rethink water JOLIET

Draft Report

Prospectus for Lake Michigan Water – New Indiana Intake Alternative

Alternative Water Source Program

City of Joliet, Illinois
November 19, 2020

Stantec CMT Crawford, Murphy & Tilly Engineering Enterprises, Inc. SA STRAND ASSOCIATES CORNWELL ENGINEERING GROUP

rethink water JOLIET

Stantec

CMT Crawford, Murphy & Tilly

Engineering Enterprises, Inc.

SA STRAND ASSOCIATES

CORNWELL ENGINEERING GROUP

V3

TABLE OF CONTENTS

1 Executive Summary

With its January 7, 2020 decision, the City of Joliet took a major step forward in its effort to implement a new, reliable, long-term water supply for the City and possibly the region with the selection of Lake Michigan Water as its alternative water source. The City of Joliet is now facing another major decision – selecting between Lake Michigan Water from the Chicago Department of Water Management or Lake Michigan Water from a new intake in Indiana.

1.1 Prospectus Goals and Objectives

The goal of this Prospectus is to present the business case associated with the Lake Michigan Water - New Indiana Intake Alternative. A separate Prospectus document has been prepared for the Lake Michigan Water – Chicago Department of Water Management (CDWM) Alternative. With the two Prospectus documents, a side-by-side comparison can be made to aid in the City's selection of a new water source alternative.

Each of the Prospectus documents have a similar structure with each meant to be able to stand on its own. To allow this, some sections are the same in both Prospectus documents. Section 1 contains the Executive Summary which is a unique summary of the alternative. Sections 2 through 5 are the same in both Prospectus documents and present background information related to the Alternative Water Source Program and the work completed as part of the 2020 evaluation of alternatives.

Sections 6 through 10 are unique in each Prospectus document and present the description of alternative improvements, associated risks, a SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats) and the business case for the alternative.

1.2 Business Case Summary

The detailed analysis of the overall features, costs, benefits, and risks associated with the Lake Michigan Water - New Indiana Intake Alternative completed during 2020 confirms that it is a viable option for bringing high quality, treated Lake Michigan water to Joliet and the Joliet region by 2030 using infrastructure designed, built, owned, financed and operated by the City and its potential regional partners. Under this approach Joliet and its partners would have total control over critical decisions related to the design, implementation, operation, and financial management of the new water system.

However, making this new system a reality by 2030 will require an intensive program of design, permitting, external coordination, land acquisition, and construction of capital improvements. New infrastructure to bring a Lake Michigan supply to the Joliet region would include a new raw water intake and pumping station in northwestern Indiana, approximately 46 miles of new, large diameter water transmission main that crosses state lines, an intermediate pumping station, and a new, advanced surface water treatment plant and pumping station located near Joliet. From that point the treated water would be distributed to key points within Joliet through new water distribution piping, storage and pumping facilities. Joliet would retain its existing wells as an emergency source for water in the event that the new Lake Michigan water supply would be disrupted.

During the past 6 months, Joliet City staff and members of the consultant team have engaged in detailed technical analyses of the infrastructure elements of this system and conducted extensive outreach to external parties including the City of Hammond (IN), major regulatory and permitting entities in Illinois and Indiana, and municipal, utility, railway, and private entities with control of rights-of-way between Hammond and Joliet. This extensive coordination was required to verify the viability of this alternative.

Through these efforts Joliet has negotiated a preliminary agreement for access to and use of rights-of-way within Hammond to transport Lake Michigan water and obtained concurrence from regulators and permitting agencies in both Illinois and Indiana regarding the actions needed to support final design and permitting of the new water supply infrastructure. Coordination with entities in control of land along the proposed transmission main route has also provided the team with critical information regarding the suitability and likely costs associated with transmission main construction between Hammond and Joliet.

It is estimated that the 2020 cost of constructing new infrastructure to bring up to 30 MGD of water from Hammond to Joliet to serve Joliet alone would cost approximately $1.03 billion dollars; upsizing of the system to meet a potential regional maximum day demand of 60 MGD would increase costs to approximately $1.37 billion dollars. Considering the added cost for treating Lake Michigan water, operating the new water system, and financing of the required capital improvements, it is estimated that the 50-year total cost for providing water to Joliet alone or Joliet plus several regional partners would be on the order of $1.53 billion or $2.05 billion, respectively. Financial analysis suggests that a program of rate increases of 10.5 % annually from 2020 to 2022, then 12% annually from 2023 to 2032, 8% annually from 2033 to 2034, 4% in 2035 and 1% annually in 2036 to 2040 would be needed to support initial development and operation of this new system and other necessary improvements to the City’s existing water system including water main replacement of 1.6% annually.

The Lake Michigan Water - New Indiana Intake Alternative represents a bold plan for the development and implementation of a new water intake, treatment, and delivery system by Joliet and its potential regional partners. The proposed surface water treatment plant would be designed around an advanced water treatment process capable of effectively removing emerging contaminants of concern that are not yet regulated under drinking water standards. With this alternative, the City of Joliet can dependably rely on brand new infrastructure which should require minimal repairs, replacements or upgrades for over 50 years. However, implementation of this magnitude of improvements results in significant capital expenditures and debt burden, complex construction sequencing to meet the project timeline and added regulatory and administrative complexities bringing water across state lines.

Control of the project will provide Joliet and its potential partners with the ability to make critical decisions regarding design, construction, and operational issues that may directly affect the performance, cost, and/or schedule for the project. At the same time, this level of control is accompanied by overall responsibility and liability for all actions required to successfully design, permit, finance, construct, commission, and operate more than $1 billion of new infrastructure in two states in less than 10 years.

1.3 Next Steps

If the Lake Michigan Water – New Indiana Intake Alternative is selected by the City of Joliet as its new water source alternative, the City of Joliet would approve the preliminary access agreement that has already been negotiated with the City of Hammond, Indiana, as well as begin preliminary engineering design. Once the preliminary access agreement is fully executed and in effect, the City of Hammond would work with the City of Joliet to acquire the required land for the shore facilities. Concurrently, the City of Joliet and City of Hammond would work together to develop the final Access Agreement which is anticipated to be completed by Summer 2021. Preliminary design of the selected alternative would proceed through 2021 in order to reach 30% design completion and allow the City of Joliet to submit for federal loan funding by the required deadline of December 2021.

2 Problem Statement

The City of Joliet currently relies on deep wells for its primary water source. A 2015 study completed by the Illinois State Water Survey (ISWS) of the sandstone aquifers in northeastern Illinois identified decreased groundwater levels. Further refinement of this model in 2018 and in early 2020 concluded the City of Joliet's existing water source, the deep sandstone aquifer, will be depleted to the point of not being able to meet the City's Maximum Day Demands[1] by the year 2030.

2.1 Summary of Joliet's Existing System

The City of Joliet's existing water system consists of 21 deep wells and 5 shallow wells which are treated at 11 water treatment plants spread throughout the distribution system. The treated well water is then either discharged directly to the distribution system or discharged into a ground storage tank before being pumped into the distribution system. The distribution system consists of over 665 miles of watermains not including fire hydrant leads, services and private watermains, in four pressure zones. A map of the water system facilities (wells, treatment plants, pumping stations and storage tanks) as well as each of the four pressure zones is contained in **Exhibit 2-1**.

2.2 Historical Water Levels and Groundwater Modeling Projections

The City of Joliet, as well as several surrounding communities, currently utilizes the deep sandstone aquifers (St. Peter and Ironton-Galesville) as its primary source of supply. **Figure 2-1** shows the deep aquifer system in northeastern Illinois and the significant decrease in the potentiometric surface (level of water in the aquifer) over the past 150 years. Regional deep sandstone withdrawals have exceeded the sustainable yield of the aquifer. This means communities, industries and other users have pumped more water out of the ground than naturally flows back in.

In the Joliet area, the sandstone aquifers receive virtually no recharge through the ground from rainfall. As a result, water levels in the aquifer have dropped as much as 800 feet in some areas. Eventually water levels within the deep sandstone aquifer will reach a point where the City of Joliet's wells will become inoperable.

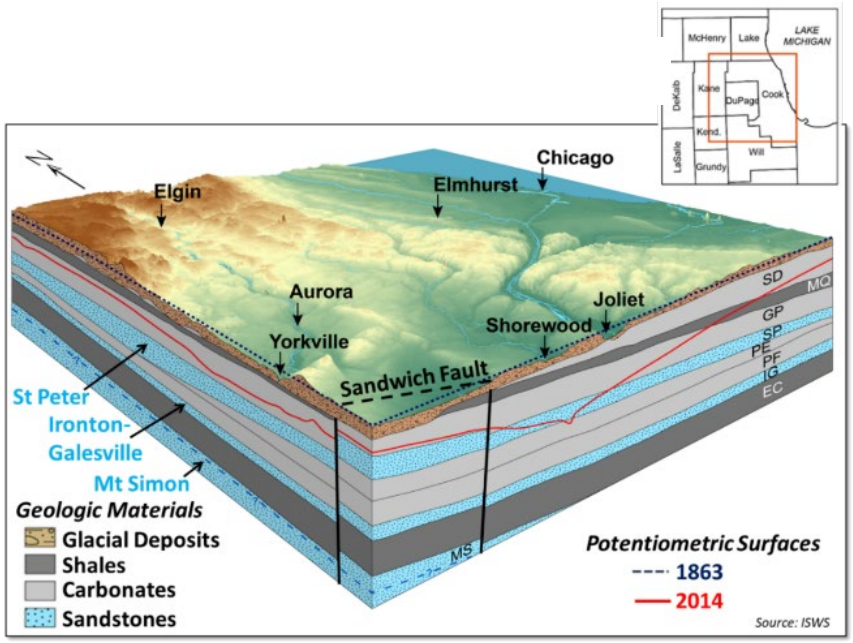


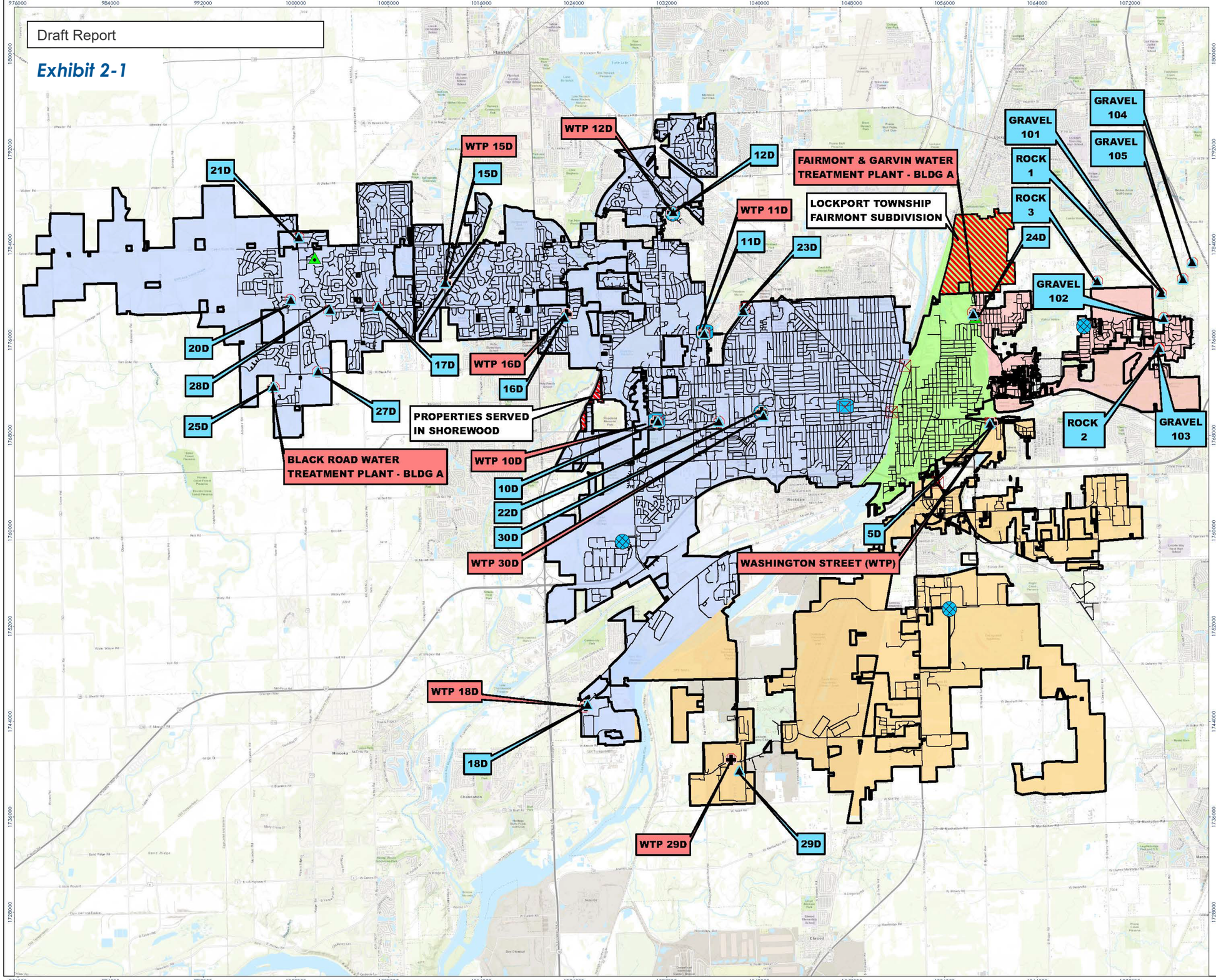
Figure 2-1
Northeastern Illinois Bedrock Geology, From ISWS

[1] Maximum Day Demand is the 24-hour water usage during the highest day of water usage in a year.

(This page has been intentionally left blank.)

Draft Report

Exhibit 2-1



Disclaimer: The location of facilities associated with this alternative is approximate for the purpose of conceptually estimating alternative costs. Siting of proposed facilities will be evaluated during preliminary design following water source alternative selection.

rethink water JOLIET

JOLIET

Figure No.

Title

EXISTING WATER WORKS SYSTEM: EXHIBIT 2-1

Client/Project

City of Joliet Department of Public Utilities
Alternative Water Source Program

Project Location

Will and Kendall County IL

Prepared on 09-18-2020

N

0 4,000 8,000 Feet

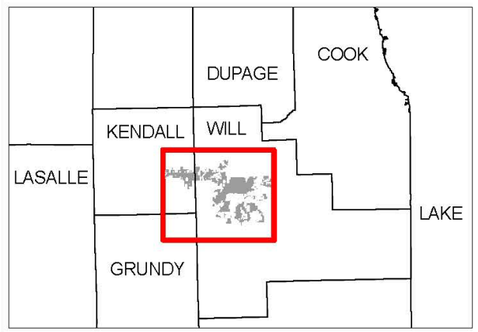
(At original document size of 11x17)
1:48,000

Legend

- Existing Water Wells
- Existing Treatment Plant
- Booster Station
- Elevated tank
- Stand pipe
- Reservoir
- Watermain

Pressure_zones

- High
- Low
- Ridgewood
- Southeast



Location Map: Not to Scale

Notes

1. Coordinate System: NAD 1983 StatePlane Illinois East FIPS 1201 Feet
2. Data Sources: WILL CO., COOK CO., DUPAGE CO., IDOT, INDOT, INDNR and USFWS DATA DOWNLOADED FROM WEB 3/11/2019 to 8/26/2019
3. Background: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Stantec · CMT Crawford, Murphy & Tilly · Engineering Enterprises, Inc. Outstanding Service – Every Client – Every Day

STRAND ASSOCIATES® · CORNWELL ENGINEERING GROUP · V3

(This page has been intentionally left blank.)

The Illinois State Water Survey has a long history of investigating groundwater supply in northeastern Illinois, beginning as early as 1919. In 1959, ISWS published the *Preliminary Report of the Ground-Water Resources of the Chicago Region*[2] which concluded that future changes in the locations and rates of groundwater withdrawals, if left unmanaged, could jeopardize the long-term viability of the deep sandstone aquifers. In 2015, ISWS published *Changing Groundwater Levels in the Sandstone Aquifers of Northern Illinois and Southern Wisconsin: Impacts on Available Water Supply*[3] which concluded that local desaturation of the deep sandstone aquifers would occur in the Joliet area by 2040.

In 2018, ISWS was tasked with updating the regional groundwater model and determining the timeframe remaining in the deep groundwater aquifers to reliably provide water to the City of Joliet as part of the *Joliet Alternative Water Source Study*[4]. Based on the results of this study, ISWS concluded that more than three of the City's existing wells are at risk of desaturation by 2030, resulting in Joliet not being able to meet its Maximum Day Demands.

In 2019, ISWS began a three-year groundwater modeling study for the Southwest Water Planning Group, of which Joliet is a member, to update the deep sandstone aquifer model for the southwest suburban region. Based upon this study[5], the overall conclusion for Joliet remains consistent with the 2018 modeling results and many of Joliet's wells on the west side of the City fall into the highest risk category, "Risk of well inoperability", by 2029, as shown in **Figure 2-2.**

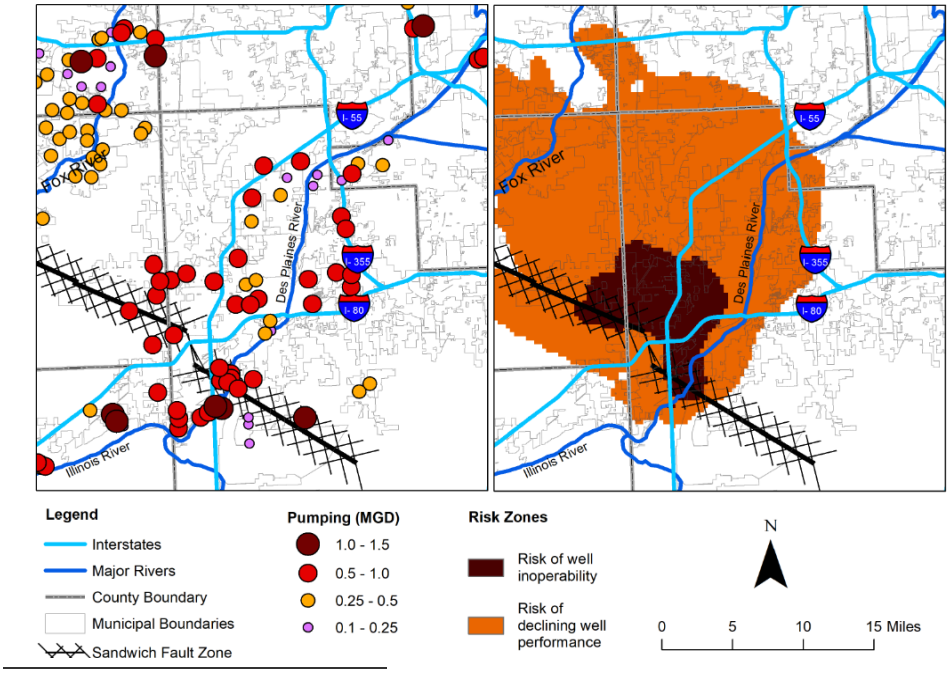


Figure 2-2
2029 Risk in the Ironton-Galesville Sandstone Aquifer (before Joliet switches), From ISWS

[2] Suter, Max et. al. *Preliminary Report on Ground-Water Resources of the Chicago Region, Illinois.* Illinois State Water Survey (1959) (Hyperlink)
[3] Abrams, Daniel. *Changing Groundwater Levels in the Sandstone Aquifers of Northern Illinois and Southern Wisconsin: Impacts on Available Water Supply.* (2015) (Hyperlink)
[4] CMT, EEI, Stantec. *City of Joliet Alternative Water Source Study - Phase I FINAL Report, Appendix E – Groundwater Modeling.* (January 2019). (Hyperlink)
[5] Abrams, Daniel. B. and Cecilia Cullen. *Analysis of Risk to Sandstone Supply in Southwest Suburbs.* Illinois State Water Survey Contract Report 2020-4. (September 2020). (Hyperlink)

The study also addressed whether neighboring communities would remain at risk after Joliet switches to a new water source in 2030. While there appears to be an initial recovery in aquifer levels, the risk of declining well performance remains prevalent in 2050 and 2070, as shown in **Figures 2-3** and **2-4**, respectively.

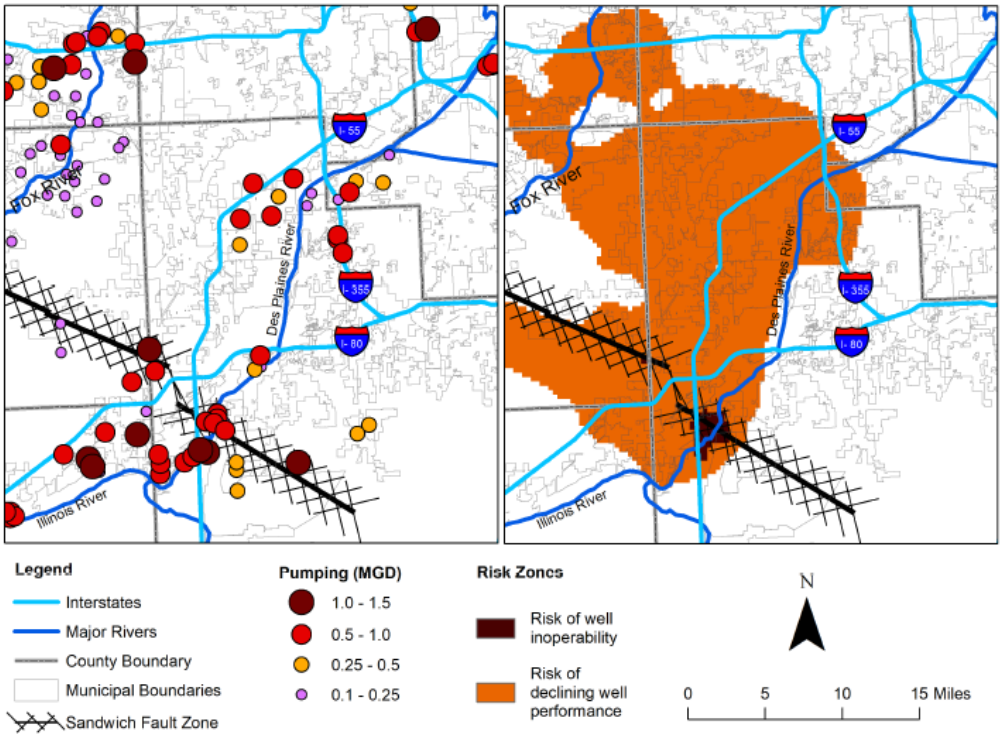


Figure 2-3
2050 Risk in the Ironton-Galesville Sandstone Aquifer (after Joliet switches), From ISWS

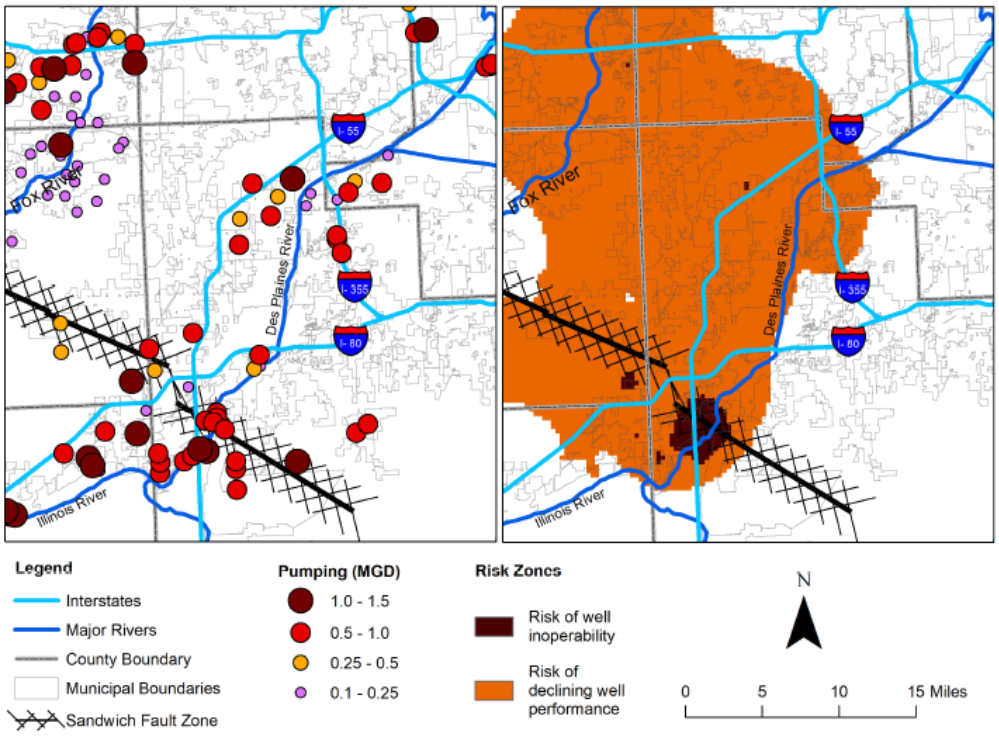


Figure 2-4
2070 Risk in the Ironton-Galesville Sandstone Aquifer (after Joliet switches), From ISWS

3 Water Sources Available in Northeastern Illinois

Northeastern Illinois is fortunate to have several possible sources of water that could be tapped to provide high quality water to its water users. There are three major sources of water available in northeastern Illinois: groundwater wells, river water and Lake Michigan water.

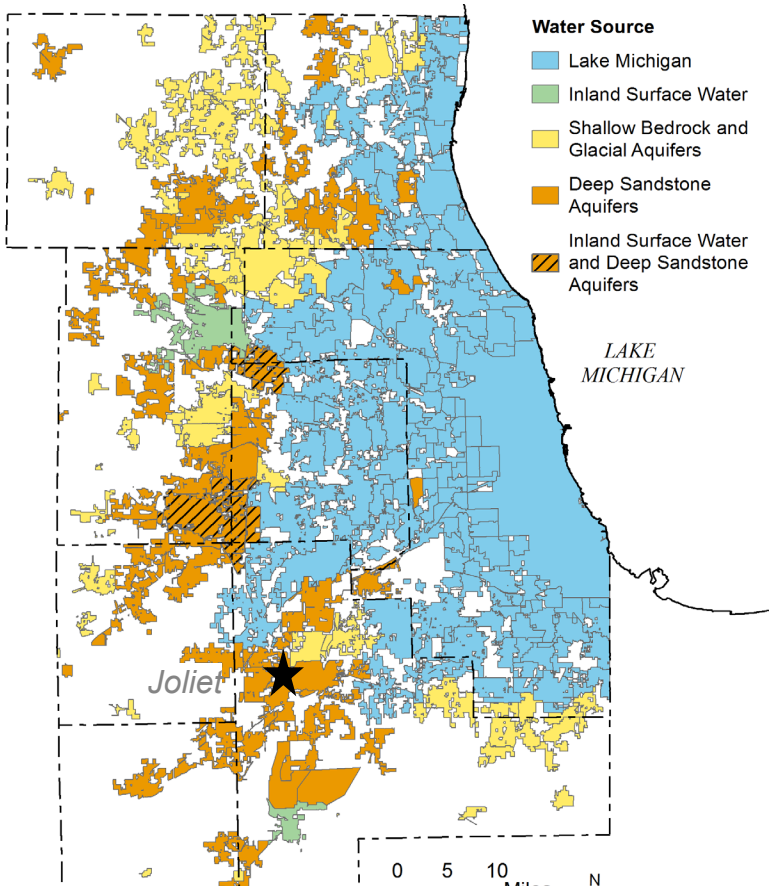


Figure 3-1
Water Sources in Northeastern Illinois, From ISWS

3.1 Groundwater Wells

Many communities in the collar counties, which are not close to Lake Michigan, utilize groundwater wells for their water source. Groundwater in northeastern Illinois consists of shallow wells (sand & gravel or Silurian Dolomite) and/or deep wells (St. Peters Sandstone or Ironton – Galesville Sandstone). In **Figure 3-1**, communities which use shallow groundwater wells are shown in yellow and communities which use deep groundwater wells are shown in orange.

3.2 River Water

There are a few communities which use river water as their primary source of drinking water in northeastern Illinois. The Cities of Elgin and Aurora utilize the Fox River and the Cities of Kankakee and Wilmington utilize the Kankakee River. In **Figure 3-1**, communities which utilize river water (inland surface water) are shown in green.

3.3 Lake Michigan Water

The majority of communities in northeastern Illinois rely on Lake Michigan water as their drinking water source. In **Figure 3-1**, communities which utilize Lake Michigan water are shown in light blue.

4 Previous Studies

As noted in Section 2, the ISWS has predicted the decline of the deep sandstone aquifers since the late 1950s and determined that at current withdrawal rates it is unsustainable for the entire region. Therefore, Joliet and its neighboring communities that use the deep sandstone aquifers as their primary source of drinking water must find an alternative water source. The northeastern Illinois area is fortunate to have several possible drinking water sources, as discussed in Section 3. Over the past 60 years multiple studies of this issue have been completed which identified potential solutions. However, in each instance, the decision to move forward with the development of a new water source for the region was deferred due to cost, complexity, or a lack of consensus. Now, given the timeline documented in the recent modeling completed by the ISWS, action is required. Knowing this, in 2018 the City of Joliet initiated the Alternative Water Source Study to identify an alternative water source for the City of Joliet and potentially the region.

4.1 Phase I Alternative Water Source Study

The Alternative Water Source Study began in July 2018 and was completed in two phases. While previous studies have been conducted, the City decided to start with all possible water source alternatives on the table for evaluation. Fourteen water source alternatives were evaluated in the Phase I Study. These fourteen alternatives covered the full range of possible water sources from groundwater (Mt. Simon aquifer & aquifer recharge), rivers (Fox River, DesPlaines River, Illinois River and Kankakee River) and Lake Michigan. The focus of the Phase I Study was to narrow the alternatives down to those which could supply high quality water and sufficient water quantity to meet the demands for the City of Joliet, and possibly the region. The Phase I Study[6] was completed in January 2019 and recommended five alternatives for further evaluation as feasible alternative water sources.

4.2 Phase II Alternative Water Source Study

The Phase II Study[7] began in early 2019 and developed a deeper analysis of five alternatives in order to determine the improvements that would be required to implement each alternative. Variations of the alternatives were also included in the evaluation. The alternatives included: Illinois River, Kankakee River, Lake Michigan Water – Chicago Department of Water Management, Lake Michigan Water – DuPage Water Commission[8] and Lake Michigan Water – New Indiana Intake.

Conceptual water infrastructure improvements were identified for each alternative and preliminary opinions of probable construction cost were established. Recognizing that the resulting water cost includes more than just construction costs, the total cost of water for

[6] CMT, EEI, Stantec. *City of Joliet Alternative Water Source Study - Phase I FINAL Report.* (January 2019). (Hyperlink)
[7] CMT, EEI, Stantec. *Final Report, Alternative Water Source Study - Phase II. City of Joliet.* (December 2019). (Hyperlink)
[8] Per a letter dated December 4, 2019 from DuPage Water Commission, the Commission does not want to be considered as an alternative water source supplier for the City of Joliet. Therefore, the evaluation for this option was removed from the Phase II Study.

each alternative was determined by including purchased water costs and operation and maintenance costs along with the construction costs.

The Phase II Study results were presented to the City Council in November 2019. In January 2020, the City Council selected Lake Michigan Water as the City's new water source as it will be a long-term, sustainable and reliable water source for the City of Joliet and potentially the region. This decision is supported by the Phase I and II Studies. The City Council elected to move forward with further evaluation of two Lake Michigan alternatives: Chicago Department of Water Management and New Indiana Intake.

4.3 Strategic Plan

In order to establish the direction of the Alternative Water Source Program and identify the means to accomplish the program goals, a strategic plan[9] was prepared. The strategic plan was prepared by City Staff and approved by the City Council, under Resolution No. 7489, concurrently with the selection of Lake Michigan water as the City's new water source. The strategic plan established a mission, vision and core values for the Alternative Water Source Program. A SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis was completed to assist in long term planning objectives. Using this information, long term goals were established in order to successfully implement the program.

The vision statement for the City of Joliet Alternative Water Source Program is:

- *To be recognized by our customers, employees, elected officials, regulatory agencies, regional partners and the water industry as a leader in providing sustainable, reliable and high-quality water in an innovative and efficient manner for our community.*

The mission statement for the City of Joliet Alternative Water Source Program is:

- *To provide a sustainable, reliable and high-quality water supply for Joliet and potentially the region by 2030 in order to support the public health, safety and economic interests of the community.*

As Joliet moves forward over the next ten years with the implementation of the Alternative Water Source Program, it will be important for the City to reflect and remain centered on the Program's vision and mission in order to successfully achieve its goals.

[9] Swisher, Allison. *City of Joliet. Alternative Water Source Program Implementation. Strategic Plan.* (January 2020). (Hyperlink)

5 2020 Evaluation

The 2020 Evaluation is a critical first step of Joliet's Alternative Water Source Program to bring Lake Michigan Water to the City of Joliet and potentially the region by 2030. At the completion of the Phase II Study, there remained a significant amount of uncertainty regarding the details of the alternative improvements, potential regional partners, future water demand, cost of improvements and funding sources that may be available. The goal of the 2020 Evaluation is to reduce this uncertainty by further defining each alternative and answering a number of critically important questions through more detailed conceptual engineering analysis, negotiation of preliminary agreement terms with potential water supply/access communities, identification of the funding required based on updated program costs, intensive outreach to potential regional partners, detailed analysis of risks and governmental advocacy. The sections below detail the significant work that was completed during 2020 in order to reduce uncertainty and further define the two remaining alternatives to aid the City Council in its decision on the final water source alternative.

Engineering for the Alternative Water Source Program, including the 2020 Evaluation, is being completed by a Consultant Team with technical expertise in large water supply and delivery projects as well as strong local knowledge required to support and advise the City on this program. The Consultant Team is being led by Stantec in partnership with Crawford, Murphy & Tilly (CMT) along with support from subconsultants including Engineering Enterprises Inc. (EEI), Strand Associates, Cornwell Engineering Group, V3, and Images Inc. Legal support was provided by Barbara Adams with Donahue & Rose. Water rate modeling was provided by Burns & McDonnell and financial advising was provided by Speer Financial. Government advocacy was provided by Barnes & Thornburg. Combined, this team of professionals has the expertise to successfully guide the City through this program.

5.1 Water Demand Scenarios

The foundation of all successful water improvement programs is accurate water use projections. The population and water usage projections for the City of Joliet and potential regional partners were originally established as part of the Phase I Study and have now been updated as part of the 2020 Evaluation. Water usage was projected to 2050 based on population projections published by the Chicago Metropolitan Agency for Planning (CMAP). Based on those projections, the population of the City of Joliet is expected to increase from 149,141 in 2019 to 202,559 in 2050. During this same timeframe, Average Day Demands[10] are anticipated to increase from 15.50 MGD to 23.61 MGD, and Maximum Day Demands will increase from 19.22 MGD to 29.27 MGD. Note that these water usage projections are for the City of Joliet only and do not include the water demands of potential regional partners.

Similar to the Phase II Study, the 2020 Evaluation considers two demand scenarios:

- 30 MGD Demand Scenario, Joliet only
- 60 MGD Demand Scenario, Regional Water Commission (including Joliet)

[10] Average Day Demand is the total water usage in a year divided by the number of days in that year.

For the purposes of this evaluation, a 60 MGD regional demand scenario was assumed. As regional outreach continues, it is envisioned that this demand scenario will be further refined to reflect the actual demands of the regional communities that decide to form and join the Regional Water Commission and could be more or less than 60 MGD.

Looking at CMAP projections, the City of Joliet, as well as several regional communities, are likely to be still growing beyond 2050. As part of the 2020 Evaluation, estimates for buildout population and water demands have been made based on Joliet's current boundary agreements and assumed land usage. This information will be further refined in 2021. The decision on final sizing of the new water system improvements is contingent upon many factors including regional participation and is planned for early 2022, prior to final design. The current conceptual design of the improvements has incorporated flexibility to allow for increased capacity, if required, to serve anticipated growth in Joliet beyond 2050.

5.2 Lake Michigan Allocation

The maximum quantity of Lake Michigan water that can be withdrawn for use in Illinois is governed by a consent decree established by the United States Supreme Court. Illinois is required to monitor and control the withdrawals, which is done pursuant to the Level of Lake Michigan Act [615 ILCS 40]. All Illinois communities that use Lake Michigan as their water source are required to have a Lake Michigan Water Allocation Permit from the Illinois Department of Natural Resources. Regardless of the alternative selected, the City of Joliet will need to obtain a Lake Michigan Allocation Permit. The City of Joliet submitted its Lake Michigan Allocation Permit Application to the Illinois Department of Natural Resources (IDNR) on September 22, 2020. The typical process takes 4 to 6 months and includes a pre-hearing and a formal hearing held soon thereafter. Conditions of obtaining a Lake Michigan Allocation include adoption of water conservation ordinances[11] and reduction of non-revenue water below 10%.

5.3 Engineering/Siting/Routing Studies

The engineering goal of the 2020 Evaluation is to refine the improvements required for each alternative, with a specific objective of reducing areas of critical uncertainty that relate to overall program costs and risks. To achieve this goal, there has been a robust program of engineering analysis completed as part of the 2020 Evaluation.

Results from the engineering analyses completed as part of the 2020 Evaluation have been compiled in a separate Basis of Design Report and related attachments. The *Alternative Water Source Program Basis of Design Report*[12] includes a description of basic design parameters and results from conceptual engineering analyses of the various infrastructure components associated with each alternative being considered by Joliet. The primary report includes a comprehensive description of each alternative and a

[11] The City of Joliet adopted amendments to its Municipal Code to address IDNR water conservation requirements on August 18, 2020 per Ordinance #18106. (Hyperlink)
[12] Stantec, CMT et. al. *Basis of Design. Alternative Water Source Program. City of Joliet.* (November 2020). (Hyperlink)

comparison of alternative features and costs. Additional details from the 2020 engineering analyses are included in attachments to the Basis of Design Report that cover:

- Updated population and water usage projections,
- Conceptual siting and design analyses for a new Lake Michigan intake and raw water pumping station including an analysis of coastal conditions (New Indiana Intake alternative only),
- Evaluation of raw water quality conditions and regulations, water treatment process options, and conceptual siting and design analyses for a new surface water treatment plant (New Indiana Intake alternative only),
- Level 1 and Level 2 routing studies for proposed raw water and finished water transmission mains including an analysis of transmission main hydraulics and major transmission main crossings,
- Conceptual design analyses for required pumping stations and water storage facilities,
- Hydraulic modeling analysis and conceptual design of the local and regional pipe networks required to distribute water to Joliet and potential regional partners,
- Development of a water source transfer plan for each alternative to allow the City to safely switch from its existing water source to the new water source with no impact to existing customers, and
- Plans for the future disposition of the City's existing wells and groundwater treatment plants.

5.4 Permitting Plans

Similar to the Phase II Study, regular meetings and communications with regulatory agencies such as Illinois Environmental Protection Agency, Illinois Department of Natural Resources, Indiana Department of Environmental Management, and Indiana Department of Natural Resources occurred during the 2020 Evaluation to confirm overall program permitting requirements. In addition, as part of the engineering studies completed during the 2020 Evaluation, individual permitting requirements were identified for each major water system improvement component including overall permitting (IDNR, IEPA), Lake Michigan crib/intake permitting (US Army Corps of Engineers, IDEM and Indiana DNR), site specific permitting (local jurisdiction), and route specific permitting (local, county, township right-of-way permits). The permitting information was then consolidated into a permitting plan for each of the two water source alternatives being considered.

5.5 Construction Sequencing/Contracting Plan

Both of the alternatives being considered by Joliet will require the completion of an intensive program of capital construction to establish a new water source for the City by 2030. During the 2020 evaluation, an initial construction sequencing/contracting plan has been developed for each option. The sequencing and contracting plan for each alternative is based on consideration of a number of factors as listed below.

- Type and location of work – logically group projects based on location and contractor capabilities
- Expected contract value and bonding requirements – package work so as to create opportunities for involvement of local, regional, and national contractors for program components with differing levels of complexity
- Interdependence of project elements – identify projects that must be completed to allow for subsequent delivery of other program elements
- Schedule risks related to permitting, land acquisition, or construction duration – identify program elements that present the greatest risk to overall program schedule

The sequencing and contracting plan for each alternative provides a roadmap and identifies program elements that are critical for meeting the City's water delivery target of 2030.

5.6 Water Source Transfer Plan

One significant component for implementation of both alternatives is the Water Source Transfer Plan. The water characteristics (hardness, alkalinity, pH, etc.) of Joliet's current groundwater source is different than treated Lake Michigan water. When switching water sources, there is the potential for the differing water characteristics to disturb the scale that has built up over years in the pipes in Joliet's distribution system, which may result in contaminants, such as lead and radium, being released into the water. In order to prevent this, a Water Source Transfer Plan will be developed and implemented as part of the source water switch. It is anticipated the Water Source Transfer Plan will include water quality monitoring in the distribution system after the switch to verify that no water quality impacts occur. As part of 2020 Evaluation, the characteristics of Joliet's existing water have been analyzed to gauge potential impact of the differing water characteristics anticipated for each alternative.

5.7 Operations & Staffing Evaluation

The two alternatives are very different in terms of staffing required for operations and maintenance (O&M) given that one involves purchasing treated water and the other requires water treatment. In order to better understand the impact to operations and staffing for the two alternatives, the 2020 Evaluation included an O*perations Planning and Staffing Strategy* memo [13] to identify required staffing levels to operate the new alternative

[13] Johnson, Joe, Brian Kazyak, and Emily Saban, Stantec. *Operations Planning and Staffing Strategy. Alternative Water Source Program. Memo to Allison Swisher.* (November 2020). (Hyperlink)

water source infrastructure and incorporate the staffing needs into the project costs.

5.8 Non-Revenue Water (NRW) Reduction

From 2016 to 2018, the City of Joliet has experienced Non-Revenue Water (NRW) percentages from 29.7% to 38.4% based on the American Water Works Association (AWWA) methodology (Manual M36 – Water Audits and Loss Control). The City of Joliet has committed to the reduction of NRW below 10% by 2040 as compliance with this is a water conservation standard expected to be a condition of receiving a Lake Michigan Allocation Permit. The City of Joliet has developed several strategies to reduce its NRW percentage. Strategies have been developed to reduce both apparent and real losses to achieve NRW below 10%. While the City already has a robust watermain replacement program that targets replacement of 1% of the watermain in the system each year, the City has committed to increasing its watermain replacement to 1.6% per year in order to reduce the real losses resulting from leakage through aging watermains. This commitment of replacement of 1.6% of the watermain in the system each year requires a yearly investment of $16.4 million beginning in 2022, which is $6.4 million per year more than its current watermain replacement program.

5.9 Water Purchase/Access Negotiations

Building on discussions with water supply and access providers from the Phase II Study, intensive negotiations with potential water suppliers (CDWM Alternative) and access providers (New Indiana Intake Alternative) have occurred in 2020. The goal of the 2020 Evaluation was to develop an initial agreement containing key concepts with the water supplier or access provider for each alternative that would be in place prior to City Council selection of the new water source. These preliminary agreements establish the major terms and conditions that would be included in, and provide the basis for negotiating, the final Water Supply or Access agreement including without limitation compensation, responsibilities of each party, real estate considerations, permitting and access to rights of way for routing of transmission mains.

5.10 Class 4 Opinions of Probable Construction Cost (OPCCs)

Cost estimating is a critical component of any major improvement program. It is important to not only identify the improvements required for an alternative, but also accurately estimate the cost to construct the improvements. For this project, cost estimates have been prepared in accordance with guidelines developed by the Association for the Advancement of Cost Engineering (AACE). These guidelines relate the accuracy range of an estimate class to the maturity of the project design.

Opinions of Probable Construction Costs (OPCC) developed for the alternatives evaluated during the 2019 Phase II Study were Class 5 OPCCs reflecting the very low maturity of project designs available (0% to 2% design completion). To account for the conceptual nature and unknown conditions associated with the Phase II analysis a moderately high contingency (30%) was added to all alternative OPCCs. For the 2020 Evaluation, additional information related to the size, characteristics and general location of program components has been used to reduce some of the uncertainty surrounding project requirements and support improvements in estimates of cost. The resulting OPCCs are considered to be Class 4 estimates that reflect a modest increase in design maturity (1% to 15% design completion) and include project specific contingencies in the range of 20%

to 25%. Further improvements in the accuracy of OPCCs will occur as an alternative is selected, field investigations and surveys are conducted, and design activities proceed.

5.11 Funding Strategy

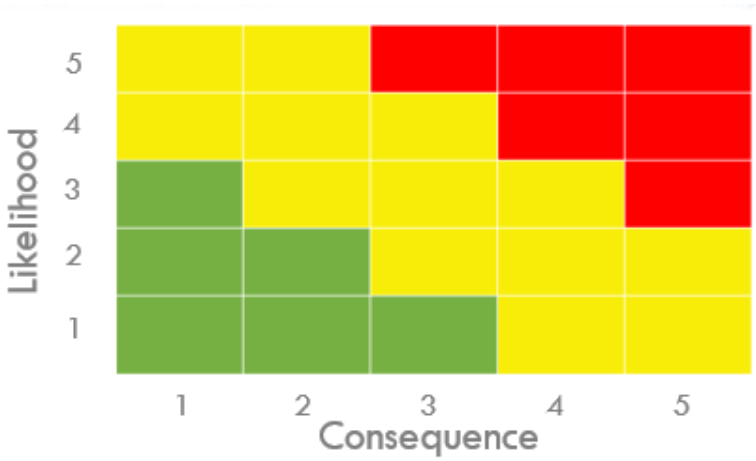
The funding strategy utilized in the Phase II Study incorporated the use of a federal low interest loan program (WIFIA[14]) and the state's low interest loan program (SRF[15]) as well as revenue bonds for the financing of the design and construction of the proposed improvements for each water source alternative. The focus of the 2020 Evaluation was to confirm the funding strategy and update it, as appropriate. The funding strategy developed for each alternative is similar, using low interest loans as much as possible and supplementing with revenue bonds for the remainder of the funding required. The updated recommended funding strategy was presented to the City of Joliet's Finance Committee on October 20, 2020. The updated funding strategy is summarized in the *Joliet Alternative Water Source Program Funding Strategy* memo[16]. The funding strategy memo also includes an evaluation of key affordability indicators to increase understanding and awareness of the potential financial burden the Alternative Water Source Program may have on certain households within the community.

5.12 Impact on Water Rates and Total Cost of Water

Using the Class 4 Opinions of Probable Construction Cost developed and the confirmed funding strategy, the City's water rate model was updated to determine the impact on monthly water rates and the total cost of water for each of the water source alternatives in order to determine the short-term and long-term cost impact to Joliet water customers.

5.13 Risk Analysis

Quite simply, risk is uncertainty that matters. Through the 2020 Evaluation, an active risk register has been developed, updated and maintained in order to track issues that could impact the feasibility, costs or schedule associated with each of the water source alternatives. This process began with a PESTLE (Political, Economic, Social, Technical, Legislative, Environmental) Analysis Workshop that was conducted in May 2020 with two (2) City Council Representatives, ten (10) City



[14] The Water Infrastructure Finance and Innovation Act (WIFIA) Program provides low-cost supplemental loans for regionally and nationally significant projects. (https://www.epa.gov/wifia)
[15] The Illinois Environmental Protection Agency (IEPA) issues State Revolving Fund (SRF) low-interest loans for drinking water projects. (https://www2.illinois.gov/epa/topics/grants-loans/state-revolving-fund/Pages/default.aspx)
[16] Broughton, Amy, Stantec. *Joliet Alternative Water Source Program - Funding Strategy*. Memo to Allison Swisher. (November 2020). (Hyperlink)

Staff and six (6) Consultant Team Members. The results of the PESTLE Analysis were summarized in the *PESTLE Analysis Result*s memo[17], provided to Joliet City Council in June 2020. By classifying the risks identified into the likelihood that the risk would occur and the consequence if the risk did occur, we are able to better mitigate the risks that are expected to have a higher likelihood of occurring that would result in more significant consequences for the project.

5.14 Regional Development

As presented at the August 25, 2020 City Council Workshop, regional development as part of the 2020 Evaluation consisted of two components: Regional Outreach and Regional Governance Evaluation.

5.14.1 Regional Outreach

As discussed in Section 2, the problem with the deep sandstone aquifer is not specific to the City of Joliet. Rather it is a regional problem. As such, it makes sense to engage neighboring communities in a regional solution. One component of the regional water system development during the 2020 Evaluation included the outreach to potential regional community and industrial participants. City staff and project team members met with 17 potential regional partner communities and two industries between June 2020 and August 2020. The regional outreach efforts have been highlighted in the *Joliet Alternative Water Source Program, 2020 Evaluation Regional Outreach Meeting Summary* memo[18]. Regional outreach included meetings between interested potential regional participants, Joliet staff and consultant team members. During these meetings, potential regional partners were asked to provide input on preferences related to governance and water source alternative.

5.14.2 Regional Governance Evaluation

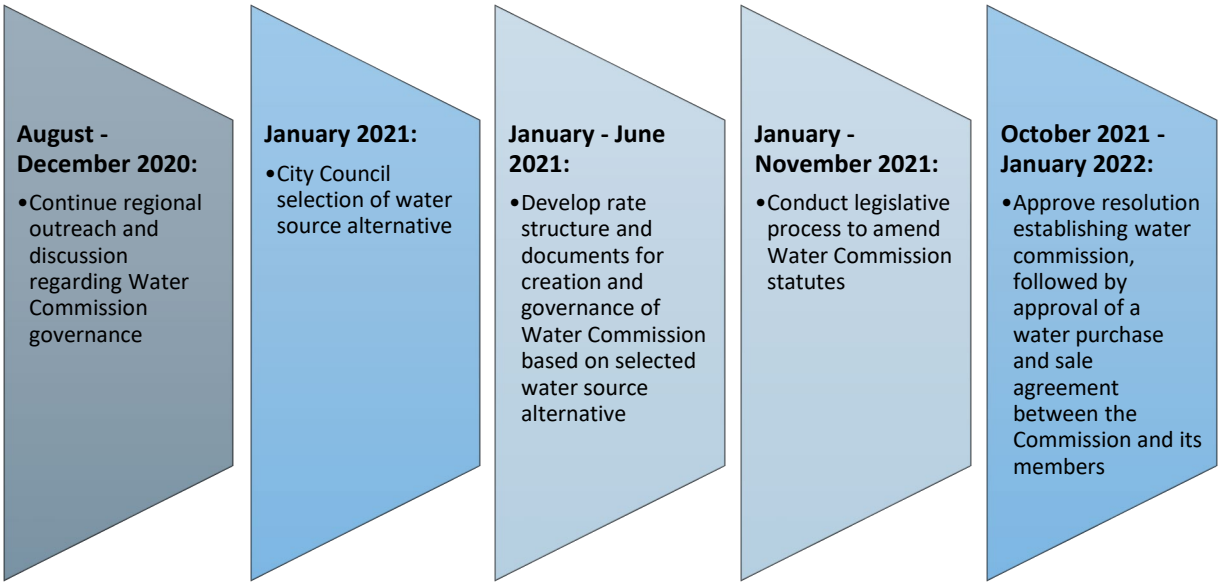
The other component of the regional water system development during the 2020 Evaluation included a Regional Governance Evaluation. The Regional Governance Evaluation was summarized in the *Joliet Alternative Water Source Program, Alternative Forms of Governance and Operation – Lake Michigan Water System* memo[19] which highlighted five major governance structures currently available in state statutes for public sector/governmental water systems and their key advantages and disadvantages. The recommended governance structure, a Water Commission with some modification to state statutes to allow for proportional voting and other ancillary issues, was presented to the City Council at the August 25, 2020 City Council Workshop. Based upon the concurrence of the City Council to proceed with the modified Water Commission format for the proposed regional water system, Staff will proceed with preparing

[17] Johnson, Joe, Russ Snow, Gavin Gilchrist, and Lila Gillespie, Stantec. *PESTLE Analysis Results*. *Memo to Allison Swisher*. (June 2020). (Hyperlink)
[18] Wallers, Pete, EEI. *Alternative Water Source Program, 2020 Evaluation, Regional Outreach Meeting Summary. Memo to Allison Swisher.* (November 2020). (Hyperlink)
[19] Adams, Barbara, Donahue & Rose, PC. *Alternative Water Source Program. Alternative Forms of Governance and Operation - Lake Michigan Water System. Memo to Allison Swisher.* (August 2020). (Hyperlink)

drafts of the documents necessary to establish and commence operation of a Commission. These documents include a resolution to create a Commission, an organizational ordinance/by-laws to be presented to potential regional partners in 2021, and the proposed legislation required to modify state statutes. The goal is to have the Regional Water Commission formed by the end of 2021, as shown in **Figure 5-1**.

Figure 5-1

Timeline for Formation of the Regional Water Commission



5.15 Governmental Advocacy/Outreach

In a significant public improvement program like this one, it is important to have the support of state and federal legislators representing Joliet and the surrounding area. To that end, the City's governmental advocacy team has been working hand-in-hand with the project consultant team on the advancement of Joliet's Alternative Water Source Program in Illinois, Indiana and at the federal level.

5.15.1 Illinois

The primary focus of the Illinois Governmental Outreach in 2020 has been to promote awareness of and garner support from state and local legislators for both water source alternatives by sharing information on the program and its benefits to the City of Joliet, the Will County region and the entire State of Illinois.

5.15.2 Indiana

The primary focus of the Indiana Governmental Outreach in 2020 has been to understand the concerns of state and local legislators on the New Indiana Intake Alternative. By understanding the concerns, we can address and mitigate the potential risks associated with this alternative which crosses state lines.

5.15.3 Federal

The primary focus of the Federal Governmental Outreach has been to draw awareness to the needs of the program for consideration for future funding opportunities, as well as support for the program at a federal level.

5.16 Public Outreach & Stakeholder Engagement

The Public Outreach and Stakeholder Engagement that began in the Phase I and II Studies has continued into the 2020 Evaluation. In spite of the limitations on engagement activities due to the pandemic, significant outreach has been conducted. Public engagement activities included the following in 2020:

- Monthly Newsletters and Educational Topics emailed to the project stakeholder list (currently containing 1018 stakeholders) and posted to the project website
- Ongoing social media posts and use of the City's electronic messaging boards
- Maintenance of the project website, www.RethinkWaterJoliet.org, which has captured all of the program activities completed to date
- Three Stakeholder Meetings held virtually on the Zoom Webinar platform in May, July and September with recordings posted to the project website
- Three City Council Workshops broadcast live on Channel 6 and the City's website in June, August and November with recordings posted to the project website
- Monthly meetings of the Water Conservation Subcommittee which continued to champion the City's water conservation efforts including the low flow toilet rebate program and rain barrel subsidy program and supported the City's decision to become a Water Sense Partner
- Public Forum to be held virtually in December to answer questions and obtain comments before the City Council selection of the alternative water source

6 Lake Michigan Water – New Indiana Intake Alternative

As an alternative to buying treated Lake Michigan water from an existing water supplier, the City of Joliet could develop an entirely new Lake Michigan water supply system through the construction of a new intake in Lake Michigan and pumping of raw water over 46 miles to a water treatment plant near the City of Joliet. Once treated, the water would be distributed through the Joliet service area. Since access to Lake Michigan is limited in Illinois, this alternative involves the construction of the Lake Michigan intake and shore facilities in Hammond, Indiana.

6.1 Description of Alternative

For this alternative, the City of Joliet would construct a new crib in Lake Michigan approximately 7,000 feet (1.3 miles) off the shore near Hammond, Indiana. An intake pipe would be constructed in Lake Michigan to bring the raw water from the crib to the shore where it would be pumped approximately 46 miles to Joliet where it would be treated before being distributed through the Joliet water system. This alternative is conceptually shown in **Exhibit 6-1**.

6.1.1 Water Source and Raw Water Quality

The water source for this alternative is Lake Michigan water from a new crib in Lake Michigan, as shown in **Figure 6-1**. The crib location was determined based on an intake siting evaluation that was performed as part of the 2020 Evaluation as summarized in the *Joliet Alternative Water Source Program, Basis of Design Report, Attachment A*[20]. The study considered depth of water, locations of known shipwrecks, navigational channels and locations of existing intakes in order to determine possible crib locations.

Note that other intake locations in Lake Michigan along the Indiana shore were also evaluated in Whiting and Gary. However, utilizing a shore facility located in Hammond resulted in the most cost-effective alternative taking into account intake length and transmission main length as well as availability of the necessary real estate to construct the shore facilities and transmission main in Indiana.

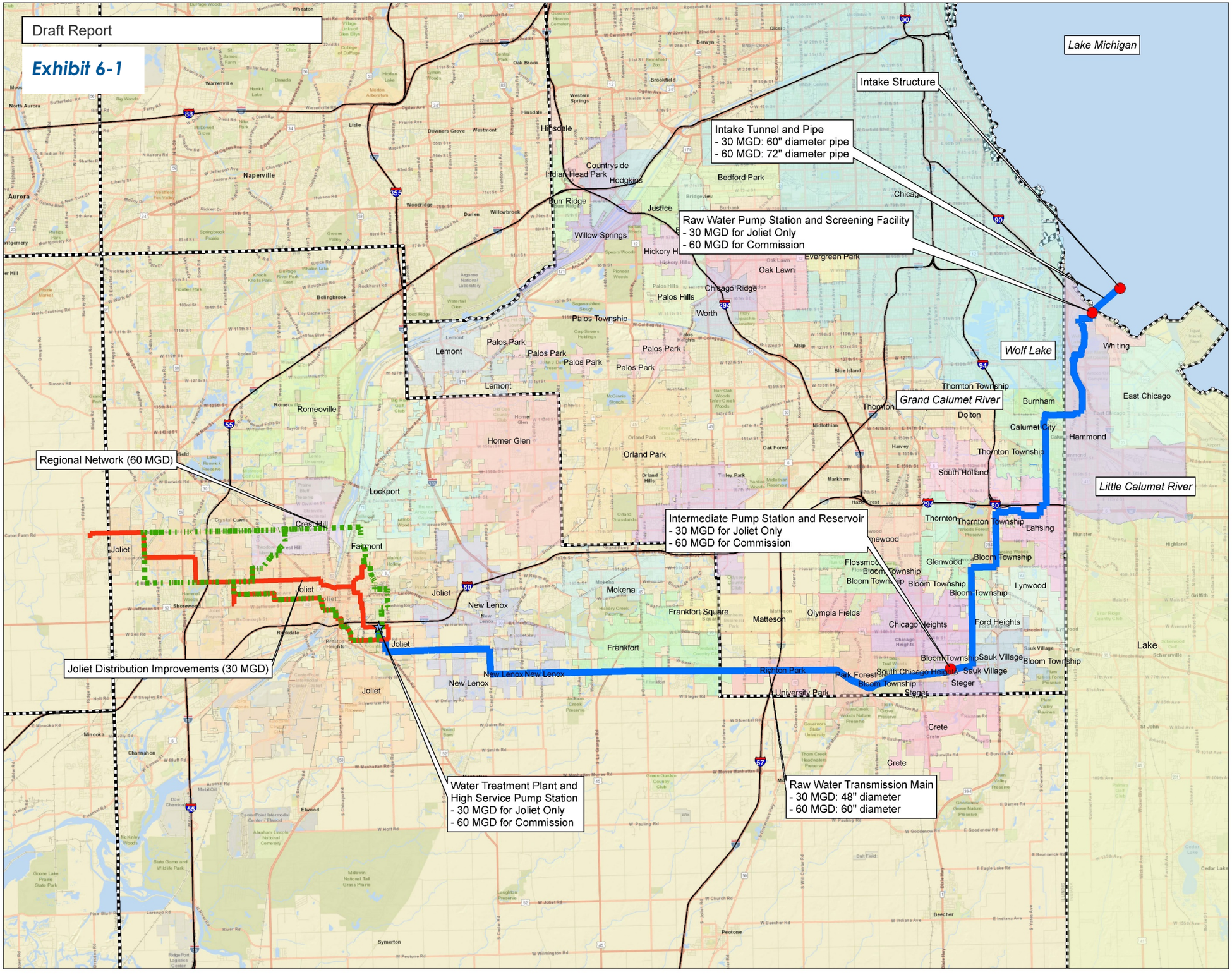
As part of the 2020 Evaluation, an investigation of raw water quality at the southern end of Lake Michigan was performed and determined that the raw water quality was sufficient to meet state and federal drinking water standards with conventional water treatment. The investigation is summarized in the *Joliet Alternative Water Source Program Basis of Design Report, Attachment B, Appendix B-1*[21].

[20] Stantec, CMT et. al. *Basis of Design. Alternative Water Source Program. Attachment A - Intake/Raw Water Pump Station. City of Joliet*. (November 2020). (Hyperlink)
[21] Stantec, CMT et. al. *Basis of Design. Alternative Water Source Program. Attachment B, Appendix B-1 Regulatory Requirements and Raw Water Quality Analysis. Memo to David Cook, P.E.* (November 2020). (Hyperlink)

(This page has been intentionally left blank.)

Draft Report

Exhibit 6-1



rethink water JOLIET

JOLIET

Figure No.
6-1

DRAFT

Title
Lake Michigan Water - New Indiana Intake Overall System Plan

Client/Project
City of Joliet Department of Public Utilities
Alternative Water Source Program

Project Location
Will, Cook, and Kendall, IL. Lake County, IN

Prepared by JV on 2020-10-29

N

0 2 4 8 Miles

(At original document size of 22x34)
1 Inch = 10000 FT

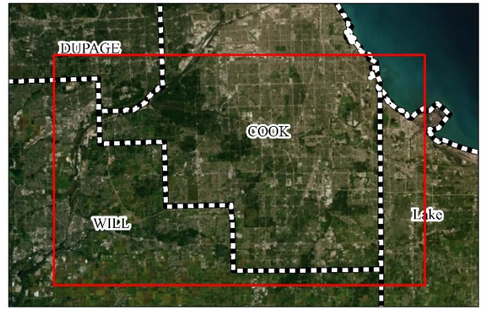
Legend

- Water Transmission Main
- Regional Network
- Water Distribution System Modifications

Facilities

Facilities

- Approximate Proposed WTP Location
- Proposed Facility
- County Boundaries



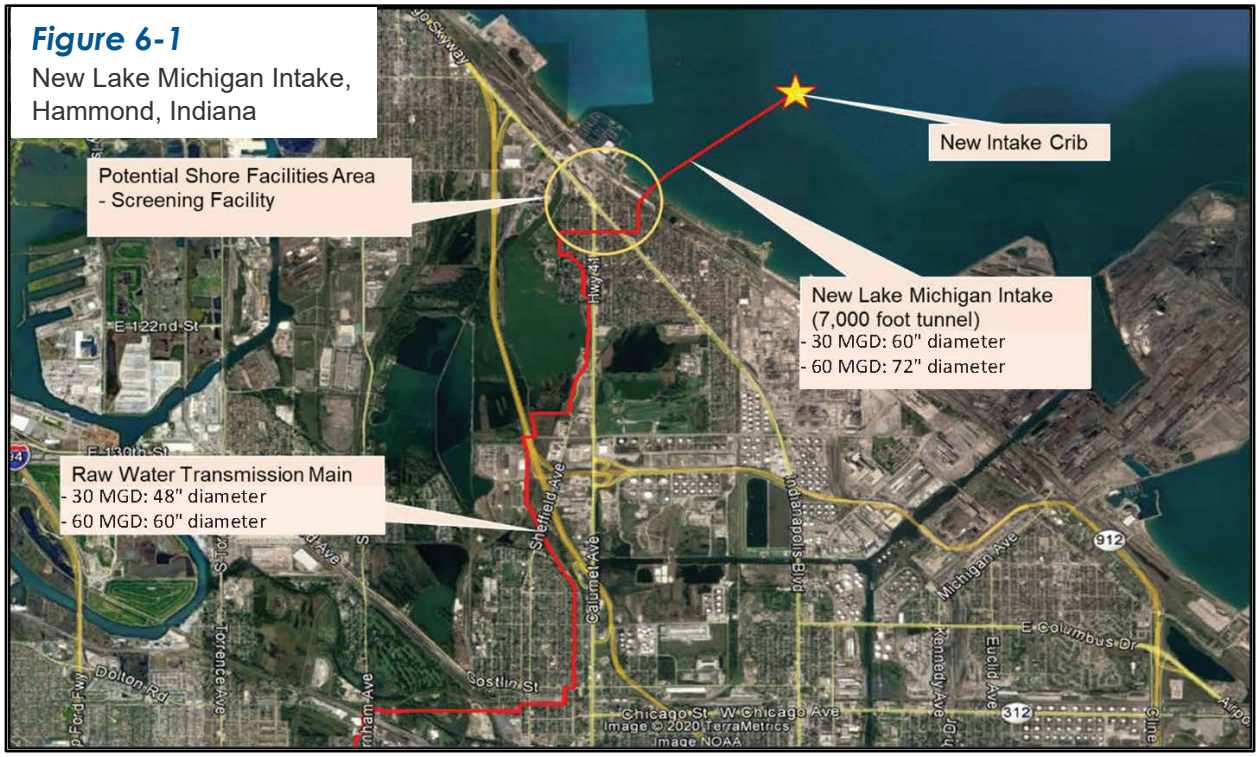
Location Map: Not to Scale

Notes
1. Coordinate System: NAD 1983 StatePlane Illinois East FIPS 1201 Feet
2. Data Sources: WILL CO., COOK CO., IDOT, INDOT, INDNR and USFWS DATA DOWNLOADED FROM WEB 3/11/2019 to 8/26/2019
3. Background: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Stantec · CMT Crawford, Murphy & Tilly · Engineering Enterprises, Inc. Outstanding Service – Every Client – Every Day

STRAND ASSOCIATES® · CORNWELL ENGINEERING GROUP · V3

(This page has been intentionally left blank.)



6.1.2 Intake Pipe

As shown in **Figure 6-1**, the City of Joliet would construct an intake pipe from the new crib location approximately 7,000 feet to the shore facilities. A 60" intake pipe is required for the 30 MGD demand scenario (Joliet only) and a 72" intake pipe is required for the 60 MGD demand scenario (Water Commission). It has been assumed that the intake pipe would be constructed via tunneling from the shore facilities.

6.1.3 Shore Facilities

As part of the 2020 Evaluation, possible locations for the shore facilities in Hammond, Indiana were evaluated and discussed with the City of Hammond. While real estate would not be secured for the shore facilities until 2021, three potential locations have been identified as technically feasible. The shore facilities will consist of a screening system, a pumping station, surge control system and standby generator. To allow for construction of the shore facilities and raw water transmission main, the City of Joliet will need to enter into an Access Agreement with the City of Hammond, as described in Section 6.2.

6.1.4 Raw Water Transmission System/Intermediate Pump Station

From the shore facilities' site, the City of Joliet will construct a new raw water transmission main between Hammond and Joliet as shown in **Exhibit 6-1**. A 48" transmission main is required for the 30 MGD demand scenario (Joliet only) and a 60" transmission main is required for 60 MGD demand scenario (Water Commission). Given the topography between Hammond and Joliet, there would be a new intermediate pumping station and reservoir along the transmission main in Illinois prior to reaching the water treatment plant near Joliet.

6.1.5 Water Treatment Plant and Finished Water Quality

Surface water treatment of the raw Lake Michigan water is required. Given the potential water service area, the water treatment plant location has been proposed in the southeastern part of Joliet to be able to more effectively maintain finished water quality when delivered to the ultimate customer. As part of the 2020 Evaluation, a Water Treatment Process Evaluation was completed which reviewed process considerations, water quality goals, and potential for treating emerging contaminants. The evaluation is summarized in the *Joliet Alternative Water Source Program Basis of Design Report, Attachment B, Appendix B-2*[22]. Three water treatment process alternatives were evaluated. Advanced Water Treatment (conventional treatment with granular activated carbon filters and ozonation) was recommended because it will meet Joliet's treated water quality goals as well as all state and federal drinking water standards, provide for effective taste and odor control and allow for treatment of emerging contaminants. The recommended water treatment process was presented at the August 25, 2020 City Council Workshop and the City Council concurred with the recommendation of Advanced Water Treatment.

6.1.6 Joliet Water Distribution System Modifications

From the new water treatment plant, the new water source will enter the Joliet distribution system at a single entry point. The current groundwater source enters the water distribution system at multiple points throughout the system. Therefore, extensive improvements are required in Joliet's water distribution system to distribute water from the single entry point. Additional storage, approximately double the amount the City of Joliet current has, will need to be constructed to have at least two times Joliet's Average Day Demand in storage in order to provide redundancy and allow for maintenance of the raw water transmission system.

6.1.7 Back-Up Well Supply

Given that the new water source will travel through over 46 miles of transmission main, which does not have redundancy[23], the City of Joliet will need to maintain its wells as a back-up water source. In the event of a transmission main break or planned maintenance lasting longer than two days, the City of Joliet would place the wells back into service until the new water source is restored. As part of the Phase I Study[24], ISWS evaluated the ability of the aquifer to supply groundwater for short-term durations (1 to 3 months) and determined that the aquifer would be able to supply the necessary back-up supply.

---

[22] Stantec, CMT et. al. *Basis of Design. Alternative Water Source Program. Attachment B, Appendix B-2 Treatment Process Evaluation - Draft. Memo to Allison Swisher. City of Joliet.* (November 2020). (Hyperlink)

[23] It was determined that a parallel transmission main would not be cost effective as compared to maintaining the City's existing well supply as a back-up.

[24] CMT, EEI, Stantec. *City of Joliet Alternative Water Source Study - Phase I FINAL Report, Appendix E – Groundwater Modeling.* (January 2019). (Hyperlink)

6.2 Key Terms for Access Agreement

Project team members and City Staff worked with City of Hammond representatives extensively during 2020 to establish the major terms and conditions for the long-term Access Agreement and memorialize them in a preliminary access agreement. The preliminary access agreement is being presented for approval to the Hammond City Council on November 23, 2020, prior to Joliet's decision on the new water source alternative. A copy of the preliminary access agreement has been included in **Appendix A**.

6.2.1 Agreement Structure and Term

The preliminary access agreement has been established to identify key terms and conditions which would be incorporated into the final Access Agreement. If the New Indiana Intake Alternative is selected, Joliet would approve and sign the preliminary access agreement, committing Joliet to move forward with negotiations with the City of Hammond for the long-term Access Agreement. Upon execution of the preliminary access agreement, the City of Joliet and the City of Hammond would work together to obtain real estate for the shore facilities. After the real estate for the shore facilities is acquired, the final Access Agreement would be developed and approved in the Summer of 2021. It is anticipated that the Access Agreement would have a term of 99 years with two 25-year renewal terms.

6.2.2 Rights and Responsibilities of the Parties

Under the Access Agreement, the City of Joliet would have full responsibility for the design, construction, financing, operation and maintenance of the new infrastructure including the crib, intake pipe, shore facilities and raw water transmission main. The City of Hammond would assist Joliet with securing real estate and will permit permanent use of its right-of-way and easements in certain Hammond-owned or controlled properties for routing of the raw water transmission main through Hammond to Illinois.

6.2.3 Real Estate Matters

The City of Hammond currently does not own land suitable for the shore facilities. Therefore, the preliminary access agreement allows for three possible real estate arrangements in connection with obtaining a site for the shore facilities: (1) Hammond will sell to Joliet land owned by Hammond or one of its affiliated entities; (2) Hammond will grant to Joliet a long-term/perpetual easement on land owned by Hammond or one if its affiliate entities; or (3) Joliet will purchase private property or obtain a long-term/perpetual easement on private property.

6.2.4 Basis for Costs and Fees

Compensation to Hammond for access to and use of right-of-way and easements in Hammond-owned or controlled property is broken down into 3 types of payments: one-time payments, reimbursement payments and annual payments. One-time payments have been identified as initial payments upon execution of the preliminary and final agreements and approval of the bidding documents, and payments for Hammond to use to enhance its right-of-way in light of the anticipated impact of the proposed construction to the City of Hammond.

Reimbursement payments are anticipated annually during design and construction to reimburse Hammond for costs incurred providing assistance to Joliet. Annual payments include property taxes (or payment in lieu of taxes if the property is tax exempt) and a two-part fee for access to right-of-way and easements in Hammond property, with one part a fixed annual fee and the other an annual volume charge based on the amount of water pumped from Lake Michigan.

6.2.5 Provisions for Assignment/Transfer

Knowing that Joliet has decided to pursue the formation of a Water Commission, the preliminary access agreement includes provisions to allow the final Access Agreement to be transferrable to the Water Commission upon its formation.

6.2.6 Limitation on Supply of Water to Certain Illinois Communities

In the negotiations of the preliminary access agreement, it was important to the City of Hammond that Joliet does not pursue supplying water to Hammond's existing and anticipated water customers in Illinois. As providing water to communities in south Cook County was not Joliet's intent, and given the location proposed for the water treatment plant near Joliet which limits the availability of finished water to these communities, this provision was included in the preliminary access agreement for the final agreement, with protection for Joliet if the provision is contested.

6.3 Land Acquisition

Joliet will need to acquire significant land rights in both Indiana and Illinois to support the construction and long-term operation of the new facilities required for the New Indiana Intake alternative. As the acquisition of land can be a time-consuming activity, it is important that specific land acquisition requirements are identified and acted on early in the overall alternative schedule. **Table 6-1** provides a summary of preliminary land acquisition needs for the Indiana Intake Alternative. Additional details are documented in the *Joliet Alternative Water Source Program Basis of Design Report*[25].

Table 6-1

Preliminary Land Acquisition Needs for the New Indiana Alternative

Alternative Component	Location	Land Acquisition Requirement
Shore Facilities	Final Site to be determined, Hammond, IN	1.5-2 acre site required for use during construction of the lake intake and as the site for the Raw Water Pump Station
Raw Water Transmission Main - Indiana	Various alignments between the intake site and the Illinois state line	ROW rights and easements required for construction and operation of transmission main

[25] Stantec, CMT et. al. *Basis of Design. Alternative Water Source Program. City of Joliet.* (November 2020). (Hyperlink)

Alternative Component	Location	Land Acquisition Requirement
Intermediate Pump Station	Southern Cook County	2-3 acre site required for intermediate pump station and standpipe
Water Treatment Plant/ High Service Pump Station	Southeastern Joliet	Approximately 15 acre site required for new 60 MGD surface water treatment plant and high service pump station
Regional Water Commission Pipe Network (Regional Option Only)	Various alignments through Joliet and adjacent communities	ROW rights and easements required for construction and operation of Regional Water Commission Pipe Network
Regional Water Commission Storage (Regional Option Only)	To be determined	Site for 1 MG Standpipe to provide storage capacity for the Regional Water Commission Network
Distribution System Improvements	Various alignments through Joliet	ROW rights and easements required for construction and operation of Distribution System Improvements in Joliet
Distribution System Pumping and Storage	Various sites for new storage and pumping facilities within Joliet	Approximately 15.5 acres of expanded or new sites required for storage and pumping facilities within the Joliet distribution system

Extensive discussions with the City of Hammond, Indiana have already been conducted, and potential sites for the shore facilities and conceptual pipeline routes through Hammond have been identified. Actions required to secure land for the shore facilities and transmission main right-of-way within Hammond will proceed immediately if the Indiana Intake alternative is selected by Joliet. Potential sites for the proposed water treatment plant have also been identified for further investigation upon selection of the option. Formal land acquisition efforts related to the other sites and easements required will proceed during preliminary engineering based on final routing/siting studies.

6.4 Permitting Plan

As part of the 2020 Evaluation, a permitting plan has been developed for this alternative and is contained in the *Joliet Alternative Water Source Program Basis of Design Report*[26]. Permitting for the New Indiana Intake Alternative is very complex given that construction will occur in both Illinois and Indiana as well as the magnitude and extent of capital improvements required including construction of the crib/intake in Lake Michigan and new surface water treatment plant. Permitting for this alternative can be classified into four categories: Overall Permitting, Lake Michigan Crib/Intake Permitting, Site Specific Permitting and Transmission Main Route Permitting.

6.4.1 Overall Permitting

Two overall permits are required for this alternative: a Lake Michigan Allocation Permit from IDNR (as described in Section 5.2) and water supply

[26] Stantec, CMT et. al. *Basis of Design. Alternative Water Source Program. City of Joliet.* (November 2020). (Hyperlink to Permitting Plans)

construction/operating permits from IEPA. Prior to construction of the new water infrastructure components, Joliet will apply for water supply construction permits from the Illinois Environmental Protection Agency (IEPA) in cooperation with Indiana Department of Environmental Management (IDEM). In addition to relatively routine IEPA permits for water pumping, storage, and conveyance improvements, Joliet will have to complete an extensive permitting program for its new surface water treatment plant. Permitting of the plant will require source water quality sampling and analysis over a two-year period, pilot testing of the proposed treatment process, and submittal of complete design documentation, plans, and specifications. An application for an overall operating permit will be submitted in conjunction with final testing and commissioning of the completed system.

6.4.2 Lake Michigan Crib/Intake Permitting

Significant time and effort will be required to obtain permits from multiple agencies with jurisdiction over various aspects of the construction of Joliet's new Lake Michigan intake. Specific permits expected to be required for intake construction include U.S. Army Corps of Engineers Nationwide and Individual Permits, a Section 401 Water Quality Certification from the Indiana Department of Environmental Management (IDEM), water supply and operating permits from IEPA (referenced above), and Indiana DNR permits related to construction impacts and monitoring and reporting on the operation of the new intake. In support of this permitting process, Joliet will also need to engage in consultations with a range of entities including the Indiana State Historic Preservation Office, the Lake Carriers Association, the U.S. Coast Guard, and others. To facilitate this process, Joliet should plan to begin outreach to permitting agencies early in the preliminary design process, submit permit applications at the 60% design stage, and allow for up to 12 months for review and approval of the intake permit.

6.4.3 Site Specific Permitting

Site specific permitting efforts such as local building permits, erosion control and stormwater discharge will be required for the new water supply facilities (treatment, pumping, and storage) to be constructed as part of the New Indiana Intake Alternative.

6.4.4 Route Specific Permitting

A variety of approvals and agreements will be required for the construction of the transmission main from Hammond to Joliet. The transmission main routing, conceptually shown in **Exhibit 6-1**,utilizes right-of-way or land controlled by nine (9) municipalities/townships, five (5) county and state governmental agencies, seven (7) railroads, one (1) utility agency corridor and three (3) private property owners.

While routing investigations have included efforts to identify and avoid sensitive environmental areas (wetlands, threatened/endangered species habitat, floodplain, etc.), detailed field assessments, efforts to obtain approvals, and mitigation planning will be required at locations where impacts cannot be avoided. Major permitting activities for the transmission main portion of the

project will include the WIFIA Programmatic Environmental Assessment (PEA) for the overall route and permits for major crossings at Wolf Lake, the Grand Calumet River, the Little Calumet River, I-80 (twice), and I-57.

6.5 Implementation Plan and Schedule

For this alternative, there are considerable improvements that need to be put in place and made operational to bring the raw Lake Michigan water to Joliet and treat it to drinking water standards. As part of the 2020 Evaluation, a detailed contracting/construction sequencing plan has been developed for this alternative and is contained in the *Joliet Alternative Water Source Program Basis of Design Report*[27].The detailed contracting/sequencing plan shows that the design, permitting and construction of the improvements for this alternative can be implemented to allow for water delivery to Joliet by 2030.

6.5.1 Design & Construction

Design of the infrastructure required to implement the New Indiana Intake Alternative is anticipated to begin in the first quarter of 2021 with construction beginning in the third quarter of 2024 and first water delivery for testing occurring in the first quarter of 2030. Preliminary design efforts and supporting field investigations will be completed in 2021 to support submittal of Joliet's WIFIA loan application in December 2021. Detailed design and bidding efforts will occur throughout 2022, 2023 and 2024, with specific program components (Lake Michigan Intake, Water Treatment Plant, select major crossings) being expedited to allow adequate time for permitting and staged construction. Other major construction contracts linked to the construction of transmission main (5-10 contracts), the intermediate pumping station, water treatment plant, and distribution/commission conveyance, pumping, and storage projects in Joliet (multiple contracts) are anticipated to be awarded and move into construction beginning in early 2025. **Exhibit 6-2** provides an overall schedule of major program activities to be completed to allow for delivery of Lake Michigan water to Joliet by 2030.

6.5.2 Start-up, Commissioning, Monitoring

Once the improvements have been constructed, start-up and commissioning will occur through the second quarter of 2030 to allow for water delivery to Joliet's customers mid-2030.

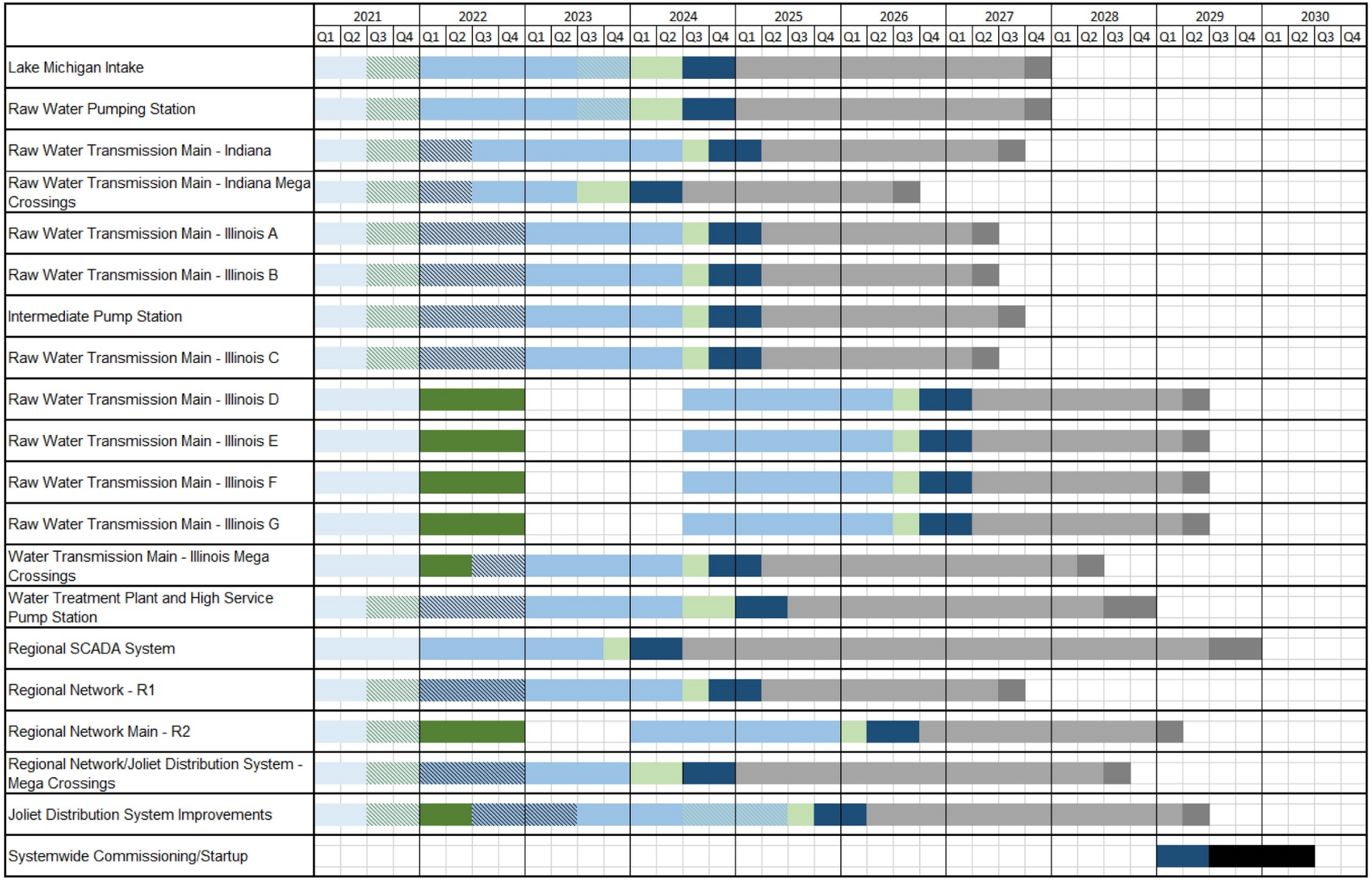
[27] Stantec, CMT et. al. *Basis of Design. Alternative Water Source* Program. City of Joliet. (November 2020). (Hyperlink to Contracting Plans)

(This page has been intentionally left blank.)

Draft Report

Exhibit 6-2

CONCEPTUAL IMPLEMENTATION SCHEDULE
LAKE MICHIGAN WATER - INDIANA INTAKE REGIONAL 60 MGD ALTERNATIVE



rethink water JOLIET

JOLIET

Figure No.

Title
Conceptual Implementation Schedule
Lake Michigan Water - Indiana Intake Alternative

Client/Project
City of Joliet Department of Public Utilities
Alternative Water Source Program

Project Location
Cook County, IL and Lake County, IN

Prepared by LG on 2020-06-23

Legend

- Preliminary Design
- Final Design
- Bidding/Contract Award
- Permitting
- Land Acquisition
- Construction
- Commissioning
- Systemwide Commissioning

Stantec

CMT Crawford, Murphy & Tilly

Engineering Enterprises, Inc. Outstanding Service – Every Client – Every Day

SA STRAND ASSOCIATES®

CORNWELL ENGINEERING GROUP

V3

(This page has been intentionally left blank.)

One component of the start-up process is implementation of the Water Source Transfer Plan as discussed in Section 5.6. As part of the 2020 Evaluation, an evaluation of the corrosion control implications of switching water sources was performed and is described in *Joliet Alternative Water Source Program Basis of Design Report*[28]. The testing performed in the 2020 Evaluation indicates that treated Lake Michigan water has similar propensity for corrosivity as Joliet's existing groundwater source. This suggests that the new water source switch will not adversely impact water quality, assuming a Water Source Transfer Plan is developed and implemented in conjunction with the switch. After further testing is performed in 2021, this will be verified. However, with this alternative, Joliet will be able to adjust the proposed treatment and finished water quality, if necessary, to allow for compatibility and minimize the potential for impact.

6.6 Operations & Staffing

As noted in Section 5.6, the 2020 Evaluation included an O*perations Planning and Staffing Strategy* memo[29] to identify required staffing levels for operation of the new water source infrastructure and incorporate the staffing needs into the project costs. The following notes the operations and staffing levels for the New Indiana Intake Alternative.

6.6.1 Operations

From an operational standpoint, the new infrastructure associated with the New Indiana Intake Alternative will require an eventual shift from the operation and maintenance of Joliet's existing wells and water treatment plants to the operation and maintenance of the new infrastructure both inside the City limits and outside the City limits. City staff will have to take on responsibility for the remote operation of intake and raw water pumping facilities in northwest Indiana, a remote intermediate pumping station in southern Cook County, and a new surface water treatment plant located in the southeastern part of Joliet. Since repair of large diameter (36" and larger diameter) watermain requires special tools and equipment, it is assumed that the City of Joliet would have Contractors on-call for repairs and maintenance to the large diameter transmission main outside City limits.

It is anticipated that the primary control center for the new system will be located at the new water treatment plant site. Automated instrumentation and controls will be installed to avoid the need for full time staffing of the remote pumping facilities, but regular visits by Utilities Department staff will still be needed to assess conditions and conduct routine maintenance. Also, while the City's existing 11 water treatment plants will be abandoned once the new system (Joliet Only or Regional) is operational, Joliet will need to continue to operate and sample its 26 existing wells monthly to maintain them as a reliable emergency water source and manage the operation of local pumping stations to cycle water through the expanded storage and conveyance system. Significant changes in

[28] Stantec, CMT et. al. *Basis of Design. Alternative Water Source Program. Attachment C.* City of Joliet. (November 2020). (Hyperlink)
[29] Johnson, Joe, Brian Kazyak, and Emily Saban, Stantec. *Operations Planning and Staffing Strategy. Alternative Water Source Program. Memo to Allison Swisher*. (November 2020). (Hyperlink)

operational approaches, procedures, and staffing will be required for the New Indiana Intake Alternative, but the general principles used by City staff to reliably deliver water to customers will remain essentially the same.

6.6.2 Staffing

Joliet currently uses a total of five (5) dedicated water plant operators and a shared pool of maintenance, utility, engineering, and administrative staff to support the operation of its existing water system. While the skills and experience of these staff will be applicable to elements of the expanded system associated with the New Indiana Intake Alternative, additional resources and staff development will be needed to operate and maintain the new supply, treatment, pumping, and storage facilities. Preliminary analyses suggest that Joliet would need to add as many as fourteen (14) new water operations, maintenance, and engineering staff to support the New Indiana Intake Alternative.

6.7 Cost of Water

Under this alternative, the cost of water would include capital costs and associated debt service; and operations, maintenance and replacement costs (OM&R). It is important to note that the costs and values presented are estimates developed with the best available information, reflect assumptions, and may vary from the final costs for implementation.

Costs are presented for 30 MGD and 60 MGD options. The 30 MGD option assumes Joliet is the only participant in the program implementation and therefore assumes all the associated costs. The 60 MGD option serves a group of regional communities, including Joliet. For the 60 MGD option, Joliet is responsible for a proportionate share of capital and OM&R costs based on projected demand profiles. Distribution of costs related to the regional option are based on assumptions that will need to be further evaluated and discussed with potential regional partners.

Key cost sensitivities for this alternative include financing terms and capital cost fluctuations. The impact of these key sensitivities on cost is described further in the *Joliet Alternative Water Source Program – Funding Strategy memo*[30].

6.7.1 Access Costs

There will be access charges associated with this alternative to allow Joliet to have access to right-of-way and easements in Hammond-owned or controlled property. Discussions with the City of Hammond have led to an understanding of the key areas of compensation to Hammond for its efforts in connection with the project and the disruption that will be caused by the project. Some of the costs will be incurred during the design and construction phase of the project and some will be incurred annually. The one-time costs include: two $1,000,000 commitment payments at key milestones, expense reimbursements, and three $2,000,000 right-of-way (ROW) enhancement payments during the three-year transmission main construction period. If Joliet obtains a right to use a property (such as an easement or lease or other form of interest) for shore facilities

[30] Broughton, Amy, Stantec. *Joliet Alternative Water Source Program - Funding Strategy*. *Memo to Allison Swisher*. (November 2020). (Hyperlink)

instead of owning it, over the life of the project, Joliet will be required to pay an annual fee for use of the site (assumed $76,500/year) assuming Hammond purchases the shore facilities property, an annual payment of property taxes (or fees in lieu of property tax if tax exempt) (assumed $26,000 initially starting in 2021, $310.500 after improvements are completed and escalated 2% annually), and a two-part fee for access to right-of-way and easements in Hammond property, with one part a fixed annual fee of $110,000 and the other an annual volumetric charge based on average day water withdrawal ($5,000/MGD annually which results in $100,000 per year based on an Average Day Demand of 20 MGD).

Access costs from 2021 to 2029 for both the 30 MGD and 60 MGD options, to be paid to Hammond, are estimated to be $9,900,000 [31]. It has been assumed that the annual costs including the ROW/easement fixed fee charge and the volumetric charge will adjust consistent with changes in the CPI not to exceed 2%. The fee for use of the shore facilities site is assumed to be $76,500 a year for the life of the project. Annual access costs, to be paid to Hammond, are approximately $390,000 in 2032 [32], and anticipated to escalate to $1,000,000 in 2079.

6.7.2 Capital Costs

The City of Joliet will be responsible for the planning, design, financing and construction of new water supply/production infrastructure, new water transmission/delivery infrastructure, and distribution system improvements, as noted in Sections 6.1.3.2 to 6.1.3.4 [33] The 60 MGD option includes capital costs associated with the regional pipe network. Joliet will finance new infrastructure assets with a combination of government program loans and revenue bonds (as described in 6.3.4 Funding Strategy). **Figures 6-2, 6-3** and **6-4** illustrate the capital cost distribution for the 30 MGD and 60 MGD options. **Figure 6.4** shows Joliet's proportional share of the regional system costs. Joliet will be responsible for 100% of the costs associated with the Joliet distribution system improvements but will share proportionately in all other costs. Capital cost responsibility for the 60 MGD regional system has been distributed according to Maximum Day Demand. The following describes the cost components referenced in the Figures:

- Charges for Access to Right-of-Way and Easements includes costs to Joliet to secure access to transmission main right-of-way and easements on Hammond-owned and controlled property through the City of Hammond. Components of this cost include commitment, reimbursement, site use, right-of-way enhancement, and fixed fee and volumetric costs, as well as property taxes (or payments in lieu of property taxes). These charges include a mix of payments during design and construction of the

[31] Escalated to year of payment, $8,600,000 in 2020 dollars.
[32] Only eight months of service are assumed in 2030. The $5,000/MGD volumetric charge is collected in the following year. Therefore, the first partial year payment will occur in 2031. The first full year payment will occur in 2032.
[33] Charges for right-of-way & easements between 2021-2029 are also included in the Capital Costs.

project, and annual payments that continue throughout operation.

- Water Transmission/Delivery Infrastructure costs include costs associated with the design and construction of facilities required to convey water from the new Indiana intake on Lake Michigan to the proposed water treatment plant site near Joliet. These facilities include the new Intake and Raw Water Pump Station, approximately 46 miles of water transmission main, an Intermediate Pump Station and Storage Facility, and a new Surface Water Treatment Plant and Pump Station in Joliet.
- Joliet Distribution System Improvements costs include all costs associated with the design and construction of local conveyance, pumping, and storage improvements required to effectively distribute water from the transmission system throughout Joliet's water supply service area and provide the two-times average day demand storage volume established to provide local reserve capacity. Improvements included in this category only serve City of Joliet water customers.
- Regional Water Commission Network Improvements costs include the conveyance and storage infrastructure required under the 60 MGD Regional option to distribute water from the transmission system to the region as shown in **Exhibit 6-1**.This does not include operating costs such as pumping and transmission to Commission members beyond the Regional Water Commission Network; this would be determined based on which items are Commission-owned or member owned improvements. This will be further evaluated in the development of the Water Commission. No Regional Water Commission Network Improvements are required for the 30 MGD Joliet Only option.

Figure 6-2

Capital Cost for 30 MGD New Indiana Intake Alternative

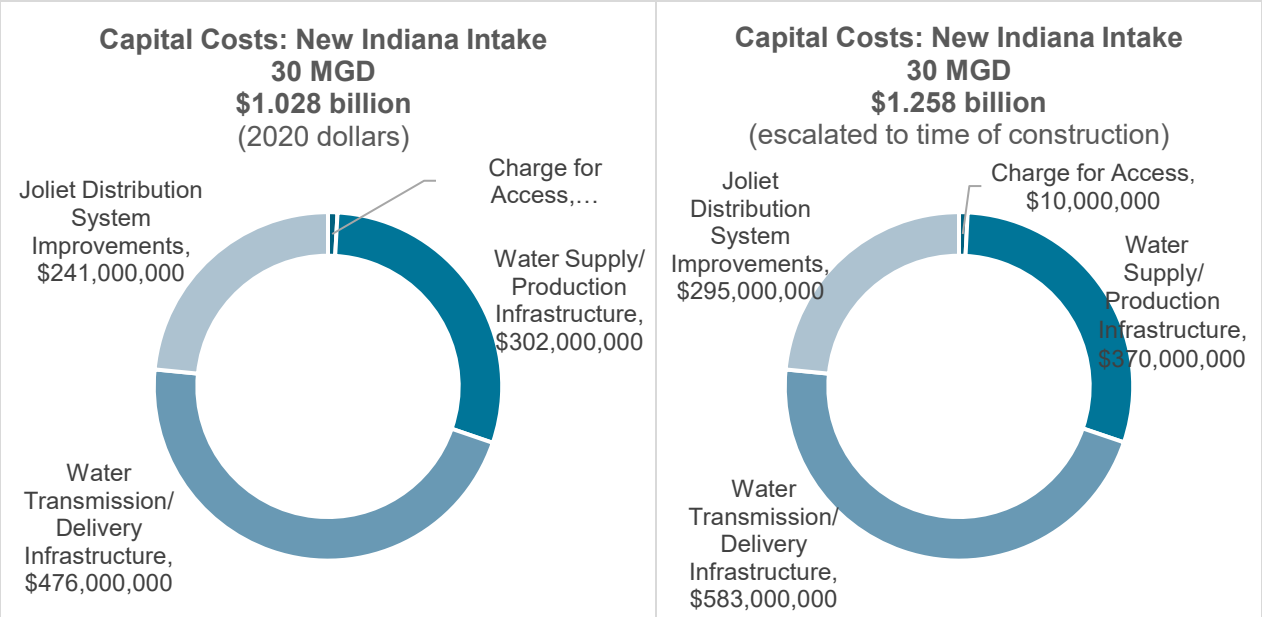


Figure 6-3

Capital Cost for 60 MGD New Indiana Intake Alternative

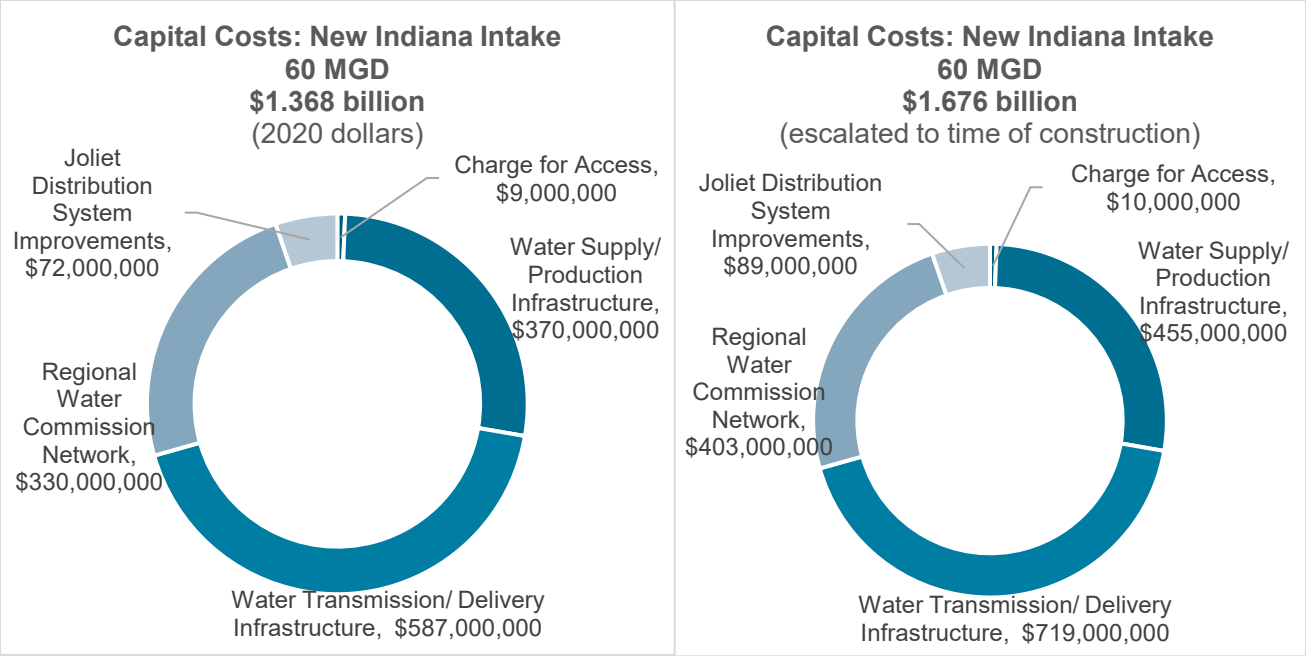
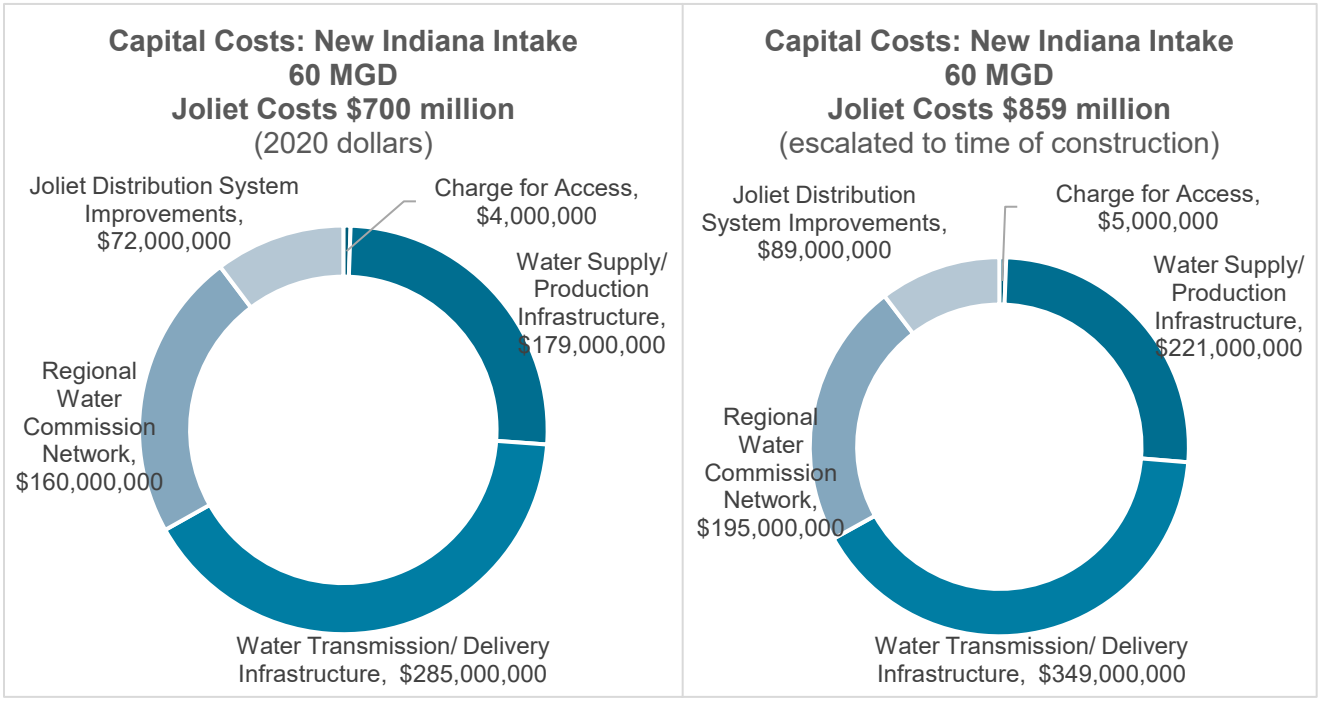


Figure 6-4

Capital Costs for 60 MGD New Indiana Intake Alternative: Joliet Capital Contribution



6.7.3 Operation, Maintenance & Replacement (OM&R) Costs

The City of Joliet will have operation, maintenance & replacement (OM&R) responsibility for the Joliet new infrastructure as described in Sections 6.1.3.2 to 6.1.3.4. OM&R responsibility for regional infrastructure would be shared. Estimated City of Joliet or Regional (60 MGD) OM&R costs for the new infrastructure are shown in **Table 6-2**.

Also shown is an estimate of Joliet's contribution to the regional operations and maintenance costs, based on Joliet's proportionate share of total average daily demand. These costs are assumed to escalate at 2% through the life of the project.

Table 6-2

New Indiana Intake Alternative – OM&R Costs

	Operations, Maintenance and Replacement Costs 2030		
	INDIANA INTAKE 30 MGD	**INDIANA INTAKE 60 MGD**	**INDIANA INTAKE 60 MGD (Joliet Share)**
Annual OM&R Costs for New Infrastructure	$14,300,000	$18,200,000	$11,100,000
Annual Credit for Reduced Well Use	($4,000,000)		($4,000,000)
Net Increase in Annual OM&R	**$10,300,000**		**$7,100,000**

6.7.4 Funding Strategy (Overview)

The updated recommended funding strategy has been described in the *Joliet Alternative Water Source Program – Funding Strategy* memo[34]. The City of Joliet will secure capital from multiple sources to fund the Alternative Water Source Program. Currently, Joliet plans to pay debt service with water rate revenues. Water Infrastructure Finance and Innovation Act (WIFIA), Illinois Environmental Protection Agency (IEPA) state revolving funds (SRF), and revenue bonds are the assumed sources of funding, as shown in **Table 6-3**. For the 60 MGD option, partner capital contributions, new funding options, and the availability of WIFIA and SRF loans may shift the funding strategy in the future.

[34] Broughton, Amy, Stantec. *Joliet Alternative Water Source Program - Funding Strategy*. Memo to Allison Swisher. (November 2020). (Hyperlink)

Table 6-3

New Indiana Intake Alternative – Funding Strategy

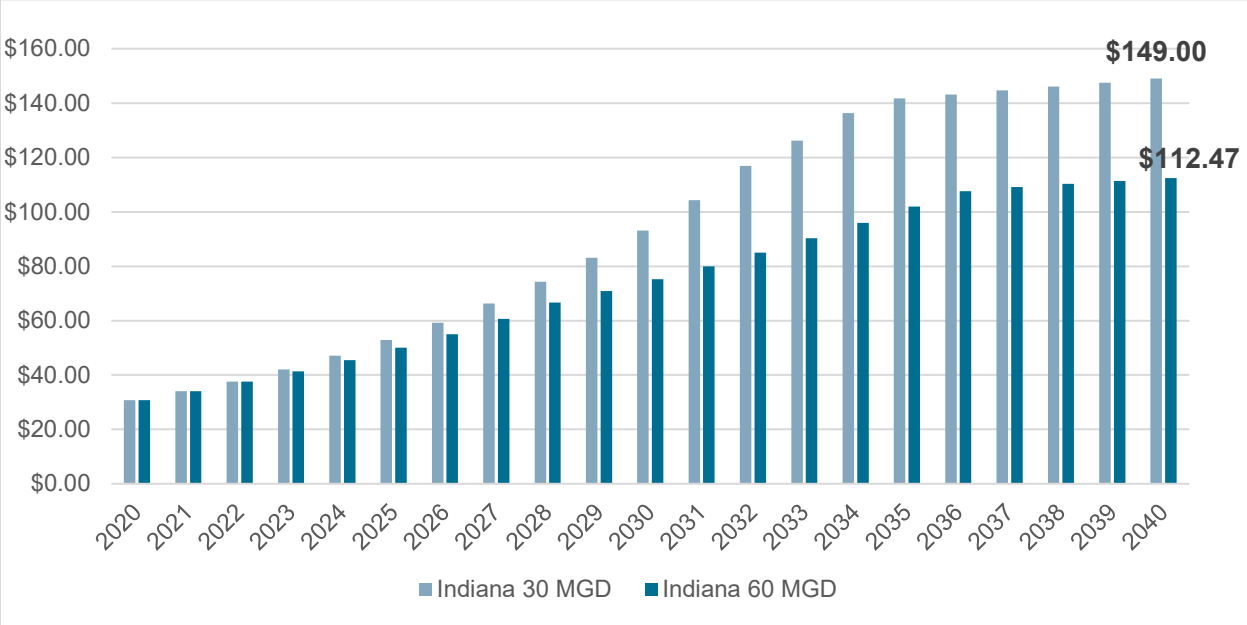
Funding Source	Interest Rate[35]	Maturity	Financing 30 MGD	Financing 60 MGD
WIFIA	2.0% - 3.0%	35 years after substantial completion	$616,000,000	$821,000,000
IEPA SRF	1.5% - 2.5%	20 years	$250,000,000	$250,000,000
Revenue Bonds	3.0% - 4.0%	30 years	$391,000,000	$604,000,000
TOTAL			**$1,257,000,000**	**$1,675,000,000**

6.7.5 Impact on Monthly Water Rates

Rate revenues will support water supply, capital repayment, and operations & maintenance costs associated with the new water source as well as Joliet's existing water system in general. Rate increases will be required to meet revenue requirements. Impacts on a typical, monthly water bill (water only – does not include sewer or trash) are reflected in **Figures 6-5** and **6-6**. In **Figure 6-5**, Joliet water revenues are increased gradually to meet water supply, operations & maintenance, and capital repayment costs. **Figure 6-6** shows the associated annual rate increases necessary to meet revenue requirements

Figure 6-5

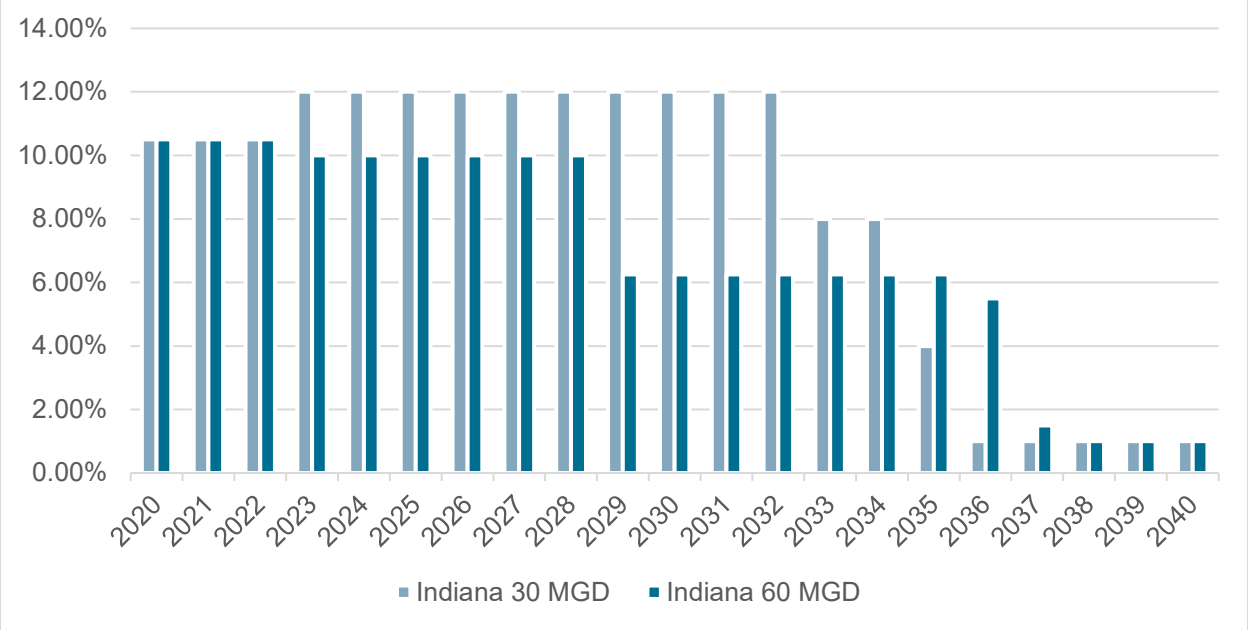
Monthly Water Cost Impact for New Indiana Intake Alternative, as well as Joliet's existing water system in general



[35] Table 6-3 shows a range of interest rate for each funding source. To be conservative the higher range of interest rates was assumed for the highest funding sources (WIFIA and Revenue Bonds) and the lower range of interest rates was assumed for the lowest funding source (IEPA SRF).

Figure 6-6

Annual Rate Increases for New Indiana Intake Alternative, as well as Joliet's existing water system in general



As shown in **Figures 6-5** and **6-6**, it is proposed that Joliet increase rates incrementally over time to build revenues to adequate levels to cover water supply, operations & maintenance, and capital repayment costs. As shown in **Figure 6-6**, rate increases for the 30 MGD alternative would be 10.5% annually for 2020 to 2022, 12% annually for 2023 to 2032 and 8% annually for 2033 to 2034, 4% for 2035, and 1% annually for 2036 to 2040[36].

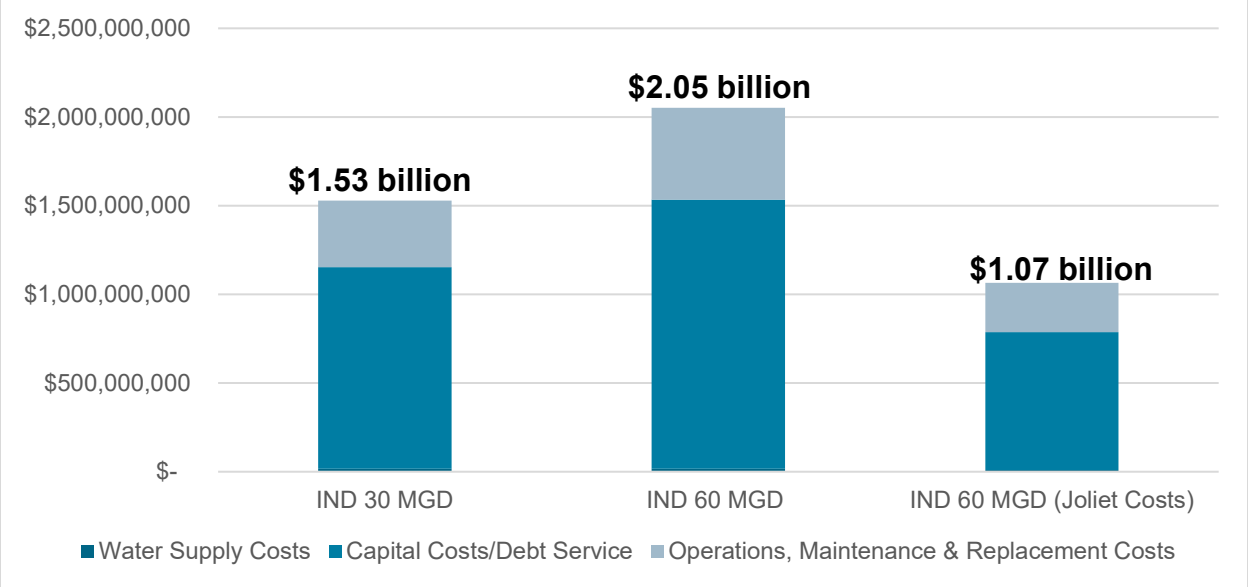
6.7.6 Total Cost of Water

For the analysis of costs over 50 years, capital costs associated with the construction of infrastructure and payment of up-front capital recovery are distributed over time based on an assumed debt service. Construction costs are forecast to increase at a rate of 3% per year, and water system operation, maintenance and replacement costs are projected to increase at a rate of 2% per year. Volumetric and fixed fee right-of-way/easement access charges are forecast to increase at a rate of 2% per year. By applying these assumptions, it is possible to calculate a "total" 50-year cost. A discount rate of 3% was applied to the annual cost projections to calculate the present value of expected future costs. **Figure 6.7** shows the projected total 50-year cost associated with the 30 and 60 MGD New Indiana Intake alternatives. The bars shown in the figure are color-coded to provide an indication of relative contribution of various cost components to the total long-term cost of the project.

[36] Long-term rate increases assume stable funding requirements after completion of the water supply project. Rate increases may vary based on operating and capital needs as they are better understood over time.

Figure 6-7

Total Cost of Water for Indiana Intake Alternative



6.8 Regional Implications

Based on the regional outreach performed as part of the 2020 Evaluation, there does not seem to be a preference amongst the regional communities between the two alternatives.

Given the location of the transmission main for this alternative, there may be more interest from potential regional partners located southeast of the City of Joliet as the transmission main will likely be routed close to these communities possibly making this alternative more cost effective.

6.9 Intergovernmental Implications

Communication and education with Illinois and Indiana state legislators and other state government officials have focused on educating them about the urgent need for an alternative water source and the proposed alternatives. In general, these officials have been supportive of the City's efforts to find a solution to its drinking water needs. None have objected to the underlying concept of the New Indiana Intake alternative. They are aware that the New Indiana Intake alternative has higher upfront costs, and other potential complications, but gives the City more long-term operational control of its water supply and the associated rates to its customers. Before formally weighing in on any particular option, state elected officials generally would like to hear additional specifics and the City's concerns.

On the federal level, the team met with Joliet's Member of Congress, Rep. Bill Foster, and held detailed briefings with his staff. The team has also briefed staff with Senators Dick Durbin and Tammy Duckworth. All have been interested and supportive of the City's plans, while raising many of the same questions the City is considering about upfront capital investments and ongoing costs. They have also shown strong interest in a regional approach to address declining deep aquifer levels and would like to participate in regional efforts. As the City's Congressman, Rep. Foster has offered to facilitate these

efforts. The delegation also expressed readiness to assist with efforts to find funding or financing assistance at the federal level.

Also, on the federal level, the team has not yet met with northwest Indiana's Representative in Congress. The team expects to meet with the Representative if the New Indiana Intake Alternative is chosen. Meetings would also be scheduled with the two Indiana Senators. It is expected they would all be supportive of the New Indiana Intake alternative.

7 Alternative Risk Analysis

As noted in Section 5, an active risk register has been developed, updated and maintained in order to track issues that could impact the feasibility, costs or schedule associated with each of the water source alternatives. At the beginning of the 2020 Evaluation, several potential risks were identified in conjunction with potential steps for mitigation. Throughout this process, some risks have been added and some of the risks have been mitigated to low likelihood. **Table 7-1** lists the risks identified for the New Indiana Intake Alternative in the order that they could occur as well as the Type of Risk (feasibility[37], construction costs, schedule, operations, disruption of service, water quality, water rates and future cost), Likelihood of Risk (probability that the risk will occur), Potential for Impact (magnitude of impact if risk occurred) and steps that Project Team Members/City Staff have taken thus far to mitigate the risk.

Likelihood of Risk has been rated as Low, Moderate or High. Risks rated as Low are assumed to have a probability of less than 10%. Risks rated as Moderate are assumed to have a probability greater than 10% but less than 50%. Risks rated as High are assumed to have a probability of greater than 50%.

Potential for Impact (sometimes referred to as consequence) has been rated as Low, Moderate or High. Risks rated as Low are assumed to have a minimal impact to project cost or schedule. Risks rated as Moderate are assumed to have an impact to the cost or schedule within the contingencies or buffers included in the program. Risks rated as High are assumed to jeopardize the ability to implement the new water source either by 2030 or at all.

Risks that have a likelihood of moderate or high are highlighted in orange in the table to emphasize the probability for impact to the implementation of this alternative.

Note that some risks shown are common to both water source alternatives.

Table 7-1

Risks Associated with the New Indiana Intake Alternative

Risk	Type of Risk	Likelihood of Risk	Potential for Impact	Steps being Taken to Mitigate Risk
Joliet is unable to obtain a Lake Michigan Allocation	Feasibility	Low	High	Joliet has been coordinating with Illinois DNR (and Indiana DNR) for the past two years on Joliet's potential to obtain an allocation. Both entities verified that Joliet's application would be covered under Illinois' diversion. Joliet submitted its Lake Michigan allocation permit application in September 2020.

[37] Feasibility refers to whether the alternative can even be attempted.

Risk	Type of Risk	Likelihood of Risk	Potential for Impact	Steps being Taken to Mitigate Risk
An Entity disputes Joliet's Lake Michigan Allocation Permit Application for the Indiana Intake	Feasibility, Schedule	Moderate	High	Illinois and Indiana regulators have both confirmed the City's interpretation that since Joliet is requesting use of a portion of Illinois' existing authorized diversion of water within Illinois, the requirements of the Great Lakes Compact do not apply in this situation. Team members have worked to educate relevant stakeholders and elected officials on this issue to prevent any attempts to challenge the City's ability to obtain Lake Michigan water, which we believe the City has a strong basis to defend[38].
Enabling legislation for Regional Water Commission is not enacted	Feasibility, Cost	Low	Moderate	Education of state and federal legislators about regional water need, urgency, and potential for regional collaboration to address the problem in order to garner support for Regional Water Commission has occurred in 2020. Legislators have been supportive of the concept.
Site for shore facilities has not been acquired	Feasibility	Moderate	Moderate	Several sites that are technically feasible for the shore facilities have been investigated by a land acquisition firm and discussed with Hammond. Land is anticipated be acquired in 2021 if this alternative is selected. There is flexibility due to multiple sites being able to accommodate the improvements.
Hammond will not approve Access Agreement	Feasibility	Low	High	Preliminary Agreement to be approved by Hammond City Council indicates intent for Hammond to approve final Access Agreement.

[38] The City has prepared a summary of the legal basis for Joliet to obtain a Lake Michigan Allocation. (Hyperlink)

Risk	Type of Risk	Likelihood of Risk	Potential for Impact	Steps being Taken to Mitigate Risk
Perception of this Alternative as being too risky limits regional participation resulting in higher construction costs for Joliet	Costs	Low	Low	Regional outreach conducted to date has not indicated this is an issue.
Lack of regional participation results in the inability to form a Water Commission	Feasibility, Cost	Moderate	Moderate	Significant regional outreach has been performed to promote a Regional Water Commission approach to allow for decreased cost due to economies of scale as well as right-of-way use outside City limits. If a Commission could not be formed, Joliet could pursue special land acquisition legislation.
Change in Hammond Mayor/Administration jeopardizes terms & conditions of Access Agreement	Feasibility	Low	High	Preliminary Agreement memorializes key terms and conditions for negotiation of final Access Agreement, which is anticipated to be approved in Summer 2021, prior to Hammond's next Mayoral election in 2023.
Unable to obtain right-of-way or acquire land for transmission main and intermediate pump station facility	Feasibility, Cost	Moderate	High	The development of a Regional Water Commission is being pursued which will mitigate land acquisition and right-of-way use issues. In addition, early outreach to impacted communities was conducted as part of the 2020 Evaluation and did not identify any potential issues.
Funding strategy cannot be achieved through lack of funding of low interest state and federal loan programs	Feasibility, Construction Cost	Low	Moderate	While the funding strategy may need to be adjusted, the program can still be financed through traditional revenue bonds at a slightly higher interest rate. Joliet has already secured WIFIA funding for a portion of the improvements.

Risk	Type of Risk	Likelihood of Risk	Potential for Impact	Steps being Taken to Mitigate Risk
The extent and complexity of improvements, permitting and land acquisition may result in Joliet not being able to construct the proposed improvements by 2030	Feasibility	Moderate	High	Joliet has full control of the design & construction of the improvements, thereby mitigating potential schedule impacts within its control. As part of the 2020 Evaluation, a permitting plan was developed noting permits on the critical path. These constraints have been incorporated into the implementation plan for this alternative.
Crossing state lines with the new infrastructure results in legislative and political roadblocks	Feasibility	Low	High	The City of Joliet conducted governmental outreach in 2020 to determine if Indiana (or Illinois) legislators would object to this alternative and did not identify a current risk.
Crossing the state line with the new infrastructure results in more complicated permitting & legal issues	Construction Cost	Low	Low	Jurisdictional issues can occur and make permitting more complex if the regulators in both states do not agree. Initial discussions with regulators suggest a cooperative stance at the current time. It should be noted that water from Indiana is currently being sold to multiple communities in Illinois.
Water Source Transfer is unsuccessful resulting in degraded water quality to customers	Water Quality, Disruption of Service	Low	High	Even though it is more than 10 years before the new water source will be online, steps are being taken to verify that the switch will not result in any impact to water quality. Water Source Transfer Testing will be performed in 2021 to verify no impact. Joliet has control over water treatment and can adjust treatment/finished water quality to achieve compatibility of the new water source.

Risk	Type of Risk	Likelihood of Risk	Potential for Impact	Steps being Taken to Mitigate Risk
Operational requirements for new water treatment plant requires more staff and existing staff is not experienced to operate surface water treatment plant	Operations	Low	Moderate	As part of the 2020 Evaluation, an Operational & Staffing Evaluation was completed to identify the number of staff required as well as the experience level required for this alternative. One of the planned mitigation steps is to hire a WTP Superintendent (Operator) experienced with Lake Michigan water treatment during construction of the WTP allowing time for training of staff. Numerous communities in Illinois and Indiana operate Lake Michigan WTPs.
Liability associated with Joliet having significantly more responsibility for source water monitoring and water treatment	Operations	Moderate	Moderate	As standard practice, Joliet will prepare a source water monitoring plan and will work with other Lake Michigan water treatment plants on monitoring of raw water quality and adjusting treatment accordingly.
Debt burden due to capital improvements negatively impacts Joliet's credit rating	Cost	Moderate	Low	Proposed water rate increases support repayment of debt. Formation of Water Commission would distribute debt burden and associated risk.
Monthly water bills become unaffordable to some customers resulting in non-payment	Water Rates	Low	Low	Project team has investigated affordability programs for Council consideration to minimize impact on affected customers.
Break occurs in the Transmission Main resulting in loss of water service to Joliet	Disruption of Service	Low	Moderate	As part of the Alternative Water Source Program the City will increase its storage to two times average day demand allowing for time to repair break. The City will maintain its existing well water supply to be an emergency back-up in the event of transmission main breakage that cannot be repaired in two days.

Risk	Type of Risk	Likelihood of Risk	Potential for Impact	Steps being Taken to Mitigate Risk
Industries on the south end of Lake Michigan will pollute water source	Operations	Moderate	Moderate	The Access Agreement includes provisions for collaboration on raw water quality monitoring, source water protection and notification. The long transmission main allows for time to react, resulting in less impact to Joliet.

For a program of this magnitude, it is no surprise that there are several risks. Significant efforts have been made during 2020 to mitigate the risks that could have the greatest impact, especially related to the feasibility of the alternative. In some cases, the risks have been completely mitigated and have been shown with a likelihood of Low.

Of the 20 risks listed, 14 of the risks relate to the implementation of the alternative (prior to water delivery) while the remaining 6 risks relate to ongoing operations after water delivery. Based upon this risk analysis, it can be concluded that the majority of risk associated with this alternative can be classified as short term in nature impacting the potential feasibility of the project due to the magnitude of the improvements and the complexities involved with crossing state lines.

8 Alternative SWOT Analysis

Based on the alternative evaluation presented in Section 6 and the risk analysis discussed in Section 7, the alternative's strengths, weaknesses, opportunities and threats can be identified. Strengths and weaknesses are internal while opportunities and threats assess external activities that may impact this alternative. While steps have been taken to mitigate risks, some risks can still be identified as weaknesses or threats for this alternative.

8.1.1 Strengths

- Joliet has control over all aspects of Joliet's new water source, including:
  - Design and construction of improvements
  - Completion schedule
  - Decisions regarding water treatment and operation of system
  - Current & future water rate setting
- More economical over time to pump and treat own water source.
- New infrastructure which should require minimal improvements for next 50+ years.
- Improvements can be completed in time to allow for new water source to be online by May 1, 2030.
- 99 year access agreement with Hammond provides certainty for access costs and ability to provide water for life of improvements.
- Joliet has ability to design water treatment plant to provide desired finished water quality and modify treatment for compatibility with Water Source Transfer Plan.
- Agreement transferrable to Regional Water Commission, if formed.

8.1.2 Weaknesses

- Future operational requirements and liability because Joliet will have responsibility for surface water treatment including source water testing and monitoring.
- Permitting for Lake Michigan Intake and Water Treatment Plant will require significant investigation, time and effort.
- Intake location on south end of Lake Michigan is vulnerable to industrial spills which could impact raw water quality and require the City of Joliet to mitigate impact to water treatment process.
- Implementation of the alternative is complex due to extent of infrastructure and magnitude of construction that will be required resulting in significant capital investment, large amount of debt, and minimal flexibility to accommodate schedule delays.

8.1.3 Opportunities

- Proposed water treatment process provides protection from future emerging contaminants, if regulated.
- Long term partnership with Hammond, Indiana on source water monitoring and collaboration to protect Lake Michigan water source.

8.1.4 Threats

- Difficulty in acquiring land for shore facilities delays progress of the project.
- Potential challenges to interstate use of water due to lack of political support and perceived violations of the Great Lakes Compact delays progress of the project.
- Inability to establish a Water Commission adds complexity to land acquisition outside Joliet limits.
- Higher interest rates than those assumed for program funding results in increased program costs and monthly water rate impact to customers.
- Increased monthly water bills result in customer non-payment thereby reducing revenues required to support program and water system in general.
- Significant debt burden negatively impacts Joliet's ability to fund future water system capital improvements.

9 Alternative Summary

When faced with a decision of this magnitude and importance that will affect the residents of Joliet for decades, even centuries to come, it is helpful to have a summary of the key alternative parameters, as shown in **Table 9-1**.

Table 9-1

Summary of Key Alternative Parameters

Parameter	Lake Michigan Water – New Indiana Intake
Improvements Required	Lake Michigan Crib, 7,000' Intake Tunnel, Pump Station, 46 miles of Transmission Main including intermediate Pump Station and Reservoir, Water Treatment Plant, Joliet Distribution System Modifications including additional Storage & Pump Stations
Capital Costs (2020 dollars)	$1.03 billion for 30 MGD system, $1.37 billion for 60 MGD system
Type of Agreement	Access Agreement for use of easements on Hammond property and right-of-way for transmission main as well as coordination for land acquisition for shore facilities
Length of Agreement	99 years plus two 25 year renewals possible (with reopeners)
Compensation	One-time payments (totaling $9.9 million), annual fixed fee payment for right-of-way use ($110,000), and annual volumetric payment based on water pumped ($5,000/MGD). Annual payments inflate by CPI, not to exceed 2%
Basis for payment	Annual charge for real estate and right-of-way access as well as annual volumetric charge based on Lake Michigan Water pumpage
Operation, Maintenance & Replacement (2020 dollars)	Net increase of $10.3 million annually for 30 MGD system, $7.1 million annually for 60 MGD system (Joliet share) (includes recommended staff)
50-year Total Cost of Water	$1.53 billion for 30 MGD, $2.05 billion for 60 MGD
Rate Increases	For 30 MGD system: 10.5% per year from 2020 to 2022, 12% per year from 2023 to 2032, 8% per year from 2033 to 2034, 4% in 2035 and 1% per year from 2036 to 2040
Estimated Monthly Water Bill	For 30 MGD system: 2030 - $93.15/month, 2040 - $149.00/month based on estimated average monthly water usage of 700 cubic feet
Control	Full Control over design, construction and operation of entire Lake Michigan Water system and setting of water rates
Operational Requirements	Joliet responsible for all aspects of water source, supply and treatment. Fourteen (14) additional staff members recommended.

10 Prospectus Summary – The Business Case

The detailed analysis of the overall features, costs, benefits, and risks associated with the Lake Michigan Water - New Indiana Intake Alternative completed during 2020 confirms that it is a viable option for bringing high quality, treated Lake Michigan water to Joliet and the Joliet region by 2030 using infrastructure designed, built, owned, financed and operated by the City and its potential regional partners. Under this approach Joliet and its partners would have total control over critical decisions related to the design, implementation, operation, and financial management of the new water system.

However, making this new system a reality by 2030 will require an intensive program of design, permitting, external coordination, land acquisition, and construction of capital improvements. New infrastructure to bring a Lake Michigan supply to the Joliet region would include a new raw water intake and pumping station in northwestern Indiana, approximately 46 miles of new, large diameter water transmission main that crosses state lines, an intermediate pumping station, and a new, advanced surface water treatment plant and pumping station located near Joliet. From that point the treated water would be distributed to key points within Joliet through new water distribution piping, storage and pumping facilities. Joliet would retain its existing wells as an emergency source for water in the event that the new Lake Michigan water supply would be disrupted.

During the past 6 months, Joliet City staff and members of the consultant team have engaged in detailed technical analyses of the infrastructure elements of this system and conducted extensive outreach to external parties including the City of Hammond (IN), major regulatory and permitting entities in Illinois and Indiana, and municipal, utility, railway, and private entities with control of rights-of-way between Hammond and Joliet. This extensive coordination was required to verify the viability of this alternative.

Through these efforts Joliet has negotiated a preliminary agreement for access to and use of rights-of-way within Hammond to transport Lake Michigan water and obtained concurrence from regulators and permitting agencies in both Illinois and Indiana regarding the actions needed to support final design and permitting of the new water supply infrastructure. Coordination with entities in control of land along the proposed transmission main route has also provided the team with critical information regarding the suitability and likely costs associated with transmission main construction between Hammond and Joliet.

It is estimated that the 2020 cost of constructing new infrastructure to bring up to 30 MGD of water from Hammond to Joliet to serve Joliet alone would cost approximately $1.03 billion dollars; upsizing of the system to meet a potential regional maximum day demand of 60 MGD would increase costs to approximately $1.37 billion dollars. Considering the added cost for treating Lake Michigan water, operating the new water system, and financing of the required capital improvements, it is estimated that the 50-year total cost for providing water to Joliet alone or Joliet plus several regional partners would be on the order of $1.53 billion or $2.05 billion, respectively. Financial analysis suggests that a program of rate increases of 10.5 % annually from 2020 to 2022, 12% annually from 2023 to 2032, 8% annually from 2033 to 2034, 4% in 2035 and 1% annually from 2036 to 2040 would be needed to support initial development and operation of this new system and other necessary improvements to the City’s existing water system including water main replacement of 1.6% annually.

The Lake Michigan Water - New Indiana Intake Alternative represents a bold plan for the development and implementation of a new water intake, treatment, and delivery system by Joliet and its potential regional partners. The proposed surface water treatment plant would be designed around an advanced water treatment process capable of effectively removing emerging contaminants of concern that are not yet regulated under drinking water standards. With this alternative, the City of Joliet can dependably rely on brand new infrastructure which should require minimal repairs, replacements or upgrades for over 50 years. However, implementation of this magnitude of improvements results in significant capital expenditures and debt burden, complex construction sequencing to meet the project timeline and added regulatory and administrative complexities bringing water across state lines.

Control of the project will provide Joliet and its potential partners with the ability to make critical decisions regarding design, construction, and operational issues that may directly affect the performance, cost, and/or schedule for the project. At the same time, this level of control is accompanied by overall responsibility and liability for all actions required to successfully design, permit, finance, construct, commission, and operate more than $1 billion of new infrastructure in two states in less than 10 years.

(This page has been intentionally left blank.)

APPENDIX A – Preliminary Access Agreement

(This page has been intentionally left blank.)

For Consideration By
Hammond City Council and Joliet City Council
(Version Dated 11/14/2020)

PRELIMINARY ACCESS AGREEMENT FOR JOLIET WATER FACILITIES

This Preliminary Access Agreement ("Preliminary Agreement") is entered into as of _____, 2021 by and between the CITY OF HAMMOND, an Indiana municipal corporation ("Hammond"), and the CITY OF JOLIET, an Illinois home rule municipal corporation ("Joliet") (collectively the "Parties" and individually, a "Party"), in consideration of the premises and promises set forth in this Agreement and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, and hereby agree as follows:

1. Background.

A. Studies conducted by the Illinois State Water Survey project a decline in the deep aquifer serving Joliet with well water and that the deep aquifer will be unable to meet Joliet's maximum day water demand by the year 2030. As a result, Joliet has been investigating a variety of alternative sources of water supply for its residents and businesses.

B. In 2018, Joliet commenced a study of possible alternative water supply sources, culminating in a decision by the Joliet City Council in January 2020 to pursue Lake Michigan water through either a new water intake located in Indiana or through the existing Chicago Department of Water Management system. In April 2020, Joliet engaged the firm of Stantec Engineers to conduct the Alternative Water Supply Program, including the firms of Crawford Murphy & Tilly, Strand Engineers and Engineering Enterprises, Inc. as subcontractors, (collectively, the "Consulting Team") to analyze these potential sources of supply in further detail to prepare and present a report and recommendations to the Joliet City Council.

C. Hammond and Joliet have entered into discussions regarding the possibility of Joliet constructing new water facilities to bring untreated Lake Michigan water to Joliet, including without limitation a new water intake along the shore of Lake Michigan adjacent to Hammond's shoreline as well as constructing in Hammond an intake tunnel, screening system, pumping station, transmission mains, and other appurtenances necessary to deliver untreated Lake Michigan water to Joliet (collectively, "Joliet Water Facilities").

D. Hammond and Joliet have discussed a variety of issues pertaining to the location of the Joliet Water Facilities in the City of Hammond and along the shore of Lake Michigan adjacent to Hammond, and have reached an understanding regarding certain key terms that would provide a basis for an ongoing, long-term agreement between Hammond and Joliet that would facilitate the provision of a new, safe, clean and reliable source of Lake Michigan water supply to Joliet.

E. The Consulting Team presented its analysis of the two Lake Michigan water alternatives to the Joliet City Council in November, 2020, and the Joliet City Council anticipates completing its review and analysis and to determine which alternative Joliet will pursue soon thereafter. Joliet has requested that Hammond approve this Preliminary Agreement to demonstrate its commitment to being host city to the Joliet Water Facilities and enter into a long-term agreement on the terms and conditions included in this Preliminary Agreement.

2. Intent to Reach a Long-Term Agreement.

A. In the event that the Joliet City Council determines to pursue the construction of the Joliet Water Facilities in and adjacent to Hammond and this Preliminary Agreement is approved by Joliet and entered into by and between Hammond and Joliet, the Parties hereby

acknowledge and agree that they will enter into additional discussions regarding the detailed terms and conditions of a long-term agreement for the construction, operation and maintenance of the Joliet Water Facilities in and adjacent to Hammond ("Long-Term Agreement").

B. The Parties agree that the Long-Term Agreement will include language setting out in detail the agreed-upon terms outlined in Sections 4 through 11 of this Preliminary Agreement, unless otherwise mutually agreed by the Parties.

C. The Parties agree that they anticipate that they will approve and enter into the Long-Term Agreement no later than July 31, 2021, unless the Parties mutually agree to a different date.

3. Initial Payments to Hammond Pursuant to this Preliminary Agreement.

In recognition of the level of effort Hammond has undertaken to allow the Parties to reach this Preliminary Agreement as well as a set of key agreed-upon terms for the Long-Term Agreement, and as a sign of Joliet's good faith, Joliet agrees to make the following payments to Hammond:

A. *Commitment Installment Payment*. Upon full approval and execution of this Preliminary Agreement by Hammond and Joliet, Joliet agrees to pay to Hammond the amount of $250,000 as the initial installment toward, and to be applied to, the total amount of Commitment Payments described in Section 8.A of this Preliminary Agreement; and

B. *Reimbursement Payment*. Following approval and execution of this Preliminary Agreement by Hammond and Joliet and within 30 days after submission of an invoice by Hammond that conforms to Section 8.B of this Preliminary Agreement, Joliet agrees to pay to Hammond the first required reimbursement payment for eligible expenses, as described in Section 8.B of this Preliminary Agreement.

4. Long-Term Agreement Term and Renewals.

The Long-Term Agreement will:

A. be for an initial term of 99 years, unless a shorter period is required by law; and

B. provide for renewal periods of 25 years each, unless a shorter period is required by law, as well as a mutually agreed protocol for its renewal or non-renewal that provides for prior notice to be given of renewal or non-renewal at least five years prior to the end of the then-current term and provides an opportunity for the Parties to revisit certain of the duties and obligations established in the Long-Term Agreement in connection with any renewal.

5. Long Term Agreement—Joliet Water Facilities.

The Long-Term Agreement will provide the following in connection with the Joliet Water Facilities:

A. *Improvements.* Joliet will design, construct, own, operate, and maintain the Joliet Water Facilities at Joliet's cost and expense, for the delivery of untreated Lake Michigan water to Joliet, Illinois for treatment.

B. *Water Delivery Date*. Joliet has determined that it anticipates the delivery of Lake Michigan water through the Joliet Water Facilities in Hammond by January 1, 2030 ("Water Delivery Date").

C. *Design/Permitting/Construction*.

i. The Joliet Water Facilities located in Hammond will meet all applicable requirements of the United States Army Corps of Engineers; the Illinois Environmental Protection Agency, the Indiana Department of Environmental Management, the Indiana Department of Natural Resources and the Joliet Utility Design and Inspection Manual; applicable provisions of the Indiana Department of Transportation standard specifications; applicable Hammond building code requirements; and other applicable federal, state of Indiana and local laws, ordinances, rules and regulations.

ii. Joliet will provide plans, drawings and specifications for the Joliet Water Facilities to Hammond for review and comment at mutually agreed upon milestones. Hammond will review and provide comments in a timely manner so as not to delay the project.

iii. Hammond will coordinate with and assist Joliet in order to facilitate the issuance of any necessary Hammond permits required under any building, construction or other codes and ordinances of the City of Hammond, including any necessary zoning changes or other zoning relief, for the Joliet Water Facilities so that Joliet is able to accept delivery of Lake Michigan water via the Facilities by the Water Delivery Date.

iv. Hammond will coordinate and cooperate with and assist Joliet in obtaining any permits, approvals or other rights and actions from other agencies and governments with jurisdiction in order to facilitate completion of the Joliet Water Facilities so that Joliet is able to accept delivery of Lake Michigan water via the Facilities by the Water Delivery Date. Hammond will not challenge or object to approval and issuance of any such permits, approvals or other rights and actions.

v. Joliet and Hammond agree to meet on a periodic basis to discuss matters pertaining to the design, permitting and construction of the Joliet Water Facilities.

vi. Hammond will not charge any fees to Joliet for the permits, approvals and other items described in detail in Section 8.F.

6. <u>Long-Term Agreement—Real Estate and Right-of-Way</u>.

The Long-Term Agreement will provide the following in connection with the necessary rights in real estate and rights-of-way to accommodate construction and operation of the Joliet Water Facilities:

A. *Real Estate Purchase*: Hammond will assist Joliet in obtaining a sufficient parcel or parcels of land (min. 1.5 acres permanent and 0.5 acres temporary) to accommodate Joliet shore facilities, including an intake tunnel, screening system, pumping station, transmission main and related appurtenances in one or more of the following ways:

i. Hammond will sell to Joliet land owned by Hammond or one of its affiliated entities on terms to be mutually agreed;

ii. Hammond will grant to Joliet a long-term/perpetual easement on land owned by Hammond or one of its affiliated entities on terms to be mutually agreed; and/or

iii. If a Hammond- or affiliate-owned site is not feasible or consistent with best practices, Hammond will facilitate Joliet's purchase of land owned by another public or private entity or acquisition of a long-term/perpetual easement on such land.

B. *Access to and Use of Rights-of-Way and Hammond-Owned Real Estate*. Hammond will grant to Joliet all necessary easements, franchise agreements, permits or other approvals for the installation of Joliet Water Facilities in rights-of-way within Hammond, and in other real estate owned by Hammond that is not right-of-way, to allow Joliet to construct, operate and maintain transmission mains and related appurtenances that are part of the Joliet Water Facilities subject to mutual agreement of the Parties as to routing and infrastructure placement. Rights-of-way means and includes any street, alley, other land or waterway, dedicated or commonly used for pedestrian or vehicular traffic or other similar purposes, including utility easements in which Hammond has the right and authority to authorize, regulate or permit the location of facilities other than those of Hammond.

7. Long-Term Agreement—Operation of Joliet Water Facilities.

The Long-Term Agreement will provide the following in connection with operation of the Joliet Water Facilities:

A. *Access; Emergencies*. Joliet will have access to the Joliet Water Facilities at all times, twenty-four hours a day, seven days a week. In the event of an emergency causing risk to public health and safety in which the Joliet Water Facilities may be involved or affected, Hammond shall immediately notify Joliet at the Joliet 24/7 contact number and Joliet shall promptly respond to Hammond's notice.

B. *Water Quality.* The Parties mutually agree to advise each other immediately if either Party learns of or receives any information about any possible contamination of, discharge into or other risk to the waters of Lake Michigan that poses a potential water quality issue to either or both of the Parties or to the facilities of either Party that are used in the intake, pumping or treatment of Lake Michigan water. The Parties will cooperate to investigate and take appropriate steps to protect the Lake Michigan source of supply and their respective facilities.

C. *Protection from Damage and Interference*. Hammond will coordinate with Joliet in order to protect the Joliet Water Facilities from damage and interference due to the work of others in or adjacent to the rights-of-way in which the Joliet Water Facilities are located. Hammond will take reasonable steps to alert permit applicants who will be working in the vicinity of the Joliet Water Facilities, as well as parties who seek to design and locate other utility-type facilities in those areas, that the Joliet Water Facilities are present and to be protected from interference and damage, and Joliet and Hammond agree that the Long-Term Agreement will further refine the extent of Hammond's obligations in this regard. Hammond will not damage, cut or remove any portion of the Joliet Water Facilities at any time without express approval from Joliet.

D. *Indiana 811*. To further facilitate protection of the Joliet Water Facilities from damage and interference, Joliet will become a member of the Indiana 811 system for locating of underground utility facilities.

E. *No Relocation or Displacement*. No utility facilities or other facilities or structures of Hammond or any entity or person will be placed in any location which will require the relocation or displacement of any of the Joliet Water Facilities or will otherwise interfere with the operation or maintenance of any of the Joliet Water Facilities, as determined by Joliet in its sole discretion.

8. Long-Term Agreement—Compensation to Hammond.

The Long-Term Agreement will provide the following in connection with compensation to Hammond. This is in addition to any payments made pursuant to Section 6.A of this Long-Term Agreement.

A. *Commitment Payments*. Joliet agrees to pay to Hammond payments in the total amount of $2,000,000 to recognize Hammond's level of effort and demonstrate to Hammond Joliet's commitment to working collaboratively to complete the Long-Term Agreement, and the preliminary design, final design and construction of the Joliet Water Facilities in Hammond, according to the following schedule:

i. Joliet has previously paid to Hammond an initial payment in the amount of $250,000, which was received by Hammond upon approval and execution of the Preliminary Access Agreement by Hammond and Joliet;

ii. Upon approval and execution of the Long-Term Agreement (which is anticipated to occur not later than July 31, 2021, or another date that is mutually agreed by the Parties), a payment in the amount of $750,000; and

iii. Upon review and approval by Hammond of bidding documents for construction of the Joliet Water Facilities, a payment in the amount of $1,000,000.

B. *Reimbursement Payments*. Joliet agrees to pay to Hammond, on the schedule set forth below, to reimburse Hammond for all actual expenses reasonably incurred by Hammond for participation by Hammond personnel, as well as by other resources obtained by Hammond, in the planning, coordination, and review of designs and construction for the Joliet Water Facilities as well as negotiation of this Long-Term Agreement. Expenses eligible for reimbursement by Joliet consist of the following items of direct and indirect expense:

- Administrative Coordination and Support by Hammond regarding Joliet Water Facilities (at hourly salary times number of hours worked);
- Document Review and Comment (at hourly salary times number of hours worked);
- Professional and Technical Consultant Services (direct cost);
- Legal Review, Consultation and Advice (direct cost);
- Copy Reproduction (direct cost); and
- Document Recordation (direct cost).

Reimbursement payments will be made by Joliet to Hammond on the schedule listed below, not greater than thirty (30) days following Hammond's submission of a complete invoice to Joliet in acceptable form with necessary supporting documents and invoices:

i. Joliet has previously paid to Hammond an initial reimbursement payment for eligible expenses incurred by Hammond during negotiations/discussions (in 2020 and 2021) related to preparation of the Preliminary Access Agreement, which was received by Hammond in the first quarter of 2021;

ii. Following approval and execution of the Long-Term Agreement by Hammond and Joliet and within 30 days after submission of an invoice by Hammond that conforms to this Section 8.B, Joliet agrees to pay to Hammond the second required reimbursement payment for eligible expenses, as described in this Section 8.B, incurred by Hammond during negotiations/discussions related to the preparation of this Long-Term Agreement and during preparation of the preliminary design for the Joliet Water Facilities; and

iii. At the end of calendar year 2022 and each year thereafter until the Joliet Water Facilities are completed, for eligible expenses incurred by Hammond for time and effort associated with coordination and support of real estate matters, and design and construction activities for the Joliet Water Facilities to be constructed within Hammond.

C. *Access to and Use of Rights-of-Way and Hammond Property*. In connection with the use of rights-of-way and other Hammond-owned real estate pursuant to Section 6.B of this Long-Term Agreement, Joliet will pay to Hammond the following two fees:

i. Fixed Fee. A "Fixed Fee" in the fixed amount of $110,000.00 per year, with the first payment to be made upon commencement of transmission main construction and annually thereafter on the anniversary date of the initial payment**.** The Fixed Fee is subject to adjustment by the Inflation Factor defined below, commencing with the payment due in the calendar year 2032 and for each payment thereafter.

ii. Volume-Based Fee. A "Volume-Based Fee" to be calculated as the product of the rate ("Rate") per million gallons per day ("MGD") times the Average Day Demand of raw water drawn by Joliet through Hammond for treatment during the previous Year, where:

a. "Average Day Demand" is equal to the total amount of water used in one Year, as measured at the raw water meter to be installed at the Joliet Water Facilities in Hammond, divided by the number of days in that Year (365 or 366 in a leap Year, unless a particular Year is defined to have more days). Average Day Demand will be determined based on a certification provided by Joliet to Hammond stating the total amount of raw water drawn and transported by Joliet through Hammond.

b. "Rate" is the amount of $5,000 per MGD and is subject to adjustment pursuant to the Inflation Factor defined below, commencing with the volume-based fee due in the calendar year 2032.

c. "Year" is a twelve-month period commencing on the first day of the month after Joliet commences drawing raw water through Hammond for the purposes of treatment and delivery to customers of Joliet. If the first day of drawing water by Joliet is not the first day of the month, then the first Year shall include the days in the partial month in which the first day of drawing water occurred.

Within forty-five (45) days after the end of the first Year and each Year thereafter under this Agreement, Joliet shall provide a written certification to Hammond providing (1) the total MGD of raw water drawn for treatment by Joliet, (2) a calculation of the Average Day Demand and (3) the total volume-based fee amount due for that Year. Joliet shall pay the volume-based fee to Hammond within thirty (30) days thereafter.

iii. Inflation Factor. The Fixed Fee and the Volume-Based Fee shall be adjusted annually commencing with the payments due in the calendar year 2032 and in each year thereafter, by adjusting each Fee by the change in the Consumer Price Index—All Urban Consumers—Chicago-Naperville-Elgin ("CPI-U"), as published by the U.S. Department of Labor, Bureau of Labor Statistics, (1982-1984=100), for the Fixed Fee for a full twelve-month period preceding the payment due date and, for the Volume-Based Fee, for the full Year for which the payment is due; provided, however, that the amount of the annual adjustment shall be not greater than two percent (2%) regardless of the actual change in the CPI-U. Adjustments shall be cumulative of the preceding adjustments.

D. *Enhanced Road Restoration or Payments in Lieu Thereof.* As part of its construction program, Joliet will work with Hammond to establish clear standards for restoration of areas impacted by construction to their original condition prior to construction and include those standards in the appropriate construction contracts. In addition, to allow Hammond to undertake its own enhanced restoration of rights-of-way and other facilities, Joliet agrees to pay Hammond an annual enhancement payment in the amount of $2,000,000 on April 1 in each of the calendar years 2025, 2026, and 2027.

E. *Property Taxes or Payments in Lieu Thereof*. If Joliet (i) owns a site within Hammond on which the shoreline portion of the Joliet Water Facilities is located, or (ii) holds an easement or leasehold for use of a Hammond-owned site within Hammond on which the shoreline portion of the Joliet Water Facilities is located, and property taxes are not assessed and levied against the property or the easement/leasehold, as applicable, Joliet agrees that it will pay to Hammond an amount equivalent to the amount of taxes that would have been paid to Hammond if the property was not exempt from such taxes.

F. *No Other Fees or Payments*. In consideration for the payments provided for in this Long-Term Agreement, including, but not limited to, the reimbursement payments provided in Section 8.B. of this Preliminary Agreement, Hammond will not charge, and Joliet will not be required to pay, any other fees Hammond might otherwise charge or assess to Joliet, or in connection with the Joliet Water Facilities project, for use of rights-of-way, real estate or for permits or approvals of any kind or nature.

9. Long-Term Agreement—Other Water Sales.

A. Joliet acknowledges that it will not sell or otherwise provide untreated Lake Michigan water obtained through or in connection with the Joliet Water Facilities to any third party

that would treat and sell that Lake Michigan water to others, except to a new water commission entity created under Illinois law (as described in Section 11 below) or such third parties as may otherwise be mutually agreed by the Parties.

B. Joliet acknowledges that Hammond operates a waterworks system through which it provides treated Lake Michigan water to the City of Chicago Heights, Illinois, ("Chicago Heights") for retail sale to Chicago Heights as well as for wholesale sales to other Illinois municipalities. Chicago Heights provides or anticipates providing such water treated by Hammond to the following additional Illinois cities and villages: City of Country Club Hills; Village of East Hazel Crest; Village of Ford Heights; Village of Glenwood, Village of Hazel Crest; Village of Homewood; Village of Flossmoor; Village of Olympia Fields; Village of Matteson; Village of Richton Park; Village of Sauk Village; Village of South Chicago Heights, Village of Thornton; and the Village of Tinley Park (the listed cities and villages together with Chicago Heights collectively referred to as "Illinois Water Customers"). Hammond has requested that Joliet not sell treated Lake Michigan water to the Illinois Water Customers, and Joliet agrees not to do so unless otherwise mutually agreed by the Parties.

C. Hammond agrees to save, keep and hold harmless and indemnify Joliet for any and all claims, liabilities, losses, and damages of every kind, nature and description, including attorneys' fees, arising or which may arise out of this Section of this Agreement which Joliet may suffer as a result of the inclusion of this Section in this Agreement and any acts or failures to act pursuant to this Section of this Agreement.

10. Long-Term Agreement—Communications and Notifications.

The Long-Term Agreement will provide for mutually acceptable timeframes and methods for the Parties to notify each other about matters pertaining to or affecting the Joliet Water Facilities, such as operational changes, system modifications, activities of Hammond or others performing construction or other activities in rights-of-way or the shore facilities site(s).

11. Long-Term Agreement—Assignment and Transfer.

The Parties agree that the Long-Term Agreement will be transferable by Joliet to a new water commission entity created under Illinois law by Joliet in cooperation with other municipalities and units of local government in the region including Grundy, Kane, Kendall and Will Counties, Illinois.

12. Long-Term Agreement—Additional Provisions.

The Parties agree that the Long-Term Agreement will include additional provisions that are not specifically mentioned in this Preliminary Agreement but that are necessary to provide an agreement that will establish the ongoing relationship of the Parties regarding the Joliet Water Facilities.

13. Notice.

All notices under this Preliminary Agreement shall be in writing and either delivered or mailed, certified mail return receipt requested,

A. to Joliet, at:

City of Joliet, Illinois
Attention: Director of Public Utilities
150 W. Jefferson Street
Joliet, IL 60432

B. to Hammond, at:

Mayor
Civil City of Hammond
5925 Calumet Avenue
Hammond, IN 46320

and

Law Department
c/o Corporation Counsel
5925 Calumet Avenue
Hammond, IN 46320

or at such other address as such Party by written notice may designate and shall be deemed given when so delivered.

14. Term and Termination of Preliminary Agreement.

A. This Preliminary Agreement will be effective upon approval and execution by Hammond and approval and execution by Joliet. If the Parties enter into a Long-Term Agreement, this Preliminary Agreement will be superseded by the Long-Term Agreement.

B. If Joliet determines that it is unable to: (i) procure sufficient financing to design and construct the Joliet Water Facilities, or (ii) obtain all of the real estate necessary to construct, install, operate and maintain the Joliet Water Facilities, then Joliet may terminate this Preliminary Agreement by giving 30 days written notice to Hammond. In the event of termination under this Section 14.B, Joliet shall pay to Hammond

i. any amounts due and payable to Hammond pursuant to Section 3 of this Preliminary Agreement that were due and payable as of the date of the notice of termination; and

ii. any additional amount of reimbursable expenses identified in Section 8.B that have been incurred by Hammond prior to notice of termination regardless of whether such expenses are otherwise due for reimbursement as of the notice of termination.

15. Execution; Counterparts. This Preliminary Agreement may be executed in several counterparts, each of which shall be an original and all of which shall constitute but one and the same agreement.

[Signatures on following page]

IN WITNESS WHEREOF, the undersigned have executed this Preliminary Agreement as of the date first above written.

CITY OF HAMMOND,
an Indiana municipal corporation

By: _____
Thomas M. McDermott, Jr.
Mayor

ATTEST:

By: _____
Robert J. Golec
City Clerk

CITY OF JOLIET,
an Illinois home rule municipal corporation

By: _____
Robert O'Dekirk
Mayor

ATTEST:

By: _____
Christa M. Desiderio
City Clerk

rethink water JOLIET

Stantec

CMT Crawford, Murphy & Tilly

Engineering Enterprises, Inc.

SA STRAND ASSOCIATES

CORNWELL ENGINEERING GROUP

Stantec

CMT
Crawford, Murphy & Tilly

Engineering Enterprises, Inc.

STRAND
ASSOCIATES

CORNWELL
ENGINEERING GROUP