Petitioner's Exhibit No. 1S

THE CITY OF EAST CHICAGO, INDIANA

INDIANA UTILITY REGULATORY COMMISSION

CAUSE NO. 44826

DIRECT SETTLEMENT TESTIMONY

OF

GREGORY D. CROWLEY

SPONSORING ATTACHMENTS 1S-1 through 1S-2

CITY OF EAST CHICAGO, INDIANA

CAUSE NO. 44826

DIRECT SETTLEMENT TESTIMONY OF GREGORY D. CROWLEY

Q. Please state your name, occupation, and business address.

A. My name is Gregory Crowley, and my business address is 5201 Indianapolis Boulevard, East Chicago, IN 46312. I am the Director of Utilities for the City of East Chicago ("East Chicago").

Q. Are you the same Gregory Crowley who prepared Prefiled Direct Testimony in this proceeding?

A. Yes, I am.

Q. What is the purpose of your settlement testimony?

A. My purpose in testifying in support of the Settlement Agreement is to (1) update the Commission on the revised debt funding request for major capital improvements ("Project") through the State Revolving Fund ("SRF"); (2) advise as to the status of the New Plant; and (3) confirm the Department's support for the Settlement Agreement.

Q. Are you sponsoring any exhibits?

A. Yes. Attachment 1S-1 to my testimony is a copy of the Preliminary Engineering Report ("PER") submitted to the SRF related to the Project (without most appendices for administrative reasons). Attachment 1S-2 is a copy of Resolution WD-16-20 executed by the Board of the Department of Waterworks, confirming the approval of the Project as revised.

Q. How did the scope of the Project change from your initial direct testimony?

A. There were three revisions. We removed from the scope of the Project a valve exercising program and a leak detection survey in the original description of the Project

submitted for SRF funding. We also removed costs related to the removal and replacement of customer-owned lead pipes.

Q. Why did you remove the valve exercising program and leak detection survey?

A. In the course of discovery and diligence on this matter, the OUCC expressed concern that these matters were not properly treated as capitalized expenditures and rather should be treated as operating expenses. Because these expenses are in the nature of maintenance, we agreed. I understand that the expenses have therefore been treated differently for accounting purposes which will be discussed by Mr. Sommer.

Q. Why did you remove the customer-owned lead-piping component?

A. Remediation of lead pipes in service lines remains a priority. However, in the course of discovery and diligence, the OUCC expressed concern that funding repairs in customer homes is not the type of expense typically borne by ratepayers through debt-funding. After discussion and negotiation, the City agreed not to pay for the privately owned portion of service lines though the debt-funding from the SRF.

Q. Have there been any material developments with the waterworks facilities since your direct testimony?

A. Yes. The Department completed performance testing at the New Plant. The Department is doing additional assessments before taking the Old Plant offline so that it can proactively manage the transition to full operation at the New Plant and shutting down the Old Plant.

Q. When do you anticipate the New Plant fully coming online?

A. We anticipate the New Plant will fully come online in 2017.

Q. What is the significance of this development?

A. The transition to the New Plant, coupled with funding for other improvements such as AMI and increased water storage, will enable the Department to provide safe and efficient water service for ratepayers. The requested rate increase is critical for these purposes.

Q. What is the overall amount of the rate increase reflected in the Settlement Agreement?

A. The OUCC and City have agreed to a 55% across-the-board increase as originally requested. I understand that the OUCC—after completing its usual and thorough discovery in this matter—agrees that the Department's circumstances justify the requested rate increase. However, as explained by Mr. Sommer, the Settlement Agreement reflects certain changes to the makeup of the 55% increase.

Q. Does East Chicago support the Settlement Agreement?

A. Yes. I believe that the Settlement Agreement is in the public interest and represents a reasonable compromise of the issues raised in this proceeding. While we are mindful of the size of the increase called for in the Settlement Agreement, the City believes that the increase will provide a significant step toward providing safe and reliable service to all customers.

Q. Does this conclude your direct testimony in this cause?

A. Yes.

VERIFICATION

I, Gregory D. Crowley, affirm under penalties of perjury that the foregoing representations are true and correct to the best of my knowledge, information, and belief.

Gregory D. Crowley

Date: 12/22/2016

PRELIMINARY ENGINEERING REPORT
Water Distribution System Improvements

Prepared For:

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CHAPTER 1: PROJECT LOCATION

The City of East Chicago is located in North Township in Lake County, Indiana. It is located on the Whiting and Highland Quadrangle Maps in Township 37 North, Range 9 West, Sections 9-11, 14-17, 20-22, 27-29, and 32-34. A map of the general project location can be found in **Appendix A1**. A map of the project area, including the existing intake, treatment plants and storage tanks can be found in **Appendix A2**.

The scope of work for the project includes installation and replacement of customer and district meters, installation of a bulk water filling station, servicing of hydrants, replacement of lead service lines, installation of new storage tanks, and demolition of an existing filtration plant. The project will provide maintenance and upgrades to existing distribution system assets, installation of new distribution assets with the goal of quantifying and reducing water loss, and provide the city with 24-hours of storage capacity.

All work activities related to the distribution system improvements will be done within the City's previously disturbed right-of-ways and easements or on City-owned property.

CHAPTER 2: CURRENT NEEDS

2.1 Current Water System

a. Water Supply

Water is supplied from Lake Michigan for each of the City's two existing filtration plants. Point-of-Entry One (POE1) is the Aldis Avenue conventional filtration plant, originally built in 1929 and upgraded in 1964. Point-of-Entry Two (POE2) is the Pennsylvania Avenue membrane filtration plant which was built in 2011. Water is conveyed to each of the treatment plants via an existing 54-inch diameter cast iron raw water intake pipe that was built in 1929 and extends 8,250 feet into the lake with four intake heads, or "cribs" at the pipe entrance. The pipe intake is at a water depth of approximately 30 feet. The configuration of the intake structure consists of 42-inch diameter piping from each individual crib structure connecting to two 48-inch diameter pipes which branch into the 54-inch line forming a "Y". Wooden screen structures at each intake reduce the potential for large objects to enter the intake manifold and piping. The pipe and cribs are cleaned annually by divers due to build-up of sediment and zebra mussels.

The 54-inch diameter water intake pipe connects to the intake wet well of the Aldis Avenue filtration plant raw water pump station that was originally constructed in 1929 and later remodeled during a 1964 plant renovation project.

In 2011, an extension of the raw water conveyance pipe was installed to enable raw water to be delivered to POE2. The raw water conveyance pipe extension is a 48-inch diameter pipe concentric to a 72-inch diameter steel casing pipe, which was installed by microtunneling under the Cline Avenue and railroad corridors. The conveyance pipe is approximately 1,100 feet in length, extending from upstream of the Aldis Avenue filtration plant raw water pump station and connecting to the Pennsylvania Avenue membrane plant raw water pump station.

East Chicago is registered with the Indiana Department of Natural Resources as a Significant Water Withdrawal Facility with the right to draw 27.999 million gallons per day from Lake Michigan. The Aldis Avenue filtration plant has a design capacity of 24 MGD, and the existing design capacity of the Pennsylvania Avenue membrane filtration plant is 16 MGD. Although the combined total rated output of both plants is 40 MGD, the City has never pumped any water volumes in excess of the authorized withdrawal limit. Recent historical water demand data indicates that peak and average daily water demand are currently much less than the authorized withdrawal amount.

The water supplied from Lake Michigan is generally of a high quality. It has moderate hardness ranging from 120-130 ppm and moderate alkalinity ranging from 110-120 ppm as $CaCO_3$. The pH typically ranges from 7.8 to 8.3. There is generally low turbidity with

occasional spikes, typically related to seasonal changes in weather patterns or storm events. Lake Michigan is a source of *Giardia* cysts and *Cyptosporidium* oocysts, but microbial quality is otherwise good. Lake Michigan is on Indiana's Section 303(d) list of impaired waters for E.coli, indicating levels above applicable water quality standards. During the summer months, moderate to serious algae-related taste and odor episodes are possible, but algae levels have overall decreased since the 1960s with increased pollution control measures. There are low levels of natural organic matter (NOM) which corresponds to low coagulant demand and disinfection by-product formation. The primary treatment concerns of the water supply are particulate removal and pathogen control.

b. Treatment

The City currently owns and operates two water treatment plants: 1) the Aldis Avenue conventional filtration plant, and 2) the Pennsylvania Avenue membrane filtration plant. The Aldis Avenue treatment plant was built in 1929, and later upgraded in 1964. The design configuration for the Aldis Avenue plant upgrade in 1964 anticipated an expansion of the plant operating capacity to 32 MGD. However, the treatment plant was eventually constructed with a design pumping capacity of only 24 MGD. Due to equipment obsolescence and the increasing cost of maintenance of the facility, the City decided to construct a new treatment plant in 2011.

The Pennsylvania Avenue membrane filtration plant is a state-of-the-art treatment facility that was erected in 2011 to replace the existing Aldis Avenue filtration plant. Shortly after plant startup in November 2011, design sizing flaws of the strainer pretreatment system caused the Pennsylvania Avenue membrane plant to remain idle for nearly 2 years after the facility was built. After completion of system troubleshooting and implementation of new strainer and membrane equipment in 2015, the membrane plant has been undergoing performance testing in 2016 to enable full-scale operation of the treatment plant. The Pennsylvania Avenue membrane plant is expected to be fully operational in early 2017. The existing design capacity of the membrane plant is 16 MGD; however, there is additional floor space at the facility to enable an expansion of plant operations to a full build-out capacity of 30 MGD. The Aldis Avenue treatment plant is expected to be decommissioned in early 2017, and later demolished in late 2017 or early 2018.

Drinking water produced by both plants is disinfected with chlorine for pathogen control. In 1992, in response to the 1991 U.S. EPA Lead and Copper Rule, East Chicago began feeding Sodium Polyphosphate powder at the Aldis Avenue treatment plant for corrosion control within the distribution system. During construction of the Pennsylvania Avenue membrane plant in 2011, IDEM approved the use of Sodium Hexametaphosphate acid solution as a corrosion inhibitor. However, the newly-approved corrosion inhibitor was not fed into the distribution system from the Pennsylvania Avenue membrane plant until

spring 2016, due to the strainer pretreatment system performance failure during start-up of plant operations in 2011. In the meantime, the Water Department continued to feed Sodium Polyphosphate powder from the Aldis Avenue treatment plant. In spring 2015, the Water Department began use of Sodium Hexametaphosphate acid solution at the Aldis Avenue treatment plant. Under recent guidance from IDEM in September 2016, the City switched to an orthophosphate-polyphosphate blend that is currently being fed at both plants to further improve the control of lead leaching in customer service lines.

c. Storage

East Chicago currently utilizes two 4 MG ground storage tanks and one 1.5 MG elevated storage tank for a total storage capacity of 9.5 MG. One of the 4MG tanks is an underground storage tank that was built in 1964 and is located at the Aldis Avenue treatment plant. The other 4 MG tank is an above-ground storage tank that was built in 2011 and is located at the Pennsylvania Avenue membrane filtration plant. The storage tank at the Aldis Avenue treatment plant is expected to be demolished, along with the rest of the facility, after the plant is decommissioned in 2017.

Built in 1949, the City's 1.5 MG elevated storage tank was last painted in 1998, but received a replacement cathodic protection system in 2015. Based on a review of recent historical water demand data, the City currently does not possess 24 hours of emergency water storage capacity. Historical data compiled from 2007-2015 indicates that the average daily demand is approximately 12.1 MGD and the peak daily demand for the City is 15.5 MGD.

d. Distribution System

East Chicago's distribution system is made up of approximately 89 miles of piping, with water mains ranging in size from 4 inches to 48 inches in diameter. The majority of the mains are constructed of cast iron or ductile iron, and many are 60+ years old. Due to the age of the system, the mains have revealed signs of deterioration resulting in several leaks and breaks to occur throughout the City annually. A map of the existing distribution system is shown in **Appendix A3**.

Customer services lines are of a similar age and condition as the water mains. However, many of these service lines are comprised of lead pipe. City records indicate that there are an estimated 4,000 lead service lines throughout the City. The City owns and maintains the public-portion of the service line from the water main to the curb stop. Beyond this point, the service line is the responsibility of the customer. In compliance with the 1991 U.S. EPA Lead and Copper Rule, the City samples for lead and copper a minimum of every 3 years per federal and state reporting requirements. After the introduction in 1992 (and continued use) of corrosion inhibitor to the finished water supply, 90^{th} percentile lead and copper sampling results have been below U.S. EPA action levels. Because the City has always been in compliance, it has not previously pursued a program to replace

lead or copper service lines. With recent increasing health and safety concerns about the dangers of lead in drinking water, the City would like to proactively begin to implement a lead service line replacement program to assist residents at the greatest risk of elevated lead levels from service line lead leaching.

Fire protection for residents and businesses is supported by 567 fire hydrants located throughout the City. Many hydrants throughout the distribution system are inoperable or incapable of meeting the fire-fighting needs of the city. During the summer of 2013, the City identified 94 hydrants known to be in need of repair or replacement. During the ensuing months, 44 of the identified hydrants have been repaired or replaced. During the fall of 2016, the City implemented a hydrant testing program to test all of the hydrants in the distribution system to identify additional hydrants in need of repair or replacement.

There are 7,067 customer meters in use throughout the distribution system. Meter installations in customer service lines range in size from 5/8-inch to 10-inches in diameter. Many of the existing installed meters, especially pit meters, are 20+ years old. Having exceeded the product's useful life, most of the meters are showing signs of deterioration. Beginning in summer 2011, the East Chicago Water Department implemented a meter replacement program to address these issues. To date, more than one-third of all residential and commercial meter installations, 5/8-inch to 1-inch in size, have been updated to radio frequency meters for use with an AMR system. The City initially read these meters with walk-by technology, but recently implemented drive-by meter reading in fall 2016.

During the spring of 2013, the City identified several high-water usage commercial and industrial customers with existing 4-inch to 10-inch meter installations as candidates for meter replacement. The goal of this effort was to replace obsolete large meters with new state-of-the-art meters with improved resolution to register a wide-range of flow, including sensitivity for low-flow customer operations. The City conducted flow tests of the targeted customer meters to determine which units to replace. Of thirty-one (31) meters tested, a recommendation was made to replace twenty-nine (29) meters. To date, twenty-one (21) of the twenty-nine (29) meters have been replaced with new high resolution meters to more accurately measure the range of low to high flows that may occur at these commercial and industrial customer accounts.

2.2 Current Population

According to the 2010 U.S. Census, East Chicago has a population of 29,698 residents. This is an 8.4% decrease from the 2000 U.S. Census population of 32,414 residents.

2.3 Current Water Consumption

a. Pumped vs. Sold

For the calendar year 2015, the total amount of water pumped from the City's treatment plants totaled 4,595.1 MG, and the total amount of water consumed was 3,177.6 MG. Included in the total water consumption is 465.8 MG which was exported to a wholesale customer, Indiana-American Water.

b. Public Water Use

The City does not currently track public water use. In the City's 2015 AWWA Water Audit, the industry standard of 1.25% was used for an estimation of unbilled unmetered authorized usage. The estimated usage for calendar year 2015 was 52.1 MG.

c. Water Loss

In 2015, non-revenue water, as a percent of water supplied, was 35%. This loss is higher than previous years, reflecting the increasing deterioration and decreasing reliability of the City's water distribution infrastructure assets. East Chicago's AWWA Water Loss Audit Report is included in **Appendix C**.

d. Water Consumption by Customer Type

East Chicago separates customers into four categories: residential, commercial, public, and industrial. In addition to businesses, commercial customers include hospitals, churches, and multi-tenant apartment complexes. Public customers represent municipal facilities, the local school district, and the public housing authority.

East Chicago is a heavily industrialized area, with the majority of water consumed by industrial customers. For calendar year 2015, a profile of water consumption by customer category indicated that approximately 62% of supplied water was consumed by industrial customers, 12% by residential customers, 8% by commercial customers, and 2% by public customers. The remaining 15% of water was sold through an existing wholesale water purchase agreement to Indiana-American Water. The existing wholesale water supply contract with Indiana-American Water will expire in fall 2017 and it is not expected to be renewed.

e. Average Design Flow

The Pennsylvania Avenue membrane filtration plant was designed based on distribution system demand flow data collected from the Aldis Avenue treatment plant during the calendar years of 1999 - 2007. From this data, an average daily design flow of 12.7 MGD was calculated. Historical average daily demand flow for the subsequent calendar years of 2007 - 2015 is 12.1 MGD. The trend indicates a slight decline in average daily demand

of 0.6 MGD. However, the most recent 2 years of data (for 2014 – 2015) indicates an average daily demand of 12.7 MGD, which is comparable to the long-term average daily demand of 12.7 MGD. **Appendix A4** shows a chart of historical average daily demand flow data. At a design capacity of 16 MGD, the Pennsylvania Avenue membrane filtration plant is currently sized to meet existing average daily demand flows.

f. Peak Design Flow

The Pennsylvania Avenue membrane filtration plant was designed based on an evaluation of distribution system demand flows for calendar years 1999 through 2007. From this data, the peak daily design flow of 16.0 MGD was calculated. Historical average daily demand flow for the subsequent calendar years of 2007 - 2015 is 15.5 MGD. The trend indicates a slight decline in average daily demand of 0.5 MGD. At a design capacity of 16 MGD, the membrane filtration plant is currently sized to meet peak daily demand flows.

2.4 Significant Water Consumers

East Chicago is a heavily industrialized city. Of the twenty (20) largest water consumers in the City, eleven (11) are industrial customers. In aggregate, the twenty (20) largest water consumers purchased approximately 2.59 billion gallons of water in 2015, which is approximately 81% of all revenue water sold during the calendar year. **Appendix B1-A** shows the customer type and annual usage for the twenty (20) largest water consumers.

a. Industrial

Overall, industrial customers account for 62% of all revenue water. In 2015, the ten (10) largest industrial water customers accounted for approximately 1.91 billion gallons, or 60.3% of revenue water. The top ten industrial water customers are:

1. ArcelorMittal
   - Indiana Harbor – East
   - Indiana Harbor – West
   - Indiana Harbor – Long Carbon (*Idled in 2015*)
   - R&D Center
2. Praxair, Inc.
   - Hydrogen Production Plant
   - HYCO Plant
   - Rare Gases
3. W.R. Grace & Co.
4. U.S. Steel Corp.
5. Safety-Kleen Systems
6. U.S. Gypsum Co.
7. Electric Coating Technologies

8. National Material Co.
9. United Transportation Group
10. Exxon Mobil

For this study, industrial water customers were tabulated by plant location, regardless of the number of meters onsite. Refer to **Appendix B1-B** for a listing for the 2015 annual water usage of the ten (10) largest industrial customers.

b. Commercial

The five (5) largest commercial water customers accounted for approximately 168.9 million gallons, or 5.32% of all revenue water. The top five commercial customers are:

1. Ameristar Casino
2. St. Catherine's Hospital
3. Millennia Housing – Lakeside Garden Apartments
4. Gas Stop
5. Luke Gas Station

Appendix B1-B contains a listing of the 2015 annual usage for the five (5) largest commercial water customers.

c. Public

The five (5) largest public water customers accounted for 38.6 million gallons of usage in 2015, or 1.3% of all revenue water. The top five public water customers are:

1. East Chicago Sanitary District
2. East Chicago Housing Authority – John B. Nicosia Senior Building
3. East Chicago Public Works Department
4. Lake County Nursing and Rehabilitation Center
5. East Chicago Housing Authority – James Hunter Senior Building

Appendix B1-B contains a listing of the 2015 annual water usage for the five (5) largest public water customers.

d. Wholesale

Currently, East Chicago has only one (1) wholesale customer, Indiana American Water (IAW). The existing 20-year wholesale water agreement with IAW will expire in fall 2017 and is not expected to be renewed. IAW's wholesale water usage in 2015 was 465.8 million gallons of water, or 15% of all revenue water (see **Appendix B1-B**).

CHAPTER 3: FUTURE NEEDS

3.1 Future Customers

Census data indicates a steady population decline in East Chicago. From 2000 to 2010, there was an 8.4% decrease in population, which is a consistent trend since the 1960s. Yet, Northwest Indiana, also known as "the Region," overall has been growing, and is estimated to increase in population by 6% by calendar year 2035. However, this trend is not universal to all Lake County communities. The influx of new residents to the area is highly influenced by individuals relocating from Illinois due to the high cost of living and the increasing crime rate in the Chicagoland region. East Chicago's limited footprint for new residential development makes it unlikely that its population will increase in the near future.

Nonetheless, East Chicago actively is pursuing efforts to stimulate residential, commercial and industrial development in the area. The City has earmarked certain parcels for future residential and commercial development and has been performing streetscape and lakefront improvement projects to make the City more attractive for developers. Additionally, there are several former industrial brownfield sites that are optimally positioned for industrial development with close proximity to Chicago and Gary for airport access, railroads throughout the City, and port access on Lake Michigan. A belief among many regional economic development organizations is that Indiana is more attractive for business development compared to nearby Chicago due to lower utility costs and taxes. Several industrial firms exited the Chicago area during the last decade to relocate business operations to less expensive areas in the Midwest. Several regional economists anticipate the trend to continue in the near future. A recent example occurred in 2016 when a manufacturer of forklifts, Hoist Liftruck, relocated its operations from Bedford Park, Illinois into a refurbished tank manufacturing facility in East Chicago.

In addition to potential new commercial and industrial customers, the City is also ideally positioned to provide wholesale water to surrounding communities. Many Northwest Indiana communities in close proximity to the City do not have facilities to produce drinking water. Therefore, these communities purchase water from other nearby water utilities. The largest water wholesalers in Northwest Indiana currently are Indiana American Water and the Hammond Water Department. Due to its proximity to the Illinois border, Hammond also sells water to many communities in the south suburbs of Chicago. Increasing numbers of communities in Illinois are interested in purchasing water from the City of Hammond due to its significantly lower prices, compared to higher wholesale prices offered by the City of Chicago. The low cost of high quality water in East Chicago could potentially make future wholesale agreements viable. East Chicago would certainly have to consider an expansion of plant capacity to become a viable player in a competitive wholesale marketplace.

3.2 Future Design Flows

When the Pennsylvania Avenue membrane filtration plant was designed in 2007, a peaking factor of 1.3 was used based on historical peak and average daily demand data from calendar years 1999 - 2007. After recalculating the peaking factor to update the trend for the subsequent calendar years of 2007 - 2015, a peaking factor of 1.3 was utilized again for the projection of future design flows. This is shown in **Appendix B2**.

The current population trend indicates a population decline for the near future. Undeterred, the City's efforts to stimulate commercial growth could increase commercial usage in the near future. Yet, the lack of residential growth could dampen this impact. The public sector will also likely see limited growth for similar reasons.

In 2008, East Chicago developed a comprehensive plan for future economic planning activities. During that time frame, six (6) areas in the City with large concentrations of vacant or underutilized industrial parcels were identified as targets for redevelopment. The vacant and underutilized areas provide an opportunity for future industrial growth within the City.

Additionally, the City is considering opportunities to supply water to other nearby utilities. Although the wholesale water purchase agreement with Indiana-American Water will expire in fall 2017, there appears to be interest from other nearby utilities to purchase wholesale water from East Chicago. Regional demand for high-quality, low-cost water indicates there is a potential for future growth of wholesale water beyond the current usage in the next 20 years.

The current and projected design flows are shown in **Appendix B2**.

3.3 Future System Needs

To assess the technical, managerial, and financial capacity of the City, the "Indiana Department of Environmental Management (IDEM) Capacity Development Self-Assessment" was completed and is attached in **Appendix D**.

East Chicago currently has sufficient water withdrawal rights to meet current demand and anticipated future development. In order to allow for commercial, industrial, and wholesale expansion, the Pennsylvania Avenue membrane treatment plant will likely need a capacity expansion from the current capacity of 16 MGD to 20 MGD within the next 20 years. Currently, the capacity of the Pennsylvania Avenue membrane treatment plant is 16 MGD, with the limiting factor being the filtration capacity of the existing membranes. The existing raw water and high service pumps and process equipment are currently sized for a 20 MGD plant capacity. Additional membrane trains and pumping equipment will be needed to increase the output capacity beyond 20 MGD.

Additionally, alternatives to the current Evoqua MEMCOR membranes will need to be evaluated. The existing membranes currently have 5 years remaining on the product

warranty. It is expected that the current membranes will need to be replaced within this timeframe. A switch to a different membrane supplier could require reconfiguration of the existing plant piping and membrane skids. However, several newer membrane technology options present the potential for more effective filtering and improved durability. Additionally, many next-generation membrane skids have a flexible design and are compatible with products from several membrane manufacturers. Membrane product flexibility would allow the City the ability to evaluate multiple competitive products for future replacements, rather than being limited by the existing proprietary MEMCOR design.

In addition to plant capacity expansion, water storage expansion will be necessary in the City to provide up to 24-hours of emergency storage capacity. This effort will require additional expansion of water storage capacity beyond what is recommended in this project.

The water distribution system will also need attention. Many of the water mains are more than 60 years old, and will eventually need maintenance or replacement. The valves and hydrants in the system will continue to require regular maintenance and testing. Routine maintenance of treatment plant and distribution system assets will be very important to assure system reliability, to reduce operating costs, and to extend the service life of equipment.

CHAPTER 4: EVALUATION OF ALTERNATIVES

4.1 Storage Tanks

a. No Action

With the No Action alternative, the City will continue with its current storage capacity of 9.5 MG, which is insufficient to meet 24 hours of emergency water demand. No Action will eventually result in a net loss of storage capacity because the future decommissioning and demolition of the Aldis Avenue treatment plant, including its 4 MG underground storage tank, in 2017 will reduce the City's water storage capacity to 5.5 MG. In the event of a local water emergency, the City does currently share a friendly relationship and water main tie-in with neighboring Hammond Water Department. However, it would not be in the City's best interests to potentially hurt this relationship by frequently looking for Hammond to frequently make-up for recurring water capacity shortfalls, especially since Hammond Water Department also must be able to maintain its wholesale water supply capacity commitments in Northwest Indiana and south suburban Chicago.

b. Restoration of Existing 4 MG Aldis Avenue Underground Storage Tank and Addition of 4 MG of New Storage

This alternative involves salvaging the storage tank at the Aldis Avenue treatment plant, even after the rest of the facility has been decommissioned and demolished. Tank level controls will need to be redesigned and replaced to enable remote operation from the Pennsylvania Avenue membrane plant. Filtrate piping would also need to be designed and installed so that finished water could be sent from the Pennsylvania Avenue membrane plant to fill the storage tank. Additionally, the tank will need significant refurbishment since routine maintenance and cleaning of the interior of the tank has not been performed in many years. Also, there is significant deterioration inside the tank. Salvaging the underground storage tank will also significantly impair the City's ability to sell and/or repurpose the rest of the existing lakefront site. Security cameras and access barriers will also need to be installed by the Water Department to prevent unauthorized access to the storage tank.

In addition to restoring the 4 MG Aldis Avenue underground storage tank, an additional 4 MG of storage capacity will need to be built to achieve compliance with the 10-State Standards Recommendations for Water Works, which requires 24 hours of storage capacity based on average daily flow plus firefighting capacity. The addition of 4 MG of new storage capacity would enable to the City to provide system capacity to meet the average design flow of 12.7 MGD plus 0.63 MG of firefighting capacity. This firefighting capacity is based on the ability for the City to provide 3,500 GPM of flow for 3 hours to industrial customers.

The Pennsylvania Avenue membrane treatment plant site design includes space consideration for a future 4 MG above-ground storage tank. However, a hydraulic model is suggested to identify the optimum location to strategically place an additional 4 MG of storage in the distribution system.

When taking into consideration the existing 4 MG of existing above-ground storage at the Pennsylvania Avenue membrane treatment plant, and existing 1.5 MG of storage at the City's elevated storage tank, the combined 8 MG of storage improvements in this alternative will result in 13.5 MG of total storage capacity.

c. Demolition of Aldis Avenue 4 MG Underground Storage Tank and Addition of 8 MG of New Storage

This alternative involves demolishing the existing Aldis Avenue 4 MG underground storage tank when the treatment plant is decommissioned and demolished in 2017. Demolition of the Aldis Avenue storage tank is justified because it is deteriorating and would require a significant investment to rehabilitate the vessel, and to design and replace the existing piping and controls.

To compensate for the loss of the Aldis Avenue 4 MG underground storage tank and to provide the additional storage required to meet the distribution system average daily demand, 8 MG of new storage capacity will need to be added to the system. The Pennsylvania Avenue membrane treatment plant site plan design includes space consideration for a future 4 MG above-ground storage tank.

Separately, an additional 4 MG of new storage will also be required to be strategically placed at another location in the distribution system based on a hydraulic model of the City. Following completion of the project, the City will have a total of 13.5 MG of storage capacity.

4.2 Meter Replacement Program

a. No Action

The No Action alternative is not a practical solution for the City. Many of the meters in the system are more than 20 years old and past the product's useful life. If they are not replaced, the older installed meters will continue to deteriorate, leading to continued meter inaccuracies and revenue loss. On a separate note, this alternative does not address the existing meter reading challenges of the City. Due to the Water Department's currently lean workforce and the high volume of pit meters that must be manually read, it is very challenging for the City to remain on a consistent 30-day meter reading and billing cycle. Additionally, pit meter readings are estimated during winter months, especially when snow accumulates on pit lids, preventing staff access to the meters.

b. Automatic Meter Reading (AMR) System

The City has been implementing an AMR system since 2011, and to-date, approximately one-third of customer meters have been replaced with RF meters. Continuation with an AMR meter replacement program will address several needs: 1) Aging water meters will be replaced and meter inaccuracies will be reduced; 2) Meter read times will also decrease, especially for pit meters, since pits will not have to be opened; 3) Bills will be consistently sent to customers on a 30-day billing cycle, which has not been recently possible due to the currently long length of time it takes to read existing meters; and 4) Meters will no longer be estimated in the winter months, even if there is significant snow accumulation.

This alternative will allow the utility to more easily collect one meter read per customer billing cycle. The RF meters are capable of storing 3 months of hourly meter reads. However, the process of collecting this data using an AMR system is time intensive and cumbersome.

c. Advanced Metering Infrastructure (AMI) System

With the AMI alternative, existing obsolete meters will continue to be replaced with RF meters, reducing meter inaccuracies. Also, hourly meter readings will be available to the Water Department throughout the entire year, so the billing cycle could be easily controlled and reduced to 30 days. As a result, meter readers will have more time available to perform service calls, shut offs, and other distribution system maintenance. Additionally, detailed water usage data will be made available to both the Water Department and its customers. This data will improve customer service, help detect water leaks more quickly, and allow water usage to be tracked for optimizing distribution system improvements.

4.3 Hydrant Improvements: Hydrant Maintenance

a. No Action

The No Action alternative results in many hydrants remaining inoperable throughout the City. This presents a safety hazard since necessary firefighting capacity will not be available when it is needed.

b. Repair/Replace Hydrants

By repairing or replacing hydrants in need of maintenance, essential firefighting capacity will be available throughout the city.

4.4 Hydrant Improvements: Hydrant Locks

a. No Action

With the No Action alternative, other actions would have to be taken to prevent water theft from hydrants. The City would have to develop clearer, stricter hydrant permitting policies, including enforcement procedures. The City's Police, Fire, and Building Departments would have to become more informed about these policies and involved in enforcing them. This option is the most cost effective, but also requires a significant amount of coordination and increased responsibility by several City departments. This increased responsibility would be a burden due to the existing lean workforce across all City departments.

b. Locks in Select Areas

With this alternative, hydrant locks will be installed in remote areas of the City that are difficult to monitor, even with a coordinated effort between departments. There are a few hydrants that are often targeted for theft because of the lack of monitoring. In tandem with this effort, there will still need to be clearer, stricter hydrant permitting policies, and coordination with the Police, Fire, and Building Departments. Installation of locks in remote areas will deter theft and ease the enforcement of existing hydrant policies. Although a magnetic key wrench will be required to open locked hydrants, the specialty lock wrench that the City is considering also has the ability to operate as a standard wrench to open unlocked hydrants. As a result, only one tool will be required to open all of the City's hydrants.

Phased purchasing of locks over time will be the most cost effective method for deployment in the City. The scope of this project proposes that the hydrants that are most difficult to monitor be targeted first for hydrant lock installation. The City can continue to purchase locks as part of an annual distribution system capital improvement program that would be beyond the scope of the current project.

c. Locks for Entire System

With this alternative, locks will be placed on all hydrants in the City. This method will be highly effective at deterring theft; however, the large quantity of locks required does not make it cost effective to be performed all at once. While the City can work toward this goal, by installing locks in phases, or as a part of an annual capital investment program, the long-term nature of the installation is beyond the scope of this project.

4.5 District Metered Areas (DMAs)

a. No Action

With No Action, the existing method to calculate water loss from nonrevenue water is to

compare the amount of water metered at the filtration plant(s) against billing records, and to attempt to quantify losses where possible. The existing approach provides an indication of the quantity of nonrevenue water, but however, does not provide any physical indication of where water loss is occurring in the distribution system.

b. Implementation of DMAs

Implementation of District Metered Areas (DMAs) is not essential to the operation of the distribution system. However, implementation of DMAs will assist the Water Department in locating and reducing water loss in the distribution system. The City will be able to proactively respond to system water loss by being able to track where discrepancies in water demand and water supply are occurring. With increasing water loss in the City, on the order of 35% in 2015, it is important for the City to be able to more accurately track water usage and find physical areas of water loss. DMAs will help pinpoint locations of leaks and possibly identify areas where theft is occurring.

4.6 Bulk Water Filling Station

a. No Action

With the No Action alternative, the City will continue to issue hydrant permits for contractor use. However, the City also will need to develop clearer, stricter hydrant permitting policies, including enforcement procedures, since current policies do not deter theft. Additionally, the City does not have a way to account for authorized unbilled usage, such as street cleaning.

b. Installation of Bulk Water Filling Station

With the addition of a bulk water filling station, the City will have a controlled process to sell water at a bulk rate to contractors. Accordingly, it will be much easier for the City to restrict hydrant usage only to the Fire and Water Departments. Additionally, current authorized unbilled City usage for activities such as street cleaning can be tracked for future water audits. The City has included a bulk water rate as part of a new rate schedule in its proposed rate increase petition to the Indiana Utility Regulatory Commission.

4.7 Lead Service Lines

a. No Action

In compliance with the 1991 U.S. EPA Lead and Copper Rule, the City samples for lead and copper at least every 3 years per federal and state reporting requirements. The samples from summer 2014, indicated a 90th percentile measurement for lead of 0.0078 mg/L; this level was lower than the U.S. EPA action level of 0.015 mg/L. The City recently sampled again in summer 2016 and the results indicated a 90^{th} percentile

measurement of 0.0084 mg/L. Therefore, the City is not required to take action to replace lead service lines. As a result, any resident desiring to replace a lead service line would have to absorb the associated expense. The high cost of this replacement is prohibitive for many residents in the City.

b. Lead Service Line Replacement Program

This project involves funding the cost of replacing the City-owned (i.e., public) portion of lead service lines for eligible residents. Eligible properties will be targeted for participation in the program based on the City's 2014 and 2016 Lead and Copper Rule sampling results, along with additional water sampling results from across the City. Residents will coordinate the replacement of the entire service line with Water Department staff and licensed City contractors, and the City will provide reimbursement to residents for the cost of replacement of the City-owned (i.e., public) portion only of the customer service line. This alternative reduces the financial burden for residents who desire to replace existing lead service lines.

4.8 Aldis Avenue Water Treatment Plant Demolition

a. No Action

The No Action alternative will allow the Aldis Avenue water treatment plant to remain intact, even after decommissioning of the facility. This is not a practical alternative since the plant will not be in use following the completion of the Pennsylvania Avenue membrane filtration plant performance tests. Located on prime lakefront real estate, the Aldis Avenue treatment plant will become an eyesore and a financial burden for the City to needlessly maintain while no longer in use.

b. Aldis Avenue Treatment Plant Demolition

This alternative involves the demolition of the Aldis Avenue treatment plant. The Aldis Avenue facility will no longer be in use after the Pennsylvania Avenue membrane treatment plant begins operating at full capacity. After decommissioning and demolishing the Aldis Avenue treatment plant, the City will have the option to sell or repurpose the land.

CHAPTER 5: EVALUATION OF ENVIRONMENTAL IMPACTS

5.1 Disturbed and Undisturbed Land

Construction and maintenance in the distribution system will occur in and adjacent to previously disturbed land. No undisturbed areas or farmland will be adversely impacted. All work areas have been previously disturbed. See **Appendix A11-A, B, C, D, E, and F** for proposed project locations.

- Storage Tank #1 and the Bulk Water Fill Station will be installed at the Pennsylvania Avenue membrane filtration plant. The site is currently grassy and paved. Minor tree removal may be necessary on the lot, but will be avoided whenever possible. See **Appendix A11-A**.
- Storage Tank #2 will be installed in the City at a location that is still being evaluated, but several sites have been targeted for further investigation. The City will attempt to place the new tank on property already owned by the City, so that land acquisition will not be necessary. Minor tree removal may be necessary based on the lot selection, but will be avoided whenever possible. See **Appendix A11-B, C, and D** for potential locations.

a. Site A for Storage Tank #2

Site A is located along Railroad Avenue near East Chicago City Hall. This location is ideal due to its close proximity to Chicago Avenue on the west side of the Canal since this site is near the existing water main interconnection with Hammond, which is located along the western border of East Chicago. If the City were to enter into a wholesale water purchase agreement with Hammond in the future, having storage near the interconnection would be beneficial. This area is currently paved. See **Appendix A11-B**.

b. Site B for Storage Tank #2

Site B is located along an unused parcel near Alder Avenue, south of the Prairie Park subdivision. This site is also near Chicago Avenue, but further east of Site A. As a result, it is not as close to the water main interconnection with Hammond. It is strategically located in the southeastern part of the City, where there is currently no storage. This area is currently comprised of grassy field. See **Appendix A11-C**.

c. Site C for Storage Tank #2

Site C is located along Gary Avenue on the Alder Street Pump Station property. This location is near the southeastern border of the City, which currently has no water storage facilities. It is in close proximity to the existing Indiana-American Water interconnection, but could be extremely valuable to the City for any future wholesale water purchase agreements with other nearby utilities, especially those located in southern Lake County. This area is currently paved and grassy. See **Appendix A11-D**.

- Hydrant maintenance will occur in previously disturbed right-of-ways of existing infrastructure. See **Appendix A11-E** for hydrant maintenance locations.
- District Metered Area meters will be installed on water mains in previously disturbed right-of-ways and roadways, based on the location of the water main. See **Appendix A11-F** for proposed meter locations.
- Lead service line replacement will occur on residential properties. These areas are currently grassy or paved based on the location of the service line. Eligible properties have not yet been determined by the City.
- Demolition will occur at the Aldis Avenue water treatment plant site. This area is currently paved and grassy. It is located in a developed area.

5.2 Historical and Architectural Resources

There are no known historical, architectural, or archaeological sites that will be significantly impacted by this project. Distribution system work activities will be performed in previously disturbed easements and rights of way. The Meter Replacement Program includes the replacement of meters on historical properties in the City. It was confirmed by the Northwest Field Office of the Indiana Landmarks Center that this activity is not considered a negative impact to the property that could result in substantial harm. **Appendix A5-A, B, C, D, and E** show the proposed improvements in relation to the listed sites. **Appendix E** includes excerpts from the Lake County Interim Report for the project area. The State and National Registers were consulted for new additions within the project area.

5.3 Wetlands

Wetlands will not be affected by construction or operation of the project. **Appendix A6** shows the National Wetlands Inventory Map. Wetlands for the proposed project areas are found in **Appendix A11-A, B, C and D**. Mitigation measures to mitigate and compensate for wetland impacts cited in comment letters about the project from the Indiana Department of Natural Resources and the U.S. Fish and Wildlife Service will be implemented.

5.4 Hydrology

a. Surface Water

There are no stream or river crossings in the project area. The project will not adversely affect waters of high quality listed in 327 IAC 2-1-2(3), exceptional use streams listed in 327 IAC 2-1-11(b), Natural, Scenic, and Recreational Rivers and Streams listed in 312 IAC 7-(2), Salmonid Streams listed in 327 IAC 201.5-5(a)(3), or waters on the Outstanding Rivers list (Natural Resources Commission Non-rule Policy Document).

b. 100-Year Floodplains and Floodways

No floodplain or floodway will be impacted by the construction or operation of the project. **Appendix A7** provides the floodway map for East Chicago. Flood maps for the proposed project areas are found in **Appendix A11-A, B, C and D**. If practical and necessary, aboveground structures will be built above the 100-year flood boundary.

c. Groundwater

According to the Lake County Soil Survey, the primary soil type in East Chicago is Urban land. The original surface layer and subsoil layer of this soil have been disturbed so much that the original soil type can no longer be identified. The majority of other soils in the City are Oakville-Adrian and Adrian soils. The high seasonal groundwater level for Oakville-Adrian soil found in the project area ranges from 2 to 6 feet. The high seasonal groundwater level for Adrian soil found in the project area ranges from 0 to 3 feet. These groundwater levels vary within the City and are heavily influenced by the water level of Lake Michigan. If necessary, dewatering will be employed during construction with the flow directed toward a sedimentation basin prior to being discharged to surrounding surface waters. There are no known sole source aquifers in the area. This project will not impact the drinking water supply.

5.5 Plants and Animals

The construction and operation of the project will not negatively impact state-listed or federal-listed endangered species and their habitats.

The project will be implemented to minimize impact to non-endangered species and their habitat. Mitigation measures cited in comment letters from the Indiana Department of Natural Resources and the U.S. Fish and Wildlife Service will be implemented.

5.6 Prime Farmland and Geology

No farmland will be impacted by the proposed projects. The Farmland Conversion Impact Rating from the National Resources Conservation Service is provided in **Appendix F**. The main soil type in the City is Urban land, which is well draining. There are pockets of Oakville-Adrian soil and Adrian muck soils, primarily along waterways in the City, but these areas will not be impacted by the proposed project. A topographic map of the project area is attached in **Appendix A8**. Soil Maps for the proposed projects are attached in **Appendix 9A**, **B, C, and D**.

Soil types do not include karst, bedrock, or hydric soils, so the project will not be adversely affected by these conditions.

5.7 Air Quality

Construction activities may generate noise, fumes, and dust normally resulting from such activities. To reduce noise impacts, construction activities can be limited to normal daytime hours. No fumes are anticipated in this project. To reduce the adverse impacts from dust, periodic watering of soil can be performed to reduce suspension of particles. One of the areas impacted by elements of this project is located on a U.S. EPA USS Lead Superfund site. Lead and arsenic were identified in the soil in this area. A map showing the impacted area is shown in **Appendix A10**. Dust control during construction activities in this area should be implemented and all work activities should follow all applicable standards, including OSHA Regulations and NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985). The noise, fumes, and dust are short-term impacts, lasting only during the construction phase.

Construction activities should not impact ozone, airborne pollutants, or other current or future air quality concerns.

5.8 Open Space and Recreational Opportunities

The construction and operation of the proposed project will neither create nor destroy open space and recreational opportunities.

5.9 Lake Michigan Coastal Program

This project is located within the Lake Michigan Coastal Zone; however, this project will not impact the Lake Michigan Coastal Zone. All project work will be conducted in a manner consistent with Indiana’s approved coastal management program.

5.10 Natural National Landmarks

The construction and operation of the proposed project will not affect Natural National Landmarks.

5.11 Secondary Impacts

East Chicago, through the authority of its Council, planning commission, or other means will ensure that future development, as well as future supply, storage, distribution, or treatment works projects connecting to SRF-funded facilities will not adversely affect wetlands, wooded areas, steep slopes, archeological/historical/structural resources or other sensitive environmental resources. The City will require any new development and treatment works projects to be constructed within the guidelines of the U.S. Fish and Wildlife Service, INDR, IDEM, and other environmental review authorities.

5.12 Mitigation Measures

To the extent required by the construction of this project, the following practices and measures will be incorporated into the project. Additionally, any further mitigation measured mandated by authorized reviewing agencies will be implemented.

a. Erosion and Siltation Control

- Erosion and sediment control measures in the project specification will require contractors to provide a schedule for clearing, grading, excavating, and restoring disturbed areas and a description of appropriate soil erosion control measures to be implemented during construction. This program shall meet all applicable federal, state and local requirements.
- Natural vegetation will be retained wherever feasible.
- Land grading and excavating will be kept to right-of-ways and to a minimum wherever possible.
- Appropriate structural and agronomic practices, including sedimentation basins, seeding, mulching, liming, and fertilizing, will be provided during and after construction to control runoff.
- Surface and subsurface drainage systems will be stabilized to avoid sedimentation problems as soon as possible, if disturbed.
- Construction entrances, roadways, and parking lots will be stabilized during construction to the extent possible.
- Construction activities will be scheduled to avoid excessively wet conditions whenever possible.
- Areas of exposed soil will be periodically wetted to reduce dust. No chemicals will be used for dust control.
- The existing top soil will be reused during the restoration process. Excess material resulting from soil displacement will be used elsewhere in the project whenever feasible.
- Discharge from dewatering will be directed to sedimentation basins prior to discharging into surrounding surface waters, if necessary.

b. Air Quality Impacts

- Exposed soils and unpaved roadways will be periodically wetted to reduce the suspension of dust and airborne-contaminants, particularly in the U.S. EPA USS Lead Superfund site. All work activities at this site will follow applicable standards, including OSHA Regulations and NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985).
- The number and size of construction equipment and vehicles will be minimized whenever possible to reduce emissions.

c. Noise Impacts

- Construction activities will be limited to normal daytime hours.
- Construction equipment and water system machinery will be dampened and enclosed, wherever possible, to reduce noise pollution.

d. Traffic Impacts

- Construction in or adjacent to roadways will be scheduled to avoid peak rush-hours.
- Traffic will be rerouted to alternative roadways if necessary.

CHAPTER 6: PROPOSED PROJECTS

6.1 Project Scope

The selected project scope includes improvements in the distribution system, an increase in storage, and demolition of the Aldis Avenue treatment plant in order to address the current needs of the City. Currently, the City does not have 24 hours of water storage capacity to be used in the event of an emergency. The City's existing water distribution infrastructure assets have deteriorated due to age, causing increased water loss and decreased operational reliability throughout the system. Many customer meters, particularly pit meters, have exceeded the product's useful life expectancy and are showing increasing signs of deterioration. Several hydrants throughout the system are inoperable and do not meet the fire-fighting needs of the City. There is currently not an effective method of locating and correcting sources of nonrevenue water in the distribution system, including water theft and water main leaks. Many customer service lines throughout the City are comprised of lead and/or lead solder, and residential customers experiencing elevated lead levels would like to have their service lines replaced. The Pennsylvania Avenue membrane filtration plant, built in 2011 to replace the Aldis Avenue treatment plant, is nearing the completion of performance tests. Upon successful completion of the performance tests, the Aldis Avenue treatment plant is expected to be decommissioned and demolished in 2017.

The proposed project scope includes: 1) construction of new water storage tanks to provide additional emergency water storage capacity for the City; 2) installation of an Advanced Metering Infrastructure (AMI) system to improve flow measurement at customer service lines and to simplify the billing process; 3) installation of hydrant locks to reduce water theft; 4) maintenance of hydrants to replace inoperable components; 5) implementation of District Metered Areas (DMAs) to improve flow measurement in the water mains; 6) installation of a bulk water filling station to simplify the sale of water to contractors; 7) implementation of a lead line replacement program to improve water quality at customer service taps; and 8) demolition of the Aldis Avenue water filtration plant.

Work related to the distribution system will occur in previously disturbed rights of way. Storage capacity will be added at the Pennsylvania Avenue membrane filtration plant. Additional sites for storage capacity are still in the process of being identified by the City, but several sites have been proposed. Demolition will be performed at the Aldis Avenue water filtration plant. The improvements are shown in **Appendix A11-A, B, C, D, E and F**. **Appendix G** contains the Preliminary Design Summary.

6.2 Project Components

a. Storage

1. The existing 4 MG underground storage tank at the Aldis Avenue water filtration plant will be demolished as a part of the plant demolition project. See **Appendix**

A11-A.

2. One (1) new 4 MG above-ground water storage tank (Storage Tank #1) will be built at the Pennsylvania Avenue membrane filtration plant. This new tank will supplant the capacity of the existing Aldis Avenue 4 MG underground storage tank, which is proposed for demolition. See **Appendix A11-A**.
3. One (1) additional 4 MG storage tank (Storage Tank #2), type and location to be determined, will be strategically located on City-owned property. The City will acquire additional land for site development, only if necessary. See **Appendix A11-B, C and D** for potential locations.

b. Distribution/Transmission

1. Radio frequency (RF) meters will be installed to replace existing outdated and obsolete meters. The new meters will provide more accurate and reliable water measurement for billing.
2. An Advanced Metering Infrastructure (AMI) system will be installed to automatically collect and transmit data from new RF meters to the Water Department. This will streamline meter data collection and allow leaks in customer service lines to be detected more quickly than currently possible. Hourly meter data will be available, via an online portal, to the Water Department staff and customers.
3. Necessary maintenance on hydrants identified for repair or replacement will be performed. This is critical for providing necessary firefighting capacity throughout the City. See **Appendix A11-E**.
4. Representing approximately 5% of the total hydrants in the City, hydrants located in remote areas will have hydrant locks installed. Hydrant locks will deter theft from hydrants and reduce nonrevenue water.
5. District Metered Areas (DMAs) will be implemented in the City, by dividing the distribution system into 5 sectors. Meters will be installed on water mains in these sectors and connected to the AMI system for monitoring. DMA meter consumption data will be compared to customer meter consumption data to identify areas of nonrevenue water for further investigation and corrective action. See **Appendix A11-F**.
6. A Bulk Water Filling Station will be installed in the rear yard of the Pennsylvania Avenue membrane filtration plant, allowing contractors to purchase water at a bulk rate. This will allow the City to more easily monitor and regulate fire hydrant usage. See **Appendix A11-A**.
7. A Lead Service Line Replacement Program will assist residents with elevated lead levels in drinking water to replace existing service lines. Although the details are still being finalized, the City will pay for the entirety of the City-owned (i.e., public) portion of the service line replacement. This will assist residents by easing

the financial burden of a service line replacement in order to receive safe drinking water.

c. Other: Demolition

1. The Aldis Avenue water treatment plant, including the existing 4 MG underground storage tank, will be decommissioned and demolished in 2017 after the Pennsylvania Avenue membrane filtration plant has completed performance tests and is operating at full capacity. This will allow the City to repurpose or sell the lakefront property currently occupied by the Aldis Avenue treatment plant and ease the financial burden of maintaining the existing outdated facility. See **Appendix A11-A**.

6.3 Project Costs

An itemized cost estimate for the selected project scope is shown in **Appendix B3**, Project Component Construction Cost Estimate. The Total Project Cost Estimate is provided in **Appendix B4**.

6.4 Project Schedule

DATE	PROJECT ACTION
December 2016	Submit PER to IDEM
March 2017	Anticipated IDEM Approval of PER
May 2017	Plans and Specs Submitted to IDEM
July 2017	Anticipated IDEM Approval of Plans and Specs
August 2017	Bid Authorization and Advertisement
October 2017	Loan Closing
October 2017	Bid Award
November 2017	Initiation of Construction
June 2018	Substantial Completion of Construction
July 2018	Initiation of Operation

6.5 Green Project Reserve Sustainability Incentive

The Green Project Reserve Sustainability Incentive will be achieved through water efficiency. Replacing the existing outdated and obsolete water meters with Advanced Metering Infrastructure (AMI) will allow for accurate flow measurement. Improved water efficiency assessments with the implementation of District Metered Areas (DMAs) will

allow the City to monitor where water is being used in the distribution system, and to locate and improve areas yielding nonrevenue water. The Bulk Water Filling Station will allow for easier regulation of hydrants to deter water theft and measurement of authorized unbilled consumption to more accurately account for nonrevenue water in future water audits. The GPR checklist is provided in **Appendix H**.

CHAPTER 7: LEGAL, FINANCIAL, AND MANAGERIAL CAPABILITIES

7.1 Resolutions

The Signatory Authorization Resolution was approved by the East Chicago Department of Waterworks Board of Commissioners on July 7, 2016. The signed Resolution is provided in **Appendix I**.

The PER Acceptance Resolution was approved by the East Chicago Department of Waterworks Board of Commissioners on November 21, 2016. The Resolution is provided in **Appendix J1**.

The PER Modification Acceptance Resolution was approved by the East Chicago Department of Waterworks Board of Commissioners on December 19, 2016. The Resolution is provided in **Appendix J2**.

7.2 SRF Financial Information

The preliminary analysis of the financial capabilities of the City is provided in the SRF Financial Information Form in **Appendix K**. This information reflects the best available estimates for the proposed project costs. The estimated post-project customer rate reflects the new rate schedule proposed by the City in its petition to the Indiana Utility Regulatory Commission for a rate increase. The petition was filed on August 4, 2016 and is still pending review and approval at the time of submittal of this report.

7.3 Land Acquisition

The City will attempt to use City-owned property for all proposed projects. If it is practical and necessary to acquire land for additional storage capacity, the City will submit proof that the acquired land has been secured prior to SRF Loan Closing.

7.4 Project Scope Modification

As a condition of the proposed settlement agreement with the Office of Utility Consumer Counselor (OUCC) for the proposed rate increase with the IURC, the original project scope was revised. Line items related to City-funded removal of the customer-owned portion of lead service lines, valve exercising, and leak detection were removed from the project funding request. These items were initially discussed as potential projects at the public hearing and are included in the transcript. Afterwards, it was determined that their removal from the scope of the project did not warrant an additional public hearing.

A Resolution for the approval of the PER in its modified version was presented to the East Chicago Department of Waterworks Board of Commissioners on December 19, 2016. The PER Modification Acceptance Resolution is provided in **Appendix J2**.

CHAPTER 8: PUBLIC PARTICIPATION

8.1 Public Hearing Information

A public hearing was held at 12:00 PM local time on Thursday, October 27, 2016 in the East Chicago City Council Chambers located in City Hall to discuss the recommendation of upgrades to the East Chicago Water Department drinking water infrastructure proposed in the PER, and to solicit questions and concerns from interested parties. The meeting was advertised in *The Times of Northwest Indiana* on Monday, October 17, 2016, in compliance with the minimum public notice requirement of ten days. A copy of the publisher's affidavit, including the public notice statement, is provided in **Appendix L1**. The PER was available for review during this time and at the public hearing.

8.2 Transcripts and Sign-In Sheet

Minutes from the public hearing are provided in **Appendix L2**. There were no attendees to the public hearing, so a sign-in sheet is not included with this submittal.

8.3 Written Comments

Following the public hearing, five days were reserved for written public comments concerning the project to be submitted. No written comments were received.

Appendix B3
Project Component Construction Cost Estimate

Item Description	Quantity	Unit Cost	Total Cost
STORAGE			
Storage Tank	2	$4,222,847	$8,445,696
Storage Total			**$8,445,696**
DISTRIBUTION/TRANSMISSION			
AMI Meter System			
5/8" RF Inside Set Meters	2427	$180	$436,860
5/8" RF Pit Meters	1640	$235	$385,400
3/4" RF Inside Set Meters	167	$250	$41,750
3/4" RF Pit Meters	99	$302	$29,898
1" RF Inside Set Meters	69	$325	$22,425
1" RF Pit Meters	10	$365	$3,650
Meter Installation	4412	$125	$551,500
Fixed Network Receivers	4	$16,500	$66,000
Mobile Data Collector	1	$7,000	$7,000
Server	1	$13,000	$13,000
AMI Software	1	$11,500	$11,500
Software Implementation/Training	1	$5,000	$5,000
Billing Software Integration	1	$5,000	$5,000
Total			**$1,578,983**
Hydrant Improvements			
Hydrant Replacement	50	$2,228	$111,400
Hydrant Installation	50	$931	$46,550
Hydrant Locks	33	$250	$8,250
Hydrant Wrenches	20	$150	$3,000
Total			**$169,200**
District Metered Areas			
12" Mag Meter	5	$10,749	$53,745
16" Mag Meter	6	$14,000	$84,000
24" Mag Meter	2	$20,000	$40,000
Meter Installation	13	$10,000	$130,000
Total			**$307,745**
Bulk Water Filling Station			
Pre-Fabricated Bulk Water Station	1	$34,700	$34,700
Station Installation	1	$20,000	$20,000
Total			**$54,700**
Lead/Copper Line Replacement			
Utility Owned Replacement	500	$1500	$750,000
Total			**$750,000**
Distribution/Transmission Total			**$2,860,628**

OTHER PROJECTS			
Old Plant Demolition	1	$854,504	$854,504
Other Project Total			**$854,504**
CONSTRUCTION COST			**$12,160,828**
CONTINGENCIES (10% CONSTRUCTION)			**$1,216,083**
CONSTRUCTION COSTS SUB-TOTAL			**$13,376,911**

Appendix B4
Total Project Cost Estimate

Item Description	Total Cost
NON-CONSTRUCTION COSTS	
Administrative, Legal, Bond	$159,245
Engineering Fees	$1,363,844
Non-Construction Cost Subtotal	**$1,523,089**
CONSTRUCTION COSTS (Table II)	
Storage	$8,445,696
Distribution/Transmission	$2,860,628
Other Projects	$854,504
Contingencies (10% Construction)	$1,216,083
Construction Cost Subtotal	**$13,376,911**
TOTAL PROJECT COST	**$14,900,000**

RESOLUTION NO. WD-16-20

DECLARATORY RESOLUTION OF THE BOARD OF TRUSTEES OF THE DEPARTMENT OF WATERWORKS ADOPTING WITH MODIFICATION RESOLUTION WD-16-03

WHEREAS, the Board of Trustees (the "Board") of the Department of Waterworks (the "Department") of the City of East Chicago, Indiana (the "City"), the governing body of the Department and the Waterworks District of the City (the "District"), exists and operates under the provisions of Indiana Code 8-1.5-4, as amended from time to time; and

WHEREAS, the Board previously passed Resolution WD-16-03 authorizing the rebuilding, repairing, extending, and improving of the waterworks system of the City ("the Project") and related matters, subject to a public hearing and future final action confirming, modifying, or rescinding Resolution WD-16-03; and

WHEREAS, the Board held the public hearing on October 27, 2016, at East Chicago City Hall, in which Crowley Engineering presented the Preliminary Engineering Report ("PER") related to the Project;

WHEREAS, the Board received no sufficient evidence objecting to the recommended Project at the public hearing;

WHEREAS, certain modifications were later made to the PER and the scope of the Project planned to be funded through the State Revolving Fund ("SRF") in connection with the related Rate Case being pursued by the Department; in particular, line items related to the removal of customer-owned lead-piping, valve exercising, and leak detection were removed from the PER and the scope of the Project;

WHEREAS, the revised PER was presented to the Board on November 7, 2016, and approved by "SRF Loan Program PER Acceptance Resolution"; and

WHEREAS, the Board now desires to take final action on Resolution WD-16-03:

NOW, THEREFORE, BE IT RESOLVED by the Board of Trustees of the Department of Waterworks of the City of East Chicago, Indiana, as follows:

1. Resolution WD-16-03 is approved as modified, in that the scope of the Project is narrowed and revised as reflected by the previously approved PER.

2. This Resolution shall be in full force and effect upon its passage.

ADOPTED AND APPROVED this 19th day of December, 2016.

BOARD OF TRUSTEES OF THE
DEPARTMENT OF WATERWORKS OF THE
CITY OF EAST CHICAGO, INDIANA

Joseph Ochoa, President

John Bakota, Vice President

Anthony Askounis, Member

Ray Lopez, Member

Henry Ventura, Member

Eva Lozano, Secretary

CERTIFICATE OF SERVICE

The undersigned hereby certifies that the foregoing was served this 22d day of December, 2016, electronically or by hand delivery to:

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Indiana Office of Utility Consumer Counselor
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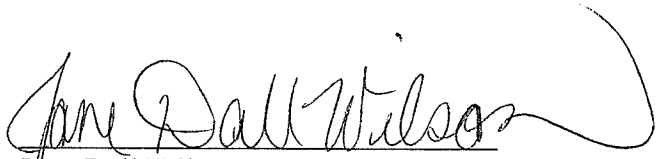

Jane Dall Wilson