

# **2022 FACILITY PLANNING REPORT**

## **NEW FOX RIVER SECOND WASTEWATER TREATMENT PLANT, PUMP STATION, AND FORCEMAIN**

**City of Ottawa, Illinois**

**Project No.: 21-611**

**September 15, 2022**



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**Champaign, Illinois 61821**

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**Prepared for:**

**City of Ottawa**

**301 West Madison Street**

**Ottawa, Illinois 61350**

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# FEHR GRAHAM

ENGINEERING & ENVIRONMENTAL

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FOR

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PROJECT NO.: 21-611

DATE: September 15, 2022



License Expires: November 30, 2023

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## TABLE OF CONTENTS

1.0	EXECUTIVE SUMMARY .....	1-1
1.1	Applicant and Project Information .....	1-1
1.2	Project Description .....	1-1
1.3	Project Justification.....	1-2
1.4	Project Cost Estimate.....	1-2
1.5	Project Affordability for Residents and Utility Customers.....	1-2
1.6	Environmental Review and Impacts .....	1-4
2.0	INTRODUCTION.....	2-1
2.1	Study Purpose and Scope .....	2-1
2.2	General Background .....	2-1
2.2.1	Project Location .....	2-1
2.2.2	Projected Growth.....	2-2
2.3	Prior Planning.....	2-2
2.3.1	2022 NPDES Permitting Engineering Report .....	2-2
2.4	Future Planning.....	2-3
3.0	EFFLUENT LIMITATIONS.....	3-1
3.1	Existing Illinois River WWTP Limits .....	3-1
3.2	New Fox River Wastewater Treatment Plant Expected Effluent Limits .....	3-2
3.2.1	Water Quality and Effluent Standards.....	3-2
3.2.2	Expected Effluent Limits for New Fox River Second WWTP .....	3-2
4.0	CURRENT SITUATION .....	4-1
4.1	Existing Wastewater Collection System.....	4-1
4.2	Existing Illinois River WWTP.....	4-2
4.3	Current Flows and Loads.....	4-3
5.0	FUTURE SITUATION.....	5-1
5.1	Planning Period.....	5-1
5.2	Land Use and Zoning.....	5-1
5.3	Population Projections.....	5-1
5.3.1	Population to be Serviced by New Fox River Second WWTP .....	5-2
5.4	Forecast of Flows and Loads for New Fox River WWTP .....	5-2
5.5	Basis of Design .....	5-4

5.6	Summary of Planning Considerations.....	5-4
6.0	EVALUATION OF ALTERNATIVES .....	6-1
6.1	No Action .....	6-1
6.2	Regionalization.....	6-2
6.3	WWTP Alternatives.....	6-3
6.3.1	Alternative #1 New Fox River WWTP with Pump Station & Forcemain .....	6-3
6.3.2	Alternative #2 Existing WWTP Upgrades with New Pump Station & Forcemain .6-4	
6.3.3	Alternative #3 Land Application of New Fox River WWTP Effluent.....	6-4
6.4	Evaluation of Alternatives.....	6-6
6.4.1	Life Cycle Cost Analysis .....	6-7
7.0	PLAN SELECTION .....	7-1
7.1	Public Involvement .....	7-1
7.1.1	Fox River Watershed Study Group and Local Environmental Groups .....	7-1
7.1.2	Public Hearing .....	7-1
7.1.2.1	Public Comments .....	7-1
7.2	Ranking and Discussion of Alternatives .....	7-1
7.3	Description of Proposed Project .....	7-2
7.4	Anti-Degradation Analysis .....	7-3
7.4.1	Receiving Stream Description .....	7-3
7.4.2	Physical Characterization of the Water Body .....	7-3
7.4.3	Biological Characterization of the Water Body.....	7-4
7.4.4	Identification and Quantification of Load Impacts .....	7-4
7.4.4.1	Stream Dissolved Oxygen Impacts.....	7-4
7.4.4.2	Existing Pollution Loading Estimate .....	7-4
7.4.4.3	BOD5 Reduction.....	7-5
7.4.4.4	Suspended Solids Reductions .....	7-6
7.4.4.5	Ammonia Nitrogen Reductions.....	7-7
7.4.4.6	Phosphorus Reductions .....	7-8
7.4.4.7	Total Nitrogen Reductions .....	7-9
7.4.4.8	Fecal Coliform Reductions .....	7-10
7.4.5	Anticipated Benefits of the Proposed Activity.....	7-11
7.5	Environmental Impacts .....	7-11

	7.5.1	Construction Impacts.....	7-11
	7.5.2	IDNR EcoCAT Signoff.....	7-12
	7.5.3	SHPO Signoff .....	7-12
	7.5.4	Tribal Signoff.....	7-12
	7.5.5	Wetlands and Floodplains .....	7-12
	7.5.6	Preliminary Anti-Degradation Conclusion .....	7-13
8.0		PROJECT FINANCING.....	8-1
	8.1	Current Sewer System Revenues and Expenditures.....	8-1
	8.1.1	Operating Revenue .....	8-1
	8.1.2	Non-Operating Revenue .....	8-1
	8.1.3	Operating Expenses .....	8-1
	8.1.4	Summary of Sewerage System Revenues vs Expenditures .....	8-1
	8.2	Opinion of Probable Project Costs.....	8-2
	8.3	Potential Financing Method .....	8-2
	8.3.1	IEPA WPCLP.....	8-2
	8.3.2	Recommended Financing Strategy .....	8-3
	8.3.3	Debt Service .....	8-3
	8.3.4	Operations and Maintenance Coverage Requirements .....	8-3
	8.3.5	Reserve Requirements.....	8-4
	8.4	Opinion of Future Probable Operations and Maintenance Costs .....	8-4
	8.5	Opinion of Future Replacements Costs .....	8-4
	8.6	Sewer User Fees.....	8-4
	8.6.1	Number of Residential and Non-Residential Users .....	8-4
	8.6.2	Actual Billed Sewer Flows Based on Historical Billing Data .....	8-4
	8.6.3	Current Average Monthly Sewer Bill .....	8-4
	8.6.4	Future Average Monthly Sewer Bill .....	8-5
	8.6.5	Future Debt Service Charge .....	8-6
9.0		PROJECT IMPLEMENTATION .....	9-1
	9.1	Project Schedule .....	9-1
	9.2	City's Responsibilities.....	9-1
	9.2.1	Hire a Consulting Engineer.....	9-2
	9.2.2	Public Hearings .....	9-2
	9.2.3	Fiscal Sustainability Plan .....	9-3

9.2.4	Financial Information Checklist .....	9-3
9.2.5	Debt Ordinance.....	9-4
9.2.6	Sewer Rates Ordinance.....	9-4

## TABLES

Table 3.1 – Current Illinois River WWTP NPDES Permit (No. IL 0030384) Discharge Limits
Table 3.2 – Expected Future NPDES Permit Effluent Limits for New Fox River WWTP
Table 4.1.1 – List of CSOs Located on City’s Existing Combined Sewer System
Table 4.3.1 – 12 Month Average Flow and Loads for Existing Illinois River WWTP
Table 5.3.6 – Design Year (2053) Population Projection, Ottawa
Table 5.3.2 – Design Year (2053) Population Project, New Fox River second WWTP
Table 5.4.1 – Proposed Design Flows and Loading for New Fox River second WWTP
Table 6.3.1 – Present Worth Cost Comparison of the Alternatives
Table 7.2.4.2 – Typical Domestic Septic Tank Effluent Pollutant Concentrations
Table 7.2.4.3 – BOD <sub>5</sub> Reductions
Table 7.2.4.4 – Suspended Solids Reductions
Table 7.2.4.5 – Ammonia Nitrogen Reductions
Table 7.2.4.6 – Phosphorus Reductions
Table 7.2.4.7 – Total Nitrogen Reductions
Table 7.2.4.8 – Fecal Coliform Reductions
Table 8.1.4-1 – Water and Sewer System Revenues and Expenditures

## **EXHIBITS**

Exhibit A – Existing Illinois River WWTP Current Permits

Exhibit B – IEPA Correspondence on Discharge Limits on New Fox River Second WWTP

Exhibit C – Project Location Map

Exhibit D – Existing Illinois River WWTP Site Plan, Process Flow Diagram, and Loading Data

Exhibit E – Alternative #1 New Fox River WWTP Site Plan and Cost Estimate

Exhibit F – Alternative #2 Existing Fox River WWTP Upgrade Site Plan and Cost Estimate

Exhibit G – Alternative #3 No Discharge New Fox River WWTP Effluent Land Application Cost Estimate

Exhibit H – Preliminary Basis of Design and Process Flow Diagram for Recommended Alternative

Exhibit I – 303d Map for Impaired Waterways

Exhibit J – Stream DO Calculations

Exhibit K – Environmental Signoffs

Exhibit L – Wetland Map

Exhibit M – FIRMette Flood Map

Exhibit N – Existing Sanitary Sewer Use and Rate Ordinances

Exhibit O – Five-Year Financial Projections and Annual Debt Service Comparison

## **1.0 EXECUTIVE SUMMARY**

The purpose of this planning report is to present alternatives to expand sanitary sewer system capacity to serve currently unsewered areas and future planned growth areas on the northern part of the City of Ottawa (City) and increase treatment capacity for the wastewater treatment system owned and operated by the City. This report is prepared in accordance with the IEPA's WPCLP facility planning requirements for the new Fox River second WWTP. In general, the project includes a new pump station, influent sewers, sanitary force main, and a new second WWTP on a parcel near the Fox River. The proposed Fox River second WWTP will provide greater treatment capacity, system reliability, and higher levels of treatment that will ensure that the new plant is compliant with its expected discharge NPDES permit requirements. The proposed project will also allow currently unsewered areas to receive sanitary sewer service and increase wastewater collection system capacity to serve the planned growth in the northern part of the City, by routing the proposed flows away from the City's existing combined sanitary sewer system whereby reducing risk of additional CSOs.

### **1.1 Applicant and Project Information**

The City of Ottawa, located in LaSalle County, proposes to construct a new second WWTP and a tributary sanitary sewers, pump station, and forcemain. The US Census Bureau estimates the 2020 population to be 18,201 residents, and the design year (2053) population is estimated to be about 19,100. The City currently has 158 unsewered homes that are operating on individual septic systems. As part of this project, these homes will be connected into the sanitary sewer system for a centralized treatment at a new Fox River second WWTP to be located on the eastside of the river.

### **1.2 Project Description**

The proposed project will include a new second WWTP near the Fox River that will provide treatment capacity for currently unsewered homes as well as planned development. This project will also include gravity sewers to collect from these unsewered areas, a new pump station, and new force main to transmit these flows to the new WWTP. This plant will be designed to include biological nutrient removal (BNR) treatment to meet effluent phosphorous levels of 1.0 mg/L and target total nitrogen levels of 10 mg/L or less. All efforts will be taken to minimize impacts to the environment. The anti-degradation assessment as included in this report, concludes that the proposed project in general will



not have any negative impact to the receiving waterway, the Fox River. Refer to Exhibit C for the project location map, showing the existing WWTP, proposed second WWTP, new pump station, and gravity sewer and force main.

### **1.3 Project Justification**

The City would like to extend its sanitary sewer services to the currently unsewered areas that are on individual aging septic systems and provide a centralized wastewater treatment at a strategic location that would keep the incremental sanitary flows away from the existing combined sanitary sewer system and would also allow the future planned growth in the northeast corridor. The existing sanitary sewer system has several CSOs. The City's existing Illinois River WWTP was last upgraded in 2005. The existing Illinois River WWTP treats the sewer flows received from the existing combined sanitary sewers. The existing plant is in good operating condition, the City is at a critical point where they need additional treatment and collection capacity to allow service to currently unsewered areas and in a planned manner to transport additional sewer flows away from the existing combined sewer system and minimize associated CSOs as mentioned above. A new treatment plant and the recommended improvements to the collection system will create this required capacity and set the City up for future planned growth.

### **1.4 Project Cost Estimate**

Project Cost Estimate: \$29,900,000.

### **1.5 Project Affordability for Residents and Utility Customers**

A minor increase to the current sewer base fee portion of the combined water and sewer rates will be necessary to fund this proposed project. The current rate ordinance includes a Water base fee and incremental water use fee portion; current CSO separation base fee portion; and current Sewer base fee and incremental sewer fee portion that is based on the water usage. The sewer base fee portion of the current combined water and sewer rates would need to be increased as a part of this project. Not factoring any IEPA principal forgiveness, the Sewer base fee portion will need to be increased to \$14 from the current \$9.60, and the rest of the current ordinance would not need any changes. If the 15% principal forgiveness is available, the increased Sewer base fee portion will be \$12 from the current \$9.60, with no changes to the rest of the existing water and sewer rate components in the rates ordinance, as detailed in Section 8.7 of this report.

Current average monthly residential cost of service is \$90.42 calculated as follows:

Water portion (@ \$9.60 base fee and \$3.12/100ft <sup>3</sup> @ average 9.34 units of 100ft <sup>3</sup> ):	\$38.74
CSO Separation portion (@\$12 base fee)	\$12.00
<u>Sewer portion (@ \$9.60 base fee + \$3.22/100ft<sup>3</sup> @ average 9.34 units of 100ft<sup>3</sup>):</u>	<u>\$39.68</u>
<b>Average combined water and sewer monthly bill:</b>	<b>\$90.42</b>

Future average monthly residential cost of service: Without any principal forgiveness, will be approximately \$94.82 without any principal forgiveness, or \$92.82 with 15% principal forgiveness, all estimated as follows:

Without Principal Forgiveness:

Water portion (@ \$9.60 base fee + \$3.12/100ft <sup>3</sup> @ average 9.34 units of 100ft <sup>3</sup> ):	\$38.74
CSO Separation portion (@\$12 base fee)	\$12.00
<u>Sewer portion (@ \$14 base fee + \$3.22/100ft<sup>3</sup>@ average 9.34 units of 100ft<sup>3</sup>):</u>	<u>\$44.08</u>
<b>Total combined water and sewer bill (est.):</b>	<b>\$94.82</b>

Per user per month

With 15% Principal Forgiveness:

Water portion (@ \$9.60 base fee + \$3.12/100ft <sup>3</sup> @ average 9.34 units of 100ft <sup>3</sup> ):	\$38.74
CSO Separation portion (@\$12 base fee)	\$12.00
<u>Sewer portion (@ \$12 base fee + \$3.22/100ft<sup>3</sup>@ average 9.34 units of 100ft<sup>3</sup>):</u>	<u>\$42.08</u>
<b>Total combined water and sewer bill (est.):</b>	<b>\$92.82</b>

Per user per month

Average Monthly Residential Water Use: 6,986 Gallons (or 9.34 billing units of 100 ft<sup>3</sup> each unit)

Number of customers or Service Connections: 7,467 users

Median Household Income (MHI): 2020 Estimate = \$53,544

Percentage of MHI needed to pay the projected average annual residential sewer portion (\$44.08 per user per month) is 0.99% of MHI for each user without any principal forgiveness. If the 15% principal forgiveness is available, the resulting projected average annual residential Sewer portion (\$42.08 per user per month) drops to 0.94% of MHI for user. In either case, the actual percentage (%) is far below the 1.5% MHI affordability screener making this project affordable to the system users as per the IEPA affordability guidelines.

## **1.6 Environmental Review and Impacts**

This project is expected to have a net positive impact on the water quality of the Fox River by providing a complete treatment for untreated or partially treated flows which are currently leached out of aging septic fields or could potentially get discharged via exiting CSOs, if connected to existing combined sewer system. The anti-degradation assessment as included in this report, concludes that the proposed project has no negative impact to the receiving waterway, the Fox River, and that the phosphorous load will not increase to the Fox River from the current estimated loading. The State Historic Preservation Office's (SHPO's) environmental signoff was received on December 22, 2021. Also, the consultation with the IDNR to determine compliance with the IL Endangered Species Act, IL Natural Areas Preservation Act, and the IL Wetland Act, found that adverse effects are unlikely. Construction of the project will not impact any wetlands. Fehr Graham has also submitted requests for tribal sign offs on July 21, 2022, requesting notification of any conflict with tribal lands in the project area. While a few of those signoffs have been received, the most of them are awaited as at the time of preparing this report. Those signoffs will be forwarded to the Agency once they are received.

## 4.0 CURRENT SITUATION

### 4.1 Existing Wastewater Collection System

The existing collection system consists of a network of sanitary sewer lines spanning throughout the city. Individual flows from the city residents flow through the network of sanitary sewer lines by gravity. All these individual flows accumulate into the different lift stations that are strategically placed throughout the city. These lift stations then use a combination of pumping and gravity to bring the flows into the City's existing Wastewater Treatment Plant. The IEPA has determined that a large portion of the existing collection system consists of combined sewers. Due to the storm flows seen during wet weather events, the system has been authorized of combined sewer and treatment plant discharges (combined sewer overflow, CSO), as part of their NPDES permit. As listed in the Illinois River WWTP facility's NPDES permit (Exhibit A), the plant is allowed to discharge CSO's from the locations listed on the table below.

**Table 4.1.1**

**List of CSOs located on City's Existing Combined Sewer System**

Discharge Number	Discharge Description	Receiving Water
002	Allen Park	Illinois River
003	1 <sup>st</sup> Avenue and Prospect Avenue	Illinois River
004	3 <sup>rd</sup> Avenue and Van Buren Street	Illinois River
006	Riverview Drive	Illinois River
007	East Island Avenue	Illinois River
008	South Leland Street	Illinois River
009	South Buchanan Street	Illinois River
011	Main Street West	Fox River
013	East Madison	Fox River
014	South Guion Street	Fox River
017	East Michigan Street	Fox River
18A	Main Street East Bank	Fox River
18B	Ottawa High School	Illinois River
019	South Chester Street	Illinois River

The NPDES permit requires the facility to monitor and treat its CSOs according to regulations, before being discharged from one of the permitted discharge locations.

It should be noted that these CSOs are received by both the Illinois River and Fox River. A new treatment facility on the Fox River and future improvements to the collection system could decrease the risk of CSOs in the area. Thereby reducing the need of discharging untreated combined sewage, and instead capturing these flows and treating them at a new facility.

The City also has a total of 158 unsewered accounts. These residencies, whose population makes up approximately 582 people, relies on septic systems for the on-site treatment and disposal of waste. These homes are primarily within the following three communities, Retz Mobile Home Association, Fields Hill Improvement Court, King Mobile Home Court. The improvements as discussed in this report will create collection system and treatment capacity to transport the waste from these homes to a new treatment facility.

#### **4.2     Existing Illinois River WWTP**

The city currently has an existing wastewater treatment plant that is located just south of the Illinois river, near the intersection of State and Hitt Streets. The approximate coordinates of the WWTP are 41° 20' 23" N, and 88°50' 55" W.

The existing WWTP was built in 1956 and went through regular improvements over the course. The last major improvements were made in 2009. The current Wastewater Treatment Plant is rated for DAF of 4.0 MGD and a DMF of 8.0 MGD. The facility also has excess flow treatment and storage capabilities for flows in excess of 5,556 GPM.

Three pipes provide the influent wastewater, an 18" gravity line and two pressure lines, 18" and 10", that bring flows into the sewage plant, where dry weather and excess flows are then separated. Excess flow is sent to the existing excess flow lagoon. Dry weather flow goes through mechanical screening and grit removal and is then sent to the aeration tanks. The wastewater goes through biological treatment in the aeration tanks and then flows into the secondary clarifier. Sludge and any remaining solids settle in these clarifiers and then the wastewater flows into the chlorine contact tanks. Disinfection of the wastewater takes place in these contact tanks and then the effluent is discharged into the Illinois river under the standards of NPDES Permit No. IL0030384.

### 5.3.1 Population to be Serviced by New Fox River Second WWTP

The collection system improvements and new treatment facility will be sized to service the currently unsewered homes, as well as the City's planned development. The below populations correlate to a design year population of the currently unsewered and new planned development areas.

**Table 5.3.2**

#### **Design Year (2053) Population Projection, New Fox River Second WWTP**

Development Type	Population
Unsewered <sup>(1)</sup>	582
New Development	8,418
Total	9,000

<sup>(1)</sup> Currently on aging individual septic systems.

### 5.4 Forecast of Flows and Loads for New Fox River WWTP

As discussed previously, the collection system improvements and new Fox River second WWTP will be sized to meet the flows created by the unsewered communities and new developed growth. Therefore, the proposed design indicates a DAF of 0.9 MGD and a DMF of 2.25 MGD. This will provide enough capacity for that which can be immediately sewered, as well as the growth planned for the area.

Assuming that there will be no remarkable changes in the constituents and characteristics of wastewater flows from the City during the 30-year planning period, it is anticipated that the wastewater loading will continue to increase, at current domestic waste strength, as the population increases, and the City growth continues.

The proposed plant design flows and loading parameters are summarized in the table below.

**Table 5.4.1****Proposed Design Flows & Loading for New Fox River Second WWTP**

Parameter	Units	30-year (2053) Design Values
Flows:		
Design Average Flow (DAF)	[MGD]	0.90
Design Maximum Flow (DMF)	[MGD]	2.25
Peaking Factor	-	2.5
BOD <sub>5</sub>		
Concentration	[mg/L]	204
Load	[lbs/day]	1,530
TSS		
Concentration	[mg/L]	240
Load	[lbs/day]	1,800
TKN		
Concentration	[mg/L]	36
Load	[lbs/day]	270
TP		
Concentration	[mg/L]	5.6
Load	[lbs/day]	42.3
Hydraulic P.E. <sup>(2)</sup>	[P.E.]	9,000
Organic P.E. <sup>(1)</sup>	[P.E.]	9,000
SS P.E. <sup>(1)</sup>	[P.E.]	9,000
TKN P.E. <sup>(1)</sup>	[P.E.]	9,000
Total-P P.E. <sup>(1)</sup>	[P.E.]	9,000

<sup>(1)</sup> Based on unit loading factors found in 35 Illinois Administrative Code 370, and Table 3-16 from Metcalf & Eddy *Wastewater Engineering: Treatment, Disposal, and Reuse*, 5<sup>th</sup> ed. Copyright 2014, The McGraw-Hill Companies, New York, N.Y.

<sup>(2)</sup> Based on 100 gpd/person as found in 35 IAC 370 Section 520.c.

To estimate future mass loadings to the WWTP for design year 2053, the following loading rates are used: a BOD<sub>5</sub> loading of 0.17 ppd/P.E., a TSS loading of 0.2 ppd/P.E., a TKN loading of 0.03 ppd/P.E., and a total phosphorus loading of 0.0047 ppd/P.E. The loading rates are based on Table 3-16 from Metcalf & Eddy *Wastewater Engineering: Treatment, Disposal, and Reuse*, 5<sup>th</sup> ed. It was chosen to use these default values rather than rely on existing wastewater concentrations as the existing collection system has some combined sewers that dilute the strength of the raw wastewater.

## **6.0 EVALUATION OF ALTERNATIVES**

There are three viable “Treatment and Discharge” alternatives that have been considered for this project as required and suggested by IEPA in the early planning discussions to support a new NPDES permit application, in addition to the general “No Action and Regionalization” alternatives. The first treatment alternative would construct a new Fox River second wastewater treatment facility with BNR capability at a new location. The second treatment alternative would upgrade the City’s existing wastewater treatment facility to provide BNR treatment as part of this project. The third treatment alternative would involve constructing a new Fox River WWTP augmented with the treated effluent storage and spray irrigation piping and facilities for effluent land application instead of new discharge into Fox River. All of these alternatives would include additional new sanitary sewers, a pump station, and force main to collect and transport wastewater flows from the unsewered homes and future planned areas to WWTP for treatment. Along with the above treatment alternatives, the general “No Action and Regionalization” alternatives are also qualitatively evaluated. All of these alternatives are discussed in detail below.

### **6.1 No Action**

For the purpose of this report, a No Action alternative means that the City does not plan for a second WWTP to accommodate its future expansion. The unsewered communities will keep using their existing septic tank systems to treat and discharge wastewater. The 2022 engineering report evaluated the flow and load data of the existing Illinois River WWTP and described justification of routing any additional sewer flows away from the existing combined sewer system. According to that report, the existing plant is near its full capacity. The existing plant in recent months have experienced flows and loads exceeding its capacity. The 2021 report also mentioned that Fox River, which flows through the City, is an impaired waterway according to the IEPA’s 303d list. Thus, the unsewered communities and the septic tank discharges only add to the pollution of the Fox River. Moreover, there is a public health hazard and odor problem associated with discharging contaminated water into streams and open ditches. Similar problems are associated with wastewater which ponds in the backyards of residents whose septic tank leach fields are not functioning properly.



To help ensure that the City remains a viable community in the future and to allow the expansion of the City, it should have the capability to provide the basic services that new residents and businesses expect, such as good water, good streets, and good wastewater handling facilities. The City is committed to eliminating pollution in an environmentally sound manner.

The City also believes that the citizens of Ottawa want to be law-abiding and that proper treatment capabilities would significantly lower the risk of anti-pollution law enforcement. The City also thrives for future generations, and that not to shirk the responsibility of cleaning up its pollution, not to mention providing essential services. For these reasons, the City have considered steps that could be taken to eliminate wastewater pollution and plans to expand in the future and not having ample wastewater treatment capabilities will hinder future growth. Therefore, a No Action alternative is not consistent with these interests of the City or the future goals it has and would not be given further consideration.

## **6.2 Regionalization**

Under the regionalization strategy, adding the new future sewer connections to the existing sewer system and taking the flows the existing Illinois River WWTP was considered and evaluated as a part of treatment plant alternatives in the next sections. That strategy is found prohibitively costly compared to the other viable alternative and was not given further consideration.

Additionally, given the current flows and load of the existing Illinois River WWTP, only a portion of the expected new flows can be directed to the existing plant without impairing its treatment capabilities. The rest of the expected flows would need to be treated at a different location. Connecting the new flows to the existing sewer network will be challenging as the City will mostly grow around the Interstate-80 corridor, which is a new developmental area and does not have extensive sewer network around. Thus, an extensive sewer network would need to be constructed, a portion of which will take the flows to the existing WWTP. Rest of the flows will need to be taken elsewhere for treatment.

Based on that the other strategy could be to regionalize and take remainder of the flows to nearby communities. However, logistically and administratively taking flows from the same area to two different locations for treatment is not a feasible solution. However, the nearest facilities that Ottawa may consider regionalizing with are either in the Cities of La Salle, Streator, or Morris. La Salle is 15 miles west of Ottawa. In order to regionalize with La Salle, approximately 15± miles of forcemain would need

to be laid along with large pump stations and pumps capable of pumping all the flows to the La Salle WWTP. This construction will also involve crossing of multiple IDOT roads and also streams. This is assuming that La Salle treatment plant has enough treatment capabilities and agrees to take flows from Ottawa.

Streator is approximately 17 miles south of Ottawa. To regionalize with Streator, approximately 17± miles of forcemain would have to be laid, along with large pump stations and pumps. This construction will involve crossing of multiple streams and more importantly the Illinois River. Again, this all depends on if the Streator WWTP has enough capacity and is willing to take flows from Ottawa.

Morris is approximately 20 miles east of Ottawa. To regionalize with Morris, approximately 20± miles of forcemain would need to be laid. Large pump stations and pumps would also need to be installed to carry the flows to Morris. As is the case of other two nearby cities, this all depends on if the Morris WWTP has enough capacity and is willing to accept flows from Ottawa.

Additionally, regionalizing with other nearby facilities will require an intragovernmental agreement. Typically, such agreements take a long administrative time and thus could have a longer time frame for implementation consideration, if the City decides to regionalize. Moreover, the cost associated with regionalization will be prohibitively more than building a new second WWTP within the City as long stretches of forcemain would need to be laid to regionalize along with large pump stations and pumps. Lastly, the City will lose its ability to control its sewer rate and ordinances as these will be dictated by the connecting authority's sewer rate and ordinance. The City of Ottawa will require explicit permission from the connecting authority if the City decides to add any new connections. Therefore, the regionalization is not considered a viable option for the City's needs and not given any further consideration in this report.

## **6.3 WWTP Alternatives**

### **6.3.1 Alternative #1 New Fox River WWTP with Pump Station & Forcemain**

This alternative includes the construction a new WWTP. The new WWTP will be rated for a DAF of 0.9 MGD and a DMF of 2.25 MGD. The approximate coordinates for this new proposed WWTP are 41° 21' 32" N, and 88°48' 06" W. A new lift station would be constructed at a convenient location to collect flows. The proposed location of the new lift station is at the north-eastern part of the City and the

approximate coordinates for the lift station are 41°21' 15" N, and 88° 48' 38" W. A system of gravity sewers would be constructed along the City's unsewered and future growth areas to bring flows into this new lift station. A force main would then transport the flows to the new WWTP for treatment. The new treatment facility would include a plant influent pump station, screening, grit removal, BNR system including anoxic, anaerobic, and aerobic tanks, secondary clarifiers, tertiary filtration, chlorination, and de-chlorination. The new facility would discharge the treated wastewater into the Fox River from its outfall with approximate coordinates 41°21' 32" N, and 88° 48' 16" W. Sludge treatment at this new Fox River second WWTP would include aerobic digestion, supernatant contact treatment, and a liquid sludge storage lagoon. A site plan of this new Fox River second WWTP is included in Exhibit E.

#### 6.3.2 Alternative #2 Existing WWTP Upgrades with New Pump Station & Forcemain

This second option also includes sanitary sewers to collect unsewered and planned areas, as well as a pump station and force main to the existing WWTP. The proposed new lift station location for both alternatives is same and has the approximate coordinates of 41°21' 15" N, and 88° 48' 38" W. This alternative would require upgrading the existing WWTP to allow for biological nutrient removal. To allow for the additional new flows, modifications to the existing screening structure would be necessary. New anaerobic and anoxic tanks would be constructed to provide BNR treatment. Modifications to the aerobic tanks would be made, including new mixers and air diffusers added. A new tertiary filter building, a third WAS tank, and a sludge thickener would also be constructed. Based on the existing flows and loads, this plant is not currently seeing 80% loading of either flows or biological loads, therefore, these improvements would maintain the existing basis of design flows of 4.0 MGD DAF, and 8.0 MGD DMF. These improvements be based on providing biological nutrient removal and a fully complied solids loading. A site plan of these improvements can be found in Exhibit F.

#### 6.3.3 Alternative #3 Land Application of New Fox River WWTP Effluent

The land application, or No Discharge, alternative was evaluated to determine the feasibility of completely eliminating the surface water discharge from the new Fox River second WWTP, thereby reducing the pollutant loading to the Fox River. This alternative includes all of new facilities included for a new Fox River WWTP including new sewers, pump station and forcemain that are outlined in the Alternative #1, and are augmented with additional effluent handling and spray facilities to eliminate the

surface water discharge. The “Illinois Design Standards for Slow Rate Land Application of Treated Wastewater,” Part 372 of the Illinois Administrative Code, Title 35, Subtitle C, Chapter II, was used to determine the parameters and facilities required for land application disposal.

In accordance with the Part 372 Design Standards, all land application systems must provide adequate storage for times when effluent cannot be land applied due to inclement weather, and primarily during winter months. For the purposes of this evaluation, 150 days of storage based on the DAF of 0.90 MGD was used, resulting in a total required storage lagoon volume of 135 MG. The storage lagoon volume would be divided into a multiple cell configuration requiring approximately 40 acres.

An application rate of two inches of water per week over a 31-week application period was used to estimate the land application area required, which resulted into approximately 200 acres. The application rate of two inches of water per week assumes that available land is relatively permeable and does not have a high clay content. Should actual soils dictate an application rate of one inch per week or lower due to high clay content, the land application area required would need to be doubled.

There are few golf courses established in the town, however, being small golfing outfits, there irrigation usage is not anticipated to be of such a magnitude that would justify capital investment of installing infrastructure to send the plant effluent those outfits and be cost effective. Therefore, only using nearby agricultural farmlands for spray irrigation with the proposed plant effluent is considered in this alternative. The total land area required for the installation of storage lagoons and pumping facilities, and spray irrigation infrastructure (piping, spray nozzles, controls, groundwater monitoring wells, etc.) on the farmlands is collectively estimated to be approximately 240 acres. Since the new Fox River second WWTP is planned to be located on a seven-acre parcel, additional land would have to be purchased.

The land surrounding northwest part of Ottawa is predominately agricultural. For the purposes of this report, it is assumed that available land can be purchased within two miles of the new WWTP. A new plant site effluent pump stations and forcemain would need to be constructed to transport treated effluent to the storage lagoons, and there on to the land application sites.

The cost estimate for Alternative #3 includes costs for new sanitary sewers, pump station and forcemain, and new 0.9 MGD WWTP facilities, and facilities to store and land spray application of the plant's treated effluent to agricultural fields, etc. Since the proposed land application site would be considered agricultural area with no public access, only secondary treatment without disinfection is required. Therefore, the costs associated with chlorine disinfection and de-chlorination systems are excluded from the total project cost of this alternative.

#### **6.4 Evaluation of Alternatives**

Proposed Alternative #1, which includes the construction of a second WWTP, collection pump station, and extending the City's existing sanitary sewer system, is estimated to cost approximately \$29,900,000. Of this probable project cost, the new proposed lift station, gravity sewers, and force main portion is estimated at approximately \$3,925,000. An itemized breakdown of these costs can be found in Exhibit E. Based on the location of the proposed new Fox River second WWTP, the new force main would require one river crossing, crossing the Fox River. The new plant would be located off of Illinois Route 71 on a property currently owned by Halterman-Reynolds LLC. The City is already in communication with the owner about purchase of this land. One clear benefit of building on this location is that plot has significant acreage that would allow for any future additions to this new treatment plant to occur in the future. In addition, this location is set back far enough from the Fox River that no flood walls would be considered necessary.

Proposed Alternative #2, which includes upgrades to the existing WWTP and collection system, is estimated to cost approximately \$74,000,000. Of this probable project cost, the new proposed lift station, gravity sewers, and force main portion is estimated at approximately \$17,020,000. A detailed breakdown of all the costs can be found in Exhibit F. Based on the location of the existing WWTP, the new force main would require two river crossings, crossing both the Fox and Illinois Rivers. In addition, this force main would require one railroad crossing. All of these complex bored crossings would result in a significantly larger cost for the collection system improvements for this alternative. Additionally, due to relatively longer forcemain length, pump station would need larger pumps compared to the other alternative. To provide a BNR treatment process at the existing treatment plant, all of the existing available space at the plant site would be occupied by new tanks and buildings. This ultimately leaves no

available space for any future upgrades at this treatment plant location. In addition, this plant is provided with a flood wall constructed in 2016, while this flood wall does a good job at minimizing risk of WWTP flooding from the Illinois River, Alternative #1 would have no risk of flooding at all.

Proposed Alternative #3, which includes upgrades to the existing WWTP, collection system, and treated effluent storage and surface discharge facilities, is estimated to cost approximately \$47,883,000. Of this probable project cost, the new proposed lift station, gravity sewers, and force main portion is estimated at approximately \$3,925,000 as is the case with Alternative #1.

#### 6.4.1 Life Cycle Cost Analysis

The Life Cycle Cost Analysis below is based on a discount rate of -0.5%, as appropriate for a 20-year planning period based on Office of Management and Budget (OMB) Circular A-94, 2021.

**Table 6.3.1**

**Present Worth Cost Comparison for the Alternatives**

Alternative	Capital Cost	Present Worth O&M	Present Worth Salvage Value	Present Worth Replacement Costs	Net Present Worth
Alt 1: 2 <sup>nd</sup> New WWTP, with New Pump Station and FM	\$29,900,000	\$10,545,000	(\$9,431,000)	\$944,000	\$31,958,000
Alt #2: Convert Existing WWTP to BNR, with New Pump Station and FM	\$74,000,000	\$12,654,000	(\$21,942,000)	\$1,480,000	\$66,192,000
Alt 3: "No Discharge-Land Application" of Effluent from 2 <sup>nd</sup> New WWTP, with New Pump Station and FM	\$47,883,000	\$15,818,000	(\$13,039,000)	\$1,570,000	\$48,232,000

As shown above, the Alternative #1 would have lowest capital cost as well as lowest net 20-year present worth costs compared to Alternative #2 and Alternative #3. While Alternative #2 is the costliest of the three-alternatives evaluated, it also has several disadvantages as noted in the described in the earlier section. In regard to Alternative #3, total project cost of that alternative is nearly 60% more and the net present worth cost is nearly 50% more, respectively, than those of the recommended Alternative #1. Therefore, Alternative #2, and Alternative #3 are not considered as cost effective, and that Alternative #1 New Fox River second WWTP with new pump station and forcemain delineated in this planning report will continue to be the recommended alternative. This alternative is preferred by the City as it also positions a new treatment facility on a strategically beneficial location that can be further expanded with ease as the City grows.

## **7.0 PLAN SELECTION**

### **7.1 Public Involvement**

#### **7.1.1 Fox River Watershed Study Group and Local Environmental Groups**

The reach of Fox river where the new plant will be located, falls under Fox River Watershed Study Group's study area. Fox River Watershed Study Group is performing a science-based evaluation to reduce the phosphorus discharges into the Fox River. Therefore, the City is recommended to submit a copy of this planning report to Fox River Study Group's office at 628 State Route 31, in Oswego, Illinois, and obtain their consensus with this planning and the treatment goals. Additionally, IEPA also suggested that it may be beneficial for the City to consult with any local environmental groups to seek their consensus on the discharge limitations to minimize any comments to the draft discharge permit when IEPA public notice it during the future design phase.

IEPA would require submitting a copy of the above discussions with Fox River Study Group and any local environmental groups including their comments or consensus during the project design phase prior to issuing the new NPDES permit.

#### **7.1.2 Public Hearing**

The City will be required to hold several public hearings at early stages of the project. All the required public hearings will need to be jointly conducted by the City officials, Consulting Engineer, and City Attorney and would need to be convened at the City Hall. The City will be required to follow local protocol about notifying the public in advance of these public hearing dates. A list of the recommended minimum number of required public meetings can be found in Section 8.2.2.

##### **7.1.2.1 Public Comments**

As a part of the public hearings, a time limit is allotted for public to submit any comments they may have. These comments will be reviewed and discussed with all stakeholders and would need to be addressed in the planning and design of the proposed plant improvements.

### **7.2 Ranking and Discussion of Alternatives**

As described in the earlier sections, a total of three treatment and discharge alternatives were studied for this report. Based on the project costs and net present worth, Alternative #1 involving a new Fox



## **8.0 PROJECT FINANCING**

### **8.1 Current Sewer System Revenues and Expenditures**

The City has its own staff that operates the existing wastewater system and treatment. The wastewater system and treatment are maintained as part of a combined water and sewer Fund, which is intended to be self-supporting through connection and user fees charged for services to the public.

The wastewater flows from all users of the wastewater facilities are non-metered and clients are billed based on their potable water usages. The City provided copies of the past audits from Fiscal Year ending (FY) 2021, 2020, and 2019. These past audits and current billing registers are used to better understand the user revenues and wastewater operating expenses.

#### **8.1.1 Operating Revenue**

Based on the last audited financial statements for FY 2021, the annual operating revenue from a combined water and sewer charges was \$7,994,754.

#### **8.1.2 Non-Operating Revenue**

The sewerage system non-operating revenue for the FY 2021 is reported to incur a loss of \$268,471.

#### **8.1.3 Operating Expenses**

The water and sewerage system operation and maintenance expenditures for the fiscal year ending April 30, 2021 is reported to be \$5,742,095, which includes \$1,905,817 of depreciation. A review of past audits indicates that the City is able to adequately fund operation and maintenance expenses from its water and sewer revenues. When the City completes construction of the refurbished plant, the annual operation and maintenance expenses are anticipated to be increased to about \$500,000 a year.

#### **8.1.4 Summary of Sewerage System Revenues vs Expenditures**

The combined water and sewerage system revenues and expenditures for the last audited fiscal year 2021 is summarized as follows:

**Table 8.1.4-1**

**Water and Sewer System Revenues/Expenditures**

	FY 2021 Audit
Water and Sewer System Billing Revenue	\$7,994,752
O&M Expenses with Depreciation	(\$5,742,095)
Non-Operating Revenues (Expenses)	(\$268,471)
Net Change in Position before Capital Items	\$2,273,312

Refer to Exhibit N for projected revenues and expenses. Any surplus balance that the City generates in its annual revenue is recommended to keep as an emergency contingency fund. Since it is estimated that the O&M expenses for the plant upon refurbishment and upgrade will increase, the user charges would need to be increased to cover the additional expenses associated with the capital improvement and O&M costs for the proposed project.

**8.2 Opinion of Probable Project Costs**

The estimated total project cost for the recommended project is \$29,900,000. The estimated project costs include construction costs, contingencies, design, bidding and construction engineering, construction observation, and legal/administration costs.

**8.3 Potential Financing Method**

**8.3.1 IEPA WPCLP**

The State of Illinois put into operation the WPCLP as a result of a desire to continue to protect existing water quality in the absence of federal and state grant programs. The loan program provides low interest loans to municipalities for a wide range of wastewater projects. Interest rates are established annually at 50 percent of the current market rate with a debt service period of up to 20 years. The current (2023) Base interest rate for fiscal year ending 2023 is 1.24%. However, the City qualifies for a Small Community rate resulting in 75% of Base rate with actual interest of 0.93%, and 30-year term. According to IEPA criteria, the City could also qualify for up to a 15% principal forgiveness, resulting in an actual loan repayment amount of only 85% of the total project cost. Qualifying for this assistance would make the financing on this project loan much more affordable. Applicants for financial assistance, during any fiscal year commencing July 1<sup>st</sup>, must file a pre-application along with this facilities plan submission to the Agency. At this time, a WPCLP loan will be considered as a potential funding source, with the possibility of principal forgiveness.

### 8.3.2 Recommended Financing Strategy

The total project cost for the proposed alternative is \$29,900,000. Based on a review of the available funding sources, the City has several possible options to finance the project. Although the following presents a recommendation based on the available information, it should be noted that Fehr Graham is not a financial consultant, and the City should consult with a professional financial consultant before deciding on any of the following options.

A strategy that incorporates the most probable funding mechanisms and minimizes the amount of funds that must be financed is desirable. The following discussion proposes a strategy that meets this objective and is suited for the City for financing this project:

1. Any available cash from the Water and Sewer Fund, or any other City fund, that could be used to fund a portion of the project would reduce the amount that had to be financed and therefore reduce user fee increases.
2. The remainder of the project costs could then be financed through the IEPA WPCLP loan program.
3. As a part of contingency planning should there be no funding provided by the IEPA WPCLP loan, the City should be prepared to finance the project with one of the other funding sources, most likely an alternate or revenue bond issue.

The debt services and incremental O&M expenses will have to be paid for by users as part of their Sewer base fee portion of the combined water and sewer revenues. Projected cash flows from revenues and expenditures associated with this project are delineated in Exhibit N.

### 8.3.3 Debt Service

Increased user rates will be required to fund the annual debt service that accompanies the WPCLP loan. With no principal forgiveness an annual debt service payment of \$1,145,170 can be expected. If principal forgiveness of 15% is available, the loan debt service is \$973,395.

### 8.3.4 Operations and Maintenance Coverage Requirements

Funds will also have to be allocated for the operations and maintenance of existing and new wastewater facilities. The recommended alternative of a new WWTP with BNR capabilities will have an incremental annual operations and maintenance budget of about \$500,000, with an estimated total of about \$3,130,349 per year.

#### **8.3.5 Reserve Requirements**

If the City has any current debt service obligations, the IEPA may require a debt service reserve account to be made, details of which will be known once the City is ready to adopt another ordinance for user rate increases, etc., which typically occurs near the end of the design phase.

#### **8.4 Opinion of Future Probable Operations and Maintenance Costs**

The future probable cost for annual O&M is estimated to be about \$3,130,349 total.

#### **8.5 Opinion of Future Replacements Costs**

The future probable cost for Replacements to various equipment over the 30-year planning period is estimated to be \$837,000 by the end of fifteenth year.

#### **8.6 Sewer User Fees**

##### **8.6.1 Number of Residential and Non-Residential Users**

The wastewater collection system is not metered, and therefore the City relies on their water usage and bill clients for both water and wastewater based on water usages. As of 2022, City bills a total of 7,309 users. As a result of this project, the City will be able to provide sewer services to 158 households that are currently on the individual septic system. Therefore, the resulting total number of users will be 7,467.

##### **8.6.2 Actual Billed Sewer Flows Based on Historical Billing Data**

The average usage is estimated based on the known average monthly bill and current rate ordinance. It can be estimated that the typical homeowner has an average monthly usage of approximately 6,986 gallons, which equates to  $9.34 \times 100\text{ft}^3$  units. This will need to be confirmed as part of a rate ordinance preparation effort during the design phase.

##### **8.6.3 Current Average Monthly Sewer Bill**

The current average monthly bill for all users that have both water and sewer services is as follows:

Water Portion (@ \$9.60 base fee and \$3.12/100ft <sup>3</sup> , at 9.34 units of each 100ft <sup>3</sup> ):	\$38.74
CSO separation Portion (@\$12 base fee)	\$12.00
<u>Sewer Portion (@ \$9.60 base fee + \$3.22/100ft<sup>3</sup>, 9.34 units of each 100ft<sup>3</sup>):</u>	<u>\$39.68</u>
<b>Average combined water and sewer monthly bill:</b>	<b>\$90.42</b>

#### 8.6.4 Future Average Monthly Sewer Bill

This Facility Plan has proposed improvements to the WWTP, as discussed in earlier sections of this report. Funding of these improvements will require increased sewer base fee portion to residential users. In order to avoid the budget deficit and a need for transferring money from other funds or cash reserves, the City is also recommended to adopt the water portion rate increase. Exhibit O provides a detailed summary of the average monthly bills and expected user fees after the improvements.

In summary, the improvements will require an increase to the Sewer base fee to \$14 from the current \$9.60 plus \$3.22/ 100ft<sup>3</sup> incremental for the scenario which assumes no principal forgiveness is available. If 15% principal forgiveness is offered, then the increase in the Sewer base fee would need to be \$12 in lieu of \$14 increase plus an \$3.22/100ft<sup>3</sup>.

The future average monthly bill estimation for both scenario is summarized below:

##### Without Principal Forgiveness:

Water portion (@ \$9.60 base fee + \$3.12/100ft <sup>3</sup> @9.34 units of 100ft <sup>3</sup> ):	\$38.74
CSO (@\$12 base fee)	\$12.00
<u>Sewer (@ \$14 base fee + \$3.22/100ft<sup>3</sup> @9.34units of 100ft<sup>3</sup>):</u>	<u>\$44.08</u>
<b>Average future combined water and sewer monthly bill est:</b>	<b>\$94.82</b>
	<b>Per user per month</b>

##### With 15% Principal Forgiveness:

Water portion (@ \$9.60 base fee + \$3.12/100ft <sup>3</sup> @9.34 units of 100ft <sup>3</sup> ):	\$38.74
CSO (@\$12 base fee)	\$12.00
<u>Sewer (@ \$12 base fee + \$3.22/100ft<sup>3</sup> @9.34units of 100ft<sup>3</sup>):</u>	<u>\$42.08</u>
<b>Average future combined water and sewer monthly bill est:</b>	<b>\$92.82</b>
	<b>Per user per month</b>

The increased sewer portion of average bill (\$44.07) would result in 0.99% of the MHI without principal forgiveness. With 15% principal forgiveness, the increased sewer portion of average bill (\$42.07) would result in 0.94% of the MHI. In either scenarios, the actual %MHI would be far below the 1.5% MHI threshold for affordability and that the project undertaking will not result in the financial burden to the residents as per EPA affordability guidelines.

#### 8.6.5 Future Debt Service Charge

A breakdown of the annual debt service comparison of the design is given in Exhibit O. The total future annual debt service charge for the IEPA loan will be based on a loan amount for the entire project cost, with a 30-year loan at an interest rate of 0.93%, resulting in an annual debt service of \$1,145,170. If 15% principal forgiveness is available, this annual debt service becomes \$973,395.

# EXHIBIT C - PROJECT LOCATION MAP



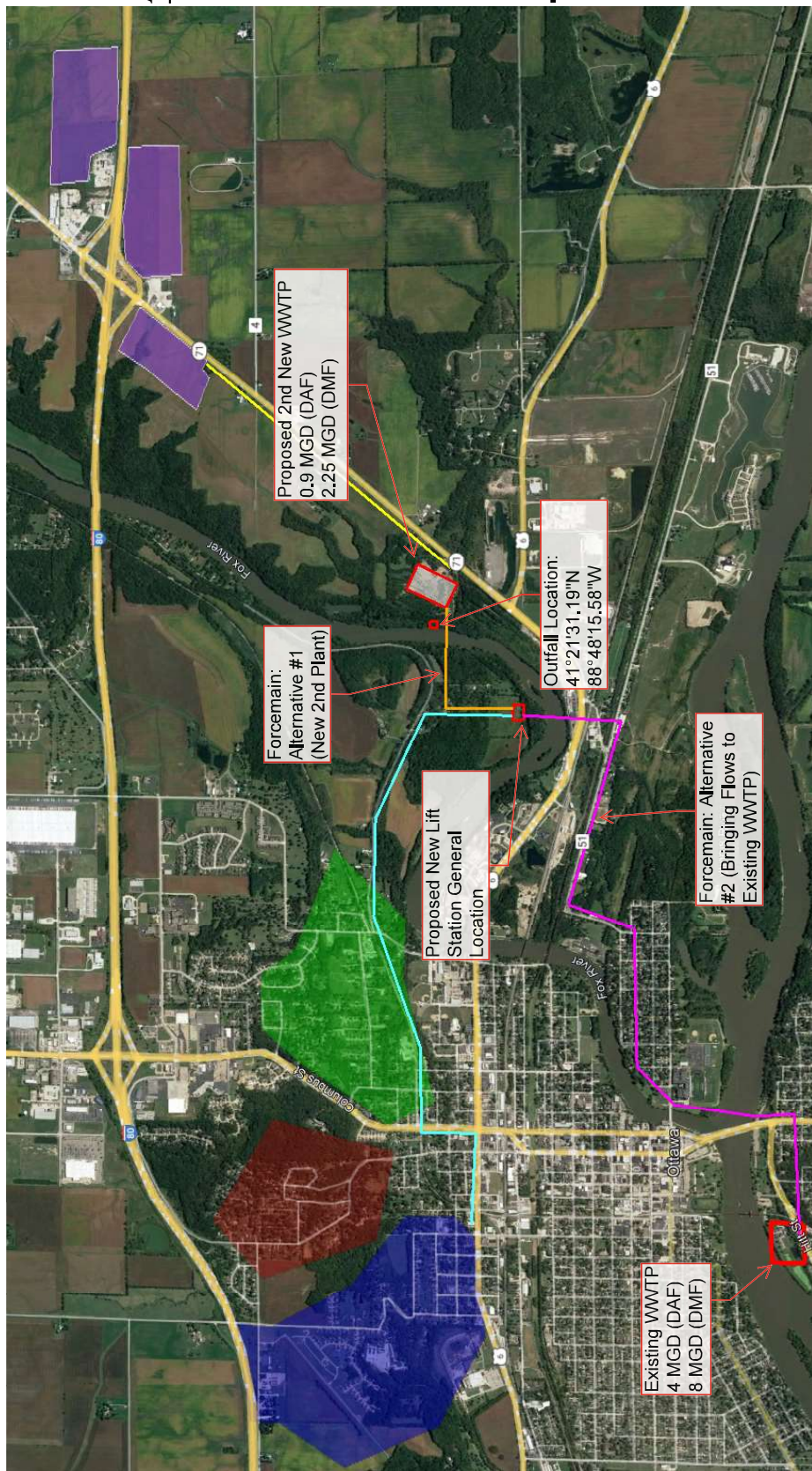
## LEGEND: UNSEWERED AREAS AND FUTURE GROWTH

- Retz Mobile Home Association
- Fields Hill Improvement Court
- King Mobile Home Court
- Future Growth

Combined Unsewered Population: 582 P.E

Total Acreage of Future Growth: 180 Ac., 8418 P.E

Total: 9,000 P.E



- Proposed Forcemain From New Lift Station to WWTP (Alt #1)
- Proposed Gravity Sewer
- Proposed Forcemain from New Lift Station to Existing WWTP (Alt #2)
- Existing Gravity Sewer

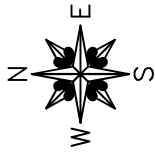
## PIPING LEGEND:

**FEHR GRAHAM**  
 ENGINEERING & ENVIRONMENTAL  
ILLINOIS DESIGN FIRM NO. 184-00325

ILLINOIS  
IOWA  
WISCONSIN

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PRELIMINARY  
(FOR INFORMATION ONLY)

STRUCTURES

- 05 INFLUENT PUMP STATION
- 10 HEADWORKS STRUCTURE
- 20 SCREENING, GRIT REMOVAL, METERING, NPW SYSTEM
- 30 BIOLOGICAL NUTRIENT REMOVAL SYSTEM STRUCTURE
- 40 SEE COLOR LEGEND BELOW
- 45 SECONDARY CLARIFIER #1
- 50 SECONDARY CLARIFIER #2
- 60 CONTROL BUILDING
- 70 LAB, OFFICE, BATHROOM, CONTROL ROOM, BLOWERS, TERTIARY FILTRATION
- 80 CHLORINE CONTACT TANK
- 85 AEROBIC DIGESTER #1
- 90 AEROBIC DIGESTER #2
- 100 SLUDGE PUMP BUILDING
- 110 SLUDGE TRANSFER PUMPS, SUPERNATANT RECYCLE PUMPS
- 120 SLUDGE STORAGE LAGOON
- 130 CHEMICAL FEED BUILDING
- 140 CHLORINE, SODIUM BISULFITE, COAGULANT

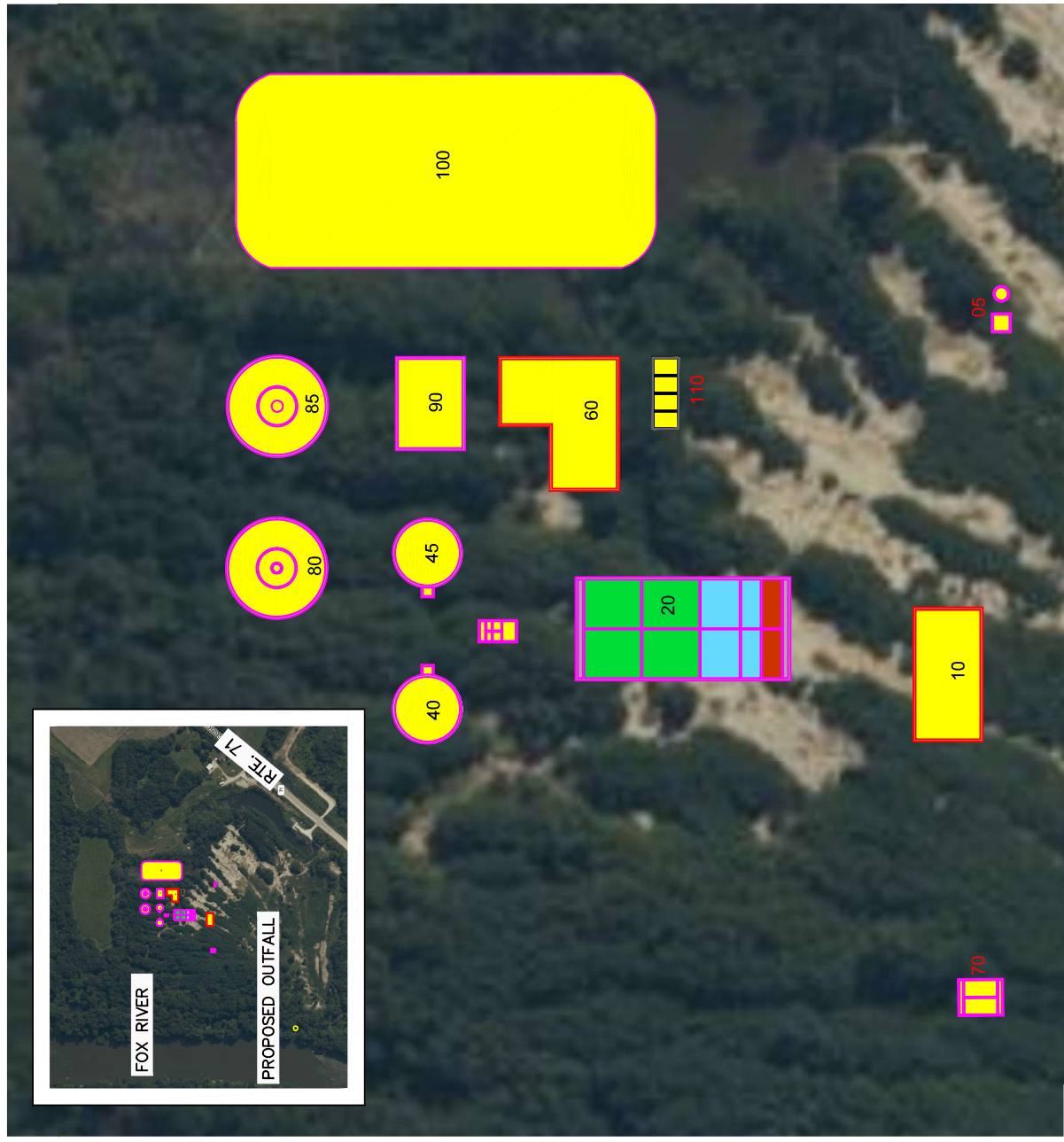
COLOR LEGEND

- ANAEROBIC TANK
- ANOXIC TANK
- AEROBIC TANK

ALT. # 1 SITE PLAN – NEW WWTP  
OTTAWA, ILLINOIS

**FEHR GRAHAM**  
ENGINEERING & ENVIRONMENTAL  
ILLINOIS IOWA WISCONSIN

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OPINION OF PROBABLE PROJECT COST AND PRESENT WORTH - PLANNING  
 ALTERNATIVE #1 NEW FOX RIVER (SECOND) WWTP  
 City of Ottawa, IL  
 9/15/2022; **Updated 04/17/2023**

ALTERNATE #1 - NEW FOX RIVER (SECOND) WWTP WITH PUMP STATION AND FORCE MAIN					
		EQUIPMENT			
ITEM	DESCRIPTION	MATERIAL	INSTALLATION	LUMP SUM	CAPITAL
NEW PUMP STATION AND FORCEMAIN					
PUMP STATION				\$	2,160,000
1	Gravity Sewer From Unsewered Areas			\$ 800,000	\$ 800,000
2	Structures and Site Work			\$ 200,000	\$ 200,000
3	Pumps and Accessories	\$ 200,000	30%		\$ 260,000
4	Pump Station Generator			\$ 400,000	\$ 400,000
5	Site Restoration			\$ 300,000	\$ 300,000
6	Electrical and Control			\$ 100,000	\$ 100,000
7	Piping and Painting			\$ 100,000	\$ 100,000
FORCE MAIN				\$	2,200,000
8	Force main, Excavation, and Backfill (3000 LF @ \$150/LF)			\$ 450,000	\$ 450,000
9	Bore and Jack River Crossing (550 LF @ \$2000/LF)			\$ 1,100,000	\$ 1,100,000
10	Site Restoration			\$ 650,000	\$ 650,000
NEW FOX RIVER (SECOND) WWTP					
05 INFLUENT PUMP STATION				\$	690,000
1	Excavation			\$ 40,000	\$ 40,000
2	Concrete Wet Well			\$ 180,000	\$ 180,000
3	Backfill			\$ 30,000	\$ 30,000
4	Influent Pumps	\$ 300,000	20%		\$ 360,000
5	Process Piping			\$ 80,000	\$ 80,000
10 PRELIMINARY AND PRIMARY TREATMENT BUILDING				\$	1,794,000
6	Excavation			\$ 10,000	\$ 10,000
7	Aggregate Pad			\$ 10,000	\$ 10,000
8	Backfill			\$ 10,000	\$ 10,000
9	Structure (Complete)			\$ 750,000	\$ 750,000
10	Fine Screens	\$ 160,000	20%		\$ 192,000
11	Bar Screen	\$ 35,000	60%		\$ 56,000
12	Gates, Guardrail, and Grating			\$ 75,000	\$ 75,000
13	Grit Chamber, Grit Pump, Grit Washer	\$ 350,000	30%		\$ 455,000
14	Non-Potable Water System	\$ 80,000	20%		\$ 96,000
15	Piping and Painting			\$ 50,000	\$ 50,000
16	Electrical and Control			\$ 40,000	\$ 40,000
17	Sampler			\$ 50,000	\$ 50,000
20 BIOLOGICAL NUTRIENT REMOVAL SYSTEM STRUCTURE				\$	3,559,000
18	Excavation			\$ 20,000	\$ 20,000
19	Aggregate Pad			\$ 20,000	\$ 20,000
20	Backfill			\$ 20,000	\$ 20,000
21	Concrete Tanks			\$ 2,100,000	\$ 2,100,000
22	Mixers	\$ 295,000	30%		\$ 384,000
23	Diffusers	\$ 200,000	30%		\$ 260,000
24	Mixed Liquor Return Pumps	\$ 200,000	20%		\$ 240,000
25	Nitrate Return Pumps	\$ 200,000	20%		\$ 240,000
26	Gates, Guardrail, and Grating			\$ 120,000	\$ 120,000
27	Piping and Painting			\$ 80,000	\$ 80,000
28	Electrical and Control			\$ 75,000	\$ 75,000
30 MIXED LIQUOR SPLITTER BOX				\$	595,000
29	Concrete			\$ 200,000	\$ 200,000
30	Excavation and Backfill			\$ 15,000	\$ 15,000
31	Gates, Guardrail, and Grating			\$ 35,000	\$ 35,000
32	RAS/WAS Valves	\$ 40,000	30%		\$ 52,000
33	Scum Pumps (2 Total)	\$ 45,000	20%		\$ 54,000
34	Flow Meters (4 Total)	\$ 55,000	15%		\$ 64,000
35	Electrical and Control			\$ 55,000	\$ 55,000
36	Piping and Painting			\$ 120,000	\$ 120,000
40/45 SECONDARY CLARIFIERS #1 & #2				\$	2,025,000
37	Concrete			\$ 705,000	\$ 705,000

OPINION OF PROBABLE PROJECT COST AND PRESENT WORTH - PLANNING  
 ALTERNATIVE #1 NEW FOX RIVER (SECOND) WWTP  
 City of Ottawa, IL  
 9/15/2022; **Updated 04/17/2023**

<b>ALTERNATE #1 - NEW FOX RIVER (SECOND) WWTP WITH PUMP STATION AND FORCE MAIN</b>					
ITEM	DESCRIPTION	EQUIPMENT		LUMP SUM	CAPITAL
		MATERIAL	INSTALLATION		
38	Excavation and Backfill			\$ 120,000	\$ 120,000
39	Guardrail, and Grating			\$ 200,000	\$ 200,000
40	Clarifier mechanism	\$ 375,000	25%		\$ 468,000
41	Launder Cover and Baffles	\$ 120,000	50%		\$ 180,000
42	RAS/WAS Pumps (4 Total)	\$ 110,000	20%		\$ 132,000
43	Electrical and Control			\$ 70,000	\$ 70,000
44	Piping and Painting			\$ 150,000	\$ 150,000
<b>60 CONTROL BUILDING</b>					<b>\$ 3,469,000</b>
45	Excavation			\$ 12,000	\$ 12,000
46	Aggregate Pad			\$ 10,000	\$ 10,000
47	Backfill			\$ 12,000	\$ 12,000
48	Structure (Complete)			\$ 1,150,000	\$ 1,150,000
49	Laboratory			\$ 80,000	\$ 80,000
50	Disk Filters	\$ 850,000	10%		\$ 935,000
51	Blowers	\$ 400,000	10%		\$ 440,000
52	Plant Generator			\$ 650,000	\$ 650,000
53	Electrical and Control			\$ 100,000	\$ 100,000
54	Piping and Painting			\$ 80,000	\$ 80,000
<b>70 CHLORINE CONTACT TANK</b>					<b>\$ 320,000</b>
55	Concrete			\$ 200,000	\$ 200,000
56	Excavation and Backfill			\$ 20,000	\$ 20,000
57	Gates, Guardrail, and Grating			\$ 50,000	\$ 50,000
58	Piping and Painting			\$ 50,000	\$ 50,000
<b>80/85 AEROBIC DIGESTER #1 &amp; #2</b>					<b>\$ 2,374,000</b>
59	Concrete			\$ 1,200,000	\$ 1,200,000
60	Excavation and Backfill			\$ 180,000	\$ 180,000
61	Guardrail, and Grating			\$ 300,000	\$ 300,000
62	Mixers	\$ 180,000	30%		\$ 234,000
63	Diffusers	\$ 200,000	30%		\$ 260,000
64	Electrical and Control			\$ 75,000	\$ 75,000
65	Piping and Painting			\$ 125,000	\$ 125,000
<b>90 SLUDGE PUMP BUILDING</b>					<b>\$ 1,020,000</b>
66	Excavation			\$ 10,000	\$ 10,000
67	Aggregate Pad			\$ 10,000	\$ 10,000
68	Backfill			\$ 10,000	\$ 10,000
69	Structure (Complete)			\$ 600,000	\$ 600,000
70	Sludge Pumps	\$ 100,000	20%		\$ 120,000
71	Recycle Return Pumps	\$ 100,000	20%		\$ 120,000
72	Electrical and Control			\$ 50,000	\$ 50,000
73	Piping and Painting			\$ 100,000	\$ 100,000
<b>100 SLUDGE STORAGE LAGOON</b>					<b>\$ 1,445,000</b>
74	Excavation			\$ 900,000	\$ 900,000
75	Clay Liner			\$ 485,000	\$ 485,000
76	Piping			\$ 60,000	\$ 60,000
<b>110 CHEMICAL FEED BUILDING</b>					<b>\$ 644,000</b>
77	Excavation			\$ 10,000	\$ 10,000
78	Aggregate Pad			\$ 10,000	\$ 10,000
79	Backfill			\$ 10,000	\$ 10,000
80	Structure (Complete)			\$ 260,000	\$ 260,000
81	Liquid Chlorine Feed System	\$ 60,000	20%		\$ 72,000
82	Sodium Bisulfite Feed System	\$ 70,000			\$ 70,000
83	Coagulant Feed System	\$ 85,000	20%		\$ 102,000
84	Electrical and Control			\$ 50,000	\$ 50,000
85	Piping and Painting			\$ 60,000	\$ 60,000
<b>ESTIMATED CONSTRUCTION COSTS</b>					<b>\$ 22,295,000</b>
<b>CONSTRUCTION CONTINGENCY (10%)</b>					<b>\$ 2,230,000</b>
<b>DESIGN ENGINEERING (INCL. PLANNING)</b>					<b>\$ 2,900,000</b>

OPINION OF PROBABLE PROJECT COST AND PRESENT WORTH - PLANNING  
 ALTERNATIVE #1 NEW FOX RIVER (SECOND) WWTP  
 City of Ottawa, IL  
 9/15/2022; **Updated 04/17/2023**

ALTERNATE #1 - NEW FOX RIVER (SECOND) WWTP WITH PUMP STATION AND FORCE MAIN					
ITEM	DESCRIPTION	EQUIPMENT		LUMP SUM	CAPITAL
		MATERIAL	INSTALLATION		
				<b>CONSTRUCTION ENGINEERING (INCL. BIDDING)</b>	\$ 2,450,000
				<b>PROJECT FINANCIAL/LEGAL ADMINISTRATION</b>	\$ 25,000
				<b>OPINION OF PROBABLE PROJECT COST - PLANNING</b>	\$ 29,900,000

**Notes:**

1. The above estimate is budgetary in nature and is based on "2023 Dollars". This estimate is intended to present "Rough Order of Magnitude (ROM)" for the preliminary scope items mentioned above for qualitative comparison of the alternates considered in the study, and is prepared based on several assumptions, which shall be validated during design of this alternative, if so chosen, and the above preliminary cost estimate needs to be updated.

2. Since the Engineer has no control over the cost of labor, materials or equipment, or over the Contractor's method of determining prices, or over competitive bidding, or market conditions, his opinion of Probable Project Cost or Construction Cost that are provided herein are made on the basis of his experience and qualifications and represent his best judgment as a design professional familiar with the construction industry, but the Engineer cannot and does not guarantee that the proposals, bid or the Construction Cost will not vary from opinions of probable cost prepared by him. If the client wishes greater assurance as to the Construction Cost, he shall employ an independent cost estimator.

