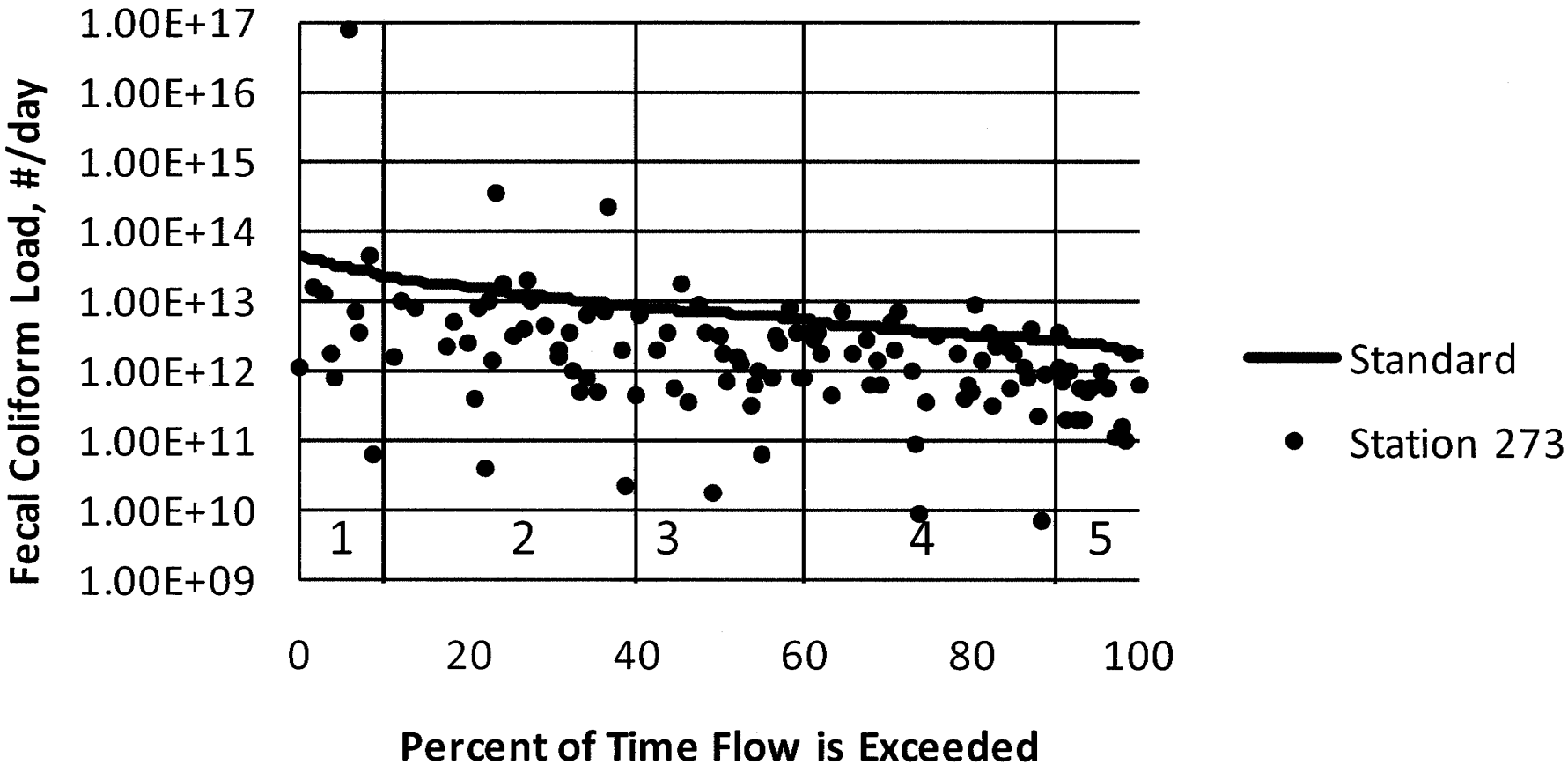

Load Duration Curve - I-90
Fecal Coliform Load, #/day
1.00E+17
1.00E+16
1.00E+15
1.00E+14
1.00E+13
1.00E+12
1.00E+11
1.00E+10
1.00E+09
1
2
3
4
5
0
20
40
60
80
100
Percent of Time Flow is Exceeded
Standard
Station 240

Load Duration Curve - Tyler Cr.

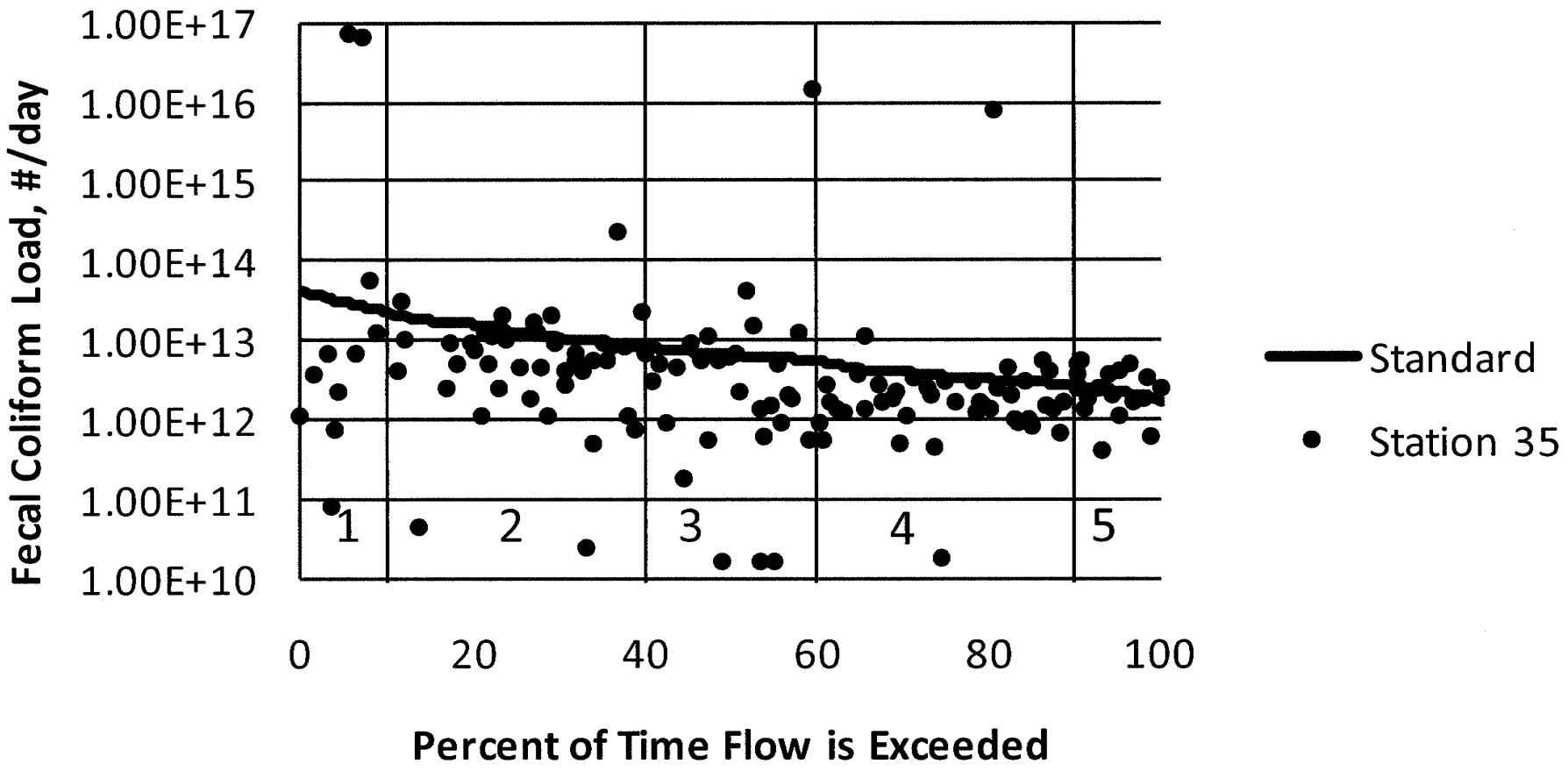


Note: Fox R Algonquin flows were used for this analysis

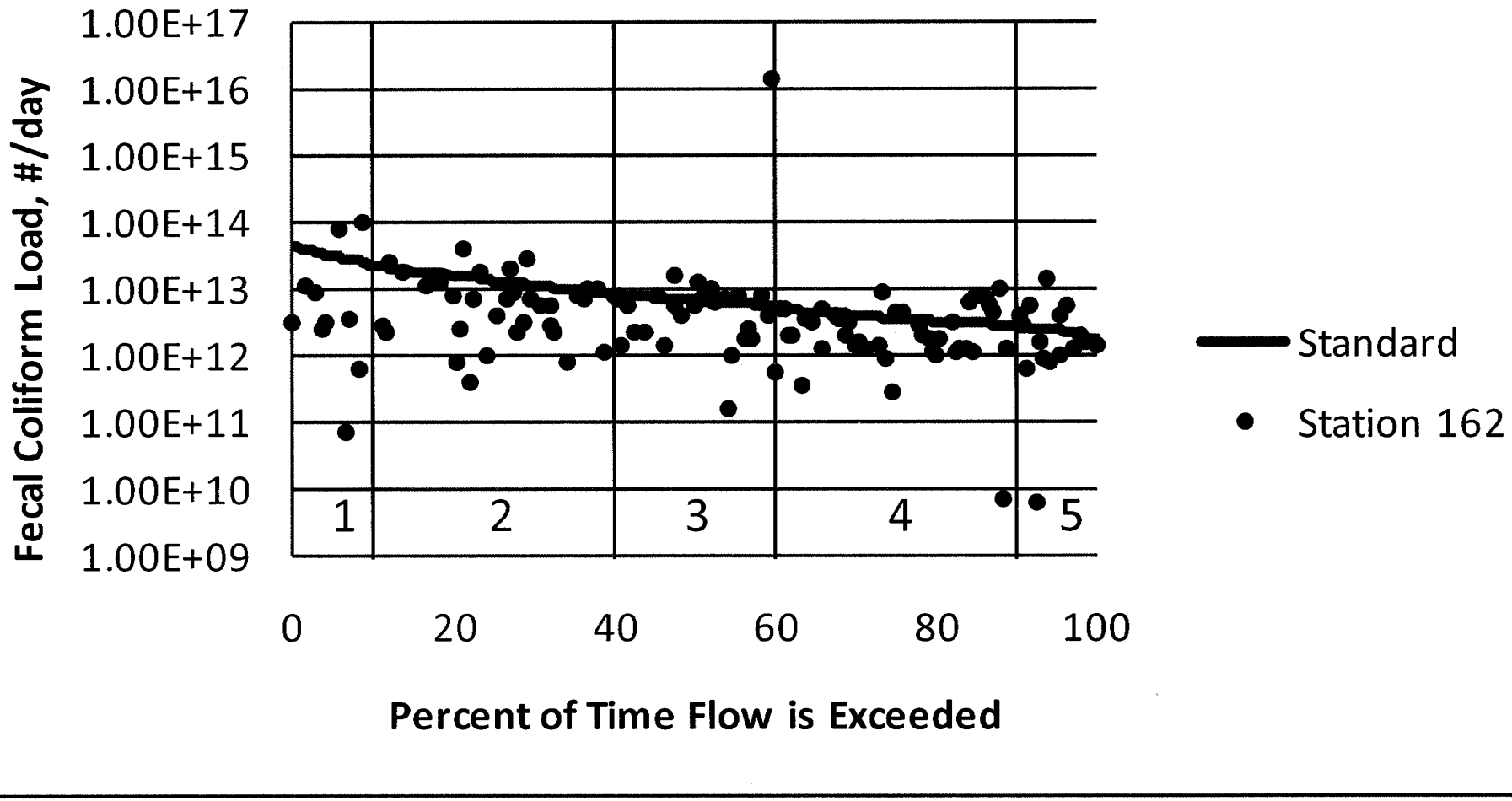
Load Duration Curve - Kimball St.



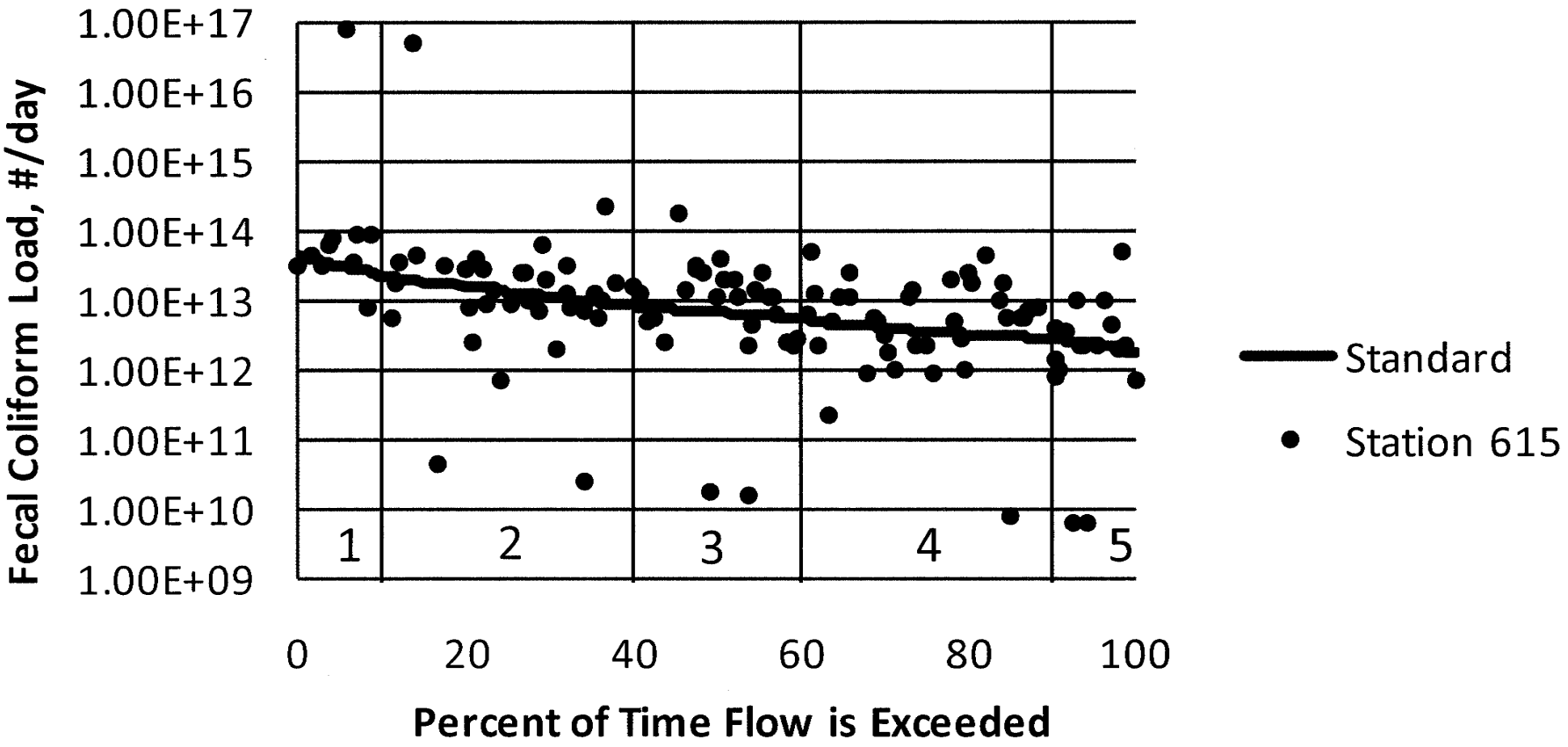
Load Duration Curve - National St.



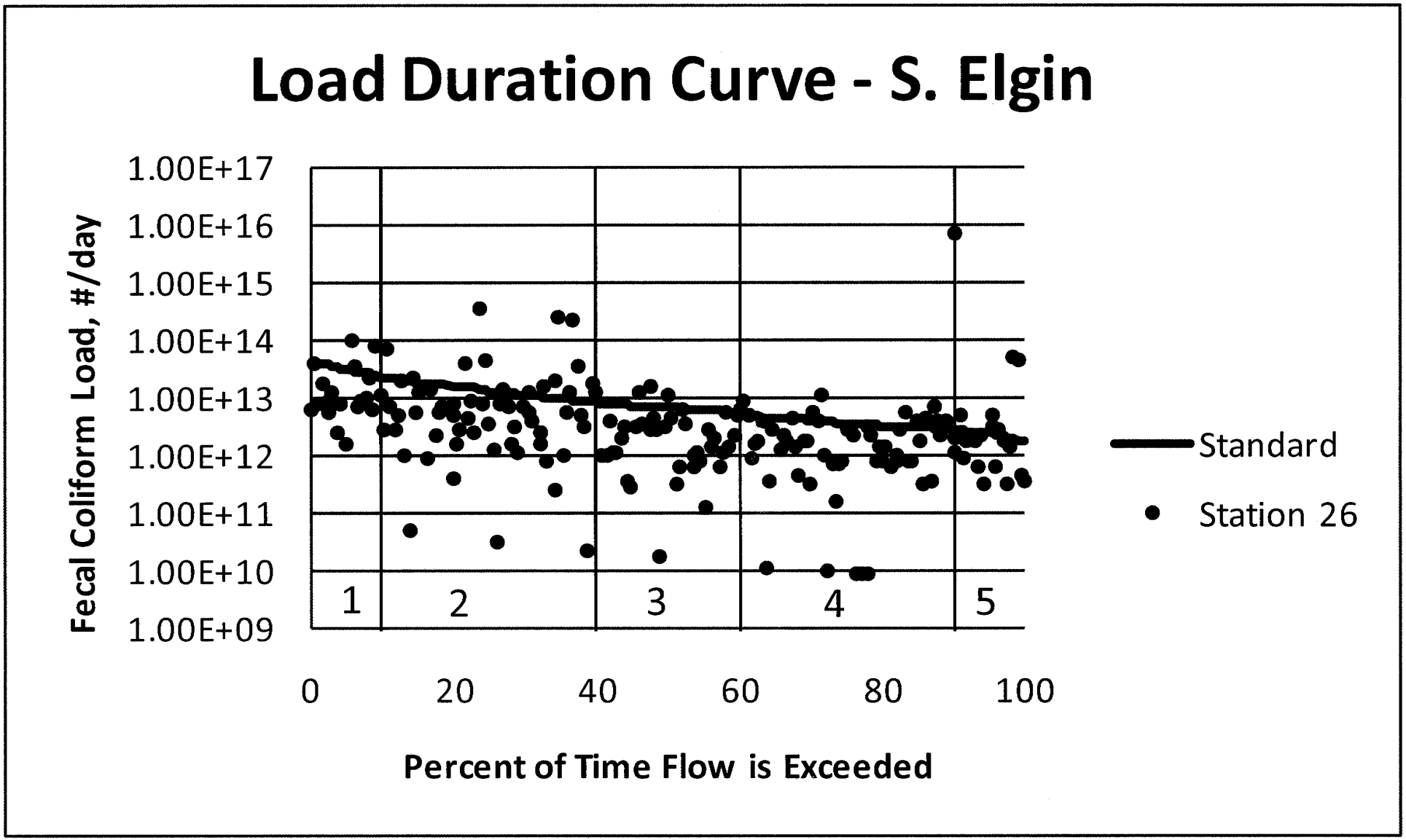
Load Duration Curve - Elgin/S. Elgin



Load Duration Curve - Poplar Cr.



Note: Fox R Algonquin flows were used for this analysis


Load Duration Curve - S. Elgin
Fecal Coliform Load, #/day
1.00E+17
1.00E+16
1.00E+15
1.00E+14
1.00E+13
1.00E+12
1.00E+11
1.00E+10
1.00E+09
1
2
3
4
5
0
20
40
60
80
100
Percent of Time Flow is Exceeded
Standard
Station 26

APPENDIX H
IDNR AND INHS CORRESPONDENCE

Illinois Department of
Natural Resources
One Natural Resources Way Springfield, Illinois 62702-1271
http://dnr.state.il.us

Pat Quinn, Governor
Marc Miller, Director

February 17, 2010

Michael Ott
Strand Associates, Inc.
910 West Wingra Drive
Madison, WI 53715

Re: FRWRD LTCP
Project Number(s): 1006322 [1922006]
County: Kane

Dear Applicant:

This letter is in reference to the project you recently submitted for consultation. The natural resource review provided by EcoCAT identified protected resources that may be in the vicinity of the proposed action. The Department has evaluated this information and concluded that adverse effects are unlikely. Therefore, consultation under 17 Ill. Adm. Code Part 1075 is terminated.

Historical records of the State endangered Black-crowned Night Heron exist within the study area. Should an improvement project proceed as a result of this study, a new consultation to evaluate specific impacts will be required.

This consultation is valid for two years unless new information becomes available that was not previously considered; the proposed action is modified; or additional species, essential habitat, or Natural Areas are identified in the vicinity. If the project has not been implemented within two years of the date of this letter, or any of the above listed conditions develop, a new consultation is necessary.

The natural resource review reflects the information existing in the Illinois Natural Heritage Database at the time of the project submittal, and should not be regarded as a final statement on the site being considered, nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments. If additional protected resources are encountered during the project's implementation, you must comply with the applicable statutes and regulations. Also, note that termination does not imply IDNR's authorization or endorsement of the proposed action.

Please contact me if you have questions regarding this review.

Rick Pietruszka
Division of Ecosystems and Environment
217-785-5500

EcoCAT
Ecological Compliance Assessment Tool

Applicant:	Strand Associates, Inc.	*IDNR Project #:*	1006322
Contact:	Michael Ott	Alternate #:	1922006
Address:	910 West Wingra Drive Madison, WI 53715	Date:	02/17/2010

Project: FRWRD LTCP
Address: Raymond Street and Purify Drive, Elgin

Description: We are developing a combined sewer overflow control plan. IEPA has just required we conduct a sensitve area analysis on the Fox River. A sensitive area is defined as either a federal/stae listed endangered aquatic species AND/OR the presence of shellfish beds. This report is due Friday February 26 so the timeline is tight.

Natural Resource Review Results

Consultation for Endangered Species Protection and Natural Areas Preservation (Part 1075)
The Illinois Natural Heritage Database shows the following protected resources may be in the vicinity of the project location:

Bluff Spring Fen INAI Site
Bluff Spring Fen Nature Preserve
Black-Crowned Night Heron *(Nycticorax nycticorax)*
Elfin Skimmer *(Nannothemis bella)*
Osprey *(Pandion haliaetus)*

An IDNR staff member will evaluate this information and contact you within 30 days to request additional information or to terminate consultation if adverse effects are unlikely.

Location

The applicant is responsible for the accuracy of the location submitted for the project.

County: Kane
Township, Range, Section:
41N, 8E, 24

IL Department of Natural Resources Contact
Rick Pietruszka
217-785-5500
Division of Ecosystems & Environment

Local or State Government Jurisdiction
Fox River Water Reclamation District
Michael Ott
1170 Houbolt Road
Joliet, Illinois 60431

Disclaimer

The Illinois Natural Heritage Database cannot provide a conclusive statement on the presence, absence, or condition of natural resources in Illinois. This review reflects the information existing in the Database at the time of this inquiry, and should not be regarded as a final statement on the site being considered, nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments. If additional protected resources are encountered during the project's implementation, compliance with applicable statutes and regulations is required.

Terms of Use

By using this website, you acknowledge that you have read and agree to these terms. These terms may be revised by IDNR as necessary. If you continue to use the EcoCAT application after we post changes to these terms, it will mean that you accept such changes. If at any time you do not accept the Terms of Use, you may not continue to use the website.

1. The IDNR EcoCAT website was developed so that units of local government, state agencies and the public could request information or begin natural resource consultations on-line for the Illinois Endangered Species Protection Act, Illinois Natural Areas Preservation Act, and Illinois Interagency Wetland Policy Act. EcoCAT uses databases, Geographic Information System mapping, and a set of programmed decision rules to determine if proposed actions are in the vicinity of protected natural resources. By indicating your agreement to the Terms of Use for this application, you warrant that you will not use this web site for any other purpose.

2. Unauthorized attempts to upload, download, or change information on this website are strictly prohibited and may be punishable under the Computer Fraud and Abuse Act of 1986 and/or the National Information Infrastructure Protection Act.

3. IDNR reserves the right to enhance, modify, alter, or suspend the website at any time without notice, or to terminate or restrict access.

Security

EcoCAT operates on a state of Illinois computer system. We may use software to monitor traffic and to identify unauthorized attempts to upload, download, or change information, to cause harm or otherwise to damage this site. Unauthorized attempts to upload, download, or change information on this server is strictly prohibited by law. Unauthorized use, tampering with or modification of this system, including supporting hardware or software, may subject the violator to criminal and civil penalties. In the event of unauthorized intrusion, all relevant information regarding possible violation of law may be provided to law enforcement officials.

Privacy

EcoCAT generates a public record subject to disclosure under the Freedom of Information Act. Otherwise, IDNR uses the information submitted to EcoCAT solely for internal tracking purposes.

INHS & Museum Mollusk Collection Records

Fox River (Illinois River Dr.) 030
Elgin, Elgin Yacht Club
Kane County, Illinois , USA
T41N, R8E, sec. 11, NE

4 May 1994
H.E. Kitchel, C.A. Taylor, M.A. Harris & M.J. Wetzel

Catalogue No.	Species	V	L	D	R	SP
INHS 17410	*Lasmigona costata*	1			1	
INHS 17413	*Pyganodon grandis*	1		1		
INHS 17405	*Amblema plicata*	1		1		
INHS 17406	*Cyclonaias tuberculata*	1			1	
INHS 17407	*Elliptio dilatata*	1			1	
INHS 17408	*Fusconaia flava*	1			1	
INHS 17412	*Pleurobema sintoxia*	1			1	
INHS 17414	*Quadrula pustulosa*	2			2	
INHS 17404	*Actinonaias ligamentina*	1			1	
INHS 17409	*Lampsilis cardium*	1		1		
INHS 17411	*Ligumia recta*	1			1	
not saved	*Venustaconcha ellipsiformis*	0		1		

Fox River (Illinois River Dr.) 009
Elgin, ~500 yds downstream from dam
Kane County, Illinois , USA
T41N, R8E, sec. 14, NE
42.04056 , -88.28875

4 August 1930

Catalogue No.	Species	V	L	D	R	SP
INHS 32952	*Elimia livescens*	448	448			448

Fox River (Illinois River Dr.) 045
Elgin, National/ Walnut St. bridge
Kane County, Illinois , USA
T41N, R8E, sec. 24

17 September 1993
B.M. Burr, R.C. Heidinger, B. Davin & V. Mosca

Catalogue No.	Species	V	L	D	R	SP
INHS 15945	*Cipangopaludina chinensis*	1	1			1

Fox River (Illinois River Dr.) 004
South Elgin
Kane County, Illinois , USA
T41N, R8E, sec. 35

23 August 1957
M.R. Matteson, Paul & Tommy
below dam

Catalogue No.	Species	V	L	D	R	SP
INHS 7568	*Lampsilis cardium*	1	1			

V = # vouchered, L = live, D = dead, R = Relic, SP = soft parts.

Fox River (Illinois River Dr.) 004
South Elgin, State St. bridge
Kane County, Illinois , USA
T41N, R8E, sec. 35

9 July 1999
R.W. Schanzle, et al.
4 man-hours; hand picking

Catalogue No.	Species	V	L	D	R	SP
INHS 23697	*Pyganodon grandis*	1			1	
INHS 23695	*Elliptio dilatata*	1			1	
INHS 23698	*Quadrula pustulosa*	1			1	
INHS 23696	*Lampsilis cardium*	1			1	

Fox River (Illinois River Dr.) 009
Elgin
[Kane] County, [Illinois] , USA
[T41N, R8E, sec. 14]

Catalogue No.	Species	V	L	D	R	SP
INHS 274	*Amblema plicata*	2				

1914

Catalogue No.	Species	V	L	D	R	SP
INHS 757	*Fusconaia flava*	3				

1916

Catalogue No.	Species	V	L	D	R	SP
INHS 341	*Pyganodon grandis*	1				

13 November 1931
C.K. Carpenter

Catalogue No.	Species	V	L	D	R	SP
MCZ 115591	*Utterbackia imbecillis*	1				

[pre-1919]

Catalogue No.	Species	V	L	D	R	SP
INHS 918	*Villosa iris*	2				

[Fox River] (Illinois River Dr.) 009
Elgin
[Kane] County, Illinois , USA
[T41N, R8E, sec. 14]

Catalogue No.	Species	V	L	D	R	SP
INHS 686	*Elliptio dilatata*	1				
INHS 15236	*Planorbella armigera*	26				

1914

Catalogue No.	Species	V	L	D	R	SP
INHS 1687	*Lampsilis cardium*	2				

Tyler Creek (Fox River Dr.) 056
Elgin, Eagle Heights Park
Kane County, Illinois , USA
T41N, R8E, sec. 10, SW

14 July 1999
K.S. Cummings & C.A. Mayer
1.5 man-hours

Catalogue No.	Species	V	L	D	R	SP

INHS 23582	*Alasmidonta viridis*	3	2	2		1
INHS 23583	*Anodontoides ferussacianus*	1	4			1
INHS 23585	*Lasmigona complanata*	1	17			1
INHS 23586	*Lasmigona compressa*	1	2			1
INHS 23584	*Lampsilis cardium*	1	9			1
INHS 23587	*Venustaconcha ellipsiformis*	1	5			1

Tyler Creek (Fox River Dr.) 047
0.75 mi W Elgin, Randall Rd.
Kane County, Illinois , USA
T41N, R8E, sec. 9, NW

4 September 1996
S. Pescitelli

Catalogue No.	Species	V	L	D	R	SP
INHS 21895	*Lasmigona complanata*	1	1			1

APPENDIX I
MODEL OUTPUT AND DATA SUMMARY

I.01 INTRODUCTION

This appendix provides additional information on the storage and peak hourly flow rate models presented in Section 3.

I.02 STORAGE REQUIREMENTS

A. Rainfall vs. Overflow Volume

FRWRD currently records overflows by documenting the amount of time the overflow pump runs and multiplies it by the pump's capacity to get an overflow volume for that particular day. PS 31 overflow information and rainfall data for the years 2006 through 2009 were used to determine if a relationship between rainfall data and overflow volume existed. Six different recurrence intervals were evaluated. The first graph in Figure I.01-1 shows the relationship between overall rainfall volume and overflow volume.

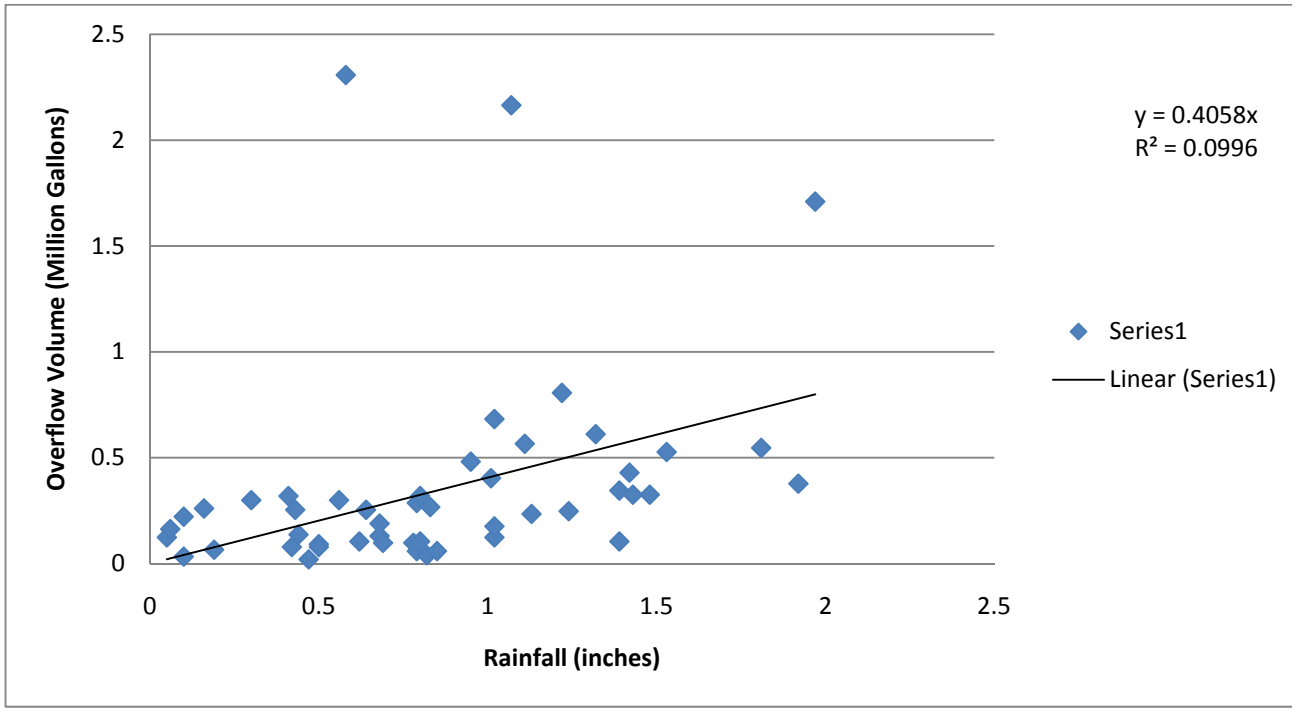


Figure I.01-1 Overall Rainfall Depth vs. Overflow Volume

There appears to be no correlation (R^2 value of .0996) between overall rainfall depth and overflow volume. This is likely because there are many types of rainfall events from slow and constant 24-hour rains to short 15-minute downpours that can affect overflow volumes.

A similar exercise was done comparing different rainfall recurrence intervals to the PS 31 overflow volumes. The rainfall data was obtained from the USGS rain gauge located at Tyler Creek in South Elgin. Figures I.01-2 through I.01-7 compare peak 15-minute, 30-minute, 1-hour, 6-hour, 12-hour, and 24-hour rainfall to overflow volume.

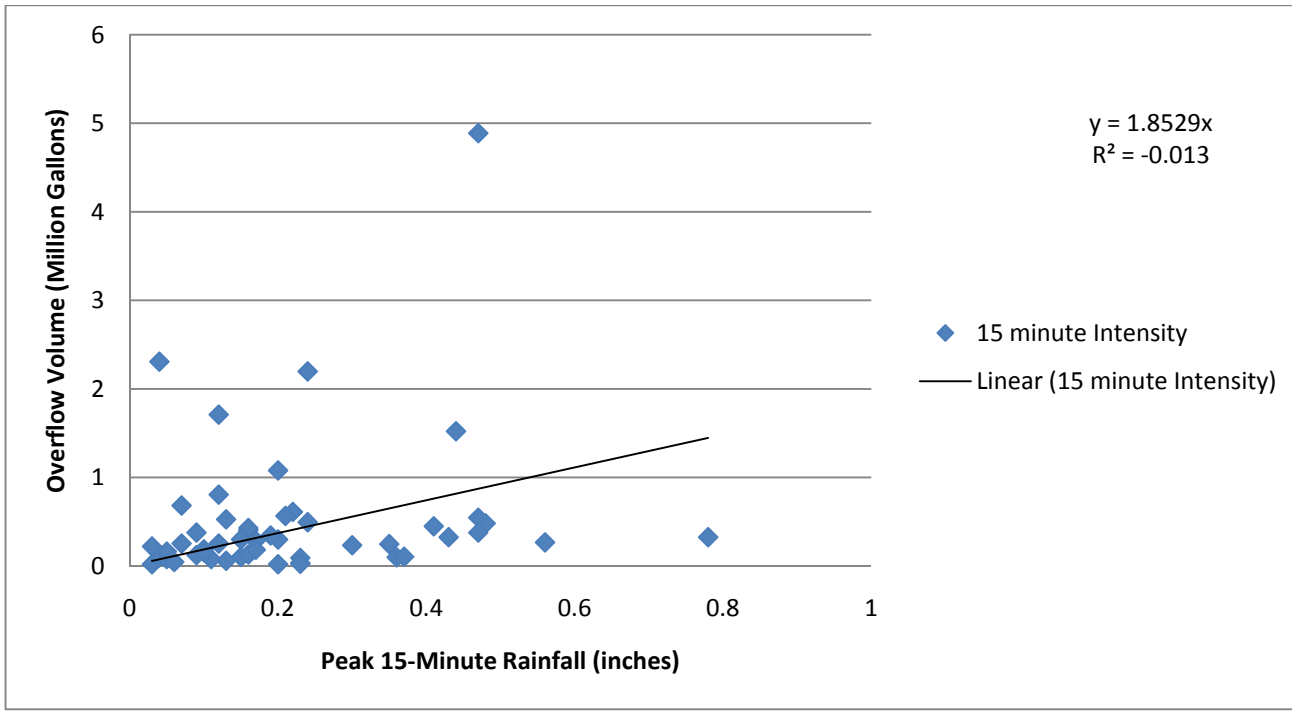


Figure I.01-2 Peak 15-Minute Rainfall vs. Overflow Volume

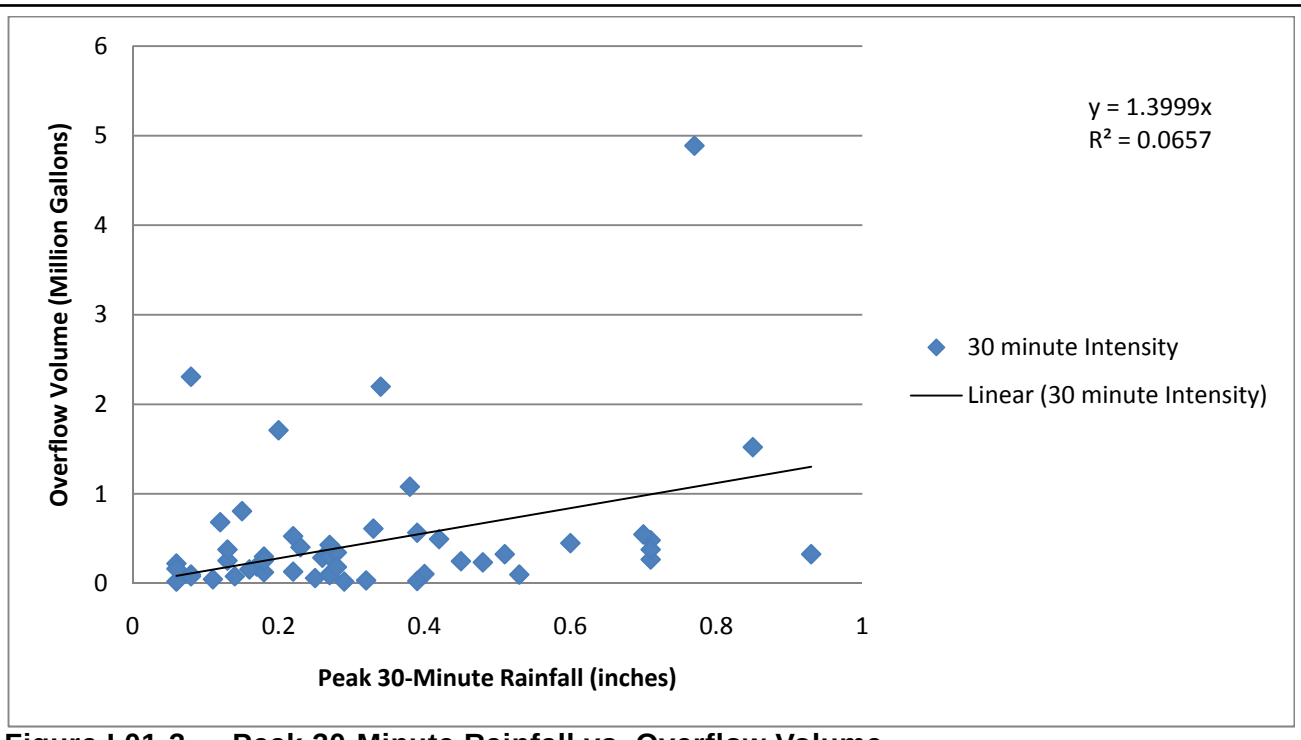


Figure I.01-3 Peak 30-Minute Rainfall vs. Overflow Volume

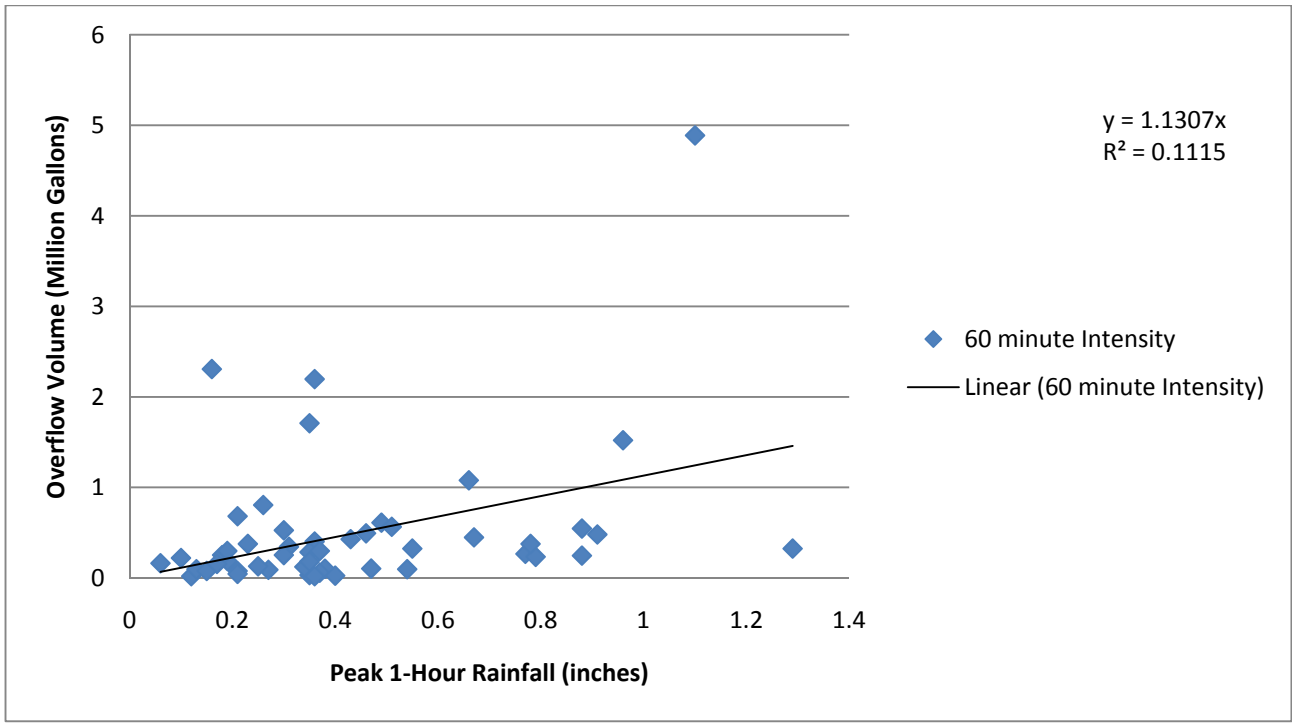


Figure I.01-4 Peak 1-Hour Rainfall vs. Overflow Volume

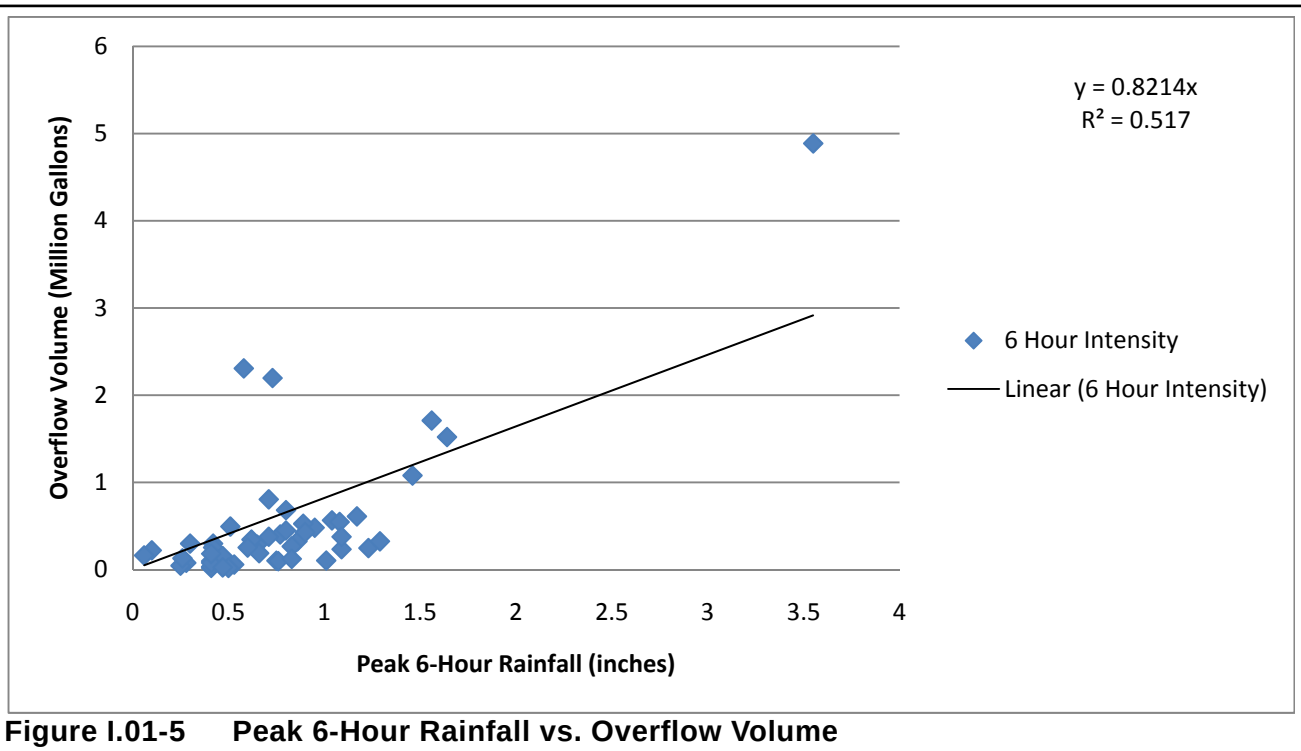


Figure I.01-5 Peak 6-Hour Rainfall vs. Overflow Volume

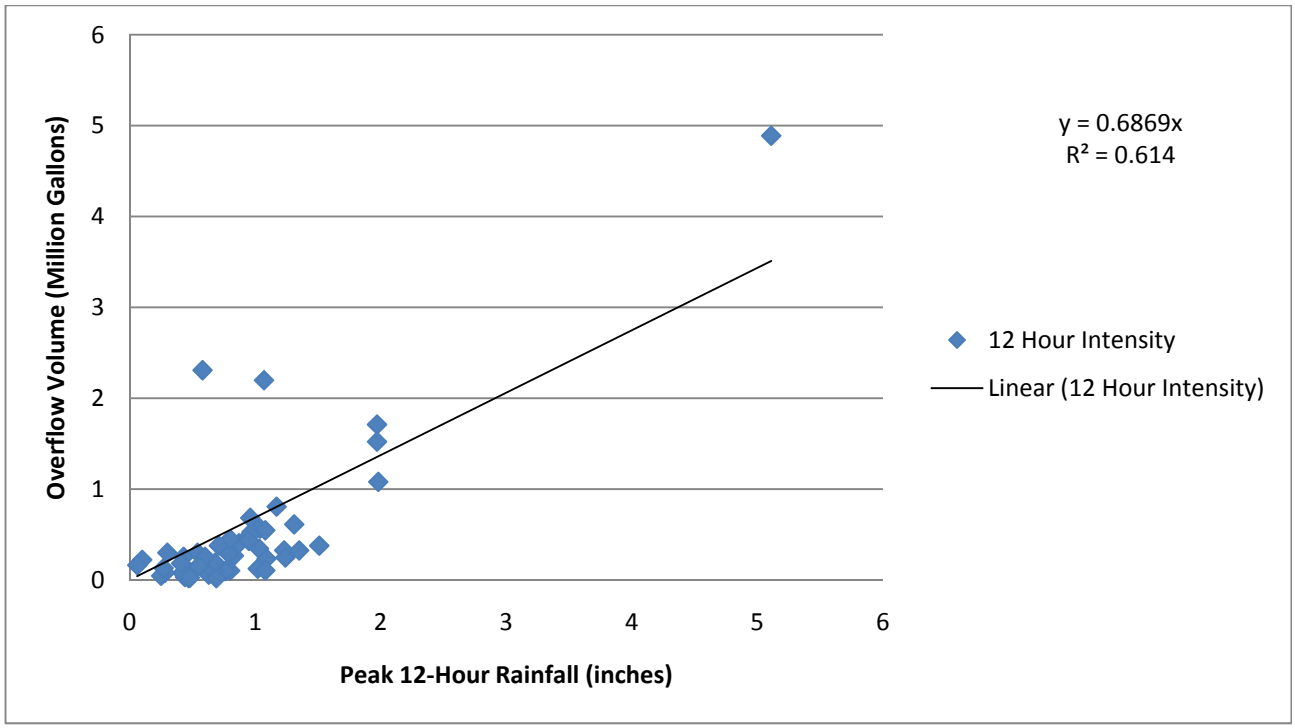


Figure I.01-6 Peak 12-Hour Rainfall vs. Overflow Volume

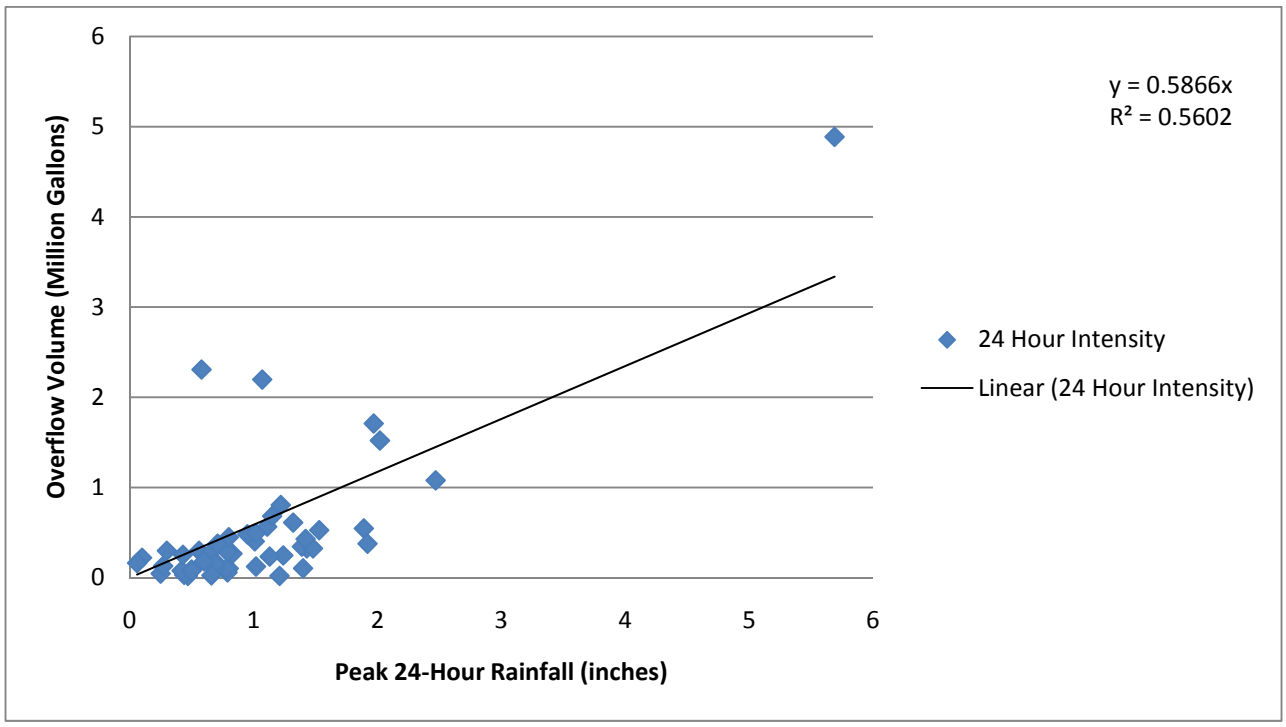


Figure I.01-7 Peak 24-Hour Rainfall vs. Overflow Volume

There was only a slight correlation between rainfall data and overflow volume (R^2 values ranging from - 013 to .614). As stated previously in this report, this is likely because of several factors including inlet constraints into the CSS, capacity constraints conveying flow to PS 31, CSO overflows occurring upstream in Elgin's system, and changing antecedent conditions throughout the system.

B. Storage Model Methodology

A different approach was required to model the required storage needed for different levels of control. A partial duration analysis was performed to determine the probability of a certain overflow volume being required based on a finite, yet broad and robust, dataset. Data from 2004 and 2005 were used in addition to the four years of data used for the previous analysis. The storage alternative was analyzed for 24-, 48-, and 72-hour storage requirements. Ultimately, the 72-hour storage requirement was used to provide a conservative volume required in the event of back-to-back events.

The days in which an overflow occurred and the approximate volume that overflowed were compiled. Three consecutive days' worth of overflow data was summed throughout the dataset to determine the 72-hour storage requirement for each overflow event. The overflow volumes were then ranked from smallest to largest as shown in Table I.02-1. Finally, for different theoretical overflow volumes (1 MG, 1.5 MG, 2 MG, etc.), the number of times that storage volume was exceeded in the six years' worth of data is shown in Table I.02-2.

Overflow Volume (MG)	Number of Times Exceeded in 6 years	Occurrences per Year
12	1	0.167
8	2	0.333
7	3	0.500
6	5	0.833
5	6	1.000
4	7	1.167
3	7	1.167
2.5	14	2.333
2	18	3.000
1.5	23	3.833
1	26	4.333
0.75	32	5.333

Table I.02-2 Occurrences per Year Overflow Volume was Exceeded

As discussed in Section 3 of this report, the extreme back-to-back events that occurred in August 2007 were removed from the dataset used to develop the storage model. This event was a 50-year rainfall event. If it were used as part of the analysis, it essentially would only receive a recurrence interval of six years' because it was the highest volume that was witnessed during the six years worth of data. This would have skewed the model to be far too conservative. Therefore, it was removed for the development of the storage model. The 72-hour overflow volume for this event was plotted as a check to the predictability of the model and it fell very close to the theoretical trend line representing the model (see Figure 3.03-3).

TABLE I.02-1

72-HOUR OVERFLOW VOLUMES

Ranking	72-Hour Volume (MG)	Ranking	72-Hour Volume (MG)	Ranking	72-Hour Volume (MG)	Ranking	72-Hour Volume (MG)
1	0.013	44	0.104	87	0.2665	130	0.624
2	0.013	45	0.104	88	0.273	131	0.6435
3	0.013	46	0.104	89	0.286	132	0.663
4	0.0195	47	0.104	90	0.286	133	0.663
5	0.0195	48	0.1105	91	0.299	134	0.676
6	0.026	49	0.1105	92	0.299	135	0.6825
7	0.026	50	0.1105	93	0.299	136	0.7345
8	0.026	51	0.117	94	0.299	137	0.754
9	0.0325	52	0.117	95	0.3055	138	0.806
10	0.0325	53	0.1235	96	0.312	139	0.897
11	0.0325	54	0.1235	97	0.312	140	0.9035
12	0.039	55	0.1235	98	0.3185	141	0.9035
13	0.039	56	0.1235	99	0.3185	142	0.936
14	0.0455	57	0.1235	100	0.325	143	1.014
15	0.0455	58	0.13	101	0.325	144	1.079
16	0.0455	59	0.13	102	0.325	145	1.339
17	0.0455	60	0.1365	103	0.3315	146	1.521
18	0.0455	61	0.143	104	0.338	147	1.651
19	0.0455	62	0.143	105	0.3445	148	1.7095
20	0.052	63	0.156	106	0.3445	149	1.768
21	0.052	64	0.1625	107	0.3705	150	1.9955
22	0.0585	65	0.169	108	0.377	151	2.145
23	0.0585	66	0.1755	109	0.377	152	2.1645
24	0.0585	67	0.1755	110	0.39	153	2.197
25	0.0585	68	0.182	111	0.403	154	2.3075
26	0.065	69	0.182	112	0.416	155	2.5415
27	0.065	70	0.182	113	0.416	156	2.548
28	0.0715	71	0.1885	114	0.429	157	2.5935
29	0.0715	72	0.1885	115	0.4485	158	2.652
30	0.078	73	0.2145	116	0.4485	159	2.691
31	0.078	74	0.2145	117	0.455	160	2.7495
32	0.078	75	0.2145	118	0.4615	161	2.951
33	0.078	76	0.2145	119	0.481	162	4.888
34	0.078	77	0.221	120	0.481	163	5.5445
35	0.0845	78	0.2275	121	0.481	164	6.11
36	0.0845	79	0.234	122	0.494	165	6.5585
37	0.091	80	0.2405	123	0.5005	166	7.9495
38	0.091	81	0.247	124	0.5265	167	8.6515
39	0.0975	82	0.2535	125	0.533	168	12.9545
40	0.0975	83	0.2535	126	0.546		
41	0.0975	84	0.2535	127	0.546		
42	0.0975	85	0.26	128	0.5655		
43	0.0975	86	0.2665	129	0.611		

I.03 PEAK HOURLY FLOW MODEL

A. Peak Hourly Flow Determination

PS 31 is equipped with five constant speed pumps. Three of these pumps flow to the SWWTF and two of the pumps are overflow pumps to CSO 004. As previously stated in this report, flow recording at PS 31 consists of a circular chart recorder for the three pumps conveying flows to the SWWTF and on and off runtimes for the overflow pumps.

It is fairly easy to determine the flows entering the pumping station when an overflow is not occurring because these flows are documented on the circular chart recorder. However, when an overflow occurs, it is difficult to quantify the flow rate that is entering PS 31 because there is no chart documenting the overflow pumps. As a result, a means of estimating peak hourly flows into PS 31 was developed.

If the overflow pump is running continuously for 60 minutes, it can be concluded that the peak hourly flow at the pumping station is the peak hourly capacity of the pumping station during that hour (typically between 13 and 15.5 mgd), plus the capacity of the overflow pump (9.4 mgd). However, the overflow pump very seldom ran for a full hour. To estimate the flow rate into the station, a percentage of the maximum pumping capacity of the overflow pump was added to the flow rate being pumped to the SWWTF. The percentage was based on the fraction of time the overflow pump was running compared to a full off/on cycle. For example, if the overflow pump turns off for three minutes, and then runs for ten minutes, the total off/on time for that particular cycle was 13 minutes. Furthermore, of that 13 minutes, the pump was actually running for ten minutes which is approximately 77 percent. This means that the pumping rate of the pump during that cycle reached approximately 77 percent of the total capacity or 7.2 mgd. This overflow pumping rate was then added to the pumping rate of the three pumps conveying flows to the SWWTF to estimate the peak hourly flow into PS 31

This exercise was performed for each overflow event between 2004 and 2009. Each overflow event, depending on the number of times the overflow pump turned on and off, had a number of different peak hourly flow rates associated with it. If the overflow pump only turned on once, the associated peak flow rate was determined to be the peak flow rate for that event. If there were multiple off/on cycles and consequently multiple flow rates, the maximum flow rate for the event was determined to be the maximum of the flows calculated from the off/on pumping cycles. As stated, this procedure was done for every event between 2004 and 2009 and furthermore each off/on cycles was identified within those six years. Table I.03-1 is a sample of the procedure used to develop the peak hourly flows.

Day	Time	Overflow Pump Run Time (minutes)	Overflow 1 Off Time Prior	Total Off/On Cycle	Percentage on compared to total cycle time	Flow for total off/on cycle duration (mgd)	PS 31 Pumps (mgd)	Off/On Cycle Peak Hourly Flow	Event Peak Hourly Flow
24-Mar-04	5:10:12 AM	3.3	60.00	63.31	5.23%	0.49	14.4	14.89	22.84
	5:13:30 AM						13.8		
	6:51:53 AM	3.8	98.37	102.17	3.71%	0.35	14.8	15.15	
	6:55:41 AM						14.2		
	8:13:26 AM	6.3	77.76	84.10	7.54%	0.71	15.7	16.41	
	8:19:47 AM						14.6		
	8:24:07 AM	14.5	4.34	18.87	76.99%	7.24	15.6	22.84	
	8:38:39 AM						14.8		
	8:42:50 AM	6.6	4.19	10.80	61.19%	5.75	15.6	21.35	
	8:49:26 AM						14.8		
	8:57:47 AM	4.0	8.33	12.30	32.25%	3.03	15.7	18.73	
	9:01:45 AM						14.8		

Table I.03-1 Estimated Peak Hourly Flow Rate into PS 31

B. Flow Model Development

Once a peak hourly flow rate was estimated for each event, it was necessary to develop a model, similar to the storage model, to use as a predictive tool for identifying levels of control for the alternative analysis. As presented above, only a slight correlation between overflow volume and rainfall existed. It was assumed that the relationship between peak flow and rainfall had the same complexities involved (e.g., antecedent moisture, overflows in Elgin).

The peak hourly flow rates during each event were ranked from smallest to largest. See Table I.03-2 for these rankings. The number of times that peak hourly flow rate was exceeded in the six years' worth of data is shown in Table I.03-3.

TABLE I.03-2

PEAK HOURLY FLOW RATES

Ranking	Peak Hourly Flow Rate (mgd)	Ranking	Peak Hourly Flow Rate (mgd)	Ranking	Peak Hourly Flow Rate (mgd)
1	13.6	44	18.3	87	21.5
2	13.8	45	18.3	88	21.5
3	13.9	46	18.3	89	21.7
4	13.9	47	18.4	90	21.7
5	14.0	48	18.5	91	21.8
6	14.0	49	18.6	92	21.8
7	14.1	50	18.6	93	21.9
8	14.3	51	18.6	94	21.9
9	14.4	52	18.8	95	21.9
10	14.4	53	18.9	96	22.1
11	14.7	54	18.9	97	22.2
12	15.0	55	19.0	98	22.2
13	15.0	56	19.1	99	22.3
14	15.2	57	19.1	100	22.3
15	15.2	58	19.2	101	22.4
16	15.2	59	19.3	102	22.5
17	15.5	60	19.4	103	22.6
18	15.5	61	19.4	104	22.6
19	15.7	62	19.4	105	22.8
20	15.9	63	19.7	106	23.0
21	16.0	64	19.7	107	23.0
22	16.0	65	19.8	108	23.0
23	16.4	66	19.9	109	23.1
24	16.5	67	20.0	110	23.2
25	16.5	68	20.2	111	23.3
26	16.7	69	20.3	112	23.6
27	16.9	70	20.3	113	23.8
28	17.1	71	20.4	114	24.0
29	17.1	72	20.6	115	24.2
30	17.2	73	20.6	116	24.6
31	17.2	74	20.6	117	24.6
32	17.3	75	20.7	118	24.8
33	17.3	76	20.9	119	25.0
34	17.4	77	20.9	120	25.4
35	17.7	78	20.9	121	25.8
36	17.8	79	21.0	122	25.8
37	17.8	80	21.0		
38	17.9	81	21.0		
39	18.0	82	21.1		
40	18.0	83	21.1		
41	18.1	84	21.3		
42	18.2	85	21.3		
43	18.3	86	21.3		

Peak Hourly Flow Rate (mgd)	Number of Times Exceeded in 6 years	Occurrences per Year
25	4	0.667
24	9	1.500
23	16	2.667
22	27	4.500
21	42	7.000
20	56	9.333
19	67	11.167
18	83	13.833
17	95	15.833
16	101	16.833
15	111	18.500

Table I.03-3 Occurrences per Year Estimated Peak Hourly Flow was Exceeded

The associated models corresponding with the data presented in this appendix can be found in Section 3.

APPENDIX J
ADDITIONAL COST INFORMATION

Appendix J
FRWRD LTCP
Alternative 2a-Upgrade PS 31 @ 4 Occurrences per Year [1] [2]

20 Year TPW | Discount Rate 6%

Item	Size/Length	Units	Unit Cost	Capital Cost	Service Life	Replacement Cost (P.W.)	20 yr Salvage Value	Salvage Value (P.W.)
New Screening[3]	30	mgd	N/A	$360,000	20	$0	$0	$0
Upgraded Pumping-Equipment [4]	22	mgd	N/A	$900,000	15	$380,000	$600,000	$190,000
Upgraded Pumping-Structural	22	mgd	N/A	$500,000	50	$0	$300,000	$90,000
Upgraded Pumping-Mechanical	22	mgd	N/A	$120,000	15	$50,000	$80,000	$30,000
Upgraded Pumping-Electrical	22	mgd	N/A	$1,200,000	15	$500,000	$800,000	$250,000
30" FM-Railroad Crossing (Bore and Jack)	160	l.f.	$1,300	$210,000	40	$0	$100,000	$30,000
30" FM Bike Path Crossing	40	l.f.	$378	$20,000	40	$0	$10,000	$0
30" FM Open Run (Trees)	1330	l.f.	$265	$350,000	40	$0	$180,000	$60,000
30" FM Minor Street	650	l.f.	$399	$260,000	40	$0	$130,000	$40,000
SWWTP Primary Clarifiers-Structure	80	ft	$936,300	$3,750,000	50	$0	$2,250,000	$700,000
SWWTP Primary Clarifiers-Equipment	80	ft	$289,300	$1,160,000	15	$480,000	$770,000	$240,000
SWWTP Primary Sludge Pumping-Structure [5]		N/A	N/A	$660,000	50	$0	$400,000	$120,000
SWWTP Primary Sludge Pumping-Equipment		N/A	N/A	$380,000	15	$160,000	$250,000	$80,000
SWWTP Wet Weather Disinfection [6]	2200	sf	N/A	$250,000	50	$0	$150,000	$50,000
Demolition		N/A	N/A	$250,000	50	$0	$0	$0
Subtotal				$9,050,000		$1,570,000	$6,020,000	$1,880,000
Piping and Mechanical [7]				$1,300,000				
Electrical [8]				$2,510,000				
Site Work (4%)				$410,000				
Subtotal				$13,270,000				
Contractor Profit, Bonds, & Insurance (8%)				$1,060,000				
Contingencies, Legal, & Engineering (35%)				$5,020,000				
Total Capital Costs				**$19,350,000**		**$1,570,000**	**$6,020,000**	**$1,880,000**
Present Worth				$19,350,000		$1,570,000		$1,880,000

Summary of Present Worth Costs	
Capital Cost	$19,350,000
Replacement	$1,570,000
Salvage Value	($1,880,000)
PRESENT WORTH	**$19,040,000**

Estimated Annual O&M Costs	
Labor ($45/hr) [9]	$7,200
Power ($0.07/kwh) [10]	--
Chemicals	$12,090
Maintenance and Supplies [11]	$69,690
Total	$90,000
Present Worth of O&M	$1,030,000
TOTAL PRESENT WORTH	**$20,070,000**

Notes:

[1] All costs are First Quarter 2010 dollars
[2] Interest rate assumed to be 6.0%
[3] Assumes all flows to the station are screened before entering the station
[4] Assumes existing building to remain with minor structural modifications
[5] Assumes 2 new pirmary sludge pumping buildings
[6] Assumes existing chemical feed equipment has adequate capacity for added flows
[7] Piping and mechanical cost assumes 18% of new structure capital costs plus mechanical cost associated with PS 31
[8] Electrical cost assumes 20% of new structure capital costs plus electicrical cost associated with PS 31
[9] Assumes 1 laborer 8 hours of cleanup 20 times per year at $45/yr
[10] Power costs between all alternatives assumed approximately equal because of pumping requirements
[11] Assumes 2% of onsite equipment capital costs, 3% of offsite equipment captial costs, and $0.50 per linear foot of pipe

Appendix J
FRWRD LTCP

Alternative 2b-Upgrade PS 31 @ 1 Occurrence per Year [1] [2]

20 Year TPW | Discount Rate 6%

Item	Size/Length	Units	Unit Cost	Capital Cost	Service Life	Replacement Cost (P.W.)	20 yr Salvage Value	Salvage Value (P.W.)
New Screening [3]	30	mgd	N/A	$360,000	20	$0	$0	$0
Upgraded Pumping-Equipment [4]	24.6	mgd	N/A	$950,000	15	$400,000	$630,000	$200,000
Upgraded Pumping-Structural	24.6	mgd	N/A	$500,000	50	$0	$300,000	$90,000
Upgraded Pumping-Mechanical	24.6	mgd	N/A	$120,000	15	$50,000	$80,000	$30,000
Upgraded Pumping-Electrical	24.6	mgd	N/A	$1,300,000	15	$540,000	$870,000	$270,000
30" FM-Railroad Crossing (Bore and Jack)	160	l.f.	$1,300	$210,000	40	$0	$100,000	$30,000
30" FM Bike Path Crossing	40	l.f.	$378	$20,000	40	$0	$10,000	$0
30" FM Open Run (Trees)	1330	l.f.	$265	$350,000	40	$0	$180,000	$60,000
30" FM Minor Street	650	l.f.	$399	$260,000	40	$0	$130,000	$40,000
SWWTP Primary Clarifiers-Structure	85	ft	$976,000	$3,900,000	50	$0	$2,340,000	$730,000
SWWTP Primary Clarifiers-Equipment	85	ft	$301,000	$1,210,000	15	$500,000	$800,000	$250,000
SWWTP Primary Sludge Pumping-Structure [5]		N/A	N/A	$660,000	50	$0	$400,000	$120,000
SWWTP Primary Sludge Pumping-Equipment		N/A	N/A	$380,000	15	$160,000	$250,000	$80,000
SWWTP Wet Weather Disinfection [6]	2700	sf	N/A	$280,000	50	$0	$170,000	$50,000
Demolition		N/A	N/A	$250,000	50	$0	$0	$0
Subtotal				$9,330,000		$1,650,000	$6,260,000	$1,950,000
Piping and Mechanical [7]				$1,340,000				
Electrical [8]				$2,660,000				
Site Work (4%)				$430,000				
Subtotal				$13,760,000				
Contractor Profit, Bonds, & Insurance (8%)				$1,100,000				
Contingencies, Legal, & Engineering (35%)				$5,200,000				
Total Capital Costs				**$20,060,000**		**$1,650,000**	**$6,260,000**	**$1,950,000**
Present Worth				$20,060,000		$1,650,000		$1,950,000

Summary of Present Worth Costs	
Capital Cost	$20,060,000
Replacement	$1,650,000
Salvage Value	($1,950,000)
PRESENT WORTH	**$19,760,000**

Estimated Annual O&M Costs	
Labor ($45/hr) [9]	$7,200
Power ($0.07/kwh) [10]	--
Chemicals	$15,555
Maintenance and Supplies [11]	$72,190
Total	$95,000
Present Worth of O&M	$1,090,000
TOTAL PRESENT WORTH	**$20,850,000**

Notes:
[1] All costs are First Quarter 2010 dollars
[2] Interest rate assumed to be 6.0%
[3] Assumes all flows to the station are screened before entering the station
[4] Assumes existing building to remain with minor structural modifications
[5] Assumes 2 new pirmary sludge pumping buildings
[6] Assumes existing chemical feed equipment has adequate capacity for added flows
[7] Piping and mechanical cost assumes 18% of new structure capital costs plus mechanical cost associated with PS 31
[8] Electrical cost assumes 20% of new structure capital costs plus electicrical cost associated with PS 31
[9] Assumes 1 laborer 8 hours of cleanup 20 times per year at $45/yr
[10] Power costs between all alternatives assumed approximately equal because of pumping requirements
[11] Assumes 2% of onsite equipment capital costs, 3% of offsite equipment captial costs, and $0.50 per linear foot of pipe

Appendix J
FRWRD LTCP

Alternative 2c-Upgrade PS 31 @ 1 Occurrence per Ten Years [1] [2]

20 Year TPW | Discount Rate 6%

Item	Size/Length	Units	Unit Cost	Capital Cost	Service Life	Replacement Cost (P.W.)	20 yr Salvage Value	Salvage Value (P.W.)
New Screening [3]	30	MGD	N/A	$360,000	20	$0	$0	$0
Upgraded Pumping-Equipment [4]	28.8	MGD	N/A	$1,000,000	15	$420,000	$670,000	$210,000
Upgraded Pumping-Structural	28.8	MGD	N/A	$500,000	50	$0	$300,000	$90,000
Upgraded Pumping-Mechanical	28.8	MGD	N/A	$120,000	15	$50,000	$80,000	$30,000
Upgraded Pumping-Electrical	28.8	MGD	N/A	$1,500,000	15	$630,000	$1,000,000	$310,000
36" FM-Railroad Crossing (Bore and Jack)	160	l.f.	$1,641	$260,000	40	$0	$130,000	$40,000
36" FM Bike Path Crossing	40	l.f.	$448	$20,000	40	$0	$10,000	$0
36" FM Open Run (Trees)	1330	l.f.	$310	$410,000	40	$0	$210,000	$60,000
36" FM Minor Street	650	l.f.	$495	$320,000	40	$0	$160,000	$50,000
SWWTP Primary Clarifiers-Structure	90	ft	$1,014,000	$4,060,000	50	$0	$2,440,000	$760,000
SWWTP Primary Clarifiers-Equipment	90	ft	$313,000	$1,250,000	15	$520,000	$840,000	$260,000
SWWTP Primary Sludge Pumping-Structure [5]		N/A	N/A	$660,000	50	$0	$400,000	$120,000
SWWTP Primary Sludge Pumping-Equipment		N/A	N/A	$380,000	15	$160,000	$250,000	$80,000
SWWTP Wet Weather Disinfection [6]	3400	sf	N/A	$310,000	50	$0	$190,000	$60,000
Demolition		N/A	N/A	$250,000	50	$0	$0	$0
Subtotal				$9,780,000		$1,780,000	$6,680,000	$2,070,000
Piping and Mechanical (18%)				$1,380,000				
Electrical (20%)				$2,900,000				
Site Work (4%)				$460,000				
Subtotal				$14,520,000				
Contractor Profit, Bonds, & Insurance (8%)				$1,160,000				
Contingencies, Legal, & Engineering (35%)				$5,490,000				
Total Capital Costs				**$21,170,000**		**$1,780,000**	**$6,680,000**	**$2,070,000**
Present Worth				$21,170,000		$1,780,000		$2,070,000
Summary of Present Worth Costs								
Capital Cost				$21,170,000				
Replacement				$1,780,000				
Salvage Value				($2,070,000)				
PRESENT WORTH				**$20,880,000**				
Estimated Annual O&M Costs								
Labor ($45/hr) [9]				$7,200				
Power ($0.07/kwh) [10]				--				
Chemicals				$21,195				
Maintenance and Supplies [11]				$74,490				
Total				$103,000				
Present Worth of O&M				$1,180,000				
TOTAL PRESENT WORTH				**$22,060,000**				

Notes:
[1] All costs are First Quarter 2010 dollars
[2] Interest rate assumed to be 6.0%
[3] Assumes all flows to the station are screened before entering the station
[4] Assumes existing building to remain with minor structural modifications
[5] Assumes 2 new pirmary sludge pumping buildings
[6] Assumes existing chemical feed equipment has adequate capacity for added flows
[7] Piping and mechanical cost assumes 18% of new structure capital costs plus mechanical cost associated with PS 31
[8] Electrical cost assumes 20% of new structure capital costs plus electicrical cost associated with PS 31
[9] Assumes 1 laborer 8 hours of cleanup 20 times per year at $45/yr
[10] Power costs between all alternatives assumed approximately equal because of pumping requirements
[11] Assumes 2% of onsite equipment capital costs, 3% of offsite equipment captial costs, and $0.50 per linear foot of pipe

Appendix J
FRWRD LTCP
Alternative 3a - Remove PS 31 @ 4 Occurrences per Year [1] [2]

20 Year TPW | Discount Rate 6%

Item	Size/Length	Units	Unit Cost	Capital Cost	Service Life	Replacement Cost (P.W.)	20 yr Salvage Value	Salvage Value (P.W.)
42" Gravity Sewer-Open Go (with trees)	1235	l.f.	$505	$620,000	40	$0	$310,000	$100,000
42" Gravity Sewer-Railroad Crossing (Bore and Jack)	160	l.f.	$2,040	$330,000	40	$0	$170,000	$50,000
42" Gravity Sewer-Bike Path Crossing	40	l.f.	$751	$30,000	40	$0	$20,000	$10,000
30" FM Open Run (Trees)	465	l.f.	$265	$120,000	40	$0	$60,000	$20,000
30" FM Minor Street	380	l.f.	$399	$150,000	40	$0	$80,000	$30,000
SWWTP Influent Pumping-Structural	22	mgd	N/A	$1,580,000	50	$0	$950,000	$300,000
SWWTP Influent Pumping-Equipment	22	mgd	N/A	$900,000	15	$380,000	$600,000	$190,000
SWWTP Influent Pumping-Mechanical	22	mgd	N/A	$120,000	15	$50,000	$80,000	$30,000
SWWTP Influent Pumping-Electrical	22	mgd	N/A	$1,200,000	15	$500,000	$800,000	$250,000
SWWTP Influent Screening-Equipment [3]	30	mgd	N/A	$360,000	20	$0	$0	$0
SWWTP Primary Clarifiers-Structure	80	ft	$936,300	$3,750,000	50	$0	$2,250,000	$700,000
SWWTP Primary Clarifiers-Equipment	80	ft	$289,300	$1,160,000	15	$480,000	$770,000	$240,000
SWWTP Primary Sludge Pumping-Structure [4]		N/A	N/A	$660,000	50	$0	$400,000	$130,000
SWWTP Primary Sludge Pumping-Equipment		N/A	N/A	$380,000	15	$160,000	$250,000	$80,000
SWWTP Wet Weather Disinfection [5]	2200	sf	N/A	$250,000	50	$0	$150,000	$50,000
Demolition		N/A	N/A	$250,000	50	$0	$0	$0
Subtotal				$10,540,000		$1,570,000	$6,890,000	$2,180,000
Piping and Mechanical [6]				$1,300,000				
Electrical [7]				$2,510,000				
Site Work (4%)				$470,000				
Subtotal				$14,820,000				
Contractor Profit, Bonds, & Insurance (8%)				$1,190,000				
Contingencies, Legal, & Engineering (35%)				$5,600,000				
Total Capital Costs				**$21,610,000**		**$1,570,000**	**$6,890,000**	**$2,180,000**
Present Worth				$21,610,000		$1,570,000		$2,180,000

Summary of Present Worth Costs

Capital Cost	$21,610,000
Replacement	$1,570,000
Salvage Value	($2,180,000)
PRESENT WORTH	**$21,000,000**

Estimated Annual O&M Costs

Labor ($45/hr) [8]	$7,200
Power ($0.07/kwh) [9]	--
Chemicals	$12,090
Maintenance and Supplies [10]	$57,140
Total	$76,000
Present Worth of O&M	$870,000
TOTAL PRESENT WORTH	**$21,870,000**

Notes:
[1] All costs are First Quarter 2010 dollars.
[2] Interest rate assumed to be 6.0%
[3] Assumes 30 MGD screening before the new influent pumping station
[4] Assumes 2 new primary sludge pumping buildings
[5] Assumes existing chemical feed equipment has adequate capacity for added flows
[6] Piping and mechanical cost assumes 18% of new structure capital costs plus mechanical cost associated with PS 31
[7] Electrical cost assumes 20% of new structure capital costs plus electicrical cost associated with PS 31
[8] Assumes 1 laborer 8 hours of cleanup 20 times per year at $45/yr
[9] Power costs between all alternatives assumed approximately equal because of pumping requirements
[10] Assumes 2% of onsite equipment capital costs and $0.50 per linear foot of pipe

Appendix J
FRWRD LTCP
Alternative 3b - Remove PS 31 @ 1 Occurrence per Year

20 Year TPW | Discount Rate 6%

Item	Size/Length	Units	Unit Cost	Capital Cost	Service Life	Replacement Cost (P.W.)	20 yr Salvage Value	Salvage Value (P.W.)
42" Gravity Sewer-Open Go (with trees)	1235	l.f.	$505	$620,000	40	$0	$310,000	$100,000
42" Gravity Sewer-Railroad Crossing (Bore and Jack)	160	l.f.	$2,040	$330,000	40	$0	$160,000	$50,000
42" Gravity Sewer-Bike Path Crossing	40	l.f.	$751	$30,000	40	$0	$20,000	$10,000
30" FM Open Run (Trees)	465	l.f.	$265	$120,000	40	$0	$60,000	$20,000
30" FM Minor Street	380	l.f.	$399	$150,000	40	$0	$80,000	$20,000
SWWTP Influent Pumping-Structural	24.6	mgd	N/A	$1,590,000	50	$0	$950,000	$300,000
SWWTP Influent Pumping-Equipment	24.6	mgd	N/A	$950,000	15	$400,000	$630,000	$200,000
SWWTP Influent Pumping-Mechanical	24.6	mgd	N/A	$120,000	15	$50,000	$80,000	$30,000
SWWTP Influent Pumping-Electrical	24.6	mgd	N/A	$1,300,000	15	$540,000	$870,000	$270,000
SWWTP Influent Screening-Equipment [3]	30	mgd	N/A	$360,000	20	$0	$0	$0
SWWTP Primary Clarifiers-Structure	85	ft	$976,000	$3,900,000	50	$0	$2,340,000	$730,000
SWWTP Primary Clarifiers-Equipment	85	ft	$301,000	$1,210,000	15	$500,000	$800,000	$250,000
SWWTP Primary Sludge Pumping-Structure [4]		N/A	N/A	$660,000	50	$0	$400,000	$120,000
SWWTP Primary Sludge Pumping-Equipment		N/A	N/A	$380,000	15	$160,000	$250,000	$80,000
SWWTP Wet Weather Disinfection [5]	2700	sf	N/A	$280,000	50	$0	$170,000	$50,000
Demolition		N/A	N/A	$250,000	50	$0	$0	$0
Subtotal				$10,830,000		$1,650,000	$7,120,000	$2,230,000
Piping and Mechanical [6]				$1,340,000				
Electrical [7]				$2,660,000				
Site Work (4%)				$490,000				
Subtotal				$15,320,000				
Contractor Profit, Bonds, & Insurance (8%)				$1,230,000				
Contingencies, Legal, & Engineering (35%)				$5,790,000				
Total Capital Costs				**$22,340,000**		**$1,650,000**	**$7,120,000**	**$2,230,000**
Present Worth				$22,340,000		$1,650,000		$2,230,000

Summary of Present Worth Costs	
Capital Cost	$22,340,000
Replacement	$1,650,000
Salvage Value	($2,230,000)
PRESENT WORTH	**$21,760,000**

Estimated Annual O&M Costs	
Labor ($45/hr) [8]	$7,200
Power ($0.07/kwh) [9]	--
Chemicals	$15,555
Maintenance and Supplies [10]	$59,140
Total	$82,000
Present Worth of O&M	$940,000
TOTAL PRESENT WORTH	**$22,700,000**

Notes:
[1] All costs are First Quarter 2010 dollars.
[2] Interest rate assumed to be 6.0%
[3] Assumes 30 MGD screening before the new influent pumping station
[4] Assumes 2 new primary sludge pumping buildings
[5] Assumes existing chemical feed equipment has adequate capacity for added flows
[6] Piping and mechanical cost assumes 18% of new structure capital costs plus mechanical cost associated with PS 31
[7] Electrical cost assumes 20% of new structure capital costs plus electicrical cost associated with PS 31
[8] Assumes 1 laborer 8 hours of cleanup 20 times per year at $45/yr
[9] Power costs between all alternatives assumed approximately equal because of pumping requirements
[10] Assumes 2% of onsite equipment capital costs and $0.50 per linear foot of pipe

Appendix J
FRWRD LTCP
Alternative 3c - Remove PS 31 @ 1 Occurrence per Ten Years

20 Year TPW | Discount Rate 6%

Item	Size/Length	Units	Unit Costs	Captial Cost	Service Life	Replacement Cost (P.W.)	20 yr Salvage Value	Salvage Value (P.W.)
48" Gravity Sewer-Open Go (with trees)	1200	l.f.	$600	$720,000	40	$0	$360,000	$110,000
48" Gravity Sewer-Railroad Crossing (Bore and Jack)	160	l.f.	$2,359	$380,000	40	$0	$190,000	$60,000
48" Gravity Sewer-Bike Path Crossing	40	l.f.	$932	$40,000	40	$0	$20,000	$10,000
36" FM Open Run (Trees)	465	l.f.	$310	$140,000	40	$0	$70,000	$20,000
36" FM Minor Street	380	l.f.	$495	$190,000	40	$0	$90,000	$30,000
SWWTP Influent Pumping-Structural	28.8	mgd	N/A	$1,600,000	50	$0	$960,000	$300,000
SWWTP Influent Pumping-Equipment	28.8	mgd	N/A	$1,000,000	15	$420,000	$670,000	$210,000
SWWTP Influent Pumping-Mechanical	28.8	mgd	N/A	$120,000	15	$50,000	$80,000	$30,000
SWWTP Influent Pumping-Electrical	28.8	mgd	N/A	$1,500,000	15	$630,000	$1,000,000	$310,000
SWWTP Influent Screening-Equipment [3]	30	mgd	N/A	$360,000	20	$0	$0	$0
SWWTP Primary Clarifiers-Structure	90	ft	$1,014,000	$4,060,000	50	$0	$2,430,000	$760,000
SWWTP Primary Clarifiers-Equipment	90	ft	$313,000	$1,250,000	15	$520,000	$840,000	$260,000
SWWTP Primary Sludge Pumping-Structure [4]		N/A	N/A	$660,000	50	$0	$400,000	$120,000
SWWTP Primary Sludge Pumping-Equipment		N/A	N/A	$380,000	15	$160,000	$250,000	$80,000
SWWTP Wet Weather Disinfection [5]	3400	sf	N/A	$310,000	50	$0	$190,000	$60,000
Demolition		N/A	N/A	$250,000	50	$0	$0	$0
Subtotal				$11,340,000		$1,780,000	$7,550,000	$2,360,000
Piping and Mechanical [6]				$1,380,000				
Electrical [7]				$2,900,000				
Site Work (4%)				$520,000				
Subtotal				$16,140,000				
Contractor Profit, Bonds, & Insurance (8%)				$1,290,000				
Contingencies, Legal, & Engineering (35%)				$6,100,000				
Total Capital Costs				**$23,530,000**		**$1,780,000**	**$7,550,000**	**$2,360,000**

Present Worth	$23,530,000
	$1,780,000
Summary of Present Worth Costs	($2,360,000)
Capital Cost	
Replacement	**$22,950,000**
Salvage Value	
PRESENT WORTH	$7,200
	--
Estimated Annual O&M Costs	$21,195
Labor ($45/hr) [8]	$60,923
Power ($0.07/kwh) [9]	$89,000
Chemicals	$1,020,000
Maintenance and Supplies [10]	**$23,970,000**
Total	
Present Worth of O&M	
TOTAL PRESENT WORTH	

Notes:
[1] All costs are First Quarter 2010 dollars.
[2] Interest rate assumed to be 6.0%
[3] Assumes 30 MGD screening before the new influent pumping station
[4] Assumes 2 new primary sludge pumping buildings
[5] Assumes existing chemical feed equipment has adequate capacity for added flows
[6] Piping and mechanical cost assumes 18% of new structure capital costs plus mechanical cost associated with PS 31
[7] Electrical cost assumes 20% of new structure capital costs plus electicrical cost associated with PS 31
[8] Assumes 1 laborer 8 hours of cleanup 20 times per year at $45/yr
[9] Power costs between all alternatives assumed approximately equal because of pumping requirements
[10] Assumes 2% of onsite equipment capital costs and $0.50 per linear foot of pipe

Appendix J
FRWRD LTCP
Alternative 4a-72-hour Storage @ 4 Occurrences per Year [1] [2]

20 Year TPW | Discount Rate 6%

Item	Size Length	Units	Unit Cost	Capital Cost	Service Life	Replacement Cost (P.W.)	20 yr Salvage Value	Salvage Value (P.W.)
New Screening [3]	30	mgd	N/A	$360,000	20	$0	$0	$0
Upgraded Bypass Pumping-Equipment [4]	9	mgd	N/A	$1,050,000	15	$440,000	$700,000	$220,000
Upgraded Bypass Pumping-Structural	9	mgd	N/A	$500,000	50	$0	$300,000	$90,000
Upgraded Bypass Pumping-Mechanical	9	mgd	N/A	$120,000	15	$50,000	$80,000	$30,000
Upgraded Bypass Pumping-Electrical	9	mgd	N/A	$1,400,000	15	$580,000	$930,000	$290,000
18" FM-River Crossing	375	l.f.	$1,590	$600,000	40	$0	$300,000	$90,000
18" FM Bike Path Crossing	25	l.f.	$296	$10,000	40	$0	$0	$0
18" FM-Railroad Crossing (Bore and Jack)	140	l.f.	$904	$130,000	40	$0	$60,000	$20,000
18" FM Open Run	1725	l.f.	$214	$370,000	40	$0	$180,000	$60,000
18" FM Open Run (Trees)	950	l.f.	$220	$210,000	40	$0	$110,000	$30,000
24" FM-Railroad Crossing (Bore and Jack) [5]	160	l.f.	$1,069	$170,000	40	$0	$90,000	$30,000
24" FM Bike Path Crossing	40	l.f.	$336	$10,000	40	$0	$10,000	$0
24" FM Open Run (Trees)	1365	l.f.	$250	$340,000	40	$0	$170,000	$50,000
24" FM Minor Street	675	l.f.	$355	$240,000	40	$0	$120,000	$40,000
Storage Tank	1.14	mil gal	$1.11	$1,270,000	50	$0	$760,000	$240,000
Odor Control	1.14	mil gal	N/A	$80,000	10	$40,000	$0	$0
Tipping Buckets	1.14	mil gal	N/A	$250,000	20	$0	$0	$0
Electrical and Mechanical	1.14	mil gal	N/A	$40,000	15	$20,000	$30,000	$10,000
Land Acquisition	1	ac	$50,000	$50,000	40	$0	$50,000	$20,000
Dewatering Piping-18"	90	l.f.	$191	$20,000	40	$0	$10,000	$0
Subtotal				$7,220,000		$1,130,000	$3,900,000	$1,220,000
Site Work (10%)				$720,000				
Subtotal				$7,940,000				
Contractor Profit, Bonds, & Insurance (8%)				$640,000				
Contingencies, Legal, & Engineering (35%)				$3,000,000				
Total Capital Costs				**$11,580,000**		**$1,130,000**	**$3,900,000**	**$1,220,000**
Present Worth				$11,580,000		$1,130,000		$1,220,000

Summary of Present Worth Costs	
Capital Cost	$11,580,000
Replacement	$1,130,000
Salvage Value	($1,220,000)
PRESENT WORTH	**$11,490,000**

Estimated Annual O&M Costs	
Labor ($45/hr) [6]	$21,600
Maintenance [7]	$52,200
Pipe O&M (.50/lf) [8]	$2,800
Total	$77,000
Present Worth of O&M	$880,000
TOTAL PRESENT WORTH	**$12,370,000**

Notes:
[1] All costs are First Quater 2010 dollars.
[2] Interest rate assumed to be 6.0%
[3] Assumes all flows to the station are screened before entering the station and bypass pumping
[4] Assumes bypass pumps are upgraded and existing pumps replaced
[5] Assumes existig forcemain is replaced
[6] Assumes 3 laborers 8 hours each of cleanup 20 times a year at $45/hr
[7] Assumes 3 percent of all captial cost of all offsite equipment
[8] Assumes $0.50 per linear foot of new pipe

Appendix J
FRWRD LTCP

Alternative 4b-72-hour Storage @ 1 Occurrence per Year [1] [2]

20 Year TPW | Discount Rate 6%

Item	Size Length	Units	Unit Cost	Capital Cost	Service Life	Replacement Cost (P.W.)	20 yr Salvage Value	Salvage Value (P.W.)
New Screening [3]	30	mgd	N/A	$360,000	20	$0	$0	$0
Upgraded Bypass Pumping-Equipment [4]	11.58	mgd	N/A	$1,100,000	15	$460,000	$730,000	$230,000
Upgraded Bypass Pumping-Structural	11.58	mgd	N/A	$500,000	50	$0	$300,000	$90,000
Upgraded Bypass Pumping-Mechanical	11.58	mgd	N/A	$120,000	15	$50,000	$80,000	$30,000
Upgraded Bypass Pumping-Electrical	11.58	mgd	N/A	$1,600,000	15	$670,000	$1,070,000	$330,000
20" FM-River Crossing	375	l.f.	$1,617	$610,000	40	$0	$300,000	$100,000
20" FM-Bike Path Crossing	25	l.f.	$310	$10,000	40	$0	$0	$0
20" FM-Railroad Crossing (Bore and Jack)	140	l.f.	$1,044	$150,000	40	$0	$70,000	$20,000
20" FM Open Run	1025	l.f.	$226	$230,000	40	$0	$120,000	$40,000
20" FM Open Run (Trees)	950	l.f.	$235	$220,000	40	$0	$110,000	$40,000
24" FM-Railroad Crossing (Bore and Jack) [5]	160	l.f.	$1,069	$170,000	40	$0	$90,000	$30,000
24" FM Bike Path Crossing	40	l.f.	$336	$10,000	40	$0	$10,000	$0
24" FM Open Run (Trees)	1365	l.f.	$255	$350,000	40	$0	$170,000	$50,000
24" FM Minor Street	675	l.f.	$355	$240,000	40	$0	$120,000	$40,000
Storage Tank	5.74	mil gal	$0.90	$5,180,000	50	$0	$3,110,000	$970,000
Odor Control	5.74	mil gal	N/A	$300,000	10	$170,000	$0	$0
Tipping Buckets	5.74	mil gal	N/A	$800,000	20	$0	$0	$0
Electrical and Mechanical	5.74	mil gal	N/A	$150,000	15	$60,000	$100,000	$30,000
Land Acquisition	1.5	ac	$50,000	$80,000	40	$0	$80,000	$20,000
Rerouting Southwest Interceptor-24" in street	350	l.f.	$364	$130,000	40	$0	$60,000	$20,000
Rerouting Southwest Interceptor-24" open go	390	l.f.	$191	$80,000	40	$0	$40,000	$10,000
Dewatering Piping-18"	90	l.f.	$169	$20,000	40	$0	$10,000	$0
Subtotal				$12,410,000		$1,410,000	$6,570,000	$2,050,000
Site Work (10%)				$1,240,000				
Subtotal				$13,650,000				
Contractor Profit, Bonds, & Insurance (8%)				$1,090,000				
Contingencies, Legal, & Engineering (35%)				$5,160,000				
Total Capital Costs				**$19,900,000**		**$1,410,000**	**$6,570,000**	**$2,050,000**
Present Worth				$19,900,000		$1,410,000		$2,050,000

Summary of Present Worth Costs	
Capital Cost	$19,900,000
Replacement	$1,410,000
Salvage Value	($2,050,000)
PRESENT WORTH	**$19,260,000**

Estimated Annual O&M Costs	
Labor ($45/hr) [6]	$32,400
Maintenance [7]	$76,800
Pipe O&M (.50/lf) [8]	$2,400
Total	$112,000
Present Worth of O&M	$1,280,000
TOTAL PRESENT WORTH	**$20,540,000**

Notes:
[1] All costs are First Quater 2010 dollars.
[2] Interest rate assumed to be 6.0%
[3] Assumes all flows to the station are screened before entering the station and bypass pumping
[4] Assumes bypass pumps are upgraded and existing pumps replaced
[5] Assumes existig forcemain is replaced
[6] Assumes 3 laborers 12 hours each of cleanup 20 times a year at $45/hr
[7] Assumes 3 percent of all captial cost of all offsite equipment
[8] Assumes $0.50 per linear foot of new pipe

Appendix J
FRWRD LTCP

Alternative 4c-72-hour Storage @ 1 Occurrence per Ten Years [1] [2]

20 Year TPW | Discount Rate 6%

Item	Size Length	Units	Unit Cost	Capital Cost	Service Life	Replacement Cost (P.W.)	20 yr Salvage Value	Salvage Value (P.W.)
New Screening [3]	30	mgd	N/A	$360,000	20	$0	$0	$0
Upgraded Bypass Pumping-Equipment [4]	15.84	mgd	N/A	$1,150,000	15	$480,000	$770,000	$240,000
Upgraded Bypass Pumping-Structural	15.84	mgd	N/A	$500,000	50	$0	$300,000	$90,000
Upgraded Bypass Pumping-Mechanical	15.84	mgd	N/A	$120,000	15	$50,000	$80,000	$30,000
Upgraded Bypass Pumping-Electrical	15.84	mgd	N/A	$1,800,000	15	$750,000	$1,200,000	$370,000
24" FM-River Crossing [5]	375	l.f.	$1,672	$630,000	40	$0	$310,000	$100,000
24" FM-Bike Path Crossing	65	l.f.	$336	$20,000	40	$0	$10,000	$0
24" FM-Railroad Crossing (Bore and Jack)	300	l.f.	$1,069	$320,000	40	$0	$160,000	$50,000
24" FM Open Run	750	l.f.	$245	$180,000	40	$0	$90,000	$30,000
24" FM Open Run (Trees)	2315	l.f.	$255	$590,000	40	$0	$300,000	$90,000
24" FM Minor Street	685	l.f.	$355	$240,000	40	$0	$120,000	$40,000
Storage Tank	13.4	mil gal	$0.85	$11,360,000	50	$0	$6,810,000	$2,130,000
Odor Control	13.4	mil gal	N/A	$630,000	10	$350,000	$0	$0
Tipping Buckets	13.4	mil gal	N/A	$1,290,000	20	$0	$0	$0
Electrical and Mechanical	13.4	mil gal	N/A	$320,000	15	$130,000	$210,000	$70,000
Land Acquisition	3	ac	$50,000	$150,000	40	$0	$150,000	$50,000
Rerouting Southwest Interceptor-24" in street	600	l.f.	$364	$220,000	40	$0	$110,000	$30,000
Rerouting Southwest Interceptor-24" open go	550	l.f.	$191	$110,000	40	$0	$50,000	$20,000
Dewatering Piping-18"	90	l.f.	$169	$20,000	40	$0	$10,000	$0
Subtotal				$20,010,000		$1,760,000	$10,680,000	$3,340,000
Site Work (10%)				$2,000,000				
Subtotal				$22,010,000				
Contractor Profit, Bonds, & Insurance (8%)				$1,760,000				
Contingencies, Legal, & Engineering (35%)				$8,320,000				
Total Capital Costs				**$32,090,000**		**$1,760,000**	**$10,680,000**	**$3,340,000**
Present Worth				$32,090,000		$1,760,000		$3,340,000

Summary of Present Worth Costs	
Capital Cost	$32,090,000
Replacement	$1,760,000
Salvage Value	($3,340,000)
PRESENT WORTH	**$30,510,000**

Estimated Annual O&M Costs	
Labor ($45/hr) [6]	$43,200
Maintenance [7]	$102,900
Pipe O&M (.50/lf) [8]	$2,300
Total	$150,000
Present Worth of O&M	$1,720,000
TOTAL PRESENT WORTH	**$32,230,000**

Notes:
[1] All costs are First Quater 2010 dollars.
[2] Interest rate assumed to be 6.0%
[3] Assumes all flows to the station are screened before entering the station and bypass pumping
[4] Assumes bypass pumps are upgraded and existing pumps replaced
[5] Assumes existig forcemain is replaced
[6] Assumes 3 laborers 16 hours each of cleanup 20 times a year at $45/hr
[7] Assumes 3 percent of all captial cost of all offsite equipment
[8] Assumes $0.50 per linear foot of new pipe

APPENDIX K
LONG TERM CONTROL PLAN EVALUATION CHECKLIST

Long Term Control Plan Evaluation Checklist

Permittee: Fox River Water Reclamation District | **Permit Number: IL 0028657**

Reviewer: | **Date:**

Documents Reviewed:

LTCP Page #	Evaluation Criteria	Yes	No	N/A	Remarks
	System characterization: Compilation and analysis of existing data on CSS and receiving water(s)				
	Major Question: Has the permittee collected and presented existing information and data on the CSS and receiving waters in a format that is understandable and consistent with the CSO Control Policy and guidance?				
	General				
p. 1-1 and Appendices	1. Are the LTCP and all other pertinent reports and studies available to the reviewer?	X			
p. 1-1	2. Is the owner/operator of the CSS identified?	X			
p. 1-1	3. Is the owner/operator of the POTW identified?	X			
p. 2-1	4. Is there a general description of the CSS that includes the area (acres) and an estimate of the population served?	X			
	CSS				
p. 2-1; App C	5. Is the location provided for the major interceptors and each CSO outfall (latitude/longitude or street address) and identified on a map?	X			
p. 1-1; App B&C	6. Are the identified CSO outfalls consistent with the existing permit? Note: Listing will have to be rectified if not consistent.	X			
p. 2-1; App C	7. Have the CSS area and its sewersheds been delineated?		X		Text refers reader to Elgin LTCP
	8. Have land use and estimated impervious cover been provided for each sewershed?		X		Text refers reader to Elgin LTCP
p. 2-1, Fig. 2.02-1	9. Are the principal hydraulic control structures identified (interceptors; regulators; pump stations; storage and controls facilities; POTW)?	X			
p. 2-3; Table 2.03-1	10. Is POTW capacity (primary and secondary; average and peak hydraulic) been specified?	X			
p. 3-1; Table 3.01-1	11. Are dry weather sanitary flow (base) estimates or patterns presented?	X			
p. 3-1; Table 3.01-1	12. Are wastewater flows to the CSS from neighboring or satellite communities identified and quantified, if present?	X			
p. 3-1; Table 3.01-1, App. I	13. Are any existing flow metering or SCADA records described?	X			
p. 3-5	14. Are chronic problem areas or bottlenecks within the CSS described?	X			
p. 2-2	15. Did the permittee identify significant industrial users within the CSS service area?	X			
	Receiving Water(s)				
p. 2-1	16. Are all of the CSO-impacted waters identified?	X			
p. 2-6 thru -14	17. Is the available information on stream flow or tidal conditions, water quality and sediment in the receiving water(s) summarized and presented?	X			

Long Term Control Plan Evaluation Checklist

LTCP Page #	Evaluation Criteria	Yes	No	N/A	Remarks
p. 2-8; Table 2.04-1	18. Are the pollutants of concern identified for each receiving water?	X			
p. 2-7; App. A	19. Does the characterization provide information on the known effects of the CSOs on water quality during wet weather events?	X			
p. 2-5	20. Are the current water quality standards and existing and designated uses of each receiving water identified?	X			
p. 2-7	21. Is there information on whether the designated uses are currently being met or not?	X			
	22. Are any known impairments attributable to CSOs identified for the receiving waters (303(d) list, 305(b) list, fish kills, beach closures, etc.)?			X	
	23. If a TMDL has been or will be developed, does the permittee consider the TMDL in the LTCP?			X	
p. 2-15 and -16	24. Is the presence or absence of sensitive areas adequately determined and presented?	X			
	25. If present, have CSO outfalls located in sensitive areas been identified?			X	
Sec. 2.04: p. 2-5 through 2-14	26. Was the available information on pollutant loadings, from other point and nonpoint sources in the watershed, identified and compiled?	X			ISWS is under contract by FRSG to develop and model this
	Rainfall				
p. 3-4	27. Are long-term rainfall records and annual average conditions identified and evaluated?	X			
p. 3-4; App I	28. Does the permittee demonstrate an adequate understanding of the rainfall conditions that cause CSO events at each outfall?	X			
	System Characterization: Collection system and receiving water monitoring				
	Major Question: Is the monitoring program sufficient to document the frequency and magnitude of CSO event-associated impacts. and to inform the evaluation and selection of CSO controls?				
	Collection System				
p. 3-2; App I	29. Are recent sufficient data available for an adequate range of storms to characterize the hydraulic response of the CSS, including frequency, volume and flow rate, and pollutant loads from CSOs at major or representative outfalls? *(Data should be from within the last five years and include at least two storms >1" to two storms ~0.3".)*	X			
p. 2-9; App A	30. Does the LTCP present estimated concentrations of the pollutants discharged and reasonable justification (compiled through sampling, from literature values, or with values from other CSO studies)?	X			
p. 3-2; App I	31. Was rainfall data collected within the CSS during the flow monitoring periods?	X			
Sec. 3; App I	32. Does the flow monitoring data adequately portray the hydraulic response of the CSS to rainfall?	X			
p. 4-11	33. Is the monitoring program able to evaluate the effectiveness of any controls measures implemented as part of the NMC?	X			
	Receiving Water(s)				

Long Term Control Plan Evaluation Checklist

LTCP Page #	Evaluation Criteria	Yes	No	N/A	Remarks
Sec. 2.04: p. 2-5 through 2-14	34. Does the monitoring program take into account the type (I.e., free flowing, tidal) and physical characteristics of the receiving water?	X			Questions 34 thru 39 are part of the ISWS modeling effort for the FRSG.
Sec. 2.04: p. 2-5 through 2-14	35. Is there information on the impact of CSO pollutant loadings on the receiving waters for the water quality parameters of concern? *(Typically bacteria, BOD, and TSS)*	X			
Sec. 2.04: p. 2-5 through 2-14	36. Is the monitoring sufficient to document pre-control baseline conditions, in order to allow the permittee to demonstrate the long-term benefits of CSO controls?	X			
Sec. 2.04: p. 2-5 through 2-14	37. Does the monitoring program include adequate spatial and temporal coverage during wet weather conditions to support an evaluation of the impacts associated with CSOs?	X			
Sec. 2.04: p. 2-5 through 2-14	38. Is the monitoring sufficient to show whether other sources of pollutants, such as storm water and upstream sources, will preclude the attainment of water quality standards even if CSOs are eliminated?	X			
Sec. 2.04: p. 2-5 through 2-14	39. Does the monitoring consider the appropriate range of possible CSO impacts on receiving waters? *(Typically bacteria and floatables; sometimes dissolved oxygen, metals, or nutrients.)*	X			
	System characterization: Collection system and receiving water modeling				
	Major Question: Has the permittee developed, calibrated, and verified a model of the collection system and/or receiving water, as appropriate, that is able to support the evaluation and selection of CSO controls given the complexity of the CSS?				
	Collection System				
Sec. 3; Figures 3.02-1, 3.03-1 thru -3 and App I	40. Has some type of model (e.g. spreadsheet, SWMM, HydroWorks, etc.) been developed to assess the response of the CSS to different rainfall conditions with respect to CSO volume, frequency and peak overflow rate?	X			
p. 3-7; Table 3.02-1 Figures 3.02-1, 3.03-1 thru -3	41. Does the selected CSS model framework adequately address the engineering and regulatory needs of the LTCP?	X			
Sec 3.02 and 3.03; App I	42. Is the level of detail of the CSS model consistent with and representative of the complexity of the CSS?	X			
Sec 3.02 and 3.03; App I	43. Are sufficient flow and effluent concentration data available to calibrate the model? *(8 - 10 storms covering a range of annual storm sizes)*	X			
Sec 3.02 and 3.03; App I	44. Is the model credible? That is, has the model been documented, calibrated and verified to demonstrate that it generally represents observed behavior (in terms of CSO volume, duration, frequency, and peak overflow rate) over a variety of rainfall events?	X			
	Receiving Water(s)				
	45. Has some type of model been developed to assess the response of receiving waters to external CSO loads?			X	Currently in Development by ISWS
	46. Is the level of detail of the water quality model(s) relatively consistent with and representative of the complexity of the receiving waters?			X	

Long Term Control Plan Evaluation Checklist

LTCP Page #	Evaluation Criteria	Yes	No	N/A	Remarks
	47. Is the model credible? That is, has the model been documented, calibrated and verified to demonstrate that it generally represents the major processes affecting water quality for the pollutants of concern?			X	
	48. Did model results show compliance of water quality standards or demonstrate that water quality standards cannot be met regardless of the level of CSO control implemented?			X	
	Development and evaluation of CSO control alternatives				
	Major Question: Has the permittee evaluated a sufficient number of CSO control alternatives to select a cost-effective CSO control plan to meet water quality standards and protect designated uses?				
	Long-term Control Plan Approach				
p. 4-1 to -10	49. Has the permittee organized the evaluation of controls in a technical framework and approach that is understandable and consistent with the CSO Control Policy and EPA guidance?	X			
p. 4-3	50. Has the permittee identified whether the presumption approach, the demonstration approach or some combination of the two is being used?	X			
	Development of CSO Control Alternatives				
p. 4-1 to -10	51. Has the permittee considered an appropriate range of control technology within the general categories of source controls, collection system controls, storage technologies and treatment technologies?	X			
p. 4-1 to -10	52. Has the permittee evaluated a full range of potential controls with respect to meeting water quality standards and protecting designated uses? *(A full range should include zero overflow events per year, and averages of 1 to 3, 4 to 7, and 8 to 12 overflow events per year)*	X			
p. 4-1 to -10	53. Does the LTCP describe the process by which the CSO control and alternatives combinations were developed?	X			
Section 4.01-4.05	54. Does the LTCP describe the approach used to screen and narrow the list of CSO control technologies, and list the screening criteria?	X			
p. 4-11	55. Does the LTCP explain the reasons for selecting certain CSO controls?	X			
p. 4-11	56. Have the NMC been integrated into the permittee's description of the selected CSO controls?	X			The no action alternative was selected. FRWRD is currently in compliance with the NMC.
p. 4-5	57. Has the permittee considered maximization of treatment at the existing POTW for wet weather flows, and expansion of primary and secondary treatment capacity?	X			
	58. Has a cost/performance (knee of the curve) analysis been developed for the control alternatives considered?			X	No action alternative was selected, therefore a knee of the curve has not been performed.
	59. If sensitive areas are present and impacted, has the permittee given the control of CSO discharges to sensitive areas a high priority?			X	
	60. If sensitive areas are present and impacted, will the selected CSO controls eliminate all CSO impacts on sensitive areas?			X	
	61. If not, do the data support the permittee's apparent conclusion that elimination is not physically possible or economically achievable?			X	
	62. If CSO discharges to sensitive areas remain, will these CSOs receive treatment?			X	

Long Term Control Plan Evaluation Checklist

LTCP Page #	Evaluation Criteria	Yes	No	N/A	Remarks
p. 2-3; Table 2.03-1	63. Will the selected CSO controls provide the treatment of floatables and settleable solids equivalent to that achieved by primary clarification?	X			Primary Clarification and Disinfection is provided for Treated CSO Outfall A01 and Screening is provided before PS 31 CSO 004.
p. 2-3; Table 2.03-1	64. Does the LTCP demonstrate whether or not disinfection of effluent will be necessary based on applicable water quality standards?	X			Treated CSO Outfall A01 is currently disinfected.
	Water Quality Standards				
Sec. 2.04: p. 2-5 through 2-14	65. Is sufficient information provided to show that CSO discharges remaining after implementation of the planned control program will not cause or contribute to the non-attainment of water quality standards or existing?	X			The post construction monitoring program will also continue to provide information on water quality.
	66. If water quality standards cannot be met because of CSO discharges that remain after implementation of the planned control program, has the permittee shown one of the following preclude the attainment of use as determined through the use attainability analysis (UAA) (40 CFR 131.10(j)) to justify a water quality standards review:			X	
	67. * additional controls would cause "substantial and widespread economic and social impact"; * naturally occurring pollutant concentrations exist; * low flow conditions exist; * human-caused conditions exist and cannot be remedied or removal would cause more damage than to leave in place; * hydrological modifications exist and water body restoration or operation of the modification is not possible; * natural physical conditions, unrelated to water quality exist.			X	
	68. Has it been demonstrated that there may be removal of designated uses based on 40 CFR 131.10 (g) and (h)?			X	
Sec. 2.04: p. 2-5 through 2-14	69. If water quality standards cannot be met because of sources other than CSOs, are the other limiting sources and natural background conditions sufficiently documented?	X			
	Watershed Considerations				
p. 2-9; 4-12	70. Is the LTCP monitoring being coordinated with other municipal efforts, or ongoing or planned state programs, within the same watershed?	X			
p. 2-9	71. Has LTCP development been coordinated with watershed or TMDL efforts?	X			
	Financial Capability				
	72. Has an adequate assessment of the financial resources available for the implementation of CSO controls been completed? *(Financial indicators may include total annual wastewater and CSO control cost per household; unemployment rate; median household income; property tax revenue collection rate)*			X	
	Public participation				
	Major Question: Does the LTCP document the process used to inform the public about the alternatives for CSO control and engage them in the decision process?				
	General				

Long Term Control Plan Evaluation Checklist

LTCP Page #	Evaluation Criteria	Yes	No	N/A	Remarks
p. 5-1	73. Did the public participation process actively involve rate payers, industrial users of the CSS, persons near impacted waters, and persons who use the impacted waters?	X			
	74. Does LTCP include a record of the public participation events, including the number of people attending and a record or summary of participant comments?	X			Additional public hearing scheduled for May 2010.
	75. Does the LTCP document decisions or changes made in response to public comments?		X		Additional public hearing scheduled for May 2010.
	Selection of controls and implementation				
	Major Question: Does the LTCP document a reasonable process for evaluating a range of controls and selecting a suite of CSO controls sufficient to meet water quality standards and designated and existing uses?				
	Interaction with the NMC				
p. 4-11	76. Does the LTCP document benefits derived from implementation of the NMC?	X			
	Selection and Development of Recommended Plan				
p. 4-10 & 4-11	77. Does the LTCP adequately document the controls selected for implementation, including detailed descriptions, preliminary engineering analysis, and cost estimates?	X			
p. 4-10	78. Can the selected alternative reasonably be considered sufficient to provide for the attainment of applicable water quality standards and the protection of existing and designated uses?	X			
	Financing Plan				
	79. Does the LTCP recommend a financing approach demonstrating how the permittee will finance the alternative selected; identifying a specific capital and annual cost funding approach?			X	The no action alternative was selected.
	80. Did the permittee evaluate funding through increased sewer user fees and rate structures for residential, commercial and industrial users?			X	
	81. Did the permittee evaluate grant and loan availability and other sources of financing?			X	
	Implementation Schedule				
	82. Are the implementation phases of the LTCP consistent with permittee's available resources and the priorities for eliminating the CSO-induced impairment?			X	
	83. If sensitive areas are present and impacted by CSOs, has the permittee given the control of CSO discharges to sensitive areas a high priority?			X	
	Operational Plan				
	84. Does the LTCP document how the current operational plan for the CSS will be developed/revised to include the operational and maintenance needs of the controls selected for implementation?			X	The no action alternative was selected. Current operational plan to remain.
	Post-construction Compliance Monitoring				
p. 4-12	85. Does the LTCP describe how and when post-construction monitoring will be conducted and how the results will be reported?	X			

Long Term Control Plan Evaluation Checklist

LTCP Page #	Evaluation Criteria	Yes	No	N/A	Remarks
p. 4-13	86. Does the post-construction compliance monitoring program include adequate spatial and temporal coverage during wet weather conditions to assess the effectiveness of CSO controls and improvement from pre-control baseline conditions associated with LTCP implementation?	X			