



11333 N. Cedarburg Road
Mequon, WI 53092
Phone: 262-236-2913
Fax: 262-242-1580

www.ci.mequon.wi.us

Water Utility

MEQUON MUNICIPAL WATER UTILITY COMMISSION
Regular Meeting
Tuesday, October 10, 2023
7:30 PM or immediately following Committee of the Whole
Christine Nuernberg Hall

Agenda

- 1) Call to Order, Roll Call
- 2) Approval of Meeting Minutes
Action requested: review and approve
 - a. September 12, 2023, Minutes
- 3) Discussion Items
 - a. Authorization of Water Utility Leak Audit by ASTERRA in an Amount Not-to-Exceed \$37,500
 - b. Adoption of the Updated Mequon Water Utility Master Plan
- 4) Adjourn

Dated: October 10, 2023

/s/ Andrew Nerbun, Chair

Notice is hereby given that a quorum of other governmental bodies may be present at this meeting to present, discuss and/or gather information about a subject over which they have decision-making responsibility, although they will not take formal action thereto at this meeting.

Persons with disabilities requiring accommodations for attendance at this meeting should contact the City Clerk's Office at 262-236-2914, twenty-four (24) hours in advance of the meeting.

Any questions regarding this agenda may be directed to the Public Works Office at 262-236-2913, Monday through Friday, 7:00 AM - 3:30 PM.



11333 N. Cedarburg Road
 Mequon, WI 53092
 Phone: 262-236-2913
 Fax: 262-242-1580

www.ci.mequon.wi.us

Water Utility

MEQUON MUNICIPAL WATER UTILITY COMMISSION
Regular Meeting
Tuesday, September 12, 2023
7:00 PM
Christine Nuernberg Hall

Minutes

1) Call to Order, Roll Call

Meeting was called to order at 7:29 PM

Present:

Commissioner Andrew Nerbun
 Commissioner Kelly Tolocko
 Commissioner Dale Mayr
 Commissioner Jeffrey Hansher
 Commissioner Gregg Bach
 Commissioner Brian Parrish
 Commissioner Kathleen Schneider
 Commissioner William Gebhardt
 Commissioner Robert Strzelczyk -- **Excused**

Also present: City Administrator Jones, Assistant City Administrator Schoenemann, City Attorney Sajdak, City Clerk Fochs, Director of Public Works/City Engineering Lundeen, Water Utility Supervisor Voigt, City Water Engineer Fulsaa, City Water Engineer Durbin, Administrative Assistant Schlereth, press and interested public.

2) Approval of Meeting Minutes

a. August 8, 2023, Minutes

RESULT: **Approved by Voice Acclamation [Unanimous]**
MOVED BY: Commissioner Mayr
SECONDED BY: Commissioner Schneider

Attachment: 9-12-23 Water Minutes (8863 : September 12, 2023 Minutes)

AYES:	Nerbun, Tolocko, Mayr, Hansher, Bach, Parrish, Schneider, Gebhardt
NOT PRESENT:	Strzelczyk

3) Discussion Items

- a. A Review of the Draft Water Utility Master Plan Update

Discussion ensued on updating the contract with Milwaukee Water Works from 1999.

Commissioners favor outreach to private well residents making them aware of the option to voluntarily connect to the water main.

4) Adjourn

- a. Motion to Adjourn at 8:00 PM

RESULT: **Approved by Voice Acclamation [Unanimous]**
MOVED BY: Commissioner Bach
SECONDED BY: Commissioner Hansher

AYES:	Nerbun, Tolocko, Mayr, Hansher, Bach, Parrish, Schneider, Gebhardt
NOT PRESENT:	Strzelczyk

Respectfully Submitted,

Ren Schlereth
Administrative Assistant

Attachment: 9-12-23 Water Minutes (8863 : September 12, 2023 Minutes)



11333 N. Cedarburg Road
 Mequon, WI 53092-1930
 Phone: 262-236-8150
 Fax: 262-242-9655

www.ci.mequon.wi.us

Office of Mequon Municipal Water Utility Commission

TO: Mequon Municipal Water Utility Commission
FROM: Jim Voigt, Director of Operations
DATE: October 10, 2023
SUBJECT: Authorization of Water Utility Leak Audit by ASTERRA in an Amount Not-to-Exceed \$37,500

Background

The past five years the Mequon Water Utility has experienced an elevated amount of estimated background water leakage in the distribution system as reported on the Public Service Commission's (PSC) annual report. Every water distribution system has background leakage, which may be undetected water main and/or service leaks that have not yet surfaced above ground. The industry goal is to keep the estimated background leakage below 5%.

Analysis

In 2022, the estimated volume of background leakage was approximately 17.8% of the volume of water purchased from either the North Shore Water Commission (NSWC) or Milwaukee Water Works (MWW). The prior five years of estimated background leakage and cost to the Utility is illustrated in the table below.

Estimated Background Leakage

PSC Reported Values	2018	2019	2020	2021	2022
Volume of Water Purchased (kgal)	418,401	417,596	451,850	487,999	508,792
Estimated Background Leakage (kgal)	48,621	57,205	46,677	68,748	90,576
Background leakage %	11.6%	13.7%	10.3%	14.1%	17.8%

Annual Estimated Cost of Background Leakage	\$ 89,310	\$ 107,171	\$ 88,510	\$ 131,222	\$ 172,976
---	-----------	------------	-----------	------------	------------

In 2021 and 2022, the estimated dollar value of the water lost to undetected background leakage was around \$150,000. Reducing the estimated background leakage to below 5% would save the Utility approximately \$125,000 per year. Estimated costs are based on the reported purchased water costs on the annual PSC reports.

The following pages include a proposal for Asterra to conduct a one-year leak detection survey of the Mequon Water Utility (Exhibit A). Asterra uses satellite technology that

detects soil moisture resulting from treated water leaks, through the analysis of synthetic aperture radar (SAR). By analyzing the SAR data, Asterra will identify areas of the city that have the potential of a non-surfacing leak. A leak detection crew will then focus on targeted areas of the city that have a high possibility of a subsurface water leak and conduct an acoustical survey of the area. This allows crews to focus on pinpointing suspected leaks as opposed to conducting an acoustical survey of the entire City to try and find the areas to try and pinpoint a leak. Included in the proposal is time for a leak detection crew from Asterra survey areas identified by the SAR technology to pinpoint suspected water leaks.

Fiscal Impact

Asterra is offering the Mequon Water Utility (MWU) a significant discount (\$16,500) to complete the scan of the city if the work is completed at the same time Asterra will be completing the scans for the Milwaukee Water Works and other communities in the Greater Milwaukee Area. The work is scheduled for late fall of 2023. Listed below are the costs for the leak survey and detection service.

Asterra Leak Detection Proposal

Prevent	\$ 18,500.00
Leak Detection Crew - 10 days	\$ 19,000.00
Total	\$ 37,500.00

Because of the late fall 2023 scheduling, Asterra will bill 50% of the Prevent scanning in 2023 and 50% in 2024. The work from the Leak Detection Crew will not be billed until 2024, when the field work occurs. The total amount billed in 2023 will be \$9,250 and the amount billed in 2024 will be \$28,250. The amount billed in 2023 will be booked against Maintenance of Mains Expenses, 620679-673003. This account currently has \$11,947.34 available. The amount for 2024 will be included in the 2024 Operations Budget. The Utility also has \$18,000 available in the Maintenance of Wells and Springs from budgeted work that will no longer occur in 2023. If necessary, these funds can be transferred to the Maintenance of Mains Expenses account.

Based on purchased water costs (\$1.90/kgal), if the leak detection survey identifies four average non-surfacing service leaks of 15,000 gpd each, the cost for the Asterra survey and leak detection crew will pay for itself within a year. Non-surfacing leaks typically run for a long duration before being found and repaired and can leak for over a year.

Recommendation

Staff recommends that the Water Utility Commission approve the Asterra Leak Detection Proposal. If approved, staff will generate a purchase order for the 2023 billings (\$9,250) and include the 2024 billings (\$28,250) in the 2024 budget.

Attachments:

Exhibit A- ASTERRA Proposal (PDF)

A proposal for City of Mequon, WI



Proposal & Scope of Work

Prepared by Jake Morrison, Sales Development Representative

18 July 2023

4180 La Jolla Village Dr., #530

San Diego, CA 92037

858.521.9442 US

[asterra.io](https://www.asterra.io)

ASTERRA

ASTERRA uses patent-protected technology for infrastructure condition assessment, pipe replacement modeling, and leak detection in urban and rural, water or sewage networks, using L-band synthetic aperture radar (SAR) mounted on a satellite. The technology is based on a proprietary algorithm that detects soil moisture resulting from treated water or wastewater leaks, through the analysis of SAR data. This is of considerable value to industry, governments, and citizens. Because the observation point is orbiting 390 miles above the Earth, this allows for simultaneous monitoring of pipes within a large network.

ASTERRA's Martian Roots

ASTERRA's core technology is based on the search for underground water on Mars and other planets. Lauren Guy, a geophysicist, and entrepreneur who developed the approach, quickly recognized the application could be even more effective here on Earth. The water was closer, the need more immediate, and the technology had the potential to solve a number of critical problems. Mr. Guy founded Utilis (now known as ASTERRA) in 2013 to develop applications for the new technology. In 2016, leak detection in underground water systems became the first commercially used application. This solution is now called Recover.

A Revolutionary Change

From an orbiting satellite, our algorithm which is fine-tuned to detect treated drinking water and wastewater, reveals underground leaks as small as 0.2 gallons per minute. Now, managers of underground water infrastructure can see the water leaking from their systems. Even in the largest cities, it could be seen all at once, with unheard-of speed and efficiency. ASTERRA continues to refine the technology and expand its applications beyond leak detection, adding pipeline monitoring and deficiency analysis as well as property assessment to its growing capabilities.

Impact

ASTERRA actively contributes to the United Nations Sustainable Development Goals, particularly focusing on Goal numbers 6 (Clean Water and Sanitation), 9 (Industry, Innovation, and Infrastructure), and 13 (Climate Action). By leveraging our expertise in satellite-based infrastructure intelligence, we empower organizations to make data-driven decisions and build a resilient and sustainable future. We are dedicated to creating lasting positive change and supporting the achievement of the SDGs globally.



1. Satellite Radar – Scan Acquisition

Raw scans of the area taken by radar over Areas of Interest (AOI) received from client

2. Radiometric Corrections

ASTERRA takes the raw scan and prepares it for analysis, by filtering interferences from buildings, manmade objects, vegetation, water bodies, and more

3. Algorithmic Analysis

ASTERRA's unique and patented algorithm targets the spectral signature of treated water or wastewater and its interaction with the soil

4. Availability to Client

Newly detected leak locations are delivered via the EO Discover platform to the client on an ongoing basis, with frequency depending on the level of monitoring purchased.

Advantages of Ongoing Monitoring

Today, utilities typically survey their system blindly and reactively. This approach yields minimal results which leads many utilities to deprioritize proactive leak detection. Usually, utilities are forced to use limited resources for work orders to find, dig and repair leaks. In most cases, this results in falling further behind the curve and increased pipe breakages. Rather than leak detectors surveying the entire system blindly, Recover guides leak detectors to likely leak locations or points of interest which ASTERRA has highlighted through their analysis. Now, leak detectors only need to walk 5-10% of the system where water is already leaking. With a single scan, ASTERRA identifies ~30% of the active leaks in your system. Additional scans allow for ongoing monitoring which will result in more active leaks being identified in your system. Additionally, leaks are continuously arising and enlarging, thus ongoing monitoring will continue to detect more leaks even in areas previously inspected.

Client Benefits & Impact

ASTERRA provides a comprehensive, accurate, and non-invasive remote sensing solution for locating leaks and monitoring any potable water and wastewater system in the world. This works over any type of terrain – flat or hilly; sparsely populated or densely populated high-rises. This is done by extracting information from SAR scans taken high above the ground and converting them into locations of underground potable water or wastewater leaks. Reducing NRW additionally has a positive effect on the environment. By reducing non-revenue water loss, the amount of processing decreases, resulting in a reduction of power use and the associated environmental effects. Locating and fixing wastewater leaks in sewer systems also helps the environment by preventing pollution.

Main benefits of Recover:

- Non-invasive technology: Deployment of sensors or hardware on the ground is not necessary.
- ASTERRA technology is effective irrespective of soil type, pipe material, and pipe diameter.
- Covers large areas at once. Surveys an entire system in urban and rural areas, while also providing location intelligence at a fine resolution. Identifies potential leaks in areas that traditional acoustic leak detection programs may not typically survey.
- Find more leaks in a shorter period: Increases the efficiency of traditional acoustic leak detection programs by prioritizing work locations and offering quicker response times.
- Screening technology that can be used directly or indirectly for condition assessment, asset budget planning and work on structural changes prioritizing network riskier zones.
- Identifies background (i.e., non-surfacing) leaks that might otherwise go undetected for long periods of time.
- Can fit into either CAPEX or OPEX budgets.
- Provides a positive impact on the environment (reduces water loss, electricity used, and CO2 produced).

ASTERRA's Solutions

ASTERRA's solutions include Recover and MasterPlan for potable water and wastewater. All are made available on ASTERRA's EO Discover platform. Recover and MasterPlan are ASTERRA's commercial services offered in this proposal. The output from the proprietary algorithm is provided through the analysis of the SAR data combined with other processing techniques owned by Utilis (dba ASTERRA).

Recover for Leak Detection

Recover, the recipient of the AWWA Innovation Award in 2021, is a satellite-based solution for monitoring and detecting leaks in drinking and wastewater systems. It enhances operational efficiency and budget optimization by providing infrastructure intelligence for proactive pipe repair and planning. With Recover, entire city-wide systems can be monitored efficiently.

This advanced technology quickly locates non-surfacing leaks, allowing leak detection crews to focus on targeted repairs instead of unnecessary digging. Compared to traditional methods, Recover identifies more leaks and increases field crew efficiency by up to 400%. It offers the water industry the lowest cost per leak found, averaging 3.5 leaks per crew day compared to 1.3 with traditional acoustic methods. By reducing non-revenue water loss, which amounts to 17 billion gallons annually worldwide, Recover brings significant benefits to companies in the industry.

Furthermore, Recover assists the wastewater sector by mitigating the risks of fines, consent decrees, legal consequences, and reputational damage.

Recover Insights

At the start of the client's subscription period, each client is provided access to the EO Discover platform where they can access the data in the form of GIS files, the U-View application, or the dashboard with individual projects and field performance metrics. Each client is also provided access to the U-Collect field investigation application. The platform can be accessed 24/7 during the subscription period to view ASTERRA's analysis and results of field investigations track success metrics. Recover's specific features include:

Recover (POI Output): A GIS layer containing the POIs, provided in SHP and KML format for import into any GIS system (client-based, ESRI, or ASTERRA-provided U-Collect and U-View) that can be overlaid on a map displaying streets, pipes, hydrants, valves, and potential leak information.

EO Discover: A link to the EO Discover password-protected platform displaying data and field results, along with monitoring the progress of the project/service progress in real-time.

Temporal and Spatial Analysis: With a single scan, Recover identifies ~30% of the leaks in a given system. With multiple scans, Recover will identify up to 25% more of the leaks in the given system. Through multiple scans we can identify leak clusters through a temporal and spatial analysis which will aid in maintenance prioritization and asset management plans.

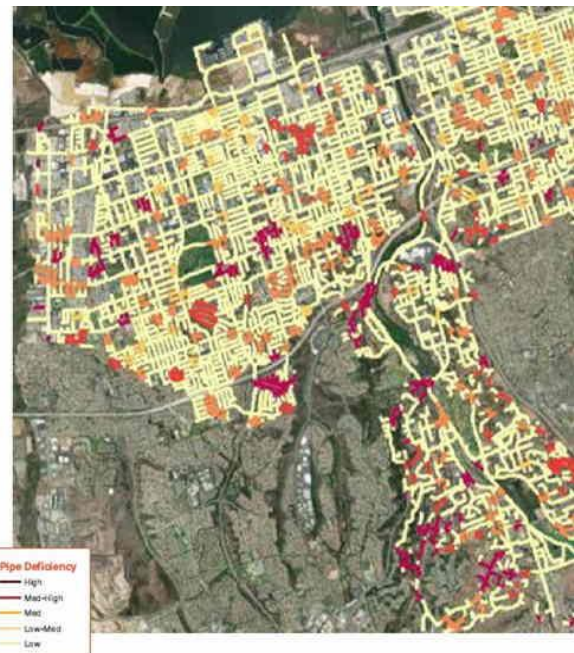
MasterPlan for Pipe Deficiency Assessment

Providing unique insights not available from anyone but ASTERRA, MasterPlan is an actual (not predictive) measurement of non-surfacing pipe leaks. It is pipe agnostic and collected non-invasively by a satellite with wide coverage, often scanning a full system instantaneously. MasterPlan provides actionable insights into your asset management plan in one easy data layer. Trained on five years of leaks discovered using Recover, the new algorithm assesses the deficiency of an entire pipe system using multiple SAR scans over time.

ASTERRA MasterPlan provides a GIS dataset containing pipe deficiency levels derived from SAR data. This solution is based on the same proven patented algorithm that is used by Recover to detect leaks in your system but is extended to monitor your system over time using statistical analysis. The general process takes all POIs identified in two consecutive satellite scans (identical coverage and angle) over your area of interest and analyzes the POI results. It then compares the POIs from multiple scans and identifies the clusters of POIs between them.

These results are processed through a learned statistical algorithm and used to assign pipes a score from low to high, signifying the level of deficiency observed.

With ASTERRA Masterplan, we can identify critical areas where the client can focus its future pipeline rehab and replacement efforts. These high deficiency areas can be used for asset management planning purposes, e.g., capital improvement replacement planning.



MasterPlan Insights

MasterPlan provides utilities and engineers with insights into actual pipe conditions. This GIS data layer is compatible and easily integrates into all GIS and GIS-based software. Combine this data with other information, such as pipe age, material, work orders, and consequence of failure to further enhance your replacement planning models or water system master plans.

MasterPlan (Pipe Deficiency Output): A GIS layer containing client pipe segments rated based on condition. Provided in SHP and KML format for import into a GIS or risk modeling system (Client map displaying streets, pipes, hydrants, valves, and potential leak information).

EO Discover: Login credentials to the EO Discover's password-protected platform for viewing the pipe data via GIS or U-View applications and for monitoring pipe deficiency levels.

MasterPlan Pipe Deficiency Assessment: A summary assessment detailing the condition of the client's pipes based on the GIS data output of pipe scores from low to high deficiency.

U-View Licenses: Licenses are provided for U-View (allows the client to view the data) for the duration of the EO Discover subscription period.

Typical Process and Timeline

- After confirmation of the order through the contract signature or receipt of a purchase order, ASTERRA will acquire the satellite scan(s). ASTERRA must have the order confirmation at least 21 days prior to the first date of satellite coverage to move forward with the satellite data procurement. The date of the acquisition is subject to the technical and operational constraints of the third-party satellite operation company and may change at any time.
- Before the acquisition, the client will provide ASTERRA with an Area of Interest (AOI). Unless agreed otherwise by the parties, the AOI is a designated geographical area to be surveyed using satellite within the client-provided service area.
- During the period prior to the scan acquisition, the client will provide ASTERRA with a GIS layer of all available treated water or sewage lines in the AOI to be analyzed. If available, the client will also provide a hydrant and valve layer within the AOI.
- Unless otherwise agreed upon by both the parties, ASTERRA will provide services only in the AOI overlapping with the client's provided GIS pipe system layer.
- After acquiring the scan and receiving the GIS pipe layers from the client, data will begin to populate on the EO Discover platform. This is approximately 7-14 business days after the first scheduled scan acquisition date. Scan acquisition dates may be changed by a third party (satellite operator) or due to technical constraints. Service start dates may be affected due to poor scan quality according to ASTERRA's quality assurance standards.
- Where applicable, leak field inspection work can begin after the leakage data has populated on EO Discover on an agreeable date between both parties.

PROPOSAL

Scope of Work

The scope of work contained herein details the work and services ASTERRA will provide as well as the roles and responsibilities of both ASTERRA and City of Mequon, WI (“**Client**”).

Roles, Responsibilities, and Offerings – ASTERRA

ASTERRA will provide Recover data as a service via EO Discover and it will consist of areas identified as potential leaks (i.e., areas containing soil moisture of treated water and/or wastewater underground) using a proprietary satellite imaging algorithm across the **Client’s** water system. ASTERRA will provide a primary contact person for technical and administrative purposes who will interact with the **Client**.

ASTERRA’s Responsibilities (“Services”):

- Acquiring and analyzing the satellite scan(s).
- Providing potential leak location data as a service through our password-protected platform, EO Discover. This data can be exported as GIS data files.
- Providing best practices for field inspection protocols to the Client.

ASTERRA’s Solution for Potable Water:

- **Recover (POI Output):** GIS layer containing the POIs, provided in GIS data files formatted for import into any GIS system.
- **EO Discover:** Provides access to monitor and track the progress of the project/service in real time and calculates ROI and impact metrics for ongoing KPI tracking. The license is for the period of service purchased.
- **U-Collect and U-View Licenses:** Provided for each of the following: U-Collect (allows field technician to collect data in the field), and U-View (allows field technician to view data from anywhere). The license is active upon delivery for the period of service. Additional licenses may be purchased and/or the initial license extended at the request of the client.

- **Kick-off Meeting:** Prior to fieldwork, an ASTERRA or ASTERRA-certified team (regardless of if it the client's team or a contractor), will call a kick-off meeting to agree on the operational field plan to address the Client's specific needs and the best practices required to get the best results.
- **Optional: Acoustic Leak Detection for Field Investigation (for Potable Water Pipelines Only):** Based upon selecting this option, ASTERRA will provide a certified subcontracted acoustic leak detection team to investigate the points of interest, provide a list of verified leaks, and mark them for repair. The leak detection field verification team(s) is proficient and experienced in using and operating acoustic equipment. The team should be provided with all the needed tools to access the listening points.
- **Optional: ASTERRA MasterPlan Pipe Deficiency Map,** provided as a GIS data set, if purchased within the Recover tier available or as an additional service option.
- **Optional: ESRI Arc GIS Field Maps Integration –** data provided in your ESRI ArcGIS online accounts for easy use in ArcGIS Field Maps. (Additional cost may apply if it is not included in the Recover service tier already).

ASTERRA's Solution for Wastewater

- **Recover (POI Output):** GIS layer containing the POIs, provided in GIS data files formatted for import into any GIS system.
- **EO Discover:** Provides access to monitor and track the progress of the project/service in real time and calculates ROI and impact metrics for ongoing KPI tracking. The license is for the period of service purchased.
- **Kick-off Meeting:** ASTERRA or ASTERRA-certified team will call a virtual kick-off meeting to discuss the data delivered and demonstrate the usage of the platform.

Roles, Responsibilities, and Offering – Client

The Client is responsible for providing baseline system data, work order history, and in some cases, an acoustic field verification team to inspect POIs identified by ASTERRA. The client shall identify a primary contact person for technical, administrative, and field inspection coordination. ASTERRA agrees to use the information described below only for the client's specific project and to not share the information with any other third party.

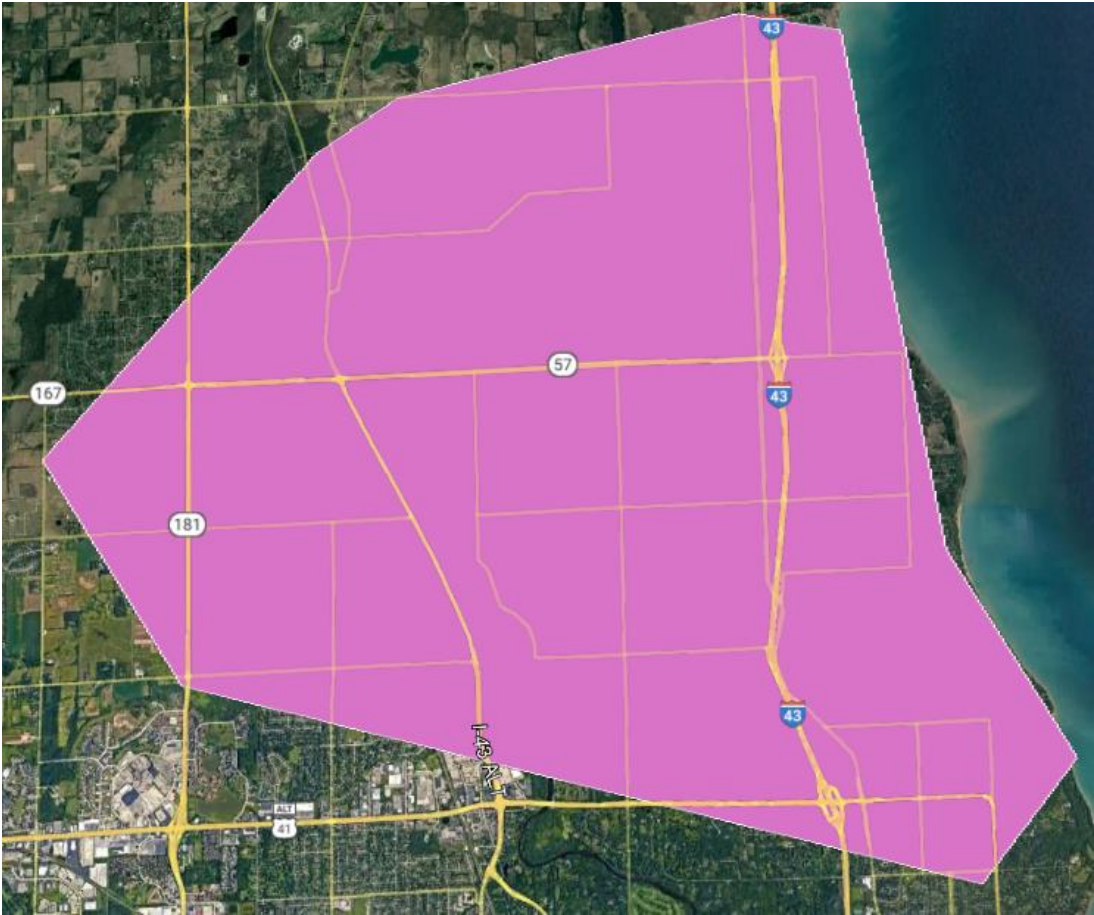
Client Responsibilities

- **Pipe System Information for Potable Water Lines:** Prior to scan acquisition, the **Client** shall provide ASTERRA with a detailed and accurate GIS pipe system layer. If GIS is not available, roads will be used to guide the analysis. ASTERRA will use this layer to identify POIs. The GIS layer should include pipe material and diameter, length of pipeline to be analyzed, hydrants, valves, and any other detailed information available.
- **Pipe System Information for Wastewater Lines:** Prior to scan acquisition, the **Client** shall provide ASTERRA with a detailed and accurate GIS pipe system layer. If GIS is not available, roads will be used to guide the analysis. ASTERRA will use this layer to identify POI locations. The GIS layer should include pipe material and diameter, forced and/or gravity lines, length of pipeline to be analyzed, manholes, depth, and any other detailed information available.
- **Leak Detection History (Work Orders):** The **Client** shall provide ASTERRA with a detailed and accurate history of leak findings and repairs beginning one (1) week before the date the first satellite scan is acquired and through the project life cycle.
- **Leak Detection Performance Metrics for Potable Water Lines:** The **Client** shall provide ASTERRA with relevant and available performance metric data related to previous **Client**-utilized leak detection methodologies. This information will be used to calculate value metrics of the service and will be provided to the Client in the final report for their use.

Client Services for Potable Water

Areas of Interest (AOI)

During this service, ASTERRA will survey the Area of Interest (AOI) to be determined by the client, contained to 140 linear miles of mains and service pipes as outlined in the image below:



Once ASTERRA receives the full GIS pipe system information from the client, the pipe and total miles analyzed per delivery will be identified. Note: both main and service lines will be counted for total pipe length calculation.



Attachment: Exhibit A- ASTERRA Proposal (8847 : Authorization of Water Utility Leak Audit)



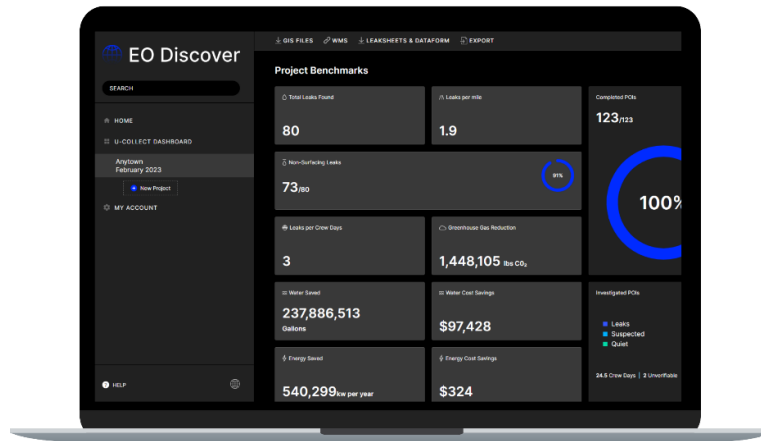
EO Discover

Subscription-Based Service Packages

ASTERRA's Recover solution and features are provided via a subscription to EO Discover with an option to select one of two district levels of service (Detect or Prevent). Each service level contains specific features designed to meet clients' current and future needs, with additional add-on services available.

Detect 	Prevent 
2 licenses: EO discover	4 licenses: EO discover
Base line leak analysis	Base line leak analysis
Leak Locations	Leak Locations
U-collect/U-View Apps (2 licenses)	U-collect/U-View Apps (4 licenses)
	Temporal and Spatial leak Analysis
	Prioritized Leak locations for field investigation

Always Included: Online support, customized success plan, best practices tutorials



Attachment: Exhibit A- ASTERRA Proposal (8847 : Authorization of Water Utility Leak Audit)

Pricing

Area of interest (AOI) for analysis:

Potable Water lines: 140 linear miles

	Detect		Prevent	
	Qty.	Price	Qty.	Price
Package	12 Months	\$23,000	12 Months	\$35,000
Discount with Shared Image		(\$10,500)		(\$16,500)
Total Package Price	12 months	\$12,500	12 months	\$18,500

Package price discount for 24 months subscription: 5%

Package price discount for 36 months subscription: 10%

Proposal is valid until: October 31st, 2023

Note: Once a package is selected, please contact ASTERRA sales team for terms of use and signature processing.

Attachment: Exhibit A- ASTERRA Proposal (8847 : Authorization of Water Utility Leak Audit)



Acoustic Leak Detection for Pinpointing

ASTERRA deliverable includes

- Acoustic Leak Detection Field Investigation.** Based upon selecting this option, ASTERRA will provide a certified sub-contractor for a dedicated acoustic field verification effort to investigate provided POI's and pinpoint possible leaks according to ASTERRA best practices and guidance. The leak detection field verification team(s) is proficient and experienced in using and operating acoustic equipment, such as amplified leak listeners, ground microphones, and leak noise correlators, at a minimum. The team(s) should be provided with all needed tools to access listening points.

Days of Boots on the Ground (BOTG) Estimated Per Utility

UTILITY NAME	LINEAR MILES OF PIPE	# OF DAYS FOR BOTG
City of Mequon	140 miles	7.8
Village of Brown Deer	94 miles	5.2
City of Glendale	92 miles	5.1
City of Cudahy	63 miles	3.5

PRICING

Service	Price
Field Leak Detection for pinpointing (sub-contracted and certified to use ASTERRA SAR technology) – 5 days	\$9,500
Field Leak Detection for pinpointing (sub-contracted and certified to use ASTERRA SAR technology) – 10 days	\$19,000
Field Leak Detection for pinpointing (sub-contracted and certified to use ASTERRA SAR technology) – 15 days	\$27,000
Field Leak Detection for pinpointing (sub-contracted and certified to use ASTERRA SAR technology) – 20 days	\$36,000

Notes:

- PO for the total project must be received by October 31, 2023.
- BOTG must be purchased in 5-day increments.
- ASTERRA will invoice 14 days in advance for Acoustic field leak detection crew. Invoice will be from Utilis Inc.
- Travel Expenses for leak detection team is included.

of Days of BOTG 10

Price \$19,000.00



11333 N. Cedarburg Road
 Mequon, WI 53092-1930
 Phone: 262-236-8150
 Fax: 262-242-9655

www.ci.mequon.wi.us

Office of Engineering

TO: Mequon Municipal Water Utility Commission
FROM: Kristen Lundeen, Director of Public Works/City Engineer
DATE: October 10, 2023
SUBJECT: Adoption of the Updated Mequon Water Utility Master Plan

Background

In September, the Water Utility Commission (WUC) reviewed and discussed the draft master plan. As a result of the discussion, the master plan document was completed and the final document is available for viewing here:

<https://www.ci.mequon.wi.us/utilities/page/mequon-water-utility-master-plan>.

At the October meeting, staff is requesting formal adoption of the document. As a best management practice, the document will be reviewed annually and scheduled for an update in five years, or FY2028.

Analysis

With the adoption of the master plan, the WUC also provided feedback on the implementation of the principles and recommendations of the document. For clarification, the document will be utilized to further formulate the following documents:

- Budget
- Implementation Plan
- Work Plan
- Annual Report

Mequon Water Utility staff also forwarded the request to amend the Milwaukee Water Works contract to the City Attorney for review and comment.

BUDGET

Elements of the master plan that will impact revenue or expenditures will be incorporated into the budget package each year, detailing both anticipated cost impacts and prioritization of projects. Operation and maintenance efforts are outlined in Exhibit B, which provides the budgeting and financial data based on the Public Service Commission of Wisconsin's (PSCW) chart of accounts.

Capital improvement projects and other long-term fiscal impacts or projects impacting the budget will be incorporated into Exhibit A of the budget documents. Exhibit A details the capital funds as proposed for the Water Utility. Projects and funding are categorized into one of seven accounts: System Storage, System Supply & Control, Water Meter Replacement,

Buried Utility Plant, Equipment Replacement, Utility Finance and Betterment of Service.

The budget package is an annual document that will be reviewed, prioritized and approved by the WUC in accordance with the recommendations of the master plan. Financial projections are a part of the 5-year Capital Improvement Plan rather than the master plan so that anticipated costs can be adjusted in real time based upon material, equipment and labor costs.

The FY2024 budget package will include the prioritized projects as recommended by the master plan.

IMPLEMENTATION PLAN

Non-expenditure or non-project related recommendations will be incorporated into the Implementation Plan. While not comprehensive, an example of the first draft of the Implementation Plan is attached. The Implementation Plan will include policies, initiatives, procedures that will be addressed over the next five years. Scheduling of the items identified in the Implementation Plan will be included in the Work Plan.

WORK PLAN

The Work Plan is the yearly schedule of the level of effort for the Mequon Water Utility Staff. It will include both elements from the budget and from the implementation plan, as well as routine operation and maintenance procedures. It identifies the plan for how staff will spend their time, updates of how the plan may be impacted as the year goes on and be presented to the WUC with the agenda packets. Similar to the Implementation Plan, while not final, a draft version of the Work Plan is attached.

ANNUAL REPORT

Each year after the closeout of the fiscal year, the Mequon Water Utility staff will issue an annual report. The annual report is a combination of the data tracking from the monthly reports, the addition of a year's worth of data summarized in the tables, charts and graphs within the master plan and to reassess the implementation plan to determine if there should be any adjustments to the work plan for the following year.

Fiscal Impact

The update to the master plan was funded in FY2023 and all efforts will be completed within budget. As noted, recommendations for further fiscal impact will be included in the budget package to be considered within the next month.

Recommendation

Staff recommends that the WUC adopt the updated master plan. The final version of the document will be available on the City's website and utilized to guide Mequon Water Utility staff moving forward.

Attachments:

2024 Water Capital Project Budget (PDF)

Water Implementation Plan (PDF)
2024 Work Plan-Water (PDF)

WATER CAPITAL PROJECT BUDGET

Capital projects for the Water Utility are system improvements and replacements outside of the normal operation and maintenance of the system. These projects typically are defined by their cost (>\$5,000), increased lifespan (1 year or more), and overall benefit to the system. Additionally, unlike maintenance and operation, which applies to the current utility infrastructure in place, capital projects usually involve the addition of new infrastructure to the system. Due to the singular nature of capital projects and the cost associated with them, proper planning and funding is required to reduce large increases in annual budget demands. Therefore, the Mequon Water Utility provides self-funding for capital expenditures based on a combination of user charges, developer’s fees, and connection fees for new customers. This allows large capital projects to be planned and funded without drastic changes in the annual budget, large scale borrowing, or changes to water rates.

Prior to 2017, the Utility was unable to self-fund capital projects. In the early years of utility ownership, the bond covenant and the revenue bond payments severely limited the Utility’s ability to properly plan and fund system improvements and replacements. However, during the first twelve years of ownership the Mequon Water Utility was steadily growing the utility through new developments in Mequon, Bayside and Thiensville. These projects increased the size of the water utility by roughly 50% (just under 3,000 customers in 2009 to approximately 4,728 customers in 2022). In 2017, the Utility re-negotiated its revenue bonds, and based on the reduced principal payments and increased customer counts, the utility has the financial ability to self-fund capital reserves.

Table 1 – History of Self-Funded Capital Budgets

	2018	2019	2020	2021	2022	2023
Total Self-Funding Capital	\$150,000	\$150,000	\$200,000	\$300,000	\$400,000	\$500,000

The Mequon Water Utility was started in the late 1990’s. Initially, the Utility was a composite of several earlier private subdivision well systems that interconnected and formed a public utility. As such, the age of the utility is beyond 20 years old. As the utility ages, components of the system will approach the end of their predicted life span or may have outlived their effectiveness. The utility is also continuously growing as existing subdivisions convert from private wells systems to public water, or new subdivisions are developed and connected. Due to the combination of these factors, the utility is entering an era where large scale capital projects, as identified in the master plan, will be needed to secure additional supply, redundancy, improved service, or meet regulations for the growing utility.

WATER CAPITAL PROJECT BUDGET

Table 2 – Self-Funded Capital Budgets

Account Name	2024	2025	2026	2027	2028
1. System Storage	\$(258,707)	\$-	\$-	\$-	\$-
2. System Supply & Control	\$82,450	\$50,000	\$-	\$-	\$-
3. Water Meter Replacement	\$(65,424)	\$100,000	\$100,000	\$100,000	\$75,000
4. Buried Utility Plant	\$1,005,365	\$100,000	\$100,000	\$100,000	\$75,000
5. Equipment Replacement	\$71,746	\$10,000	\$10,000	\$10,000	\$10,000
6. Utility Finance	\$(319)	\$5,000	\$5,000	\$5,000	\$-
7. Betterment of Service	\$158,278	\$200,000	\$280,000	\$290,000	\$360,000
TOTALS	\$993,388	\$465,000	\$495,000	\$505,000	\$520,000

While the self-funded capital accounts are established as sinking funds to provide for level budgeting and long-term funding, the water utility has identified several specific projects that would utilize the funding. For some projects, the account will require funding over a multi-year budget cycle to achieve sufficient funding. The scale or proportion of funding established for each individual account is intended to match the priority and need for the water utility.

1. System Storage

The System Storage Fund is a sinking fund utilized to maintain existing storage facilities throughout the system. Currently there are 4 storage facilities in the Utility, which require regular scheduled inspections, repairs and painting. Furthermore, this fund incorporates proactive engineering and planning to potentially include additional storage as the Utility grows.

Prioritized projects include:

- Water Tower Improvements - \$550,000
- Existing Ground Reservoir Abandonments (1) at \$80,000 (2) - \$40,000 each

2. System Supply & Control Fund

The System Supply and Control Fund is a sinking fund utilized to upgrade, install, and expand SCADA (System Control And Data Acquisition) equipment in the utility. Also included are improvements or additions to supply sources, equipment, or facilities. Long term projects and priorities revolve around ensuring the Mequon Water Utility can supply peak day demand to customers. Per NR 811.26, “[...] If more than 2 [pumping] units are installed, the total number of units shall have sufficient capacity so that if any one pump is taken out of service, the remaining pumps are capable of supplying the peak demand.” In MWU’s situation, pumping units are considered to be sources of supply as the Utility purchases all of its water. Currently, the firm water supply is sufficient to meet maximum day demands. However, if the MWW supply was out of service due to an emergency, all water for the high- and medium-pressure districts would need to be supplied by the booster pump on Port Washington Road. The Utility contractually meets the current peak day demand, however there are hydraulic limitations to providing water from the Port Washington Road booster station to the high-pressure zone for an extended period of time.

WATER CAPITAL PROJECT BUDGET

Prioritized projects include:

- Second Milwaukee Meter Pit - \$150,000
- SCADA Modifications - \$50,000
- NSWC Booster Revision - \$50,000

3. Water Meter Replacement Fund

The PSCW requires water utilities to replace residential water meters once every 20 years. Based on the utility growth – which started in 1998, the utility has been replacing water meters annually for several years. While the exact number of meters to replace varies yearly, a general estimation of 5% of the system per year gives a useful approximation of the scale and number of meters. For the next 5-year span, the approximate number of meters needing to be replaced every year is 250.

Prioritized projects include:

- 250 Meter Replacement per year - \$75-85,000 per year

4. Buried Utility Plant Fund

The buried Utility Plant Fund incorporates replacement and maintenance of all aging infrastructures that fails in the field. Examples include copper water laterals, water valves, auxiliary valves, and hydrants, along with scheduled water main replacements. It is more difficult to establish a prioritization list within this fund, due to the various types of infrastructure involved and the differing replacement/repair options for each infrastructure. Additionally, the prioritization list could fluctuate heavily from year to year as additional valves, and hydrants are identified for repair during the yearly flushing and exercising program.

Prioritized projects include:

- Hydrant Replacement (per year) - \$40,000
- Valve Replacement (per year)- \$40,000

5. Equipment Fund

The Equipment Fund is a sinking fund utilized to upgrade and replace water utility equipment. Examples include Utility Truck/Van, Dump Truck, significant tools, or analyzers. By nature of the equipment, this is a difficult fund to budget and prioritize purchases, as often equipment has no estimated lifespan and may simply quit working, requiring a fairly urgent replacement and repair.

- 2024 – Replace 801 (2006 KUV Utility Van with 135,000 Miles) with new Utility Truck - \$80,000

WATER CAPITAL PROJECT BUDGET

6. Utility Finance Fund

The Utility Finance Fund is a sinking fund utilized to upgrade, install, and expand software and equipment utilized to collect meter readings and bill the utility customers. Because of the scale of efforts needed to implement changes related to meter reading collection and billing, there are typically few major projects or changes related to this fund. Most changes are related to maintenance of the existing system and upgrading/repairing the existing functions and capabilities. However, given that the Utility is pursuing a meter replacement program for the first time in 2018, some thought should be given to changing or replacing the existing metering and billing system to better serve customers in the future (once a significant portion of the meters have been replaced).

Prioritized projects include:

- Migration to AMI Metering System - \$400,000

7. Betterment of Service Fund

The Betterment of Service (BOS) Fund is a sinking fund utilized to upgrade, install, and expand the utility plant with projects that benefit ALL customers of the system, but may not have a specific “sponsor” or “development” with which it serves. This improvement can be in quantity, quality, or reliability of water service, or any other sufficient reason. The two best examples of these projects include water main system loops and water quality loops.

Prioritized projects include:

- Buntrock Avenue Loop - \$587,000 (2023 payment due to Thiensville)
- Swan Ridge Subdivision Main Upsizing - \$300,000
- Second Milwaukee Connection Loop - \$1,000,000
- Hidden River Condos Loop - \$220,000
- Mequon Rd (River to Riverland) Loop - \$495,000
- Stonefields V Subdivision Loop - \$230,000
- Lac de Cours Loop - \$100,000
- Columbia Creek Subdivision Loop - \$420,000
- Hidden Reserve & Gebhardt Farms Loop - \$260,000

The annual budget process establishes the total capital funding allowed, as well as allocates those funds among the various accounts. The expenditure of those capital funds follows the City’s procurement policy, generally requiring Water Utility Commission authorization. While staff will work according to the prioritization of projects below, the Water Utility Commission ultimately controls which projects will be awarded on an annual basis.

WATER CAPITAL PROJECT BUDGET

Table 3 – 5-Year Project Plan

	2024	2025	2026	2027	2028
System Storage Fund Subtotal	\$ -	\$ -	\$ -	\$ -	\$ -
No Planned Projects					
System Supply and Control Fund	\$ 150,000	\$ 50,000	\$ -	\$ -	\$ -
Second MWW Meter Vault	\$ 150,000				
SCADA Improvements		\$ 50,000			
Water Meter Replacement Fund Subtotal	\$ 75,000	\$ 80,000	\$ 85,000	\$ 90,000	\$ 95,000
250 Meter Replacements	\$ 75,000	\$ 80,000	\$ 85,000	\$ 90,000	\$ 95,000
Buried Utility Plant Fund Subtotal	\$ 75,000	\$ 80,000	\$ 80,000	\$ 80,000	\$ 100,000
Hydrant/Valve/Service Replacements	\$ 75,000	\$ 80,000	\$ 80,000	\$ 80,000	\$ 100,000
Equipment Fund Subtotal	\$ 80,000	\$ -	\$ -	\$ -	\$ -
801 Replacement	\$ 80,000				
Utility Finance Fund Subtotal	\$ -	\$ -	\$ -	\$ -	\$ -
No planned projects					
Betterment of Service Fund Subtotal	\$ 887,000	\$ -	\$ -	\$ -	\$ 1,000,000
Thiensville Buntrock Repayment	\$ 587,000				
Swan Ridge Subdivision	\$ 300,000				
Second MWW Connection Loop					\$ 1,000,000
Capital Expenses Total	\$ 1,267,000	\$ 210,000	\$ 165,000	\$ 170,000	\$ 1,195,000

Accumulation of capital funds allows for level funding and minimizes fluctuations in user rates. Some capital projects require large scale funding and several years' worth of funding prior to utilization of the funds.

Table 4 - Cash Flow Analysis – Approved Capital Budget

	2023	2024	2025	2026	2027	2028
Funds Available (Jan.1)	\$435,945	\$776,612	\$503,000	\$758,000	\$1,088,000	\$1,423,000
Capital Revenue	\$500,000	\$993,388	\$465,000	\$495,000	\$505,000	\$520,000
Total Construction Funds Available	\$935,945	\$1,770,000	\$968,000	\$1,253,000	\$1,593,000	\$1,943,000
Expenses	\$159,333	\$1,267,000	\$210,000	\$165,000	\$170,000	\$1,195,000
End of Year Balance	\$776,612	\$503,000	\$758,000	\$1,088,000	\$1,423,000	\$748,000

WATER IMPLEMENTATION PLAN

Non-capital projects for the Water Utility cover a wide array of initiatives for the Utility, including operational improvements, emphasizing efficiency and reliability, and organizational advancement without the need for significant capital investments. By developing a 5-year plan for non-capital improvements or projects, the Utility is able to increase productivity, improve customer satisfaction, and improve its overall processes. Based upon the flexibility of non-capital improvements, projects may be shifted in priority as alternative Utility needs arise.

1. Reduce Non-Revenue Water (2024)
 - a. Non-revenue water has greatly increased over the past several years. With the goal to decrease this number into single digits, the MWU has obtained a proposal from a specialized firm, ASTERRA, to perform a leak survey of the system to identify locations of concern or repair. ASTERRA provides a comprehensive, accurate, and non-invasive remote sensing solution for locating leaks and monitoring potable water. This type of solution will include a raw scan of the Utility taken by radar and an analysis performed by the firm to deliver newly detected leak locations to the Utility. The estimated cost of the ASTERRA Leak Survey is \$37,500.
2. PSC Report Inconsistencies (2024)
 - a. During the Master Plan in 2023, it was discovered that the PSC report filing was inconsistent with the billing system and GIS system. The MWU will perform a study that dives into the discrepancies between the various databases and correct any inconsistencies. Staff plans on identifying these issues as part of the standard operations of the Utility and include corrections on the 2024 PSC report (filed in 2025).
3. Develop Air Relief Maintenance Program (2024)
 - a. The Utility will develop an air relief maintenance program to ensure valves are operated annually and inspected for failures. This program will be included in the standard operations budget.
4. On Main Not Using Marketing (2025)
 - a. The Utility will explore options to encourage new customer connections by on-main, not using customers. One potential option is creating a flyer that informs all on main not using customers that they have main fronting their property and the steps in order to connect to the Utility if they so choose.
5. Customer Connection Rule Revision (2025)
 - a. The Utility will perform a cost-benefit analysis of revising their customer connection rules, specifically the revenue credit. As the Utility is currently in a healthy financial position, increasing the revenue credit may incentivize new customers to connect. The Utility plans to review this policy in conjunction with On-Main, Not Using marketing.
6. Revise or Replace Milwaukee Water Works Contract (2026)
 - a. The original contract with MWW required that the customer base could not exceed 20% new development based on the original contract year. The current Utility customer base has exceeded this contract requirement. The Utility plans to address this contract requirement with MWW. Possible solutions include amending the current contract to remove the language or drafting a new contract entirely. The existing contract was inherited from WE Energies. This study will require additional funding in the operations budget for Outside Services Employed.

WATER IMPLEMENTATION PLAN

7. System Storage Analysis and Study (2027)
 - a. The 2017 Master Plan recommended actions to bring the 500,000-gallon elevated tank into operation. Once in operation, it was recommended that abandoning the existing ground storage reservoirs at Whitman Place, Ville du Parc, and the Mequon Business Park would be most beneficial. Based upon the second MWW connection, the supply situation of the MWU has changed since the 2017 evaluation. A comprehensive system storage analysis and study is recommended to determine what is the optimal long-term storage solution. Given the hydraulically inefficient location of the current elevated tank and size, it may be more effective for the MWU to abandon the existing tank and construct a new elevated storage tank in a more hydraulically advantageous part of the system. The booster pumps at Whitman Place and Ville du Parc will also be evaluated during the system storage study. This study will be best scheduled after the second MWW connection is looped into the system to truly assess the best alternatives for the future. This study will require additional funding in the operations budget for Outside Services Employed.
8. Hydraulic Water Model Study (2027)
 - a. The hydraulic water model will be utilized to prioritize distribution system looping. Ranking projects based on the additional system fire flow or number of customers benefitted will help the Utility determine how to move forward in future projects. This work will require additional funding in the operations budget for Outside Services Employed.
9. Chloramine Booster Station Study (2029)
 - a. The Utility will use the existing hydraulic model to help estimate the impacts of a chloramine booster station and perform a cost-benefit analysis to determine if a chloramine booster station is the best option to increase residuals in problem areas and improve water quality. This study will require additional funding in the operations budget for Outside Services Employed.
10. Reserve Requirements and Rate Reduction Analysis (2029 – 2030)
 - a. The current reserve requires 80% of the operation and maintenance expenses as determined by the City of Mequon budgeting process. The Utility will consider lowering the 80% requirement to 50% of the annual expenses and will consider adjusting the reserve requirement calculation to include only operational and maintenance cash expenses.
 - b. The retirement of existing bonds in 2029 presents a unique opportunity for the Utility to reduce rates. The current rate of return is above the PSC benchmark and provides sufficient cash flow for capital projects and bond obligations. Without any bond payment required, the needed cash is reduced. The Utility plans to use the financial model to model a rate reduction and its impacts on rate of return and cash flow.

**Mequon Water Utility Commission
2024 Work Plan (October 2023)**

Month	Agenda Topics
October (2023)	<ul style="list-style-type: none"> • Finalize 2024 Budget and CIP • Collect 10 Bacti Samples • Collect Chlorine Residuals • Dead End Flushing • Quarterly NRW Update • Pump Out Hydrants • Continue Meter Change Program
November	<ul style="list-style-type: none"> • Collect 10 Bacti Samples • Collect Chlorine Residuals • Dead End Flushing • Pump Out Hydrants • Cross Connection Inspections • Remove Bulk Meter
December	<ul style="list-style-type: none"> • Perform Quarterly Meter Reading (2.5 days) • Finish Cross Connection Inspections • Disinfection By-Product Sampling • Collect 10 Bacti Samples • Collect Chlorine Residuals • Develop bid package for Reservoir and Pneumatic Tank Cleaning (both storage facilities)
January (2024)	<ul style="list-style-type: none"> • Begin Cross Connection Inspections • Collect 10 Bacti Samples • Collect Chlorine Residuals • Quarterly NRW Update • Bid out Reservoir and Pneumatic Tank Cleaning
February	<ul style="list-style-type: none"> • Cross Connection Inspections • Collect 10 Bacti Samples • Collect Chlorine Residuals • Approve Reservoir and Pneumatic Tank Cleaning • Dead End Flushing
March	<ul style="list-style-type: none"> • Cross Connection Inspections • Reservoir and Pneumatic Tank Project • Perform Quarterly Meter Reading (2.5 days) • Disinfection By-Product Sampling • Collect 10 Bacti Samples • Collect Chlorine Residuals • Assist Finance Staff in PSC Report Preparation

Attachment: 2024 Work Plan-Water (8828 : Water Master Plan Adoption)

<p>April</p>	<ul style="list-style-type: none"> • Hire Summer Staff for 2024 • Install Bulk Water Meter • Start Valve Exercising Program • Asterra Leak Detection • Collect 10 Bacti Samples • Collect Chlorine Residuals • Dead End Flushing • Quarterly NRW Update • Assist Finance Staff in PSC Report Finalization • Update Financial Model after PSC Report Finalized • Update tables from Master Plan (customer counts, REU, Demands, etc)
<p>May</p>	<ul style="list-style-type: none"> • Collect Disinfection By Products Samples • Water Main Break Restoration • Start Hydrant Flushing Program • Continue Valve Exercising Program • Collect 10 Bacti Samples • Collect Chlorine Residuals • Upgrade Meter Reading system to Temetra
<p>June</p>	<ul style="list-style-type: none"> • Perform Quarterly Meter Reading (2.5 days) • Disinfection By-Product Sampling • Collect 10 Bacti Samples • Collect Chlorine Residuals • Dead End Flushing • Continue Hydrant Flushing Program • Complete Valve Exercising Program
<p>July</p>	<ul style="list-style-type: none"> • Develop Air Relief Maintenance Program • Collect 10 Bacti Samples • Collect Chlorine Residuals • Dead End Flushing • Quarterly NRW Update • Complete Hydrant Flushing Program
<p>August</p>	<ul style="list-style-type: none"> • Collect 10 Bacti Samples • Collect Chlorine Residuals • Hydrant Painting • Dead End Flushing • Begin Meter Change Program
<p>September</p>	<ul style="list-style-type: none"> • Perform Quarterly Meter Reading (2.5 days) • Disinfection By-Product Sampling • Collect 10 Bacti Samples • Collect Chlorine Residuals • Hydrant Painting • Dead End Flushing • Draft 2025 Budget and CIP • Develop 2025 Work Plan • Work on PSC Inconsistencies

Attachment: 2024 Work Plan-Water (8828 : Water Master Plan Adoption)

October	<ul style="list-style-type: none"> • Finalize 2025 Budget • Update Financial Model based on adopted budget • Collect 10 Bacti Samples • Collect Chlorine Residuals • Dead End Flushing • Pump Out Hydrants • Quarterly NRW Update • Work on PSC Inconsistencies
November	<ul style="list-style-type: none"> • Remove Bulk Fill Meters • Restock Main Break Equipment • Collect Disinfection By Products Samples • Collect 10 Bacti Samples • Collect Chlorine Residuals • Pump Out Hydrants • Cross Connection Inspections •
December (2024)	<ul style="list-style-type: none"> • Perform Quarterly Meter Reading (2.5 days) • Cross Connection Inspections • Disinfection By-Product Sampling • Collect 10 Bacti Samples • Collect Chlorine Residuals • Dead End Flushing • Work on PSC Inconsistencies

Unscheduled Work Plan Items

- Capital Projects
 - Swan Ridge Development and Meter Vault (estimated spring)
 - Enclave Phase VII (estimated summer)
 - Alberta Subdivision (estimated fall)

2023 Completed Items

<ul style="list-style-type: none"> • Expansion to River Hills and The Grove • 2023 Master Plan • Hydrant Replacements 	<ul style="list-style-type: none"> • Freistadt and Main Water Main Extension • Enclave Phase VI Water Main Extension • L&C Sampling
--	--

Attachment: 2024 Work Plan-Water (8828 : Water Master Plan Adoption)