Petitioner's Exhibit 1

FILED
December 12, 2022
INDIANA UTILITY
REGULATORY COMMISSION

THE CITY OF EAST CHICAGO, INDIANA

INDIANA UTILITY REGULATORY COMMISSION

CAUSE NO. 45827

DIRECT TESTIMONY

OF

WINNA GUZMAN

SPONSORING ATTACHMENTS WG-1 through WG-8

CITY OF EAST CHICAGO, INDIANA

CAUSE NO. 45827

DIRECT TESTIMONY OF WINNA GUZMAN

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

A. My name is Winna Guzman. I am Director of the East Chicago Water Department (the "Water Department" or "Petitioner"), and my business address is 400 East Chicago Ave. East Chicago, IN 46312.

Q. Please describe your formal education and summarize your experience.

A. I attended Calumet College of St. Joseph in Whiting, Indiana. I have been employed with the City of East Chicago, Indiana since 1995. This includes holding various positions, from building commissioner (2010-2017) overseeing day-to-day departmental operations, to my current position as director of the Water Department (2017-Present).

Q. What are your current duties?

A. I currently serve as Director for the Water Department. In this role, my responsibilities include overseeing day-to-day departmental operations, supervising and guiding personnel, overseeing and managing departmental budgets, implementing and enforcing of policies and procedures, etc. I am also responsible for preparing and presenting reports and departmental information to the governing board and various entities regarding operations, collections and audit data, etc. as required.

Q. How long have you served as Director of the Water Department?

A. I began serving in this role as of June 2017.

Q. Have your job responsibilities as Director expanded in recent years?

A. Yes. In 2021, the Director of Utilities for the City of East Chicago departed, and my role expanded to include supervision of the filtration and distribution operational functions.

Q. How many employees do you supervise?

A. I directly supervise 27 employees.

Q. What is the purpose of your direct testimony in this proceeding?

A. The purpose of my direct testimony is to introduce Petitioner's case-in-chief and the witnesses who will be testifying on behalf of East Chicago. I will also testify to update the Commission on the Water Department's plans to fund the capital projects through SRF loans and to describe the required rate increase. I will also describe the Water Department's past and intended future efforts to replace lead service lines within the distribution system.

Q. Are you sponsoring any exhibits?

A. Yes. Attachment WG-1 is a copy of the Petition in this matter. Attachment WG-2 is a copy of Resolution WD-22-27 adopted on November 7, 2022, authorizing the request for Commission authority to increase water rates by the amount of the aggregate increase identified in the Baker Tilly Municipal Advisors, LLC rate study. Attachment WG-3 is a copy of resolutions WD-22-32 and WD-22-33 initially authorizing the capital projects and the preliminary bond resolution. Attachment WG-4 is a summary of the positions with the Water Department, including open positions, and utility revolving division positions (which perform work for the Water Department and the Sanitary District), including open positions. Attachment WG-5 contains maps showing the locations of the Water Department's CIP projects. Attachment WG-6 is the Right of Entry Agreement the Water Department proposes to use for the Lead Service Line

Replacement Project. Attachment WG-7 is the most recent water loss audit report. Attachment WG-8 is the summary from the most recent hydrant maintenance report.

Q. Please briefly introduce Petitioner's other witnesses and the topics they will be covering.

A. In addition to my testimony, East Chicago is offering the testimony of the following Petitioner's witnesses:

Mr. Andre Riley, a Certified Public Accountant and a partner with the firm of Baker Tilly Municipal Advisors, LLC, supports our revenue increase, test year, and financing request and discusses the details around our phased in approach to implementing rates consistent with Indiana Code § 8-1-2-42.7.

Mr. John Caruso, an engineer with engineering firm, Christopher B. Burke Engineering, Ltd. who does engineering work under contract with East Chicago, discusses East Chicago's engineering and construction needs for the upcoming rate cycle, including the lead service line replacement project as well as the Water Department's plans for its conventional plant facility.

Q. When was East Chicago's last rate increase?

A. East Chicago petitioned for a rate increase in 2016 and the rates went into effect in 2017. It has been more than five years since East Chicago sought a rate increase.

Q. How do East Chicago's rates compare with other municipal water departments?

A. According to information published by the IURC in January 2022, East Chicago has the eighth lowest average monthly bills of regulated water utilities in the state of Indiana. Even if East Chicago obtains the rate increase requested in this cause, customers' average monthly bills for a customer using 4,000 gallons per month will still be less than $36/month after Phase III, which is mid-range for all of the water utility rates in Indiana.

The Water Department has been losing money on its water service for a number of years, subsidizing it by other means, and a rate increase is seriously needed. Mr. Riley explains the need in greater detail in his testimony.

Q. Did East Chicago meet with the Office of Utility Consumer Counselor ("OUCC") prior to filing its case-in-chief?

A. Yes. We met with the OUCC on November 30, 2022.

NEED FOR ADDITIONAL FUNDING FOR OPERATIONS

Q. Does the Water Department have a positive cash flow?

A. No. As described in the testimony sponsored by Mr. Andre Riley, the Water Department has been operating at a loss for some period of time.

Q. What are some of the causes of increased expenses?

A. There are several necessary capital improvement projects discussed below and in Mr. Caruso's testimony. There are also increased maintenance and repairs due to an aging distribution system, and increased costs for goods and services such as materials, chemicals, salaries due to supply and demand and inflationary pressures. We are also seeing increased operational and maintenance costs related to water treatment. The City has also implemented various annual programs such as leak detection, fire hydrant assessment, and water main condition assessments, and as repairs and replacements are required based on those findings, the City needs funds to correct issues as they are identified. Additionally, in line with state and federal policy, the Water Department wants to move forward its Lead Service Line Replacement ("LSLR") project begun following the last rate case.

Q. Does the Water Department need to budget for additional operating expenses?

A. Yes. In addition to increasing costs of supplies, the Water Department has a number of vacancies that need to be filled.

Q. Please explain.

A. In the 2020 budget, referenced in Baker Tilly Municipal Advisors, LLC's cost of service study at Attachment AJR-1, we budgeted for three new positions and one open position for the Water Department, as well as one new position and three open positions for the shared utility department. But our needs have increased in the past two years, and the pandemic has changed the employment landscape. The Water Department has added new positions and had other employees leave their positions.

Q. How many vacant positions does the Water Department currently have?

A. We are currently in the hiring process for nine (9) full-time and eight (8) part-time positions. These include positions in accounting, administration, maintenance, and plant operation. A summary of these positions is attached as WG-4. We are actively seeking and interviewing candidates for these positions and hope to fill them quickly.

Q. Does the Water Department also have initial expenses related to the CIP Projects?

A. Yes. We expect certain engineering and other expenses.

Q. How will the Water Department finance the CIP Projects until the rate case is decided?

A. The Water Department plans to secure a Bond Anticipation Note (BAN) in early 2023 to cover costs in the interim. Details on the BAN are included in Andre Riley's testimony.

Q. Will the BAN satisfy all the costs of CIP?

A. No. The costs of the CIP projects are anticipated to total approximately $26.62 million. The BAN is expected to provide temporary funding of approximately $1.9 million. This will allow East Chicago to commence funding of engineering costs related to the new

tank, Roxana water main replacement and lead service line replacement projects. This rate increase will be critical to provide adequate operating revenue to permit the Water Department to pay off the BAN with long-term debt anticipated to be issued through the State Revolving Fund Loan Program (SRF).

Q. Does the Water Department owe any amounts from Interfund Loans?

A. Yes. The Water Department has outstanding interfund loans totaling $5,000,000. We owe $1,000,000 to the tank refurbishment fund and $2,000,000 to the stormwater department. The Water Department is authorized to borrow up to $2.4 million from the stormwater department but has not yet borrowed that amount. We anticipate borrowing an additional $200,000 from the stormwater department by year end. The Utility also has an additional $2,000,000 interfund loan from the City's general fund.

Q. Has the Water Department received additional appropriations from the City that are not interfund loans?

Yes. In 2021, the Water Department appropriated $1,550,000 from the City's CEDIT fund for water-related repairs and capital outlays, and in 2022, the Water Department appropriated an additional $1,500,000 from the City's general fund for additional water repairs and equipment. These funds are to be used to cover the associated costs of the Utility and are not in the form of outstanding interfund loans.

Q. Why has the Water Department needed interfund loans as well as appropriated money from other City funds?

A. First, 2021 operating receipts have come in roughly 16.7% below what we anticipated in the prior rate case. Second, operating disbursements are approximately 19.2% higher than the previous rate case anticipated. Some causes of this mismatch include rate

fatigue on the receipt side and rising operational costs as detailed in Mr. Andre Riley's testimony.

Q. Is the Water Department being supported in any other way by other City budgets?

A. Yes. Certain maintenance and repair expenses have been funded through other City budgets, in particular, the Engineering Department budget. In road improvement projects, the Engineering Department has typically paid the cost of full road reconstruction, including all underground water utility expenses, such as service lines, meter pits, valves, manholes, fire hydrants, mains, and related infrastructure. In other instances, where needed water main repairs have exceeded the Water Department's budgeted funds, costs of repair or replacement have been paid by the City.

Q. Should the Water Department be covering these types of expenses?

A. It would be appropriate for the Water Department to cover expenses related to its maintenance, repair, and replacement of its distribution system.

MEMBRANE FILTRATION PLANT TRANSITION FROM CONVENTIONAL PLANT

Q. Can you describe the Water Department's primary water treatment and filtration plant?

A. In 2011, East Chicago completed construction of a new $52 million water treatment and filtration plant ("Membrane Plant") to replace the 1965 conventional filtration plant ("Conventional Plant"). Construction of the Membrane Plant was financed in large part by a 2009 SRF loan in the amount of $27,200,000 supported by gaming revenue. The membrane filtration plant is a state-of-the-art water treatment plant.

Q. In the last rate case, East Chicago discussed transitioning to the Membrane Filtration Plant. Has that transition been completed?

A. Essentially, yes. East Chicago uses its Membrane Filtration Plant for essentially all of its

water treatment. At this time, the Water Department only runs the Conventional Plant approximately 8 hours a week, basically just enough to keep the systems operational in case of an emergency. John Caruso discusses this in more detail.

Q. What caused the delay in fully transitioning over to the Membrane Plant, which was anticipated in the last rate case?

A. While we were hoping to have fully transitioned to the Membrane Plant by this point, the Department was delayed by the expense of decommissioning the Conventional Plant and potential environmental concerns with decommissioning. The Water Department also needed to wait until it had adequate assurance of redundancy, which was assessed this past year and which is also the subject of one of the planned capital improvement projects as discussed below. Mr. Caruso testifies to this in more detail in his testimony.

CAPITAL IMPROVEMENT PROJECTS

Q. Please describe East Chicago's capital improvement projects.

A. East Chicago's planned capital improvement projects involve the construction of replacement water storage facilities and replacement of a water main along Roxana to increase pressure and redundancy. The Water Department is also proposing to install new additional membrane filtration skids in the Membrane Plant and to replace the existing membrane filters. We are also planning to continue the LSLR program that began after the last rate case, subject to favorable funding arrangements, discussed below. John Caruso will discuss the details and price estimates for all of these projects in greater detail in his testimony. Maps showing the locations of these projects are shown in Attachment WG-5.

Q. How does the Water Department propose to finance the capital improvement projects?

A. The Water Department intends to seek funds by issuing revenue bonds through the State Revolving Fund Drinking Water Loan Program ("SRF"). The Water Department has filed two applications with SRF, and those applications are attached to Mr. Caruso's testimony.

Q. With respect to all of the capital projects, is it possible that priorities could change and other projects might be substituted for those currently planned?

A. Yes, it is possible. The projects referenced above and discussed in Mr. Caruso's testimony are projects as to which the Water Department has begun the process of applying for SRF funds. Those projects are known and identified needs of the water works system. However, it is always possible that other priorities and needs may arise that would require expenditure of funds. It is likely that as these improvements are made, other infrastructure improvements may need to be made as well.

LSLR PROJECT

Q. Please describe the LSLR Project.

A. The Water Department has already been engaged for a number of years in replacing lead service lines. In its 2016/2017 rate case, the City reached a settlement with the OUCC involving the use of what was effectively grant money from the SRF to implement an LSLR Program that was approved by the Commission.

Q. What LSLR work has the Water Department done?

A. The work was undertaken in phases. Phase I began in August 2017 and was completed in October 2018. In Phase I, the Water Department completed work on 331 houses in a particular zone. The average cost per house was $3,739.64. Phase II began in August

2018 in a second zone. Phase II contemplated lead-service-line replacement of an additional 380 homes. The work was delayed due to COVID-19, but the Water Department continued its efforts as possible. As of December 31, 2021, the Water Department had completed work on 284 houses in Phase II but at an increased cost of approximately $6,108.25 by year-end 2021. Because only modest funds remained available from SRF at that time, the City communicated with SRF and closed the existing LSLR Program in 2021. A total of 615 homes had existing lead service lines replaced with safer alternatives under the program initiated in 2017. The Water Department filed a final report in December 2021 reflecting its final progress with lead line replacement based on the virtual exhaustion of the original funding.

Q. What costs does the Water Department propose to cover in conjunction with the ongoing LSLR Project?

A. The Water Department is proposing to cover all costs associated with LSLR. The replacement will include the length of the service from the main into the residence and will involve necessary appurtenances such as shutoff valves, buffalo valve boxes, etc. As is standard procedure, the Water Department 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. The cost of replacement of the customer-owned portion of the service line would be prohibitive for many residents in the City. I understand that it is also a requirement of the federal funds being administered by the SRF that the Water Department cover the full cost of replacement of the entire lead service line, not just the utility-owned portion of the line in order to access the funding.

Q. Why is the Water Department undertaking lead service line replacement?

A. The Water Department is pursuing lead line replacement even though levels from sampling are below the federal actionable level because the Water Department believes this is an important program to protect its residents' health and well-being and because favorable funding is available to support the program as discussed in Mr. Andre Riley's testimony. According to the EPA and Center for Disease Control, lead exposure is harmful, especially for children, and the only way to eliminate the potential risk of lead exposure caused by lead service lines is to eliminate the lead service lines themselves. Additionally, East Chicago has a higher concentration of low-income customers, so the City continues to deem this a priority.

Q. Do you anticipate replacing any lead mains?

A. No. The Water Department has no lead mains in its distribution system.

Q. Please describe how the replacement of customer-owned lead service lines will be accomplished in conjunction with distribution infrastructure replacement projects.

A. If an area is slated for replacement of distribution infrastructure, efforts will be made to undertake LSLR in that area as well.

Q. Describe how the Water Department will address the costs of unusual site restoration work necessitated by structures or improvements located above the customer-owned portion of the lead service lines.

A. Unusual restorations will be assessed by the Water Department's staff prior to the lead service line replacement construction work begins. The staff will provide an estimate of the cost of unusual restoration to the property owner for review. The property owner can either choose to have the Water Department complete the restoration on their property or perform the work independently. If the property owner chooses to have the Water Department complete the restoration on their property, the Water Department will

complete the work at a cost not to exceed a cap established between the parties. The property owner must reimburse the Water Department for any costs exceeding the cap or perform any work exceeding the cap independently.

Q. Describe the process for communicating with customers and property owners prior to undertaking the lead service line replacements.

A. The Water Department intends to communicate with its customers and property owners by targeting areas by streets/blocks, and issuing utility approved notices via mail, door postings, follow-up door-to-door visits and phone calls. All of this will likely be done with the assistance of a contractor. Residents will then be able to sign up via website or by phone directly with the contractor. The Water Department also intends to use the City's resources to keep residents informed about the project, including monthly newsletters, public meetings, social media, and inserts within bills.

Q. Have you identified what areas to target for the LSLR Project?

A. Yes, the Water Department has identified addresses in East Chicago where the property has pipes containing lead. The list of these addresses is included with Mr. Caruso's testimony in Attachment JC-10, starting at page 10.

Q. How will Petitioner communicate with property owners whose service lines are being replaced?

A. The Water Department's staff and its contractors will contact affected property owners to coordinate their property's service line replacement to avoid inconvenient service interruptions. After construction is completed and service is restored through the new service line, a water flushing and sampling packet containing whole-house flushing instructions, water sampling instructions, sampling bottles, a water sampling questionnaire, and additional information about lead and drinking water will be provided

to the property owner. The Water Department's staff will coordinate with the property owner to pick up the water samples for laboratory testing and results of the tests will be provided verbally and in writing to the property owner. If additional sampling is required, the Water Department's staff will provide a new water flushing and sampling packet and arrange a new pick-up time for the additional water sample bottles.

Q. Will property owners be required to execute a contract prior to participating in the plan?

A. Yes. The Right of Entry Agreement attached hereto as Attachment WG-6 will be provided to each property owner, and subsequent to the property owner's execution of the Right of Entry Agreement, the Water Department will commence work on the lead service line replacement. The Right of Entry Agreement provides the legal framework for the completion of the lead service line replacement by the Water Department at no cost to the customer or property owner and allows the right of entry for the Water Department's staff and contractors to perform the work required. The Right of Entry Agreement describes the work that will be performed on the property and describes how circumstances that require unusual site restoration will be addressed.

Q. Can a customer decline to participate in the program?

A. Yes. A property owner can either agree to permit the Water Department to replace their lead service line by signing the Right of Entry Agreement or decline to permit the Water Department to replace the service line by acknowledging awareness of a service line containing lead material.

Q. Who will be responsible for paying for any future repairs that might need to be made once lead service lines have been replaced?

A. This project does not change the ownership of the current or future service lines. Ownership of the affected service lines will continue to remain with the property owner. Therefore, the property owner will be responsible for any future repairs to the service line once it is replaced.

MAINTENANCE AND REPAIR

Q. What maintenance and replacement activities is the Water Department undertaking?

A. The Water Department is continuously replacing or repairing valves, hydrants, buffalo boxes, and meters. The Water Department is also frequently engaged in leak repairs on mains, including substantial leaks over the last year related to the aging infrastructure. The Water Department also needs certain vehicles and related equipment to carry out the work of the Water Department, which have a limited life span.

Q. Has the Water Department undertaken any significant monitoring expenses?

A. Yes. The Water Department is undertaking specific efforts to monitor for water loss, including leak detection surveys, and to monitor the condition of its fire hydrants.

Q. Please describe the Water Department's leak detection program.

A. The Water Department has been addressing leaks within the system as aggressively as possible. Detecting leaks prevents unaccounted loss of water. Ultimately, it saves the utility and ratepayers money. This year, as it did last year, the Water Department submitted a request for proposals for leak detection programs and received proposals from companies proposing to use ultrasonic leak detection to create a survey of the entire system.

Q. Has the Water Department recently conducted a water loss audit?

A. Yes, the water loss audit was completed by M.E. Simpson in September 2022. A copy of the report is provided as Attachment WG-7.

Q. What did M.E. Simpson's report find?

A. M.E. Simpson's Water Loss Audit Report indicated that non-revenue water, as a percentage of water supplied, was approximately 28%, accounting for a $1,411,320 loss. While this is an improvement since the last rate case, the City is reviewing M.E. Simpson's recommendations to further address the issue.

Q. You also mentioned fire hydrant monitoring. Please describe the hydrant evaluation.

A. The Water Department recently engaged M.E. Simpson to test and evaluate the condition of its fire hydrants. A copy of the summary of M.E. Simpson's 2021 report is attached as Exhibit WG-8. M.E. Simpson's testing indicated needed repair or replacement of a majority of the Department's hydrants. The Water Department has been aggressive in repairing and replacing fire hydrant fixtures and related valves as referenced in the M.E. Simpson Report.

INCREASED RATE REQUEST

Q. As a municipal water utility, East Chicago is not assessed taxes on its property. Do the new rates you are seeking contemplate a payment to the Civil City in lieu of property taxes?

A. Yes. The proposed rates include recovery of East Chicago's cost to make annual payments in lieu of taxes in the amount of $1,788,900 by the end of Phase III. The determination of this amount is explained by Mr. Riley in his testimony and report.

Q. How much of a rate increase is the Water Department seeking in this proceeding?

A. The Water Department is seeking a rate increase not to exceed 102.22%, which is the amount Baker Tilly Municipal Advisors, LLC, determined was necessary in its rate study (discussed in Mr. Riley's testimony). We recognize that is a significant increase on a percentage basis, but, as noted, the City of East Chicago currently has some of the lowest average water bills in the State. The increase is $18.66 per month for an average residential household using 4,000 gallons. The rate increase is critical because the Water Department has operated at a loss for a number of years, which is unsustainable. The Water Department must also implement the capital projects described to ensure safe, reliable, and efficient water supply to customers. It is therefore in our customers' interest for East Chicago to increase its water rates to provide adequate revenue.

Q. Is the tariff for water service posted on the City's website?

A. The current tariff is posted. It can be found at https://www.eastchicago.com/DocumentCenter/View/1665/TARIFF-SCHEDULE.

Q. Does this conclude your testimony?

A. Yes, it does.

VERIFICATION

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

Winna Guzman

Date: December 12, 2022

WG-1

FILED
December 12, 2022
INDIANA UTILITY
REGULATORY COMMISSION

STATE OF INDIANA
INDIANA UTILITY REGULATORY COMMISSION

PETITION OF THE CITY OF EAST CHICAGO, INDIANA FOR AUTHORITY TO ISSUE BONDS, NOTES, OR OTHER OBLIGATIONS FOR AUTHORITY TO INCREASE ITS RATES AND CHARGES FOR WATER SERVICE, AND FOR APPROVAL OF NEW SCHEDULES OF WATER RATES AND CHARGES.	)	CAUSE NO. 45827

PETITION

Petitioner, the City of East Chicago, Indiana ("Petitioner"), respectfully petitions the Indiana Utility Regulatory Commission ("Commission") for authority to increase its rates and charges for water utility service, approval of a new schedule of rates and charges applicable thereto, and authority to issue notes, bonds, or other obligations. In support of its Petition, the Petitioner states:

1. Petitioner owns and operates a municipal water system. Municipal Ordinance 3004, passed by the City of East Chicago Common Council on August 7, 1972, authorizes the operation of a water department as a municipal utility pursuant to Ind. Code § 19-3-27-1 (now Ind. Code 8-1.5-4). The City of East Chicago Department of Waterworks collects rates and charges for the use of the services rendered by its water system pursuant to Ind. Code § 8-1.5-3-8.

2. Petitioner is subject to the jurisdiction of this Commission in the manner and to the extent provided in Ind. Code § 8-1.5-1-1 et seq., as amended, and other laws of the State of Indiana.

3. Petitioner, by its Department of Waterworks, operates, manages, and controls plants, property, pipelines, equipment, and facilities which are used and useful in the production, treatment, distribution, and sale of water and provision of water service to residential,

commercial, industrial, and other consumers. Petitioner's water utility properties are used and useful in its public service and operated and maintained so as to provide adequate, dependable, and efficient water sales and service to its customers.

4. Petitioner's existing water rates were established pursuant to Commission Orders dated April 26, 2017, in Cause No. 44826.

5. Petitioner has experienced increased cost and expense since its last rate increase approved by the Commission.

6. Petitioner must also make necessary additions, extensions, replacements, and improvements to its waterworks system to continue to provide reasonable and adequate service.

7. Petitioner proposes to obtain the necessary funds for these additions, extensions, replacements, and improvements, including a Lead Service Line Replacement ("LSLR") Program, from revenues and from the issuance of new waterworks revenue bonds through the Drinking Water State Revolving Fund ("SRF"). The proposed bonds will be in a principal amount not to exceed $30 million, which is a reasonable method for financing the planned improvements. Petitioner anticipates the term of these bonds will not exceed thirty-five (35) years and that they may be issued in multiple series. The principal and interest of the new waterworks revenue bonds will be payable solely from future revenues of the Petitioner's waterworks.

8. Petitioner's revenues provided by its current rates are inadequate to meet the carrying cost and expense of operating either its present or planned future additional plant and facilities, as well as the costs and expenses to meet or exceed environmental and other legal and customer service requirements.

9. In particular, the existing rates and charges for water service rendered by Petitioner do not produce sufficient revenue to pay all the necessary expenses incident to the

operation of the utility, including maintenance costs, operating charges, upkeep, repairs, depreciation, and interest charges on bonds or other obligations, including leases; provide a sinking fund for the liquidation of bonds or other evidence of indebtedness, including leases; provide a debt service reserve for bonds or other obligations, including leases; provide adequate money for working capital; provide adequate money for making extensions and replacements to the extent not provided for through depreciation; provide money for the payment of any taxes that may be assessed against the utility; compensate the City for taxes that would be due the City on the utility property were it privately owned; and provide a return on the utility plant. The issuance of the proposed revenue bonds for Petitioner's necessary additions, extensions, replacements, and improvements would increase the shortfall. The existing rates and charges are therefore insufficient and unlawful pursuant to Ind. Code § 8-1.5-3-8.

10. It is necessary to increase the present rates and charges in order to provide sufficient funds to meet the financial requirements of Petitioner's waterworks and maintain the utility property in a sound physical and financial condition, and to meet all environmental and other water services requirements to enable Petitioner to continue rendering adequate and efficient utility service. Petitioner also intends to use increased funding to support the issuance of long-term debt financed through SRF and to pay off a planned Bond Anticipation Note ("BAN") in an aggregate principal amount not to exceed $2,280,000.

11. Petitioner's Board of Directors of the Department of Waterworks ("Board") acts as the City's legislative body pursuant to Ind. Code §§ 8-1.5-3-4 and 8-1.5-3-8.

12. At its meeting on November 7, 2022, the Board approved the filing of this Petition with the Commission seeking authority for a rate increase consistent with the Baker Tilly rate study, which indicated an overall increase of 102.22 percent.

13. At a special meeting on December 8, 2022, the Board also approved, pursuant to Ind. Code § 8-1.5-4-15, the acquisition, construction, installation and equipping of certain improvements and extensions to the waterworks of the City, including additional storage facilities, water main replacement, expansion and replacement of filters at the membrane treatment plant, lead/copper line replacement, and related waterworks improvements. The Board further adopted a resolution authorizing the issuance of bonds to finance the construction of the improvements and extensions and addressing certain other matters.

14. The extensions, replacements, and improvements for which authority is sought to issue the bonds, notes, or other obligations are reasonably necessary for Petitioner to provide adequate and efficient utility service. The revenue bonds which Petitioner seeks authority to issue are a reasonable method of financing such extensions, replacements, and improvements. The new schedule of rates and charges will represent rates and charges which are lawful, nondiscriminatory, necessary, reasonable, and just. Therefore, the issuance of the proposed revenue bonds and the establishment of the new schedule of rates and charges should be approved by the Commission.

15. Petitioner plans to utilize a historical test year for purposes of determining Petitioner's actual and pro forma operating revenues, expenses, and revenue requirement under present and proposed rates based on the twelve (12) months ended March 31, 2020 (to avoid the impact of the COVID-19 pandemic) and believes the financial and accounting data, when properly adjusted pursuant to Petitioner's evidence, including, but not limited to, the substantial additional capital requirements Petitioner must meet and finance over the next few calendar years, fairly reflect the Petitioner's annual operations. Therefore, such historical test year, as adjusted, is a proper basis for fixing the requested new rates for Petitioner and testing the effect of those rates.

16. Petitioner considers Ind. Code §§ 8-1-2-42, 8-1-2-42.7, 8-1.5-2-19 and 8-1.5-3-8, among others, applicable to the subject matter of this proceeding.

17. Petitioner is not seeking to implement a rate adjustment mechanism under Ind. Code Ch. 8-1-31. Therefore, Petitioner does not consider Ind. Code Ch. 8-1-31.6 to be applicable to this proceeding.

18. The attorneys authorized to represent Petitioner in this proceeding, who are authorized to accept service of papers in the proceeding on behalf of Petitioner, are:

Jane Dall Wilson, Atty. No. 24142-71
Katrina Gossett Kelly, Atty. No. 28583-49
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19. Petitioner will contemporaneously file a proposed procedural schedule negotiated with the Indiana Office of Utility Consumer Counselor ("OUCC").

WHEREFORE, Petitioner respectfully requests that the Commission make such investigation and hold such hearings as are necessary or advisable and thereafter issue a final order in this Cause

a) authorizing an increase in Petitioner's rates and charges for water service as requested by Petitioner;

b) approving the establishment of new schedules of water rates and charges applicable thereto, with such schedules properly to reflect and establish the proposed rate increase;

c) approving the issuance of bonds, notes, or other obligations; and

d) making such other and further orders as the Commission may deem appropriate and proper.

Respectfully submitted,

By: *s/Jane Dall Wilson*
Jane Dall Wilson, Atty. No. 24142-71
Katrina Gossett Kelly, Atty. No. 28583-49
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Attorneys for Petitioner, The City of East Chicago, Indiana

CERTIFICATE OF SERVICE

The undersigned hereby certifies that the foregoing was served this 12th day of December, 2022, electronically or by hand delivery to:

Daniel LeVay
Indiana Office of Utility Consumer Counselor
PNC Center
115 West Washington Street, Suite 1500 South
Indianapolis, Indiana 46204
infomgt@oucc.in.gov
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s/Jane Dall Wilson
Jane Dall Wilson

WG-2

RESOLUTION NO. WD 22-27

RESOLUTION AUTHORIZING A NEW SCHEDULE OF RATES AND CHARGES FOR SERVICES RENDERED BY THE EAST CHICAGO, INDIANA, DEPARTMENT OF WATERWORKS AND RELATED MATTERS

WHEREAS, the Board of Directors ("Board") for the City of East Chicago Department of Waterworks ("Water Department") has under consideration the necessity for an increase in water user charges; and

WHEREAS, the Board has caused a study to be made by Baker Tilly Municipal Advisors, LLC ("Rate Consultants") to determine whether or not an increase in user charges for service rendered by the Water Department is required in order to enable the Water Department to pay its necessary expenses of operating, including the payment of its bonded indebtedness, funds for extensions and replacements, and all the other costs of operation as set forth in the applicable statute, IC § 8-1.5-3-8; and

WHEREAS, the Board has been advised by the Rate Consultants that the Water Department is in immediate need of a user charge/rate increase in order for the Water Department to realize sufficient revenues to properly operate its facilities as required by statute; and

WHEREAS, the Rate Consultants have provided to the Board a recommendation to implement, upon approval by the Indiana Utility Regulatory Commission, the increases described in the rate study; and

WHEREAS, the Board now finds that it will be necessary to increase the user charges for water service rendered by the Water Department in order for the revenues produced by the Water Department's facilities to comply with the statutory requirements of the State of Indiana; and

WHEREAS, the Board of Directors is empowered by I.C. § 8-1.5-4-1.5 to act as the municipal legislative body for the purpose of I.C. § 8-1.5-3-4 and I.C. § 8-1.5-3-8; and

WHEREAS, a petition will be filed in the near future and assigned an IURC Cause Number; and

WHEREAS, the full extent of the rate relief to be sought in the referenced petition to the IURC remains to be finalized; and

WHEREAS, after full review, discussion, and due consideration of the aforesaid matter presented, reported, and recommended, upon motion duly made and seconded, the following resolutions were adopted:

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF THE DEPARTMENT OF WATERWORKS OF THE CITY OF EAST CHICAGO, INDIANA

1. That a new schedule of water user charges shall be established reflecting the rate increases as described in the Rate Consultants' rate study.

2. That the Water Department Director and the Water Department employees and agents are hereby authorized to secure the approval of the rates and user charges established by this Resolution by the Indiana Utility Regulatory Commission, and to take any and all actions that are necessary to put said rates and user charges in effect for the Department of Waterworks for the City of East Chicago, Indiana.

3. That all resolutions and parts of resolution in conflict herewith are hereby repealed; provided, however, that all existing rules and regulations of the Water Department are to continue in effect and that the existing schedule of water rates and user charges for service rendered shall also remain in effect until a new schedule of rates and charges is established and approved by the Indiana Utility Regulatory Commission, and further until such time as the order of said Commission approving said new rates and charges shall direct.

4. That this Resolution shall be in full force and effect from and after its passage

and adoption.

Adopted this 7th day of November, 2022

Joseph Ochoa, President

John Bakota, Vice President

Anthony Askounis, Member

Raymond Lopez, Member

Henry Ventura, Member

ATTEST: Ateria Allen
Ateria Allen, Secretary

WG-3

RESOLUTION NO. WD-22-32

DECLARATORY RESOLUTION OF THE BOARD OF DIRECTORS OF THE DEPARTMENT OF WATERWORKS OF THE CITY OF EAST CHICAGO, INDIANA, AUTHORIZING THE REBUILDING, REPAIRING, EXTENDING AND IMPROVING OF THE WATERWORKS SYSTEM OF THE CITY AND RELATED MATTERS

WHEREAS, the Board of Directors (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 hereby finds, upon investigation, that in order to properly protect the public health and welfare and safeguard the property within the District, it is necessary to rebuild, repair, extend and improve the waterworks system of the City; and

WHEREAS, the Board has begun preparing maps, plan, specifications and drawings with full details and descriptions for the proposed work, consisting of the acquisition, construction, installation and equipping of additional storage facilities, water main replacement, expansion and replacement of filters at the membrane treatment plant, lead/copper line replacement, and related waterworks improvements (collectively, the "Project"), together with an estimate of the cost thereof;

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

Section 1. The Board hereby declares that the Project is necessary for the protection of the public health and welfare of the inhabitants of the District and the safeguarding of the property within the District.

Section 2. The Board hereby declares that the Project is of public utility and benefit.

Section 3. The preliminary plans, maps, specifications, drawings, details, descriptions and estimates prepared in connection with the Project, as submitted to the Board at this meeting, are hereby adopted. Such plans, maps, specifications, drawings, details, descriptions and estimates and this Resolution shall be made available for inspection during normal business hours by all persons interested in or affected by the Project at the Office of the East Chicago Waterworks Department, located at 400 E. Chicago Avenue, East Chicago, Indiana.

Section 4. The Board's cost estimate for the Project is not in excess of Thirty Million Dollars ($30,000,000). The Board further finds that the precise property rights and locations needed to complete the Project are impossible to determine at this time. If the final plans, maps, specifications, drawings, details, descriptions and estimates require the purchase or appropriation of land, easements or rights-of-way not currently owned by the Department, then the Board will amend this Resolution to comply with Indiana Code 8-1.5-4. The Board proposes that the Project proceed and that the Project be financed by the issuance of one or more series of bonds of the District to be issued pursuant to Indiana Code 8-1.5-4, to include all of the costs of the Project, the repayment of a short-term bond anticipation note, if issued, and the costs of issuance of said bonds, in an estimated amount not to exceed Thirty Million Dollars ($30,000,000).

Section 5. The Secretary of the Board is hereby authorized and directed to schedule a public hearing on the adoption of this Resolution at which the Board will receive or hear remonstrances from the persons interested in, or affected by, this Resolution, and determine the public utility and benefit of the Project and take final action confirming, modifying or rescinding this Resolution. The hearing shall be held at a meeting of this Board, and the Secretary of the Board is further authorized and directed to publish notice of such hearing at the time and in the

manner provided by law, including, without limitation, the provisions of Indiana Code 8-1.5-4-15 and Indiana Code 5-3-1.

Section 6. This Resolution shall be in full force and effect upon its passage.

* * * * *

ADOPTED AND APPROVED this 8th day of December, 2022.

BOARD OF DIRECTORS 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

Ateria Allen, Secretary

RESOLUTION NO. WD 22-33

A PRELIMINARY BOND RESOLUTION OF THE BOARD OF DIRECTORS OF THE DEPARTMENT OF WATERWORKS OF THE CITY OF EAST CHICAGO, INDIANA, AUTHORIZING THE ISSUANCE OF BONDS OF THE WATERWORKS DISTRICT OF THE CITY OF EAST CHICAGO, INDIANA, FOR THE PURPOSE OF PROCURING FUNDS FOR CERTAIN IMPROVEMENTS AND EXTENSIONS TO SUCH WATERWORKS, AND CERTAIN RELATED MATTERS

WHEREAS, the Board of Directors (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 (the "Act"); and

WHEREAS, the Board finds that in order to provide funds for the payment of the costs of certain improvements and extensions to the waterworks of the City (the "Waterworks"), consisting of the acquisition, construction, installation and equipping of additional storage facilities, water main replacement, expansion and replacement of filters at the membrane treatment plant, lead/copper line replacement, and related waterworks improvements (collectively, the "Project"), it will be necessary and in the best interest of the District, and the property and inhabitants thereof, to issue bonds of the District in an aggregate principal amount not to exceed Thirty Million Dollars ($30,000,000), which shall be payable solely from the net revenues of the Waterworks (the "Net Revenues"); and

WHEREAS, the Board finds that it will be necessary and in the best interest of the District to issue bond anticipation notes ("BANs") of the District in an aggregate principal amount not to exceed Two Million Two Hundred Eighty Thousand ($2,280,000), to provide interim financing for a portion of the Project and related costs, which BANs shall be payable solely from the proceeds of said bonds; and

WHEREAS, certain preliminary expenditures related to the Project have been or will be incurred by or on behalf of the District prior to the issuance and delivery of such bonds; and

WHEREAS, the Board desires to express its intention to reimburse such expenditures as have been or may be incurred prior to the issuance of such bonds, pursuant to Indiana Code 5-1-14-6 and in compliance with Section 1.150-2 of the U.S. Treasury Regulations promulgated by the Internal Revenue Service (the "Treasury Regulations"); and

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

1. The District shall proceed to undertake the Project. For the purpose of procuring funds to pay for the cost of Project, together with the expenses in connection with or on account

of the issuance of the bonds therefor, the City, acting for and on behalf of the District, shall make a loan in an amount not to exceed Thirty Million Dollars ($30,000,000).

In order to procure funds for said loan, the Controller of the City is hereby authorized and directed to have prepared and to issue and sell the bonds of the District, in one or more series or issues, the principal of and interest on which are payable solely from the Net Revenues, which bonds shall be issued in the name of the City, for and on behalf of the District, in an aggregate principal amount not to exceed Thirty Million Dollars ($30,000,000) (the "Bonds"), with a discount not to exceed the discount set forth in or determined by the Final Bond Resolution to be adopted by the Board, and which amount (together with any investment earnings thereon, if any) does not exceed the cost of the Project, together with the expenses in connection with or on account of the issuance of the Bonds, which estimated cost shall not exceed Thirty Million Dollars ($30,000,000), plus investment earnings thereon, if any, which will be provided from proceeds of the Bonds, plus any investment earnings thereon.

The Bonds shall not constitute a corporate obligation or indebtedness of the City but shall constitute an obligation of the District. The Bonds, together with interest thereon, shall be payable solely from the Net Revenues.

The Bonds shall mature and be payable no later than thirty-five (35) years from the date of issuance thereof, and shall bear interest as set forth in the Final Bond Resolution to be adopted by the Board. The Bonds may be subject to redemption prior to maturity in whole or in part in accordance with the terms set forth in the Final Bond Resolution to be adopted by the Board.

In anticipation of the issuance of the Bonds, the Board hereby authorizes the proper officers of the District to issue bond anticipation notes ("BANs") in anticipation of the issuance of the Bonds, subject to the provisions of the Final Bond Resolution to be adopted by the Board.

2. The Board hereby declares that, for the purpose of evidencing compliance with Indiana Code 5-1-14-6 and Section 1.150-2 of the Treasury Regulations, it reasonably expects to reimburse with the proceeds of the Bonds (in an amount not to exceed and payable from the sources set forth above) expenditures for the Project made by or on behalf of the District prior to the issuance of the Bonds during the period beginning on the date sixty (60) days prior to the date of this Resolution until the date of issuance of the Bonds, which expenditures are expected to be paid initially from other legally available funds of the District.

3. The President and the Secretary of the Board shall certify a copy of this Resolution to the Controller of the City.

4. This Resolution shall be in full force and effect after its adoption by the Board.

* * * * *

ADOPTED AND APPROVED this 8th day of December, 2022.

BOARD OF DIRECTORS 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

Ateria Allen, Secretary

WG-4

East Chicago Water Department Employees

ADMINISTRATIVE

Name	Division	Fund	Dept	Sub-Dept	Title	Type	Supervisor	Job Description	Notes
Winna G. Guzman	Admin/Gen	0601	309	608	Director	Full Time	Mayor/Board	Departmental administrator. Oversees the day-to-day operations, including supervising personnel, preparing annual budgets, implementation/enforcement of policies, responsible for preparing and presenting reports to the governing board regarding operations, collection and data required by state and federal agencies, etc.	
Patricia Bodnar	Admin/Gen	0601	309	608	Manager	Full Time	Director	Provides administrative support to departmental director; oversees collections and billing activities and personnel; updates and prepares Kronos/payroll for bi-weekly processing; performs bank (deposits)/City Hall (mail/etc.)/post office (mail payments) transactions; performs reversal and adjustment transactions (i.e. NSF, etc.); daily updates of collection/batch/till activities; assists with account related errors and troubleshooting, etc.; address customer concerns as needed.	
Debra Davies	Admin/Gen	0601	309	608	Custodian	Full Time	Director/Manager	Performs Custodial type duties	

DISTRIBUTION

Name	Division	Fund	Dept	Sub-Dept	Title	Type	Supervisor	Job Description	Notes
Allan Lee	Dist-Maint	0601	309	606	Supervisor	Full Time	Director/Mayor	Oversees Distribution Division activities and personnel; including planning, scheduling and executing all assignments (meter installations/repairs/shut off activities/dig-out to repair related below ground lines/etc.) necessary to operate and maintain a safe water distribution system; address after hour emergency call outs	DSL
Timothy Lukacek	Dist-Maint	0601	309	606	Hv Equ Op	Full Time	Supervisor/Foreman	Performs heavy equipment operating activities/duties	Leave of Absence since 02/21
Mike Butrym	Cust Accts	0601	309	607	Meter Inst	Full Time	Supervisor/Foreman	Performs meter installation/repairs, shut off related activities, and labor type work	
Mason Comer	Cust Accts	0601	309	607	Meter Inst	Full Time	Supervisor/Foreman	Performs meter installation/repairs, shut off related activities, and labor type work	
Jeremy Anderson	Cust Accts	0601	309	607	Laborer	Part time	Supervisor/Foreman	Performs maintenance of distribution system type work, meter installation/repairs, shut off related activities, meter testing, GIS updates, locating, and labor type work	
Reynaldo Cuevas	Dist-Maint	0601	309	606	Helper	Full Time	Supervisor/Foreman	Performs maintenance of distribution system type work, meter installation/repairs, shut off related activities, and labor type work	
Open	Dist-Maint	0601	309	606	Foreman	Full Time	Supervisor	Provides support to Supervisor on overseeing activities and personnel, etc.	
Open	Dist-Maint	0601	309	606	Dist Ma Re	Full Time	Supervisor/Foreman	Performs maintenance of distribution system type work, meter installation/repairs, shut off related activities, locating, and labor type work	DSL
Open	Dist-Maint	0601	309	606	Dist Ma Re	Full Time	Supervisor/Foreman	Assist and performs various maintenance of distribution system type work, meter installation/repairs, shut off related activities, and labor type work	DSL
Open	Cust Accts	0601	309	607	Labor	Part Time	Supervisor/Foreman	Assist and performs maintenance of distribution system type work, meter installation/repairs, shut off related activities, locating, and labor type work	
Open	Cust Accts	0601	309	607	Labor	Part time	Supervisor/Foreman	Assist and performs maintenance of distribution system type work, meter installation/repairs, shut off related activities, and labor type work	
Open	Dist-Maint	0601	309	606	Helper	Full-Time	Supervisor/Foreman	Assist and performs various maintenance of distribution system type work, meter installation/repairs, shut off related activities, locating, and labor type work	

FILTRATION

Name		Division	Fund	Dept	Sub-Dept	Title	Type	Supervisor	Job Description	Notes
Obed A. Perez, Jr.		Treat-Oper	0601	309	603	Manager	Full Time	Director/Mayor	Oversees Distribution Division activities and personnel; including planning, scheduling and executing all assignments (meter installations/repairs/shut off activities/dig-out to repair related below ground lines/etc.) necessary to operate and maintain a safe water distribution system; address after hour emergency call outs	Holds WT6 Certification
Sharma Frazier		Treat-Oper	0601	309	603	Secretary	Full Time	Manager	Performs secretarial type duties, i.e. payroll, answering telephones, general correspondence, accounts payable type activity, etc.	
Thomas Yuran		Tre-Main	0601	309	604	Foreman	Full Time	Manager	Provides support to Manager on overseeing activities and personnel, etc.	
Obed Perez, Sr.		Tre-Main	0601	309	604	Maint Man2	Full Time	Foreman	Performs maintenance, upgrades and repairs related to conventional and membrane plants as required	
Rodolfo Sanchez		Tre-Main	0601	309	604	Maint Man1	Full Time	Main Man2	Performs maintenance, upgrades and repairs related to conventional and membrane plants as required	
Thomas Kowal		Treat-Oper	0601	309	603	Chief Oper	Full Time	Manager/Foreman	Treatment Plant Operator–Membrane and Conventional Plants	Holds WT5 and WT6 Certifications
Jose Garza		Treat-Oper	0601	309	603	Operator	Full Time	Manager/Foreman	Treatment Plant Operator – Membrane Plant	Holds WT6 Certification
Luis Garcia		Treat-Oper	0601	309	603	Supervisor	Full Time	Manager	Performs Laboratory testing/collection activities, including maintaining and generating related reports	Maintains State Laboratory Certification/Requirements
Gregg Milan		Tre-Main	0601	309	604	Helper	Part Time	Manager	Performs Custodial type duties	
Markale Kristofek		Treat-Oper	0601	309	603	Operator	Full Time	Manager/Foreman	Treatment Plant Operator – Membrane Plant	WT6 Certification Pending
Juan Ramos		Treat-Oper	0601	309	603	Operator	Full Time	Manager/Foreman	Treatment Plant Operator – Membrane Plant	WT6 Certification Pending
Mark Djordjevich		Treat-Oper	0601	309	603	Operator	Contractual	Manager/Foremen	Treatment Plant Operator – Membrane Plant	Holds WT6 Certification
Enrique Gonzalez		Treat-Oper	0601	309	603	Operator	Contractual	Manager/Foreman	Treatment Plant Operator – Membrane Plant	Holds WT5 and WT6 Certifications
Open		Treat-Oper	0601	309	603	Operator	Full Time	Manager/Foreman	Treatment Plant Operator – Membrane Plant	WT6 Certification
Open		Treat-Oper	0601	309	603	Operator	Full Time	Manager/Foreman	Treatment Plant Operator – Membrane Plant	WT6 Certification
Open		Tre-Main	0601	309	604	Maint Man II	Full Time	Main Man2	Performs maintenance, upgrades and repairs related to conventional and membrane plants as required	

BOARD MEMBERS

Name	Division	Fund	Dept	Sub-Dept	Title	Type	Supervisor	Job Description	Notes
Anthony Askounis	Admin/Gen	0601	309	608	Member	Board	Mayor	Oversees financial and operational activities of the utility to ensure water system is staffed, maintained, meets any and all federal/state/local requirements; meets current and future needs of the City; adopt rules for safe, economical and efficient management and protection of the utility; award contracts for construction of capital improvements and purchases, etc.	
John Bakota	Admin/Gen	0601	309	608	Vice-President	Board	Mayor	Oversees financial and operational activities of the utility to ensure water system is staffed, maintained, meets any and all federal/state/local requirements; meets current and future needs of the City; adopt rules for safe, economical and efficient management and protection of the utility; award contracts for construction of capital improvements and purchases, etc.	
Raymond Lopez	Admin/Gen	0601	309	608	Member	Board	Mayor	Oversees financial and operational activities of the utility to ensure water system is staffed, maintained, meets any and all federal/state/local requirements; meets current and future needs of the City; adopt rules for safe, economical and efficient management and protection of the utility; award contracts for construction of capital improvements and purchases, etc.	
Joseph Ochoa	Admin/Gen	0601	309	608	President	Board	Mayor	Oversees financial and operational activities of the utility to ensure water system is staffed, maintained, meets any and all federal/state/local requirements; meets current and future needs of the City; adopt rules for safe, economical and efficient management and protection of the utility; award contracts for construction of capital improvements and purchases, etc.	
Henry Ventura	Admin/Gen	0601	309	608	Member	Board	Mayor	Oversees financial and operational activities of the utility to ensure water system is staffed, maintained, meets any and all federal/state/local requirements; meets current and future needs of the City; adopt rules for safe, economical and efficient management and protection of the utility; award contracts for construction of capital improvements and purchases, etc.	

Division	Filled Positions	Open Positions
Administration Utilities (308001/309608)	3	0
Distribution (309606/309607)	6	6
Filtration (309603/309604)	13	3
Board/Secretary (308001/309608)	5	0
Total	*27*	*9*

East Chicago Utility Inter-Department Employees

ADMINISTRATIVE

Name	Division	Fund	Dept	Sub-Dept	Title	Type	Supervisor	Job Description	Notes
Maria Perez	Util-Admin	0557	308	001	Acct. Rep	Full Time	Manager	Performs billing duties relating to fire hydrant meters, Publix, industrial, metered sewer, residential and commercial accounts; reviewing and billing ledgers to meet scheduled deadlines; apply penalty and late fees as required; service order entries; adjustments to accounts as required; final and one time billings; processing of new accounts; finalizing existing accounts; compiles/process write offs, etc.	
Almadelia Aragon	Util-Admin	0557	308	001	Acct Rep	Full Time	Manager	Performs billing duties relating to fire hydrant meters, Publix, industrial, metered sewer, residential and commercial accounts; reviewing and billing ledgers to meet scheduled deadlines; apply penalty and late fees as required; service order entries; adjustments to accounts as required; final and one time billings; processing of new accounts; finalizing existing accounts; etc.	
Lisandra Rosado	Util-Admin	0557	308	001	Acct. Rep	Full Time	Manager	Performs account payments and postings of front/drive up window transactions and collections (mail/online transactions); prepare service orders; address customer concerns; update accounts relating to return mail; open fire hydrant meter and new customer accounts; answering telephones. Performs delinquent account billing duties; maintaining delinquent accounts and process, i.e. shut off notices/agreements/service orders, etc.; address customer concerns; answer telephones and inquiries. compile bank relating documentation for Controller's Office daily and update daily related batch spreadsheets; etc.	
Raenita Roman	Util-Admin	0557	308	001	Acct. Rep	Full Time	Manager	Performs account payments and postings of front/drive up window transactions and collections (mail/online transactions); prepare service orders; address customer concerns; update accounts relating to return mail; open fire hydrant meter and new customer accounts; answering telephones. Issues leak notices to related accounts; entry of backflow reports; etc.	
Rebecca Sliger	Util-Admin	0557	308	001	Accountant	Full Time	Director	Assist with the preparation and submittal of related budgets, budget plans and forecasts, etc.; preparation of required monthly reports (i.e. urt, sales tax, etc.); reconciliation activities; Assist with managing various programs, i.e. City/SRF ledgers, processing of payments/claims; claim payment processing; accounting/reporting; write offs; preparation of budget transfer documentation and resolutions; attendance at board meetings as required; etc.	

Name	Division	Fund	Dept	Sub-Dept	Title	Type	Supervisor	Job Description	Notes
Melissa Balachowski	Util-Admin	0557	308	001	Admin Asst	Full Time	CFO/Manager	Performs duties relating to a/p type work, and as assigned by City Controller's Office	
Anthony Copeland	Util-Admin	0557	308	001	CEO	Full Time		Mayor	
Valeriano Gomez	Util-Admin	0557	308	001	CFO	Full Time	CEO	City Controller	
Open	Util-Admin	0557	308	001	Intern Adm	Part Time	Manager	Performs account payments and postings of front/drive up window transactions and collections (online/mail transactions); prepare service orders; address customer concerns; open fire hydrant meter and new customer accounts; process payment plan agreements and process web import payments; update accounts relating to return mail; answering telephones; assist with gathering required reports for Controller's office; etc.	
Open	Util-Admin	0557	308	001	Acct. Rep	Full Time	Manager	Performs account payments and postings of front/drive up window transactions and collections (mail/online transactions); prepare service orders; address customer concerns; update accounts relating to return mail; open fire hydrant meter and new customer accounts; answering telephones. Issues leak notices to related accounts; entry of backflow reports; etc.	
Open	Util-Admin	0557	308	001	Acct Rep	Full Time	Manager	Performs delinquent account billing duties; maintaining delinquent accounts and process, i.e. shut off notices/agreements/service orders, etc.; address customer concerns; answer telephones and inquiries. assist as required on postings of daily account payments, including online/window/mail transactions and collections; assisting with creating accounts; issue hydrant permits and new customer accounts; etc.	
Open	Util-Admin	0557	308	001	Acct. Assist	Part Time	Manager/Fin Adv.	Assists accountant with submittal and preparation of required monthly reports (i.e. urt, sales tax, etc.); reconciliation activities; Assist with managing various programs, i.e. City/SRF ledgers, processing of payments/claims; claim payment processing; assist with budget preparations; accounting/reporting, write offs, etc.	
Open	Util-Admin	0557	308	001	Intern Adm	Part Time	Director/Fin Adv.	Processing of accounts payable - City/SRF ledgers, processing of claims/payment processing; assist with budget preparations; accounting/reporting, write offs, etc.	
Open	Util-Admin	0557	308	001	Intern Adm	Part Time	Manager	Assists with submittal and preparation of required monthly reports (i.e. urt, sales tax, etc.); reconciliation activities; Assist with managing various programs, i.e. City/SRF ledgers, processing of payments/claims; claim payment processing; assist with budget preparations; accounting/reporting, write offs, etc.	

Name	Division	Fund	Dept	Sub-Dept	Title	Type	Supervisor	Job Description	Notes
Open	Util-Admin	0557	308	001	Intern Adm	Part Time	Manager	Assists with submittal and preparation of required monthly reports (i.e. urt, sales tax, etc.); reconciliation activities; Assist with managing various programs, i.e. City/SRF ledgers, processing of payments/claims; claim payment processing; assist with budget preparations; accounting/reporting, write offs, etc.	
Open	Util-Admin	0557	308	001	Intern Adm	Part Time	Manager	Assists with submittal and preparation of required monthly reports (i.e. urt, sales tax, etc.); reconciliation activities; Assist with managing various programs, i.e. City/SRF ledgers, processing of payments/claims; claim payment processing; assist with budget preparations; accounting/reporting, write offs, etc.	

BOARD MEMBERS

Name	Division	Fund	Dept	Sub-Dept	Title	Type	Supervisor	Job Description	Notes
Ateria Allen	Util-Admin	0557	308	001	Secretary	Board	Board	Schedule meeting dates as required, compile agenda items and prepare meeting agendas; and distribute unsigned and signed minutes of meeting and items	

Division	Filled Positions	Open Positions
Administration Utilities (308001/309608)	9	8
Board/Secretary (308001/309608)	1	0
Total	*10*	*8*

WG-5

CHRISTOPHER B. BURKE ENGINEERING LTD.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
(847) 823-0500

CLIENT:
CITY OF EAST CHICAGO
4525 Indianapolis Blvd.
East Chicago, IN
219.391.8300

No.	DATE	NATURE OF REVISION

DSN.
CHKD.
SCALE
GIS USER
MODEL ArcGIS 10.0

FILE NAME: \\bg.net\CBBEL\CBBELDFT\INDIANA\200198\Mech\Exhibits\IEPA-SRF\200198 EastChicago OverallFacilities1.mxd
DATE: 3/19/2021

TITLE:
OVERALL DISTRIBUTION FACILITIES LOCATION MAP

PROJ. NO. 20-0198
SHEET OF
DRAWING NO.
EXHIBIT A2

CHRISTOPHER B. BURKE ENGINEERING LTD.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
(847) 823-0500

CLIENT:
CITY OF EAST CHICAGO
4525 Indianapolis Blvd.
East Chicago, IN
219.391.8300

No.	DATE	NATURE OF REVISION

DSN.
CHKD.
SCALE
GIS USER
MODEL ArcGIS 10.0
FILE NAME: N:\INDIANA\20198\Mech\Exhibits\EPA-SRF\20198_EastChicago_TankSiteMap3.mxd
DATE: 3/19/2021

TITLE:
ELEVATED TANK SITE MAP

PROJ. NO. 20-0198
SHEET OF
DRAWING NO.
EXHIBIT A4

CHRISTOPHER B. BURKE ENGINEERING LTD. 9575 West Higgins Road, Suite 600 Rosemont, Illinois 60018 (847) 823-0500	CLIENT: CITY OF EAST CHICAGO 4525 Indianapolis Blvd. East Chicago, IN 219.391.8300	DSN. CHKD. SCALE GIS USER No. DATE NATURE OF REVISION MODEL ArcGIS 10.0 FILE NAME: N:\INDIANA\20019\Mech\Exhibits\IEPA-SRF\20019B_EastChicago_Roxanna_WM.mxd DATE: 3/19/2021	TITLE: ROXANNA PROPOSED WATER MAIN	PROJ. NO. 20-0198 SHEET OF DRAWING NO. EXHIBIT A5

WG-6

WATER SERVICE LINE ACCESS AGREEMENT

The undersigned property owner ("Owner") and customer of the East Chicago Water Works Department (the "Department") hereby warrants, grants and conveys to the Department and the City of East Chicago, its engineers, contractors, agents and employees the right to inspect, test, measure flows or otherwise monitor each underground lateral water service line and the right of access thereto in, upon, under, over, through and across the land over each lateral water service line from the property line to each building located upon the property belonging to the undersigned located at:
Common Address: _____

Upon inspection of property owner's water service line, the Department may, at its sole discretion, undertake, at the Department's expense, to repair, rehabilitate or replace all or any part of property owner's lateral water service line under the conditions contained herein. In consideration of such undertaking by the Department, Owner agrees as follows:

1. Owner hereby warrants that s/he is the legal owner of the above described property.

2. In the event that the Department determines to repair, rehabilitate or replace a portion or any part of Owner's lateral water service line, Owner agrees to cooperate with Department to allow reasonable additional access for such work.

3. Owner releases and waives any claim of liability against Department and the City of East Chicago, its contractors, agents, and employees from any consequence of the Department's action including the Department's determination of corrective actions or the need for such actions, selection of the contractor or employee performing the repairs, or implementation and completion of the corrective action.

4. The Department will pay the cost for the repair, replacement or rehabilitation of the lateral water servicer line and reasonable restoration.

5. Owner acknowledges that Owner retains ownership of the entire lateral water service line from Owner's building to the curb stop and that repair or replacement of the Owner's lateral service line by the Department shall not in any way transfer ownership for any portion of the lateral water service line to the Department or the City of East Chicago.

6. Owner acknowledges that Owner is solely responsible for all future maintenance of the lateral water service line and is otherwise solely responsible to keep the lateral water service line in working condition and in a good state of repair.

7. If the surface of Owner's property is disturbed by the Department at any time during the inspection or corrective action performed on Owner's water service line, the Department shall, at its sole expense, repair and restore any disturbed property to substantially the same condition that existed immediately prior to such disturbances, including necessary repairs of paving and landscaping. The Department will not be responsible for unusual site restoration requests beyond typical standard of care for public improvement projects. If, prior to or during the Work, the Department identifies a structure or obstruction that will prevent it from being able to complete the Work or require unusual site restoration, then the Department will notify the Owner to identify what portion of restoration activities

will be covered under this Agreement and what portion will be the responsibility of the Owner. The parties will mutually agree in writing which portion of the restoration activities will be the responsibility of the Owner and which will be the responsibility of the Department. If the parties are not able to in good faith reach a mutual agreement regarding restoration costs, then either party may terminate this agreement without further obligation or liability to the other.

8. Owner agrees that neither the Department, its contractor, nor subcontractors shall be liable for environmentally related claims arising from conditions on the Owner's Property prior to the beginning of the work. The Department reserves the right to discontinue work based on dangers present in the work environment (including but not limited to asbestos insulation, hazards in the area, etc.), and shall not be obligated to continue the work until any such dangers are remedied in full by the Owner to the reasonable satisfaction of the Department and within a six (6)-month time period.

9. This Agreement shall be governed by and enforced in accordance with the laws of the State of Indiana. Litigation associated with or arising under this Agreement is allowed to be filed only in the state courts located in East Chicago, Lake County, Indiana.

All of which is agreed this _____ day of _____, 2023.

East Chicago Department of Water Works
By:_____
Title:_____

_____
_____
Owner

WG-7

INTRODUCTION

A Water Loss Control Audit program was utilized to be able to help the City of East Chicago, Indiana Water Works Department locate, understand and control the water losses in the distribution system. This was accomplished by using the standard AWWA Water Audit Spreadsheet (version 5) and Water Balance through distinct tasks as outlined. The Audit was able to help determine probable areas of water loss and allowed for a review of water department practices for water accounting. It is especially important to be able to locate areas of water loss in the system including potential leakage, potential inaccurate meters, as well as potential issues with the accounting and billing departments by utilizing an audit.

WATER LOSS CONTROL SURVEY-AUDIT APPROACH

The **Water Loss Control Survey/Audit** program is a multi-phase plan encompassing a selected group of services designed to assist the *Utility* in improving water accountability and optimizing the distribution system's operational performance. The program was structured around the utility's specific needs so that the results can help optimize a structured water loss reduction program.

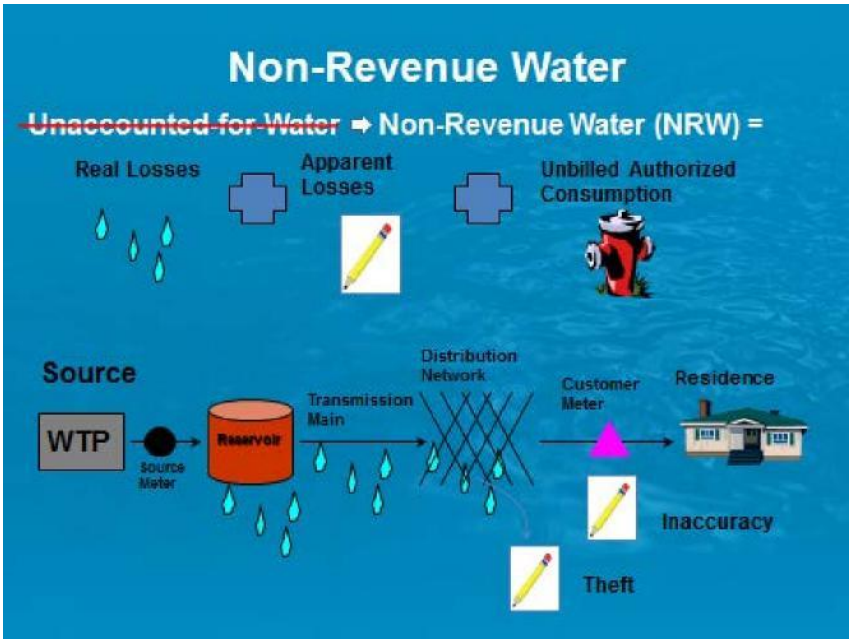
The AWWA Water Audit Format was used to track the finished water amounts from the purchased water source through the uses of water, metered, unmetered, and potential leakage in the distribution system, into the customer properties. This component analysis allowed for the various segments of water use to be examined based on available data supplied by the utility. The desired end results were to uncover potential areas of water loss that can be mitigated in the short term but also provide some long range planning goals to be set for sustainability. In simple terms, water loss occurs in two ways. It is either not measured correctly via the metering and billing process, (hence the water is not really lost, it simply was not correctly accounted for), or it leaked out of the system somewhere between the source of entry into the distribution system, to the customer's meter or service.

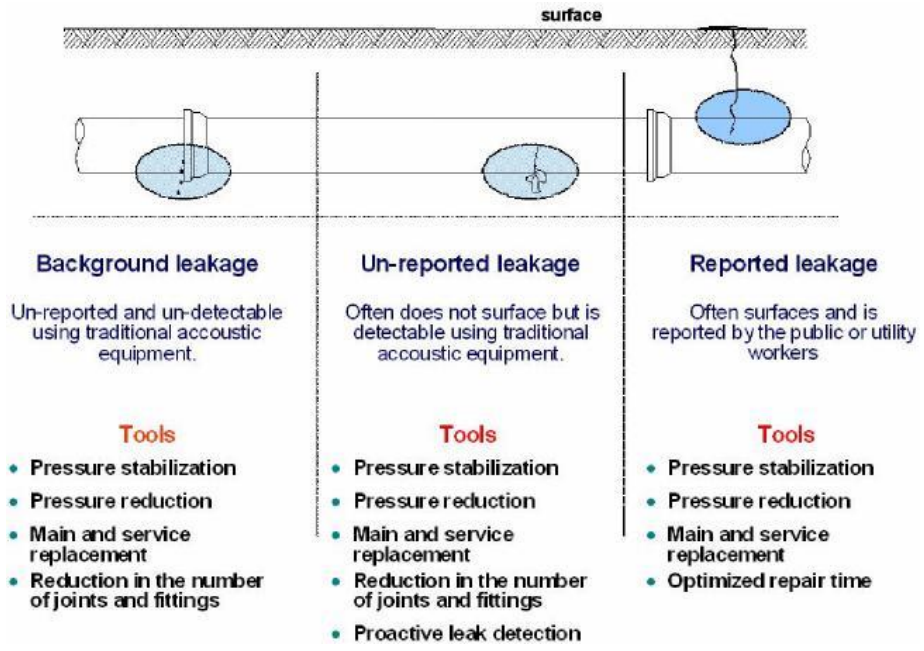
As shown in the IWA/AWWA Water Balance below, all water entering a water distribution system can be accounted for as it flows through the distribution system to customers. The most meaningful information developed from a water audit is quantity (gallons) of water loss components (apparent and real) shown in the Water Balance and the monetary value of these components. Consequently, water systems can assess the effectiveness of existing water loss management efforts, evaluate the potential for improved performance, and prioritize activities specifically designed to address deficiencies.

<table>
<tr><td rowspan="10">Water from Own Sources (corrected for known errors)</td><td rowspan="11">System Input Volume</td><td rowspan="2">Water Exported</td><td rowspan="3">Authorized Consumption</td><td rowspan="3">Billed Authorized Consumption</td><td>Billed Water Exported</td><td rowspan="3">Revenue Water</td></tr>
<tr><td rowspan="9">Water Supplied</td><td>Billed Metered Consumption</td></tr>
<tr><td>Billed Unmetered Consumption</td></tr>
<tr><td rowspan="2">Unbilled Authorized Consumption</td><td>Unbilled Metered Consumption (3.2.2.1)</td><td rowspan="8">Non-Revenue Water (NRW)</td></tr>
<tr><td>Unbilled Unmetered Consumption (3.2.2.2)</td></tr>
<tr><td rowspan="6">Water Losses</td><td rowspan="3">Apparent Losses</td><td>Unauthorized Consumption</td></tr>
<tr><td>Customer Metering Inaccuracies</td></tr>
<tr><td>Systematic Data Handling Errors</td></tr>
<tr><td rowspan="3">Real Losses</td><td>Leakage on Transmission and Distribution Mains</td></tr>
<tr><td>Leakage and Overflows at Utility's Storage Tanks</td></tr>
<tr><td>Leakage on Service Connections up to point of Customer metering</td></tr>
<tr><td>Water Imported</td></tr>
</table>

The idea is to move from **left to right** as one progresses through the audit process. As shown by the water balance, all water can be accounted for, even the loses. Once the losses are identified, steps can be taken to mitigate those losses.

SOURCES OF WATER LOSSES





OUTLINE OF WORK

The following tasks were conducted.

- **Gather data and information about the system**
- **Determine System Input**
- **Determine Authorized Consumption**
- **Determination of Apparent Loss**
- **Determination of Real Losses**
- **Calculate Operational Indicators**
  -Conclusions
- **Provide Recommendations for Water Loss Control Initiatives**

In the course of performing the audit, data was input into the Water Audit Spreadsheet (Version 5) in a specific order similar to the outline above. As the spreadsheet was filled out, data was then analyzed segment by segment. Initially the spreadsheet was filled out using data supplied by the City of East Chicago. As the data was researched and validated, the spreadsheet was amended. Once the data had been input and verified, grading scores were applied to each data entry based on the integrity of the data per the Grading Matrix contained in the AWWA audit software. Those grading scores were then added, using a weighted scale, to create what is known as the Validity Score.

Data Validity Grades are a way of providing a check on how robust the data used in the audit is. The grade provides a way to check particular conditions of individual data entries and in the end helps provide a basis for suggested improvements. At each data entry point this score is input based on scaling, *defined for each individual component* of the Audit Spreadsheet. An example is illustrated below. Each data input has its own Grading criteria on a scale of 1-10 and the score is derived by completing the Interactive Data Grading questionnaire for each data input in the audit.

Volume from Own Sources:	n	g	5	3,468.414	MG/Yr
Water Imported:	n	g	n/a	0.000	MG/Yr
Water Exported:	n	g	n/a	0.000	MG/Yr

East Chicago Water Works — AWWA Free Water Audit Software: Interactive Data Grading — acronym key

2021

VOS | VOSEA | WI | WIEA | WE | WEEA | BMAC | BUAC | UMAC | UUAC

SDHE | CMI | UC | Lm | Nc | Lp | AOP | CRUC | VPC

White = incomplete
Orange = complete
Use acronyms for navigation

Limiting criteria (see Start Page for details)

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go to input — Volume from Own Sources (VOS) - Data Grading Criteria — go to notes

vos	Criteria Question	Select Best-Fit Answers to All Visible Questions	
vos.0	Did the water utility supply any water from its own sources during the audit year?	Yes	
vos.1	What percent of own supply volume is metered?	>99%	
	For questions 2-10 below: Choose the answer that applies for those meters that measure >99% of the finished water volume. **In-situ flow accuracy testing** = a test process that confirms the flow measuring accuracy of the primary device (the flowmeter), in its installed location, using an independent reference volume. **Electronic calibration** = a process that checks for error in the metering secondary device(s) and/or the tertiary device(s). **Secondary device** can include conversion to mA, meter transmitter or similar instrumentation. **Tertiary device** can include SCADA, historian or other computerized archival system.		
vos.2	What is the frequency of electronic calibration?	Annually	
vos.3	What level of data transfer errors are checked as part of the electronic calibration process?	Data transfer errors are checked at secondary device(s) AND tertiary device(s)	
vos.4	Is the most recent electronic calibration documentation available for review?	No	Limiting
vos.5	What is the frequency of in-situ flow accuracy testing?	Less than annual but within last 5 years	
vos.6	Is the most recent in-situ flow accuracy testing documentation available for review?	No	Limiting
vos.7			
vos.8	Have testing and calibration procedures been closely scrutinized for compliance with procedures described in the AWWA M36 and/or M33 Manual(s)?	No	
vos.9	Which best describes the frequency of finished water meter readings?	Continuous	
vos.10	Which best describes the frequency of data review for anomalies/errors? These can include numbers that are outside of typical patterns, and zero or 'null' values that may reflect a gap in data recording.	Daily	
	FINAL DATA GRADE FOR THIS AUDIT INPUT:	5	

The data grade illustration above demonstrates how questions about each data input are used to define and derive the specific data grade based on the answers to each question. This takes the guesswork out of the data grade assignments.

GATHER DATA AND SYSTEM INFORMATION

Audit Questionnaire

At the start of the audit, a questionnaire was submitted to the Utility to collect and determine various points of data. Total water produced, amounts of water sold to all the water customers including; metered water, unmetered water, billed water and unbilled water, physical information on the water system such as miles of water main, numbers of water connections, operating costs of the water utility, etc. were collected. The goal was to get a feel for what information was available from the Utility and to get an idea of how water is recorded and eventually billed out to the water customers. This data was needed to determine how and where water was being used, if it was being accounted for, and/or billed for at each step of the way from production to consumption.

The questionnaire submitted by the audit team was filled out from East Chicago in an Excel sheet and it had addressed the vast majority of information requested. However, there were a few follow up questions that got asked and answered in order to get all the materials and information needed to complete the audit. In addition, the utility supplied past data from some previous years on water production, metered consumption, and other water uses. This data was used to check past trends and used as a type of “barometer” for the operations of the utility. In the end, the information gathered allowed for an overall analysis of how the utility was tracking water. The Audit spreadsheet was filled out according to the information provided. Information was cross checked from report to report, and spreadsheet to spreadsheet as a way to verify and test the information. Meter data was supplied in PDF files from reports.

In addition, East Chicago supplied their most recent IURC (Indiana Utility Regulatory Commission) annual report that contained the vast majority of the information needed to complete the audit. This report is filed annually with the IURC.

**If there are discrepancies that may be discovered at a future date, the Audit Spreadsheet can be updated and calculations will be automatically adjusted. Small adjustments will probably not have any major impact on the overall Performance Indicators for water losses, or the conclusions and recommendations for water loss reduction efforts. The audit is a “living document” and should be continuously updated annually.

DETERMINE SYSTEM INPUT

The first phase of the Water Loss Control Audit was to evaluate water production through the master water meters at each of the water treatment facilities to insure the input into the system has been accurately measured and documented. All water audits have to start with verification of the distribution system input to insure reliable water production amounts.

East Chicago surface water supply comes from Lake Michigan. The City does not export any water to other cities. East Chicago receives meter reads each day and the data is reviewed regularly.

Water Supply data for the selected audit period of January 1, 2021-December 31, 2021 were taken from the 2021 Indiana Utility Regulatory Commission (IURC) report supplied by East Chicago which contained combined monthly water produced at its two treatment facilities. This amount was included in the calculation of total Water Supplied (WS). East Chicago does not “export” water to other utilities so the exported amounts (WE) in the audit spreadsheet will be zero. After looking at the water production data from 2021, it was concluded the data was reliable with no issues with the data. Master Meter test data

for the audit period was not available for the meters for the year 2021. The city has a third party test the accuracy of all meters at the treatment facilities and finished water reservoir but 2021 data was not available so it was assumed the IURC data was reliable for water production. There will be no master meter error correction for the meter reads applied in the audit sheet. Minor adjustments for net tank level fluctuations for the storage tank during the audit year were also not tracked, and would likely not have a big impact on the audit results but will lower the Data Validity Grade for this data entry point. This will not have any major impact on the overall audit results.

Water Input into the Distribution System

The audit period is 2021 (January to December). From the water production data supplied in the IURC report the total Volume from Own Sources (VOS) input was **3,468.414** million gallons.

Master Meter Accuracy for Imported Water

An important aspect of the water introduced into the distribution system includes whether or not the production meters and/or wholesale meters are accurate. This is especially important when attempting to calculate water loss in the water system. If the finished water meters are inaccurate, then that inaccuracy will cause the end result of the audit to be inaccurate. That inaccuracy can be "telescoped" through the entire audit. In simple terms, *how you finish the audit is dependent on how you start*.

It is rare that any production or wholesale meter is 100% accurate. In the audit spreadsheet there is an adjustment for meter accuracy that is applied to the total finished water produced. There are "acceptable" limits to the accuracy level of water meters (such as 98.5%-101.5%), and AWWA has a table of suggested accuracy limits in the M6 manual for water meters for specific types and sizes of water meters. This accuracy limit however, is intended for customer meters (residential and commercial accounts) and does not always apply to production meters and wholesale flow meters. Production flow meters have no real defined accuracy limits per AWWA or any other regulatory agency. Some states are currently looking at defining rules for master meter accuracy limits but as of this report, nothing has been defined. It cannot be overstated that it is in the best interest for utilities to make sure the production flow meters are accurate for several reasons; the primary reason is that the entire water audit is based on the assumption that the water supplied amounts are accurate and can be relied on. Another reason includes proper chemical feed rates for water treatment.

3,468.414 million gallons is the 2021 totalized water from the finished water plant meters as stated above.

Water Imported and Water Exported

The City of East Chicago treats all of its water at two treatment facilities. There is a conventional rapid sand filtration plant that currently operates two days a week and, a membrane filtration plant that operates seven days per week. Meter accuracy testing of the import meters are conducted annually (records provided).

Water Supplied

Below is a copy of the Water Supplied area of the Audit showing the data inputs.

WATER SUPPLIED									Water Supplied Error Adjustments choose entry option:				
VOS	Volume from Own Sources:	n	g	5	3,468.414	MG/Yr	n	g	8	0.00%	percent
WI	Water Imported:	n	g	n/a	0.000	MG/Yr					
WE	Water Exported:	n	g	n/a	0.000	MG/Yr					
	WATER SUPPLIED:				3,468.414	MG/Yr					

In simple terms it is typical for a utility to look at water loss by of percentage losses.
Water pumped versus water sold equals water loss. This is an old way of looking at water loss.
Unmetered water use in this "old" case is not usually considered in the old calculations by most utilities.

DETERMINE AUTHORIZED CONSUMPTION

Traditionally there are four areas where water has been authorized to be used. The following is how water is normally consumed in a utility. This is taken from the AWWA Water Audit Format.

- Billed Metered Water
- Billed Unmetered Water
- Unbilled Metered Water
- Unbilled Unmetered Water

Billed Metered water is just that; water is metered during consumption and billed according to an approved rate structure. Per questionnaire submitted to the water staff, East Chicago meters all water use except a small amount of uses. Bills are generated based on approximately (**6,873** meters) taken from the IURC report. There were 5,373 residential, 1,132 commercial, 137 industrial and 231 public authorities. The IURC report also identified 3,009 meters are read by radio read, 1,500 manual read and 2,408 by touch pad. It should be noted this total is **6,917**, a difference of 44 additional meters.

The total for the Billed Metered is **2,492.158 MG**. This is the totalized amount of water that was billed by East Chicago for the 2021 Audit period. This figure does not include an adjustment for "lag time" billing.

"Lag time" is the time period between the time the production meters are read and the customer billing meters are read. For the purposes of the audit, the time periods for meter readings need to be aligned at the beginning of the audit year and again, at the end of the audit year. The residential, commercial and public meters are read monthly on the 15th of the month and industrial meters are read on the 23rd of the month. East Chicago uses radio reading, touch pad and manual reading systems. Based on data in the IURC report 44% are radio reads, 34% are touch pad and 22% are manual reads. In order to complete the lag time analysis there would need to be the December 2018 billed metered use and the January 2020 billed metered use which were not included in the IURC data.

A detailed review of meter reading data indicated East Chicago does a good job of record keeping for metering. All in all, the meter data was in extremely good shape and found to be very useful.

Billed Unmetered (BMAC) water is water that is billed for but not metered. Examples of this might include such uses as bulk sales to unmetered hydrant uses such as a landscaper, or the water use is estimated based on house size, or building size. East Chicago does not use this type of billing. Therefore, there was no consumption total to enter.

Unbilled Metered (UBAC) water use might include such items as water used by municipality such as the parks, municipal pools, utility buildings, fire departments where water use is metered, etc. but not billed. In East Chicago case there were no unbilled metered accounts.

Unbilled, Unmetered (UUAC) water use is sometimes hard to get estimates. Usually this area of water use that can be attributed to water main flushing, hydrant flushing, firefighting, or a number of other uses where the water is not metered or billed, but the use is authorized. Water utilities can use the "default" value of 1.25% of the Water Supplied that is allowed for this data input for the Water Audit, simply because tracking Unbilled, Unmetered water uses by estimates is hard to confirm unless there is a clear record of tracking by the utility. The default value is discussed below. The city did document estimated water use in this category at a slightly lower volume than the default value but the auditor chose to use the default.

Default Value Assignment

For the AWWA Water Audit, there is a default value that can be used for the area of Unbilled Unmetered water use. The default value percentage is .25% of the adjusted Water Supplied. The AWWA Water Audit Committee that composed the spreadsheet has set this particular default value based on input from data collected across the U.S. from several water utilities over several years. This estimated value comes to **6,230 MG** for 2021 for unmetered, unbilled use, other utility or municipal uses and other unmetered, unbilled but *authorized* activities.

Below is part of the Audit spreadsheet for the **Authorized Consumption** showing the categories where water was consumed.

AUTHORIZED CONSUMPTION								
BMAC	Billed Metered:	n	g	9	2,492.158	MG/Yr		
BUAC	Billed Unmetered:	n	g		0.000	MG/Yr		
UMAC	Unbilled Metered:	n	g		0.000	MG/Yr	choose entry option:	
UUAC	Unbilled Unmetered:	n	g	3	6.230	MG/Yr	0.25%	default
Default option selected for Unbilled Unmetered, with automatic data grading of 3								
	AUTHORIZED CONSUMPTION:				2,498.388	MG/Yr		

DETERMINATION OF WATER LOSS

By taking the *Water Supplied* and *subtracting* the *Authorized Consumption*, the total Water Loss can be determined. The Audit Spreadsheet for total water loss calculation is below.

WATER LOSSES	970.026	MG/Yr

These losses can now be further defined as "*Apparent losses*" (accounting or billing errors, meter inaccuracy, etc.) and "*Real losses*" (water lost to leakage on service lines or water mains).

DETERMINING APPARENT LOSS

Apparent losses comprise of three areas; Unauthorized use, Meter Inaccuracies, and Systematic Data Handling errors.

Apparent losses were determined by examining the data provided by the utility on authorized uses, examining possible *meter inaccuracies*, and identification of potential *data handling errors* for the above task of record review.

Unauthorized Consumption is a tough area to determine and requires some estimates to be made. However, reviewing customer service requests and reporting of open hydrants, et al, can usually help validate this information.

The International Utility Revenue Protection Agency estimates that most utilities lose 1% to 2% of their revenue to theft of water (per Neptune Meter Co.). For the audit, the default value from the

spreadsheet was used. It is set at **0.25% or 6.230 MG** for the audit year. This default value in the spreadsheet has been set up to be used when an actual estimate cannot be determined. The default value was based on the AWWA Water Loss Committee studies performed on theft and other unauthorized uses when the spreadsheet was being developed in the early years of 2001-2006. Typically, theft of water from the water system is not a huge loss, in terms of both actual amounts of water or revenue, unless an illegal tap is located. The utility has a good policy for operations staff to monitor potential theft.

Meter Inaccuracies

Customer metering inaccuracies are a source of Apparent Loss. The water "lost" due to Apparent Loss is not really lost, just the ability to measure consumption properly has been compromised by inaccurate meters. East Chicago has about 6,873 active metered accounts per the meter inventory listed in the IURC report for 2021.

Meters are generally not 100% accurate throughout a water system. Given the acceptable ranges of meter accuracy for 5/8" displacement meters are 95%-101% for low flows (1/4 gpm), 98.5% - 101.5% for intermediate (2 gpm) and high flows (15 gpm), there is a strong likelihood of some water loss occurring as a result of meter inaccuracy. Other sizes will exhibit similar issues. The data East Chicago supplied for the metered customers did not include any install dates so water use by age of meter could not be evaluated.

Meter Testing Activity

M.E. Simpson Co., Inc. performed approximately 97 residential meter tests during 2021. No large meters were tested. The small meter sample tested will not give an adequate sample size to make any determination on overall meter accuracy for the total meter population. The Audit team will need to rely on other studies for the derivation of overall meter accuracy estimates for the City.

The audit team also reviewed the Water Research Foundation report "Accuracy of In-Service Water Meters at Low and High Rates" conducted by the Utah State University Water Research Laboratory that studied the decline of meter accuracy based on several factors. This research was completed on water meters 5/8-inch to 2-inch in size and included the brand and type of meters in the utility's system. The audit team considered the findings in this Utah State report to estimate the potential water lost to inaccuracy based on these meter sizes and age to determine a level of meter inaccuracy to apply to the overall meter population.

For meter inaccuracy, the auditor has the option to input a percentage of overall meter under-registration for the entire meter population or input a calculated volume figure. The results of our review and analysis of the percentage accuracy in the tested, repaired and replaced meters based on the average accuracy were reviewed and compared to other audits conducted in other utilities by the audit team showed similar traits in overall meter degradation by age.

Apparent Loss due to Meter Under-Registration

The audit team feels that it is likely that the overall meter accuracy may very well be in the 95% range or possibly lower, but we chose to use the **95% accuracy level** (5.0% under registration) in this audit. A continual testing and analysis of the accuracies of the meters will aid in tightening up the loss due to meter under-registration. A more in-depth analysis of the historical metered use of all 2-inch and larger commercial, industrial and municipal meters will aid in selection of annual meter accuracy testing.

In addition, consideration was given to the conclusions of the study by Utah State on displacement residential meter inaccuracies whereby the study suggests that lower flow registrations are compromised for mechanical meters, even with new meters, not to mention age degradation. An analysis of the test results from any in-house meter testing could provide good data validation for this area for the residential meters.

The validity scores for the customer metering inaccuracies and possible improvements were set at 5 based on the definitions for the grading scale for this area. The percentage of inaccuracy was set at 5**%.** The volume loss associated with this inaccuracy is **131.166 MG**

Systematic Data Handling Errors

The utility currently uses radio read, manual and touch pad read system with meters read by the utility and compiled for the billing office. Meter reading and usage reports are run and analyzed by utility personnel to catch any anomalies that may be occurring and addresses them when located.

For the systematic data handling error area, the default value was assigned because in most billing and accounting systems that employ AMR/AMI systems, the systems cannot always detect and track errors quickly and get them fixed before the errors get transferred into the customer's bills. Usually AMR/AMI systems are trouble free to a certain degree but there has not been any major work done by the AWWA Water Loss Control Committee to define how the Systematic Data Errors can be tracked. Therefore the audit team chose to use the default value for this data entry. The default value is a value based on the experiences of the AWWA Water Loss Software Committee's where **¼ of 1% error** may occur in the reading/billing cycles. East Chicago may certainly be more/less than that but this is an area that would be difficult to document. The volume loss associated with systematic data handling errors is **6.230 MG**.

The total for the **Apparent Losses** are shown below. **143.627 MG** per year can be attributed to unauthorized uses, metering inaccuracies and systematic data handling issues using the default values and the metering inaccuracy levels.

Apparent Losses

Default option selected for Systematic Data Handling Errors, with automatic data grading of 3

								choose entry option:	
SDHE	Systematic Data Handling Errors:	n	g	3	6.230	MG/Yr		0.25%	default
CMI	Customer Metering Inaccuracies:	n	g	3	131.166	MG/Yr		5.00%	percent
UC	Unauthorized Consumption:	n	g	3	6.230	MG/Yr		0.25%	default

Default option selected for Unauthorized Consumption, with automatic data grading of 3

Apparent Losses: 143.627 MG/Yr

DETERMINATION OF REAL LOSSES

The determination of Real losses (losses attributed to leakage) was attained by input of all the water supplied, consumption data, and estimated apparent losses into the water audit spreadsheet. The Real loss amounts are obtained by subtracting the Apparent Losses from the Total Losses to yield Real Losses. Real losses are defined as water lost to actual leakage.

Real Losses

Real Losses: 826.399 MG/Yr

This Real loss calculation of **826.399 MG** per year can be averaged to a daily loss of 2**,264,106** gallons per day or about **1,572.29** gallons per minute over the entire distribution system.

It must be mentioned East Chicago had some major leaks and main breaks during the early 2021 year and the several leaks were located during a leak detection program that never surfaced.

DETERMINATION OF NON-REVENUE WATER

In a water system, the utility makes money on the water it supplies and sells to water customers but it does not make money on lost water, either Apparent losses and/or Real losses. Additionally, the Unmetered Unbilled and Unbilled Metered water uses, although classified as an Authorized use, does not generate revenue.

The total amount of Non-Revenue water was calculated based on *Total Water Loss* added to the *Unbilled Metered* and *Unbilled Unmetered* water and is **976.256 MG**.

NON-REVENUE WATER

NON-REVENUE WATER:	976.256	MG/Yr	

SYSTEM DATA

Physical Parameters of the water system

In order to be able to calculate the *Performance Indicators* for the water system, certain key information is needed about the water distribution system. Such needed information includes miles of water main, average operating pressure of the system, average overall length of service connections (from the customer service valve to the water meter) and number of active and inactive connections. This information was part of the Audit questionnaire given to East Chicago at the beginning of the audit. The data was also cross checked with the data sheets and spreadsheets supplied. These figures were input into the Audit sheet. *The data provide was **very detailed** and complete.*

SYSTEM DATA

Lm	Length of mains:	n	g	6	90.0	miles	(including fire hydrant lead lengths)
Nc	Number of service connections:	n	g	8	6,873		(active *and* inactive)
	Service connection density:				76	conn./mile main	
	Are customer meters typically located at the curbstop/property line?				No		
Lp	Average length of (private) customer service line:	n	g	6	50.0	ft	(average distance between property line and meter)
AOP	Average Operating Pressure:	n	g	5	70.0	psi	

Length of Water Mains
The overall length of mains included hydrant leads and small mains totaling **90.0 miles**.

Number of Connections:
The number reported is **6,873**. Documetation for inactive accouts and unmetered fire lines could not be determined for this audit.

Average Service line lengths:
The length of the customer service line was an estimate by the utility. The figure of **50 feet** from the curb shut off to the meter was selected because that is what East Chicago staff estimates based on observations in the field, averaging the residential line lengths with the larger commercial line lengths

Average Operating Pressure (PSI) was asked for in the Audit Questionnaire. The average given **(70 psi)** was an average derived from discussions with the Engineer and the Audit Team.

Cost data was also input into the spreadsheet. The overall cost of operating the water system was derived for the audit year based on figures in the IURC report and entered into the data field, customer retail costs were as listed on the City website and input into the data field, along with the marginal cost of water (variable production costs, the figures East Chicago provided for electrical and chemical costs), were given and entered so Performance Indicators could be calculated.

Annual cost to operate the water system

The cost to operate the water system was obtained from the 2021 data provided by the utility and confirmed with the IURC Annual Report. This amount represents the total cost to operate the water system. That amount was **$4,548,974** for the audit year. In the older version of the Audit spreadsheet this entry was required. For the new version of the audit (V6) this is no longer required but is included as an optional entry.

Customer Retail Unit Cost of Water

The customer retail unit cost of $1.74 per 1,000 gallons was applied here. It was calculated by averaging the four rates in the declining rate structure listed on the City website and looking at the IURC data for 2021.

Variable Production Costs

The variable Production Cost was taken from the Annual Report that East Chicago provided for Chemical, Electrical and other costs. That figure is **$1,395.56** per million gallons of water.

COST DATA

CRUC	Customer Retail Unit Charge:	n	g	7	$1.74	$/1000 gallons (US)	Total Annual Operating Cost
VPC	Variable Production Cost:	n	g	10	$1,395.56	$/Million gallons	$4,548,974 $/yr (optional input)

The purpose of putting these costs together is so that performance indicators can be derived showing the cost of the specific areas of loss.

Data Validity Grades were set according to the Grading Matrix from the audit software for all 20 of the data inputs, from the Water Supplied area, all the way to the Cost section. The criteria for assignment of the grading scores is set by definition so that the Utility can have the data "validated" with the end aim of using the grades as a tool for self-improvement.

DETERMINATION OF PERFORMANCE INDICATORS

The "Dashboard" tab of the FWAS V6 contains the quantification and analysis of the Performance Indicators for the water system. This is where the Non-Revenue Water Components Summary is illustrated along with the Key Performance Indicators displayed in five graphs showing losses quantified in Total losses and Unit Losses.

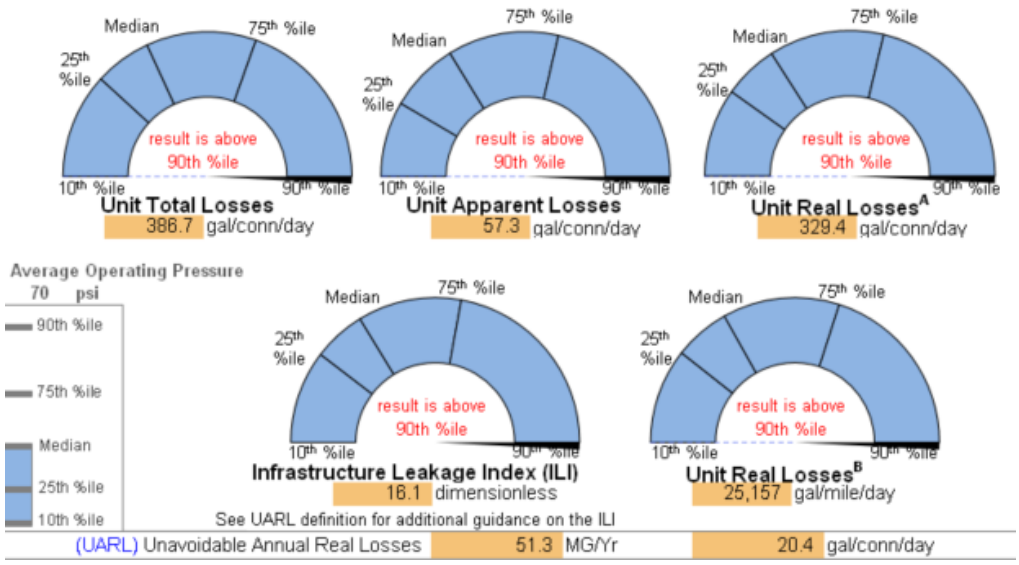
The Non-Revenue Water (NRW) Summary is shown below.

	Volume MG/Yr	Value $/Yr	Basis of Valuation
Apparent Losses	143.6	$249,336	CRUC
Real Losses	826.4	$1,153,289	VPC
Unbilled Authorized Cons	6.2	$8,695	VPC
Non-Revenue Water	976.3	$1,411,320	Blended

This specific breakdown of costs will help with targeting specific remediation measures that will be discussed further. However, a quick look indicates that Real Losses (leaks) are costing the utility **$1,153,289** annually (**Variable Costs**), and Apparent Losses (metering/accounting and billing issues) are costing the utility **$249,336** annually.

The **Operational Efficiency Indicators** offer a perspective of looking at the losses in terms of metrics. This is a way of "normalizing" the losses so that these metrics are equal for each water system that conducts an audit. The Apparent losses per connection per day indicate what level of metering and billing recovery is possible over the spectrum of the water system. The same can be applied to Real losses for leakage.

The Apparent and Real loss unit is based on the number of connections and not the number of meters.



A calculation is then made based on the physical parameters of the system for the **Unavoidable leakage**. This unavoidable leakage will be leaks that every water system will have despite all efforts to stop the leaks. The **Unavoidable Annual Real Losses** (**UARL**) is a theoretical number defined as the technical low limit of leakage that could be achieved if all available leakage technology were to be applied to the distribution system to stop leakage, based on the baseline data of the system.

The math used to determine the UARL is indicted below.

UARL (gallons/day) = (5.41Lm + 0.15Nc + 7.5Lc) x P

Where:

Lm = length of mains (miles)
Nc = number of service connections
Lc = total length of customer service lines (miles or km) or
= Nc multiplied by the average distance of customer service line, Lp (miles)
P = Pressure (psi)

By taking the calculated Real losses for the year (Current Annual Real Losses or CARL) and dividing that by the Unavoidable Annual Real Losses (UARL), a ratio is calculated called the **Infrastructure Leakage Index** or **ILI**. The **ILI** is a Benchmarking indicator that indicates the performance of the Utility for water loss, taking into account all of the variables that need to be accounted for as stated above in the UARL math.

The ILI for East Chicago is 16.1.

The ILI can be used to help determine what Real losses the Utility has that are truly recoverable if an aggressive leak detection and leak prevention program were applied to the system.

CONCLUSIONS

Overall the audit was able to demonstrate that East Chicago does a good job on the vast majority of its record keeping and water loss control efforts. The important audit details were able to be considered based on the completeness of the data needed for the audit compiled by the utility. Since the Audit is a "living document", as new information is obtained, the utility stands to reap good results for the audit process.

The metered consumption data was detailed and allowed a fairly thorough overview of how East Chicago receives its metered consumption numbers. The distribution system data was taken from the IURC Annual Reports and audit questionnaire answers generated from the water utility. The Audit team also made use of staff calls and data requests to confirm many of the characteristics of the system.

The age of the meters could not be determined based on the data supplied for the audit and may be worthwhile to conduct a deeper review of the 5/8-inch to 1-1/2-inch meters for accuracy. It should be noted that the City website lists a document that states the city was replacing approximately 6,936 meters with new radio frequency meters and install a new AMI system to automatically collect and transmit meter reading data. The estimated completion date was 2018. The IURC report for 2021 shows 1,500 meters read manually and 2,408 read with a touch pad. There were 3,009 meters that were shown as radio read.

System input

East Chicago imports all its water from Lake Michigan. The IURC report identified two water treatment facilities, one conventional rapid sand filtration and one membrane plant. The city stated the conventional plant only operates two days a week. This report also identifies four high service pumps. All pumps are vertical turbine pumps. East Chicago contracts with a third party meter testing company to performed flow tests for the meters annually.

The **VOS** meter accuracy used for the Meter Error adjustment (MMEA) was **0.00%** based on the combined pre-calibration flow tests. Based on the data provided for this task and the results of our analysis the Data Validity Score for this input was seven (7).

Authorized Consumption

Water purchased by the water customers account for **2,492.158 MG** per year as metered and billed.

Billed Metered Consumption

The figures for the billed metered consumption were obtained from the IURC 2021 report. East Chicago uses the MUNIS ERP meter reporting system to record, track and calculate the customer's water use. Numerous reports were sent to MESCO in PDF format from the MUNIS system for each class of user. The records appear to be in good order.

MESCO was not able to complete a meter reading lag analysis due to just 12 months of customer data being supplied. Since the residential, commercial and public authority meters are read generally on the 15th of the month and the industrial meters are read generally on the 23rd of the month there will be metered use in January 2021 that actually occurred in December 2020. The lag analysis calculates the water use that should be in the January 2021 summary and also the water use in December 2021 that is partially in the January 2022 summary. In order to complete this

analysis 14 months of water use data by customer class will need to be provided for next year's audit

Based on the data provided for this task and the results of our analysis and the Interactive Data Grading Tool, the Data Validity Score for this input was nine (9).

Billed Unmetered
There are no accounts that are Billed Unmetered.

Unbilled Metered
There are no accounts that are Unbilled Unmetered.

Unbilled Unmetered (UUAC)
The amount entered was **6.230 MG/Yr.** because the default .25% value option was chosen. In the response from the Utility back to the audit team they mentioned fire hydrants are flushed each year but there was no documentation for flow rates and time of flushing were supplied. The Audit Team usually finds fire department uses not well documented.

The default Data Validity Score for this input was three (3).

Water Losses
The total losses calculated out to be **970.026 MG** for the year. This appears to account for **28.03%** of the total water produced per the IURC report (pp 51).

We caution East Chicago that percentage indicators are often taken the wrong way as indicators of water loss, hence the breakout of Apparent and Real Losses by volumes and costs. Given that the Infrastructure leakage Index **(ILI) is a 16.1** there are some areas to tighten up for water loss; however there are constraints on the system that will limit what can be accomplished and will be discussed as part of the Performance Indicators.

Apparent Losses
Water purchased by water customers' account for **2,557.575 MG** per year. The volume of unrecorded water use based on a 5% under-registration of customer meters is **134.609 MG**. However there may be more apparent loss occurring than what is perceived. A customer meter accuracy testing program would aid in determining the level of under-registration occurring in the customer meters. The total volume of apparent loss is **150.464 MG.**

The Data Validity Score for this input was five (5).

Real losses were calculated to be **826.399 MG**. This can be further broken down to **2,264,107 GPD** or about **1,572.3 gpm** over the entire distribution system. The ratio of Current Annual Real Loss (CARL) to the Unavoidable Annual Real Loss (UARL) is Infrastructure Leakage Index (ILI). The ILI is **16.1** meaning the current level of leakage is approximately **16 times the UARL**. The calculated Unavoidable Annual Leakage Losses (UARL) are **51.3 MG**, that, in spite of a leak detection program, that **51.3 MG** will not easily be found, but the rest of the **775.099 MG** per year *could possibly be located* and recovered depending on the aggressiveness of the leak detection program.

Again, it must be noted the city had several major undiscovered leaks that were located during a leak detection survey.

Not all infrastructures meet the stringent assumed data criteria in the UARL calculation. Different systems have varying characteristics including age, makeup of pipe material and fittings, and pressure variability. To address this there is a factor called the Infrastructure Correct Factor (ICF) that modifies the UARL to a more realistic figure for the East Chicago system, basically increasing the UARL figure which will also reduce the calculated ILI. This method is defined in the current AWWA M36 Manual of Water Audits and Loss Control Program.

Performance Indicators

The bottom line is that **28.3%** of the water is Non-Revenue Water. That accounts for **$1,411,329** of loss. Below identifies the cost breakdown for East Chicago.

	Volume MG/Yr	Value $/Yr	Basis of Valuation
Apparent Losses	143.6	$249,336	CRUC
Real Losses	826.4	$1,153,289	VPC
Unbilled Authorized Cons	6.2	$8,695	VPC
Non-Revenue Water	976.3	$1,411,320	Blended

With the Calculated ILI (Infrastructure Leakage Index) at 16.1, East Chicago is operating in what could be considered a workable position even with what appears to be the loss issues it faces from meter inaccuracies and leakage. There are several issues with some of the data that when clarified that will more than likely reduce the ILI once these data are refined.

The above statement may seem hard to grasp, given that about 28.3**%** of the water pumped is Non-Revenue Water. The Real loss (*leakage*) accounts for about 84.6*%* of the total loss and the Apparent loss (*meter issues*) accounts for about 15.3*%* of the total loss. Reviewing the Loss Control Planning tab in the AWWA Water Audit Software the five areas of consideration based on the DVG totals of 60, tier range III, are shown below.

Water Loss Control Planning Guide

	Water Audit Data Validity Tier (Score Range)				
Functional Focus Area	**Tier I (1-25)**	**Tier II (26-50)**	**Tier III (51-70)**	**Tier IV (71-90)**	**Tier V (91-100)**
Audit Data Collection	Launch auditing and loss control team; address supply metering deficiencies	Analyze business process for customer metering and billing functions and water supply operations; Identify data gaps; improve supply metering	Establish/revise policies and procedures for data collection	Refine data collection practices and establish as routine business process	Annual water audit is a reliable gauge of year-to-year water efficiency standing
Short-term loss control	Research information on leak detection programs; Begin flowcharting analysis of customer billing system	Conduct loss assessment investigations on a sample portion of the system: customer meter testing, leak survey, unauthorized consumption, etc	Establish ongoing mechanisms for customer meter accuracy testing, active leakage control and infrastructure monitoring	Refine, enhance or expand ongoing programs based upon economic justification	Stay abreast of improvements in metering, meter reading, billing, leakage management and infrastructure rehabilitation
Long-term loss control		Begin to assess long-term needs requiring large expenditure: customer meter replacement, water main replacement program, new customer billing system or AMR/AMI system	Begin to assemble economic business case for long-term needs based upon improved data becoming available through the water audit process	Conduct detailed planning, budgeting and launch of comprehensive improvements for metering, billing or infrastructure management	Continue incremental improvements in short-term and long-term loss control interventions
Target-setting			Establish long-term apparent and real loss reduction goals (+10 year horizon)	Establish mid-range (5 year horizon) apparent and real loss reduction goals	Evaluate and refine loss control goals on a yearly basis
Benchmarking			Preliminary Comparisons - can begin to rely upon with PIs for performance comparisons for real losses	Performance Benchmarking with PIs is meaningful in comparing real loss standing	Identify Best Practices/ Best in class; PIs are very reliable as real loss performance indicators for best in class service

RECOVERABLE LOSSES

Apparent Loss Recovery

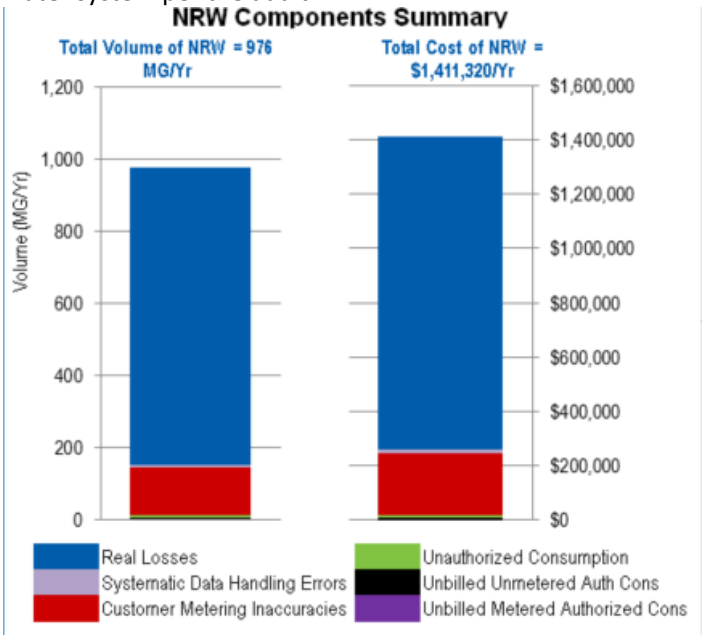
The current cost of loss for the metering inaccuracies, possible theft of water, and possible data handling errors is **$249,336**. There is no way to establish or calculate a level of Unavoidable Apparent Loss (Apparent Losses that exist despite any/all efforts to eradicate), as all water meters have accuracy thresholds that need to be met before water is accurately recorded as it is being used. In addition, no theoretical Unavoidable Annual Apparent Loss level has been established by the AWWA Water Loss Committee in a similar fashion as the Unavoidable Annual Real Loss level that has been set (per the audit software). However based on the observance of some of the meter testing reviews and discussions about the residential metering degradation from age and throughput, there may be areas that losses can be recovered. The volume and cost side of the potential recoverable Apparent Losses therefore, will be made based on the Audit team's observations with the data and analysis made. Suggestions for improvements in the metering system area will be made under "Recommendations".

Real Loss (Leakage) Recovery

The current leakage is costing the utility **$1,153,289** annually per the spreadsheet, based on Variable Production Costs (as stated earlier). If the Unavoidable Annual Real Losses (UARL) of 51.3 MG is subtracted from the Current Annual Real Losses (CARL) of 826.4 MG, then the potentially recoverable leakage losses are **775.1 MG annually** or **$1,081,698 annually**, based on Variable Production Costs as applied to leakage.

Is this realistic? Probably, but one has to consider the cost to facilitate leakage repairs is not part of this figure. However, if the utility uses the **Retail Rate** applied to leakage, then the picture changes a bit. The Audit Team cautions East Chicago that this use of the Retail Rate applied to leakage is **not** a common practice because the return on investment is limited. The utility will need to weigh out the alternatives carefully.

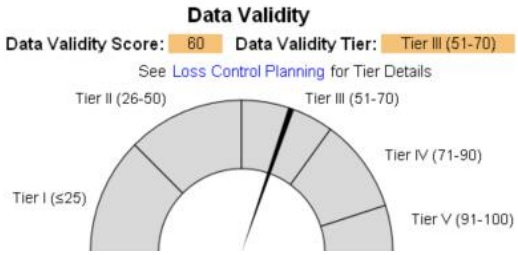
The Dashboard part of the audit software gives a great view of the operational conditions of the water system per the audit



The volume chart clearly demonstrates the spread of the losses by volume.

VALIDATION SCORE

This score is the total of the scores assigned to each component of the audit to describe the confidence and accuracy of the data input into the system. The assignment of validity scores was based on experiences with other water systems and knowledge of how the Audit format works as well as using the guidelines set in the Audit format Grading Matrix. For each component, there is a corresponding listing in the Grading Matrix (supplied in the Excel Water Audit Software).



The Audit validation score is **60 out of 100**. From the AWWA Water Loss Control Committee individuals involved with the development of the Water Audit Software Spreadsheet, it is rare that a validity score of over 90 (Tier Level 5) is ever achieved. In fact, one of the authors of the spreadsheet and of the M36 manual on Water Loss control commented at an AWWA Water Loss Committee meeting that if he were to see a score over 90 he would doubt the "validity" of the validity score. To get that high of a score, the water system would need to be up to date, robust, and qualify as a "world class water system" with all the latest technology applied for water loss control. The quality and depth of the data East Chicago supplied for this audit was very extensive which contributed to this high score. All the import meters had been tested for accuracy, the compound meters had comparative meter accuracy tests completed, and the City has completed a leak detection study for the entire distribution system.

WATER BALANCE

Below, is the completed Water Balance for the audit. This Balance sheet shows the components where water uses and losses can be traced through the system.

AWWA Free Water Audit Software
Water Balance

Water Audit Report for: East Chicago Water Works
Audit Year: 2021 Jan 01 2021 - Dec 31 2021
Data Validity Tier: Tier III (51-70)

FWAS v6.0
American Water Works Association. Copyright ©2020, All Rights Reserved.

		Water Exported (WE) (corrected for known errors) 0.000	Billed Water Exported			Revenue Water (Exported) 0.000
Volume from Own Sources (VOS) (corrected for known errors) 3,468.414	System Input Volume 3,468.414	Water Supplied 3,468.414	Authorized Consumption 2,498.388	Billed Authorized Consumption 2,492.158	Billed Metered Consumption (BMAC) (water exported is removed) 2,492.158	Revenue Water 2,492.158
					Billed Unmetered Consumption (BUAC) 0.000	
				Unbilled Authorized Consumption 6.230	Unbilled Metered Consumption (UMAC) 0.000	Non-Revenue Water (NRW) 976.256
					Unbilled Unmetered Consumption (UUAC) 6.230	
			Water Losses 970.026	Apparent Losses 143.627	Systematic Data Handling Errors (SDHE) 6.230	
					Customer Metering Inaccuracies (CMI) 131.166	
					Unauthorized Consumption (UC) 6.230	
Water Imported (WI) (corrected for known errors) 0.000				Real Losses 826.399	Leakage on Transmission and/or Distribution Mains Not broken down	
					Leakage and Overflows at Utility's Storage Tanks Not broken down	
					Leakage on Service Connections Not broken down	

Move from left to right to trace water through the system Water Balance.

RECOMMENDATIONS FOR ECONOMICALLY VIABLE WATER LOSS INTERVENTION PROGRAMS

The AWWA Audit Spreadsheet has "built in" generalized suggestions of system improvements based on the Data Validity Tier Level,

Water Loss Control Planning Guide

Functional Focus Area	Water Audit Data Validity Tier (Score Range)				
	Tier I (1-25)	Tier II (26-50)	Tier III (51-70)	Tier IV (71-90)	Tier V (91-100)
Audit Data Collection	Launch auditing and loss control team; address supply metering deficiencies	Analyze business process for customer metering and billing functions and water supply operations; Identify data gaps; improve supply metering	Establish/revise policies and procedures for data collection	Refine data collection practices and establish as routine business process	Annual water audit is a reliable gauge of year-to-year water efficiency standing
Short-term loss control	Research information on leak detection programs; Begin flowcharting analysis of customer billing system	Conduct loss assessment investigations on a sample portion of the system: customer meter testing, leak survey, unauthorized consumption, etc	Establish ongoing mechanisms for customer meter accuracy testing, active leakage control and infrastructure monitoring	Refine, enhance or expand ongoing programs based upon economic justification	Stay abreast of improvements in metering, meter reading, billing, leakage management and infrastructure rehabilitation
Long-term loss control		Begin to assess long-term needs requiring large expenditure: customer meter replacement, water main replacement program, new customer billing system or AMR/AMI system	Begin to assemble economic business case for long-term needs based upon improved data becoming available through the water audit process	Conduct detailed planning, budgeting and launch of comprehensive improvements for metering, billing or infrastructure management	Continue incremental improvements in short-term and long-term loss control interventions
Target-setting			Establish long-term apparent and real loss reduction goals (+10 year horizon)	Establish mid-range (5 year horizon) apparent and real loss reduction goals	Evaluate and refine loss control goals on a yearly basis
Benchmarking			Preliminary Comparisons - can begin to rely upon with PIs for performance comparisons for real losses	Performance Benchmarking with PIs is meaningful in comparing real loss standing	Identify Best Practices/ Best in class; PIs are very reliable as real loss performance indicators for best in class service

The Water Audit Validity Level/Score range that East Chicago is in (see below) is reflected in some general recommendations made by the Audit Software.

Audit Data Collection – Establish data collection practices…

Short Tem Controls – Establish meter testing, leak detection, and plant meter testing with infrastructure monitoring

Long Term Controls – Assemble Business case for long term needs

Target Setting – Establish long term goals for Real and Apparent loss reduction…

Benchmarking – Performance Benchmarking, begin to use preliminary results for comparisons.

Since the ILI is a 16.1, per the above table, water resources are plentiful since East Chicago uses surface water from Lake Michigan. The ongoing program for large meter testing and repair and small meter replacement along with the annual leak detection program and main replacements should aid in lowering the current ILI.

Some of these recommendations are also part of Project Team's prioritized set of recommendations on cost effective ways to continue to identify and remediate Apparent and Real Losses. Please keep in mind these are generalized recommendations based on the DVG's for each data entry and the weighted total of the overall Validity score. The individual recommendations for East Chicago take into consideration the above recommendations, but also include the Audit Team's observations of audits from other water utilities that had similar issues.

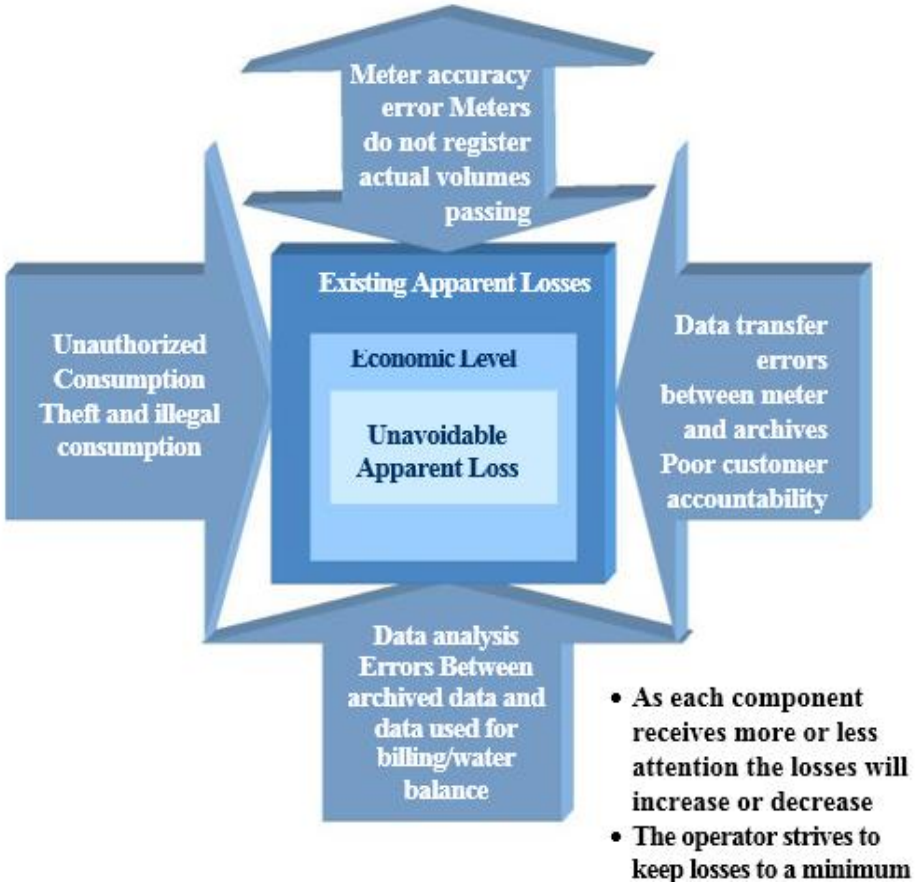
RECOMMENDATIONS

Water Supplied

The first area of loss recovery is about making sure the total system input of water is accurately metered. The master meters at each treatment facility for East Chicago are very important for the utility and water measured at these system input locations need to be measured correctly. This area of water supplied has the *biggest overall impact* on the results of the audit. Therefore, the utility should test and calibrate the meters annually and apply any errors identified to the volumes from each meter. The Data Validity Grade for the VOS is high for this area but still has room for improvement. While East Chicago is not under any state mandate for production meter testing, the production meter testing and calibrations ensure accurate accounting for the most important area of the audit, Water Supplied.

Apparent Loss Controls

Apparent Loss Controls can be applied using the AWWA "Four Pillar" approach as shown below.



Meter Accuracy

Based on data in the 2021 IURC report, no large customer meters were tested for accuracy and the accuracy of the smaller meters is not known. The audit team did find on the city website a notification that stated new radio frequency (RF) meters were being installed to replace existing outdated and obsolete meters. This notice also stated a new advanced metering infrastructure (AMI) system was going to be installed to automatically collect and transmit data from the new RF meters to the water department. This meter replacement was scheduled to have a completion date of 2018.

In the 2021 IURC report under the Metering Technology section there are three different meter reading technologies listed, RF, touch pad and manual. If the entire meter population was not changed out to RF meters this should be reflected in the pre-audit questionnaire sent to the city at the start of this audit.

The accuracy of the residential meters was not available for this audit. Analyzing and comparing the total throughput and age to the rest of the meter population may aid in accelerating a change-out program. The 12-15 year mark is where the audit team typically sees meter inaccuracies increase in the

residential sector for most water utilities depending on water quality and types of meters. The larger commercial meters, if properly maintained, can usually last 20 years.

A deeper meter analysis based on consumption and age should be planned for a few years down the road and conducted so that an economic basis for any potential change out program can be established and validated.

The Audit Team suggests utilizing the results of either an in-house or contracted meter testing program to further target a meter replacement program. Size generally gets sorted out in this process but there may be some meters that are bigger that do not generate as much revenue as smaller meters, at that point, the sizing of the meter needs to be reviewed.

- A portion of meter revenue needs to be set aside for an annual meter-testing budget, not just meter replacements.

- Meters need to be tested based on levels of revenue being generated. Experience has shown that the following guidelines seem to work but the Utility may have other guidelines that are followed:

  -Meters that generate **$14,000.00/year** or more in revenue test every year.
  -Meters that generate **$7000.00/year** or more in revenue test every 2 years.

  -Meters that generate **$3000.00-$7000.00/year** in revenue test every three years.
  -Meters that generate **$1000.00-$3000.00/** year in revenue test every fourth year.

  These figures will allow a meter-testing program to pay for itself and be cost effective for the utility.

- Meter testing needs to be conducted following a well-established methodology. This means following AWWA guidelines on flow rates for testing and conducting evaluations for each meter tested for sizing, and type. The testing should bring into consideration the "on site" conditions where the meters are located as it is usually not feasible to remove meters from settings to test meters on a test bench in a shop. Also, businesses change in a building from time to time. As a result, the water use pattern will change with it and the meters should be evaluated accordingly.

- Displacement meter testing should be looked at with consideration given to the low flow threshold. This was discussed earlier in the meter accuracy area of the audit with references to Utah State's study of displacement meters. Low flow accuracy limits starts at 95% accuracy, so 5% of the meter's use at low flow can be compromised but yet still meet new meter accuracy limits for low flow. By claiming a higher level of meter accuracy for the overall meter population during an audit, the utility shifts some water loss to the Real loss side of the equation. In some cases, the result is the utility could be looking for more leakage that does not exist. The Auditors did not see this in East Chicago but also had to somewhat assume the current level of performance for the smaller meters in the utility. The recommendation is to have random sampling tests conducted on the smaller meters as a regular meter maintenance practice.

Right sizing of the meters is an area where potential revenue recovery is possible over the long term for commercial accounts. Meters can be too big or too small when a change of building occupancy occurs. When meters are tested in place for the larger settings, right sizing should always be a part of the visual

inspection program each time the meter is tested. Generally the low flow element should see approximately 20-30% of the total flow on a compound meter and the analysis identified several meters that should be reviewed further for consideration in downsizing the meter. It must be cautioned that reducing the size of a meter to regain some lost low flow accuracy must be balanced with the potential revenue loss due to the reduction of fixed costs.

Meter Data Transfer Errors and Data Analysis Errors

Meter data transfer errors and Data Analysis errors do not appear to be a major issue with the utility. If the city did adopt a new AMI meter reading system the volume figure used in this year's audit may be less than the default used in the software. The audit team did recognize the city uses the MUNIS ERP system for data reporting and billing so there is less of a chance for manual data errors.

If the data from 2019 IURC report in the Meter Technology section is correct there are 1,500 meters that are read manually and 2,408 that are read by a touch pad. The manual reads may result in errors in data entry and the touch pad may have communication problems occasionally.

System Data Improvements

As the distribution system is worked on/improved, those physical changes need to be added to the GIS data if available. This would include such items as correct count of actual service connections to the water system. These connections should be organized as residential, commercial and fire service connections. The number of connections (active and inactive) in the audit software is used in the calculation of the UARL (unavoidable loss).

The audit team did not receive a water system diagram showing source water, treatment facilities, storage reservoirs and transmission and distribution system lines. This information aids the team to fully understand the entire water system and identify potential areas of concern relating to water loss.

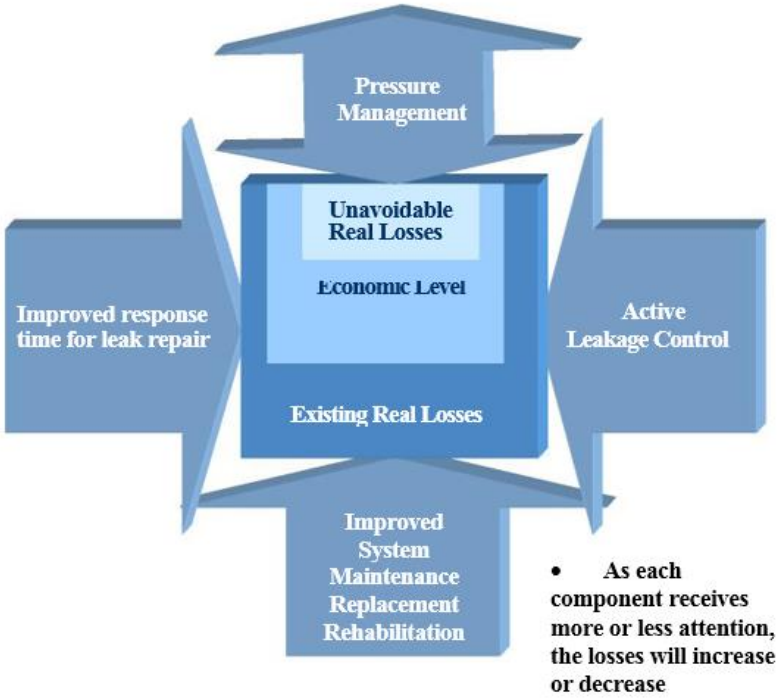
The figures used for the Volume from Own Sources (VOS) were totals from both treatment facilities. The volumes from each facility should be separated for next year's audit. The audit team was informed the conventional sand filter plant is operating two days a week currently. The accuracy of the master meters at each treatment facility should be tested annually and used in the master meter accuracy adjustment so the VOS is accurate for the audit year.

In reviewing the water distribution system section of the city website the audit team studied the **Current Situation** bullet points and in summary the city recognizes there is an increase in water loss, there are many lead and/or lead solder customer service lines that need replaced, currently there was not an effective method of locating and correcting sources of non-revenue water, including water theft and main leaks.

The **Future Improvements** bullet points identified several projects that directly address water loss and nonrevenue water such as, Implementation of District Metered Areas (DMA) to monitor and improve flow measurement in the water mains, leak detection, service line replacements and hydrant locks.

Real Loss Controls

Real Loss Controls can be applied using the AWWA "Four Pillar" approach as shown below.



Leak Detection

Active Leak Detection Control

East Chicago does not have a proactive leak detection program as part of the overall Water Loss Control Program. It is suggested that a survey program be conducted annually for the entire system as a way to reduce leakage. The cost of the leakage as indicated by the Real Loss calculation in dollars lost, indicate this program would pay for itself each year until the ILI ratio is reduced. In addition, the Variable Production Cost appears to show that the loss of water appears to put the utility in a position where it can "afford to leak". This is not a good position to be in since it can cause complacency and deter from a Proactive leak detection program.

Pressure Management is a practice taken by many utilities to control leakage. When pressure goes up, so does leakage (mostly UARL). The utility pressure is estimated at an average of 70 PSI overall. The auditors consider that operating pressure to be reasonable. Water hammer can occur from various activities. Water hammer was not explored by the audit team as it is assumed the utility staff does practice safe operating of hydrants to prevent water hammer.

System Improvements and Main Replacements

With the calculated ILI of 20.08, the need for improved data collection and validation would aid in tightening up some of the key figures used in the audit. The city has proposed projects for fire hydrant maintenance, replacement of inoperable valves and components, proactive leak detection and lead line replacements. These activities will aid in identifying where the Real Loss is occurring.

It would be an opportune time to consider internal pipe condition assessment. A sample pipeline condition assessment testing program may be cost effective to identify areas where there is still operational life left in certain pipe sections and funds could be diverted to more serious areas of the system. Given the age of the pipes and the mixture of pipe materials in East Chicago, consideration

should be given for pipeline condition assessment program as a preventative approach. The condition assessment will allow for strategic targeted main replacements and help contain costs over an extended time frame. Tracking main breaks is good but additional detail would be needed to be documented to more accurately track the volumes from leaks identified and complete a detailed economic intervention analysis for the current leak detection program.

Real Loss Component Analysis

East Chicago may want to look at utilizing the free Real Loss Component Analysis Tool developed by the Water Research Foundation (Project 4372A). This is suggested as a way for the utility to work on Real loss controls beyond an Active Acoustic Leak Detection program. The frequency of the acoustic program should include a full survey of the 90 miles of distribution system mains each year.

The Real Loss Component Analysis Tool is a free Excel based program that takes the water audit several steps further into Real loss analysis. The real loss analysis results will help guide the utility into the possible implementation of District Metered Areas (DMA's) that can help isolate some of the background leakage not able to be located using conventional means. The Real loss "study" portion can be implemented either internally (the Utility) or it can be initiated by contract.

Unmetered Water Uses

Hydrant Flushing

East Chicago should discuss with the Fire Department about documenting the specific hydrants flushed and include an estimate of the time the hydrant was flushed including the appearance of the water being flushed as a way to more accurately account for Unmetered Unbilled water use. While this will not eliminate part of the Apparent Loss totally, it can help account for Unmetered Unbilled water use. Hydrant diffusers with build in flow gauges should be used and the flow recorded. When the utility staff or fire department flushes, it is easy to give the field crews computer tablets to record the location of the flush, the amount of time for the flush, hydrant conditions, and more. Calculations can be automatically made for flush amounts that can then be recorded.

Conduct an annual water audit and validate the results.

East Chicago is committed to conducting a water audit annually as a way to monitor water loss and prioritize the loss reduction efforts. That means setting an annual agenda to have an audit setup and tracked yearly. The assignment of the audit can be to someone or a committee in the utility or the audit can be contracted out. This audit team does not recommend monthly audits as water use can vary month to month due to a variety of issues, up to and including meter misreads that get corrected month to month. The audit process means looking at the Data Validity Grades and Validity Score and using it to assist in planning of long range system improvements and data collection annually. These validity scores should improve each year the audit is performed and as the water system is modernized and updated. This auditing will allow for long range goal setting as well as being able to monitor year to year each goal that has been set.

The way to get a better Validity score is to incrementally improve the data set for each data entry into the Audit Spreadsheet. The Grading Matrix tab of the audit does just that. It is highlighted to show the current Grading scale for the data input and *spells out what the utility needs to do as a next step to get to the next highest level grade*.

Additional Water Audit Comments

The Audit team feels that with the implementation of the water loss controls suggested, the utility will see its overall Validity Score improve, and its Infrastructure Leakage Index come down. The ILI of 16.1 is not an indication of the operational efficiency or management of the distribution system but more of

the age of the system and the figure used in the Unavoidable Annual Real Losses (UARL) calculation. Using the Infrastructure Correction Factor (ICF) in the calculation of the Validity Score of 60 demonstrates the acceptance of the age of the current distribution system as an indication of why the ILI appears to be high compared to best practice utilities.

The Audit team believes a more in-depth analysis of the larger meters accuracy is important. A detailed analysis of the overall recorded use of the commercial and industrial meters should be completed to evaluate the current testing schedule. A more in-depth analysis of the potential over-sizing issue should be completed in addition to the review and analysis of the 2-inch and larger meters in the system should be completed.

Use of the Data Validity Grades for Improvements

It is recommended that East Chicago make use of the Interactive Data Grading contained in the Audit software. Each data entry from the Volume from own Sources (VOS under Water Supplied) to the Variable Production Cost (VPC) was rated according to each data entry's particular grade as applied from the questions answered.

Conduct meter accuracy testing for all meters on a semi-annual basis, along with calibration of all related instrumentation. Repair or replace meters outside of +/- 3% accuracy. Investigate new meter technology; pilot one or more replacements with innovative meters in attempt to improve meter accuracy**.**

For this audit, the Audit team did not utilize the third party meter accuracy test results for this period and did not modify the system input volume based on these results. East Chicago has detailed records of the daily pumpage and volumes and should apply the meter accuracy correction to the production volumes.

The Interactive Data Grading Tool tab for the audit has indicators for each question where a "limiting" factor exists that can be improved upon to attain a higher DVG score. The utility should consider this simple analysis to help with the overall reduction in water losses.

The leakage issue seems to be a big factor in water loss so it is advised that the city have a regular leak detection program conducted to locate hidden leaks. Water main replacements should also be tied to a condition assessment program that will help with prioritizing main replacements, given some of the mains are over 100 years old. Until the older mains are replaced, the City can expect more hidden leakage to occur.

WG-8

M.E. SIMPSON Co., Inc.

WATER SYSTEM SPECIALISTS

City of East Chicago, IN

Hydrant Maintenance

2021 Summary Report

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Valparaiso, IN 46383

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November 16, 2021

Mrs. Winna Guzman
Water Department Director
City of East Chicago
5201 Indianapolis Boulevard
East Chicago, IN 46312

RE: REPORT FOR FIRE HYDRANT MAINTENANCE

Dear Mrs. Guzman,

M.E. Simpson Co., Inc. is pleased to submit this report on the fire hydrant maintenance project for the City of East Chicago, conducted by our crews between October 6, 2021 and October 19, 2021. Fire hydrant maintenance is performed to determine operability and ensuring they are capable of providing adequate fire-flow at all times. This along with routine flushing, chlorine residual testing and fire flow tests may help ensure a greater ISO rating for the Utility (Maintenance must be performed twice annually ISO Certification).

Procedure

M.E. Simpson Co., Inc. has been contracted to inspect approximately five hundred ninety-four (594) hydrants. The logistics behind fire flow testing this number of hydrants are quite extensive. The planning, cooperation and communication between the City of East Chicago and M.E. Simpson Co., Inc. was an ongoing process throughout the project. The first step in this project was to determine the area in which inspections would take place. Next, the public was notified of the areas that would be tested in the Fire Flow Test portion of the project. The utility and local fire departments were also informed of these areas. Inspections were generally performed between 8:00 a.m. and 4:00 p.m.

Inspection Process

Hydrants should be inspected on a regular basis, at least once a year. Dry-barrel hydrants require two inspections per year, summer and winter, to mitigate the possibility of water freezing in the barrel. This is especially important in areas with high ground water where proper drainage could be affected.

Insurance ratings and ISO certifications are based in part, on the condition of the hydrants, and how closely they meet the standards for operation. Public safety depends on the ability to identify malfunctioning hydrants and being able to repair them in a timely fashion.

Randy Lusk
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General Hydrant Inspection

- **Appearance** – The color and condition of the paint, based on the Utilities color scheme was inspected and recorded. Hydrants that have been displaced due to ground-shifting or collision have been documented and the Utility immediately notified. If necessary, bollards were recommended to protect the hydrant from future collisions. Hydrants located very close to roadways and vehicle traffic were documented so they can be moved by the Utility.
- **Accessibility** – Recommendations have been made to raise or lower a hydrant when improper distance from the ground inhibited proper function. Pumper ports and nozzles not facing the correct direction have been documented, so that the hydrant can be rotated. Soil conditions will be assessed, to ensure that the ground is capable of supporting the hydrant (important for proper breakaway).
- **Location** – Locations of the exact location determined using GPS and "x-y" coordinates, based on permanent local features.
- **Leakage** – With the pumper port and nozzle caps removed, an amplified listening device was used to ensure the main-valve was not leaking.
- **Functionality** - The condition of the pumper/nozzle threads and caps was assessed for damage and proper function and lubricated for ease of operation. Dry-barrel hydrants were checked for proper drainage. The condition of the operating nut was determined, with regard to excessive wear or rounding. Hydrants which were difficult to operate were exercised by repeatedly opening and closing the main-valve with the pumper/nozzle caps securely fastened. Hydrants exhibiting evidence of unauthorized operation have been documented so security devices can be installed to protect against unauthorized usage in the future.

The above is a general description of the type of information gathered during the inspections to determine the condition of the hydrant and may be used to schedule any necessary repairs.

Dry-Barrel Hydrant Inspection and Maintenance Procedure

- Checked and recorded static pressure
- Checked the hydrants appearance. Condition of paint and proper color-coding assessed.
- Hydrants needing to be raised or lowered were documented, as well as accessibility issues.
- Removed one nozzle/pumper cap and, using a listening device, check for main valve leakage. Repaired or scheduled a repair, as necessary.
- Using a plumb-bob, checked the inside of the barrel for water or ice. Pumped water out of hydrant barrel, wait a few minutes, and then rechecked with plumb-bob to verify water is not passing through the valve on the hydrant lead. If ice was present, notified the Utility immediately so hydrant can be thawed out and put back into service.
- Replaced the nozzle/pumper cap, loose enough for air to escape. Opened hydrant a few turns, allowing air to vent from loose cap. Tightened the cap.
- Opened hydrant fully, checking for ease of operation. Repeatedly exercised the operating stem, as needed, to remove buildup and promote better operation.
- With the hydrant fully pressurized, checked for leakage around the flanges, nozzles/pumpers, seals and operating nut. Repaired or scheduled repair, as necessary.

- Partially closed the hydrant to open the drain outlets, and flushed for 10 to 15 seconds.
- Completely closed the hydrant, and then turn the operating nut 1/4 turn to 1/2 turn closed to relieve the pressure on the thrust bearing or parking.
- Removed a nozzle/pumper cap, and attach a diffuser. Flushed the hydrant to remove foreign material.
- Closed the hydrant and remove the diffuser. Place your hand over the nozzle/pumper to check for suction as the water drains out of the barrel. For no-drain hydrants, the water was pumped from the barrel.
- Checked for main valve leakage with an amplified listening device.
- Removed all nozzle/pumper caps and inspect the threads. Cleaned and applied approved lubricant to caps and nozzles/pumpers.
- Inspected cap chains for binding and ease of movement. Unbound or replaced, as necessary.
- Replaced the caps and tightened them to the Utilities specification.
- Checked operating nut lubricant and maintain as needed.
- Inspected breakaway device for damage.
- If GPS option is chosen, collect or verify the GPS location of hydrant and the "x-y" location.
- Notified the Utility immediately of inoperable hydrants needing major repair.
- Lubrication based on manufacture's procedures and recommendations (on fully assembled hydrants).

Repair

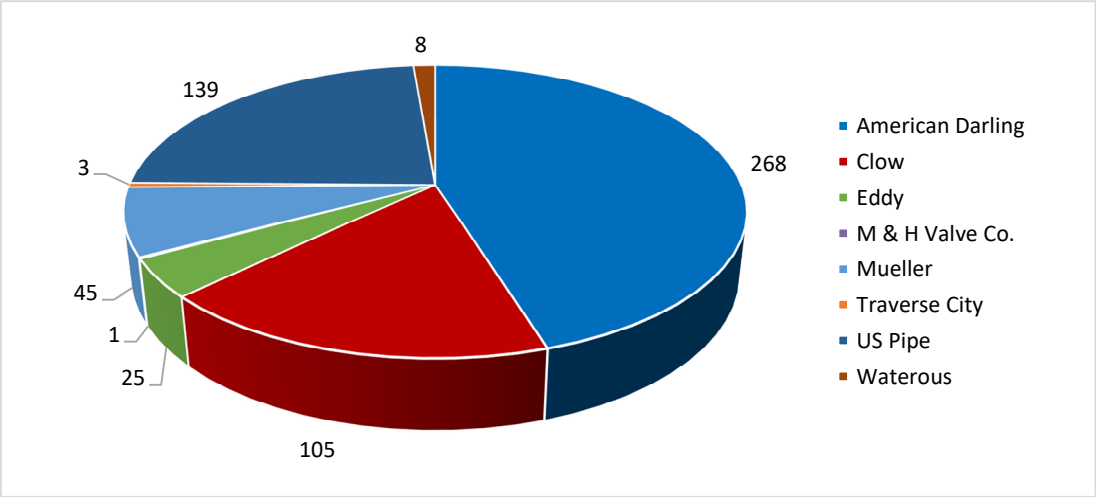
Some hydrants found with problems that are not easily fixed during the course of inspection and maintenance, such as leakage, difficult operation, corrosion, broken components, or even damage due to impact have been reported to the Utility. The following is the set of general guidelines which our technicians will follow for hydrant repair (non-excavation).

- Closed the auxiliary valve or use another means of disengaging the hydrant from the distribution system (cut-off flow and pressure).
- Disassembled the hydrant as specified by the manufacture.
- Replaced all parts which exhibited damage or wear, always replace all of the gaskets and seals.
- Reassembled the hydrant, and open the auxiliary valve (or "reconnect" it to the distribution system).
- Checked the hydrant for leakage using an amplified listening device. The main-valve should not leak.
- Manipulated the operating nut to open the main-valve, vent the air from the hydrant and then re-inspected the hydrant under pressure, checked for leakage, ease of operation and drainage.
- Notified the Utility upon completion of the repair.

Fire Hydrant Maintenance Results

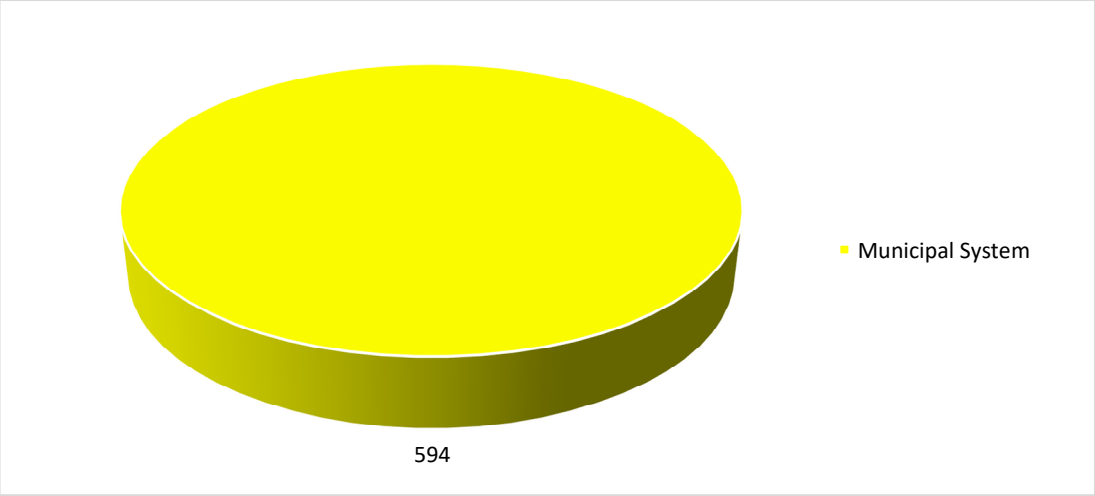
Fire Hydrant Brands

M.E. Simpson Co., Inc. located and inspected five hundred ninety-four (594) hydrants for the City of East Chicago, IN. The brands of hydrants varied slightly. 268 (45%) are American Darling hydrants. 139 (23%) are US Pipe hydrants. 105 (18%) are Clow hydrants. 45 (8%) are Mueller hydrants. 25 (4%) are Eddy hydrants. 8 (1%) are Waterous hydrants. 3 (less than 2%) are Traverse City hydrants. 1 (less than 1%) is an M & H Valve Co. hydrant.



NFPA Color Coding Standards

Municipal, Private, and Non-Potable fire-hydrants should not be painted the same color (the body of the hydrant) according to the NFPA. All five hundred ninety-four (594) hydrants are coded as Chrome Yellow (Municipal System). Hydrants requiring new paint have been noted.



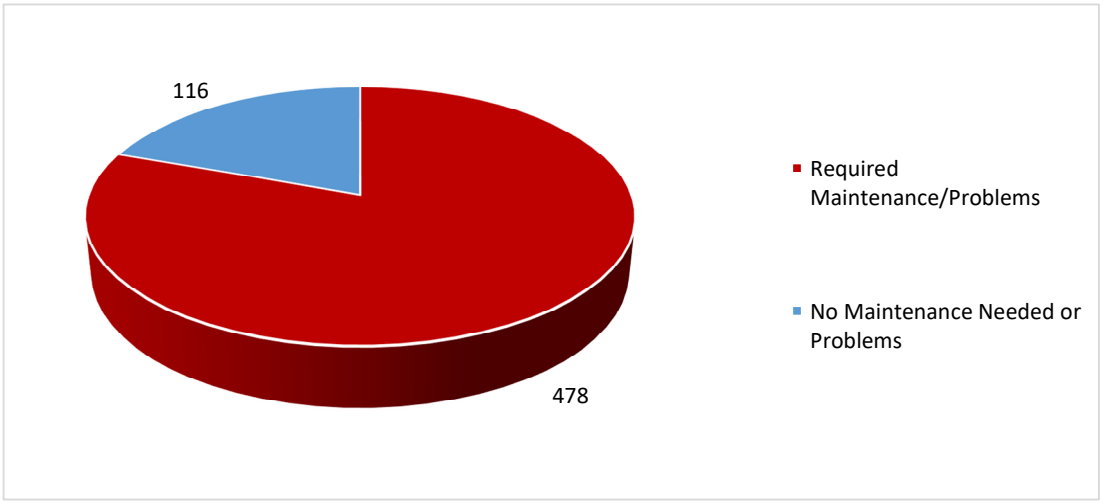
Inspection Results

The most important part of the Fire Hydrant Maintenance Program is detailing of problems with hydrants and maintenance that has occurred. This is done so proper work orders can be generated and hydrants brought to fully functional status. The following was found in the field during the Maintenance Project. Any problems or maintenance required can be found on individual hydrant report sheets.

116 Hydrants Were Inspected with No Problems

478 Hydrants Had Some Defect or Problem

- **6** Pumper Gasket Needs Replaced
- **10** Operating Nut Not OK
- **9** Operating Nut Bushing Not OK
- **76** Nozzle Gasket Needs Replaced
- **244** Needs Paint
- **181** Auxiliary Valve Not Found
- **27** Auxiliary Valve Needs Riser
- **1** Poor Water Quality
- **2** Hydrant Leaks
- **51** Hydrant Leaks Under Pressure
- **26** Drains Slow
- **30** Does Not Drain
- **16** Surrounded by Obstructions
- **7** Hydrant Facing Wrong Direction
- **59** Improper Pumper Port Clearance



Conclusions and Recommendations

The 2021 Fire Hydrant Maintenance has provided the City of East Chicago with extremely important information regarding their fire hydrants. The hydrants were all inspected and lubricated and the threads of the ports had grease applied.

The 2021 Fire Hydrant Maintenance Program had very few logistical or public relation problems and the overall procedure was extremely successful. We thank you for the opportunity to provide the City of East Chicago with this service and we look forward to continuing the Program in the upcoming years. If you have any questions regarding this report or any other portion of the project, please don't hesitate to call.

Sincerely Yours,

Randy Lusk
Innovation & Solutions Manager