CITY OF ONALASKA MEETING NOTICE

COMMITTEE/BOARD: **Board of Public Works**

DATE OF MEETING: January 6, 2015 (Tuesday)

PLACE OF MEETING: City Hall – 415 Main Street (Common Council Chambers)

TIME OF MEETING: 6:30 P.M.

PURPOSE OF MEETING

1. Call to Order and roll call.
2. Approval of minutes from the previous meeting.
3. Public Input: (limited to 3 minutes/individual)

Consideration and possible action on the following items:

4. **Approximately 6:30 PM Public Hearing(or immediately following public input)** – regarding 3rd avenue south reconstruction project including but not limited to possible parking restrictions, bicycle facility installation, street & boulevard widths and any other pertinent project items
5. Review and consideration of permanent easement acquisition from the School District of Onalaska for Well #9 reconstruction project
6. **Resolution 2-2015** – Resolution to authorize a representative to file application for the Safe Drinking Water Loan Program application
7. **Resolution 3-2015** – Resolution declaring official intent to reimburse expenditures from proceeds of borrowing
8. Review and consideration of authorization to bid Well #9 Reconstruction Project
9. Review and consideration of Onalaska Waterworks Wisconsin Department of Natural Resources Sanitary Survey
10. Pay Estimates: Strand Associates, Short Elliot Hendrickson Inc., Mathy Construction, Wapasha Construction, Fahrner Asphalt Sealers, Ayres Associates, State of Wisconsin Department of Transportation and any other contractor/developer.

Adjournment

PLEASE TAKE FURTHER NOTICE that members of the Common Council of the City of Onalaska who do not serve on the Board may attend this meeting to gather information about a subject over which they have decision making responsibility.

Therefore, further notice is hereby given that the above meeting may constitute a meeting of the Common Council and is hereby noticed as such, even though it is not contemplated that the Common Council will take any formal action at this meeting.

Notices Mailed To:

* Mayor Joe Chilsen
Ald. Erik Sjolander
Ald. Jim Olson
* Ald. Jim Bialecki –Vice Chair
*Ald Jack Pogreba - Chair
**Ald. Harvey Bertrand
Ald. Bob Muth
City Attorney Dept Heads
La Crosse Tribune Charter Com.
Onalaska Holmen Courier Life
WIZM WKTY WLXR WKBH
WLSU WKBT WXOW

*Board Members ** Alternate Member

*Jarrod Holter, City Engineer
*Fred Buehler, Financial Services Director/Treasurer

Onalaska Public Library

Date Notices Mailed and Posted: 12/31/14

In compliance with the Americans with Disabilities Act of 1990, the City of Onalaska will provide reasonable accommodations to qualified individuals with a disability to ensure equal access to public meetings provided notification is given to the City Clerk within seventy-two (72) hours prior to the public meeting and that the requested accommodation does not create an undue hardship for the City.

STAFF REVIEW SUMMARY

CITY OF ONALASKA
BOARD OF PUBLIC WORKS

January 6, 2015

Agenda Item: #4

Project/Item Name:	3rd Avenue South
Location:	3rd Avenue South
Requested Action:	Discussion on street width and bicycle facilities
Staff Report/Description:	City staff has mailed a letter to all abutting property owners for a public hearing to be held at the January meeting to discuss project impacts. With this letter proposed street configurations are included. The current staff proposals maintain the existing street width for the project.
Attachments:	Resident letter and sharrow lane details

CITY OF ONALASKA

415 MAIN STREET
ONALASKA, WISCONSIN 54650-2953
www.cityofonalaska.com

Engineering/Public Works Dept.
PHONE: (608) 781-9537
FAX: (608) 781-9506

December 10, 2014

Dear Resident/Property Owner/Business Owner:

The City of Onalaska Board of Public Works and Engineering Department wishes to inform and welcomes you to attend a public hearing on the addition of on-road bicycle facilities for 3rd Ave South as part of the proposed 2015 Utility Project on Tuesday January 6, 2014 at 6:30 PM at City Hall in Onalaska.

The public hearing will discuss three different options for the addition of on-road bicycle facilities for 3rd Ave South. A brief description of each option is listed below and the attached drawing provides a roadway cross section for each option. For each option listed the existing overall roadway cross section does not change.

Option #1 – No Change
(66' right-of-way = 10' sidewalks + 15' boulevards + 5' curb & gutter, + 36' asphalt road)

Option #1 does not change the existing road section for 3rd Ave South. The existing eight foot parking lanes and 12 foot traffic lanes would stay as they are currently.

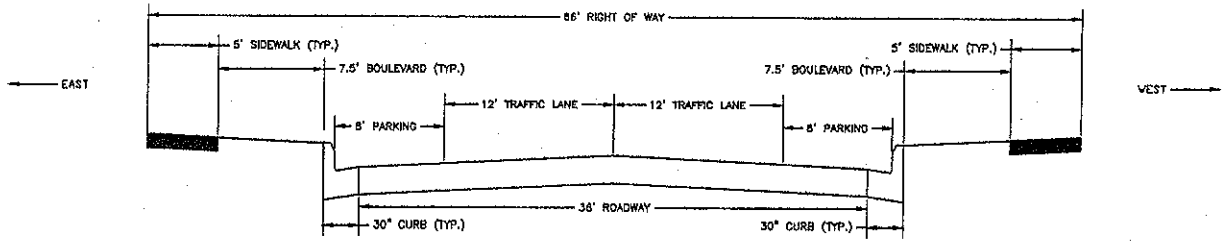
Option #2 – One Side Parking & Two Bike Lanes
(66' right-of-way = 10' sidewalks + 15' boulevards + 5' curb & gutter, + 36' asphalt road)

Option #2 would remove the existing parking on the east side of 3rd Ave South to accommodate the addition of two bicycle lanes, one on each side of the road. Each bicycle lane would be striped and signed as a dedicated bicycle lane only. Each traffic lane would be reduced from 12 feet to 10.5 feet to additionally help accommodate for the bicycle lanes. No change would be made to the sidewalk or boulevard widths and parking would remain on the west side of the street.

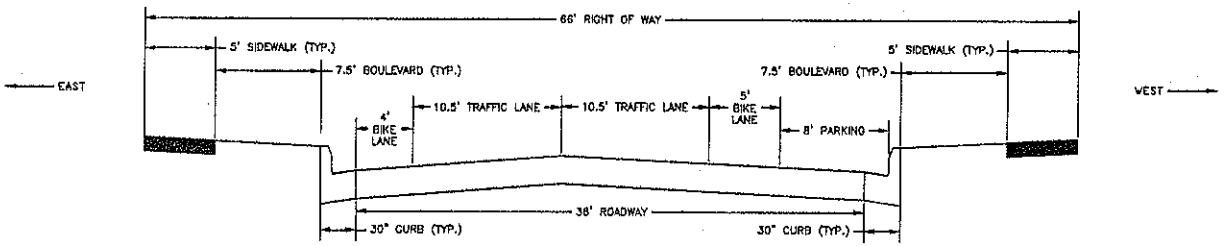
Option #3 – No Change with Bicycle Sharrows for Full Lane Bicycle Use
(66' right-of-way = 10' sidewalks + 15' boulevards + 5' curb & gutter, + 36' asphalt road)

Option #3 does not change the existing road section for 3rd Ave South. The existing eight foot parking lanes and 12 foot traffic lanes would stay as they are currently. This option would add a bicycle sharrow symbols to each traffic lane (13' off curb flag) that would allow bicycles traveling over the sharrow symbols to use the existing traffic lane as a bike lane. Bicycles traveling over the sharrow symbols would have to be treated as a motorized vehicle and granted the same rights to the traffic lane as any other motorized vehicle. No change would be made to the sidewalk or boulevard widths.

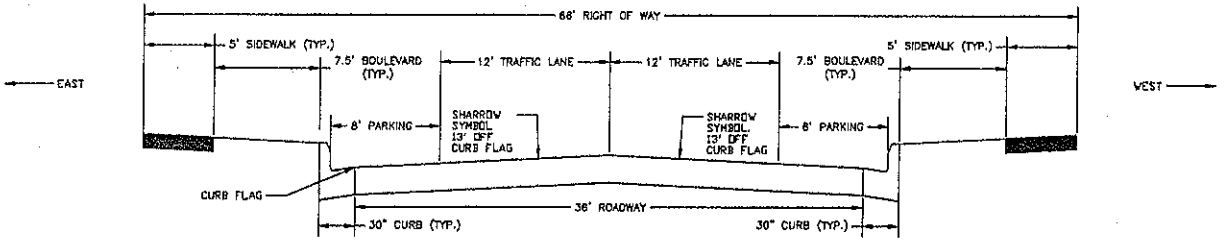
TYPICAL EXISTING 3RD AVENUE SOUTH ROADWAY SECTION

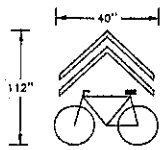


PROPOSED 3RD AVENUE SOUTH ROADWAY SECTION 2–BIKE LANES & ONE SIDE PARKING



PROPOSED 3RD AVENUE SOUTH ROADWAY SECTION TRAFFIC/FULL BIKE LANE





SHARROW SYMBOL

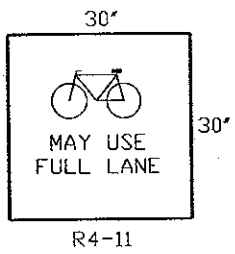
SUBMIT	REV. DATE	DRAWN	DESIGN	CHECKED
		KJS	KJS	CJH
		12/10/14	12/10/14	12/10/14

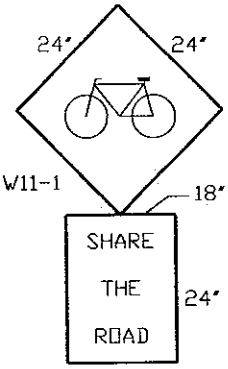
CITY OF ONALASKA
ENGINEERING DEPARTMENT
415 MAIN STREET, ONALASKA, WISCONSIN, 54650
TELEPHONE: (608) 781-9537, FAX: (608) 781-9506

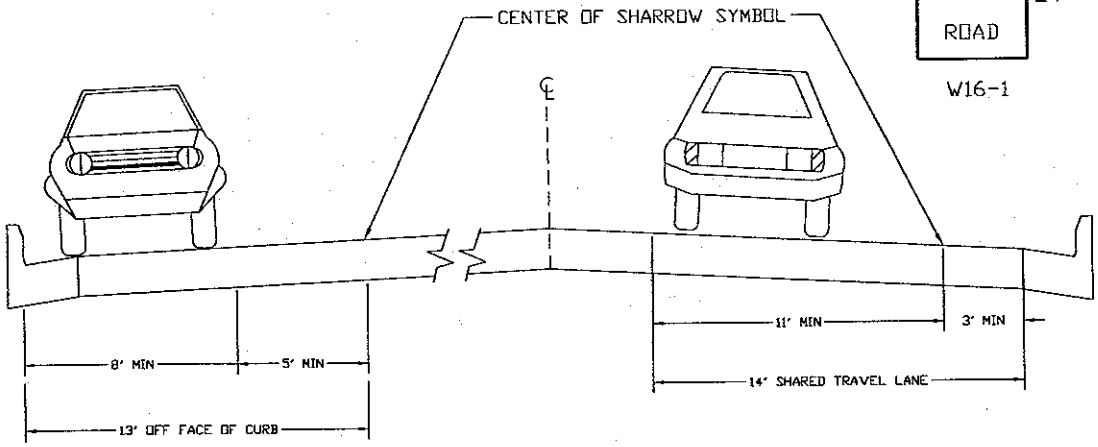
2015 UTILITY PROJECT

3RD AVE SOUTH ROADWAY DESIGNS (MAIN TO GREEN)

SHEET 1 / 1

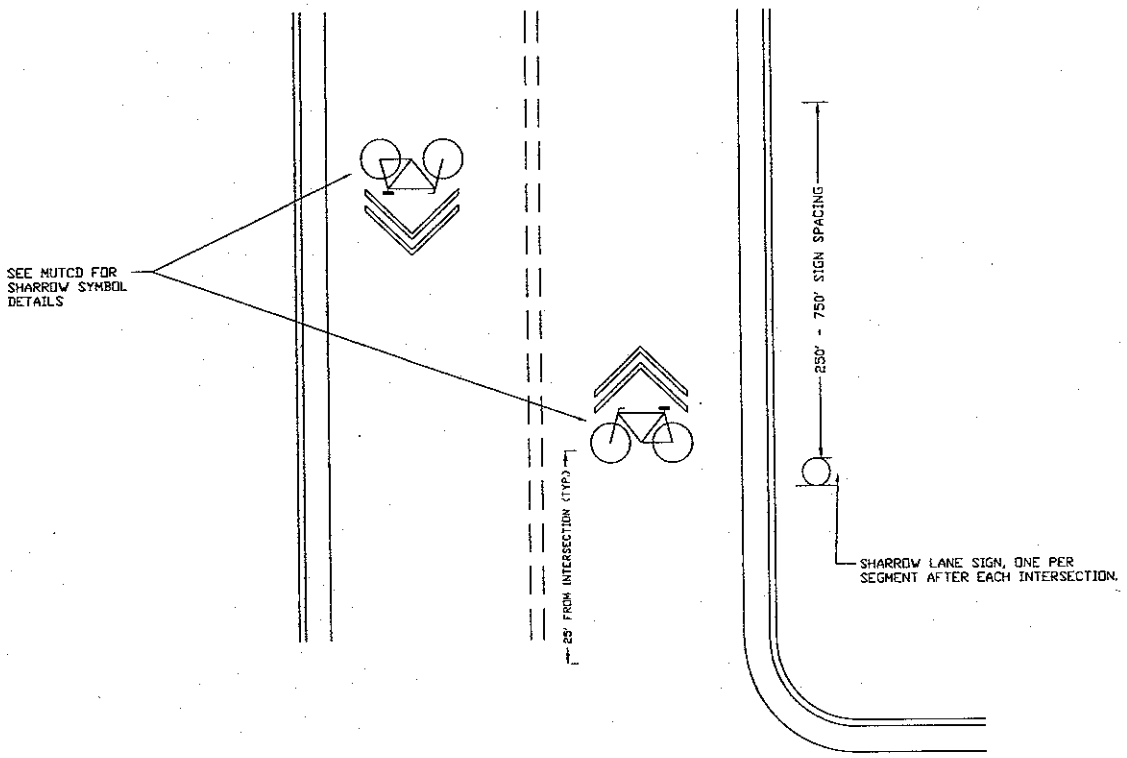






FULL LANE SHARROW WITH PARKING
NTS

SHARED LANE SHARROW WITHOUT PARKING
NTS



TYPICAL SHARROW AND SIGN LAYOUT
NTS

DRAWN	DESIGN	CHECKED
KJS	KJS	CJH
12/8/14	12/8/14	12/8/14

CITY OF ONALASKA
ENGINEERING DEPARTMENT
415 MAIN STREET, ONALASKA, WISCONSIN, 54650
TELEPHONE: (608) 781-9537; FAX: (608) 781-9506

PROPOSED SHARROW LANE DETAILS

SHEET 1 / 1

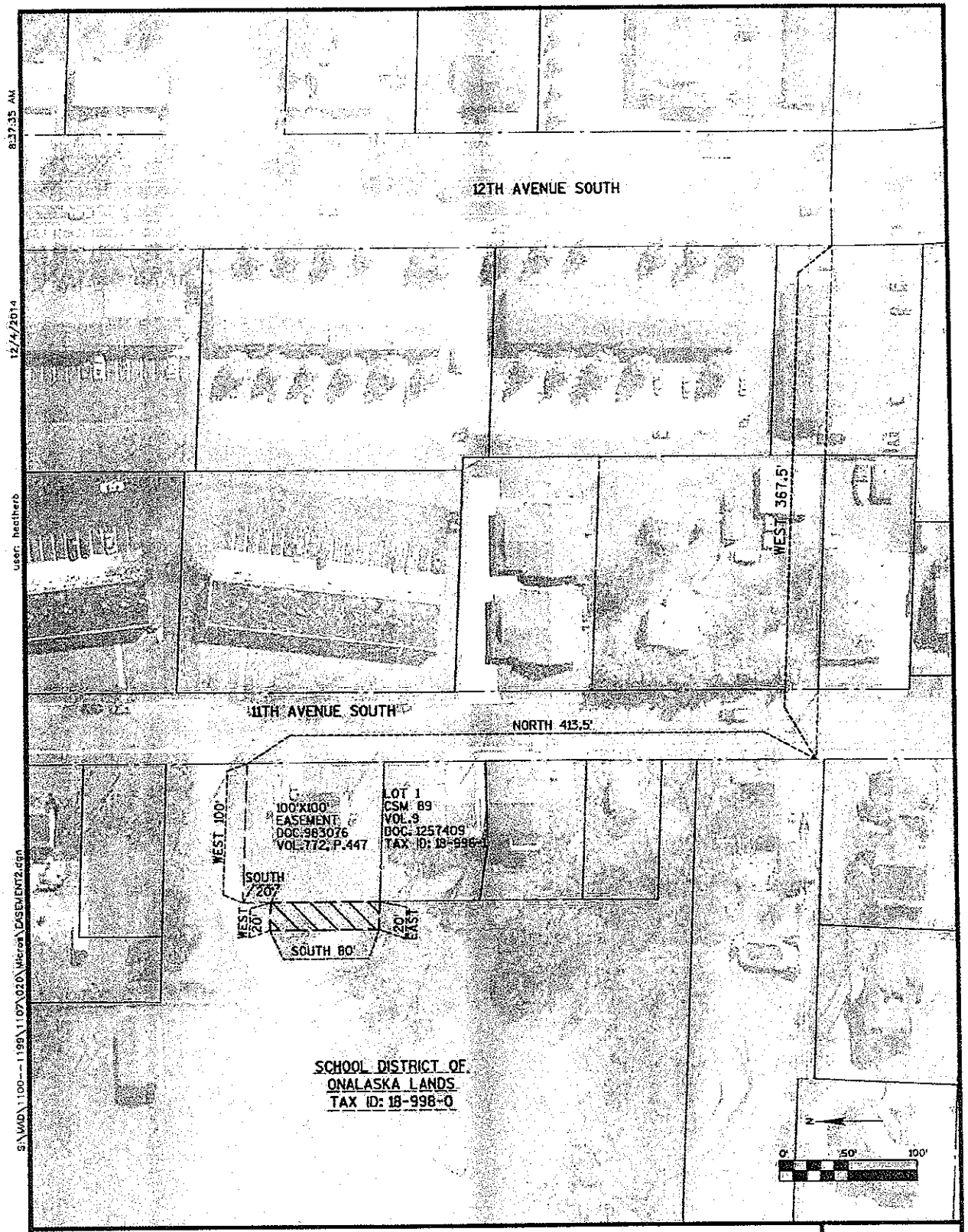
STAFF REVIEW SUMMARY

CITY OF ONALASKA
BOARD OF PUBLIC WORKS

January 6, 2015

Agenda Item: #5

Project/Item Name:	Well #9 Reconstruction
Location:	860 11th Ave. South
Requested Action:	Approval of easement acquisition
Staff Report/Description:	The Well #9 reconstruction project will require an increase in permanent easement due to increase in building footprint. The School District of Onalaska has approved the granting of permanent easement for the project.
Attachments:	Map



EASEMENT

WELL NO. 9 RECONSTRUCTION AND FILTER ADDITION

CITY OF ONALASKA

LA CROSSE COUNTY, WISCONSIN

STRAND ASSOCIATES

FIGURE NO. 1

JOB # 1107.020

EASEMENT

A 20 foot easement over, across and under a parcel of land located in the northeast 1/4 of the southwest 1/4 of Section 9, Township 16 North, Range 7 West, La Crosse County, Wisconsin, also known as Outlot 114 of the Assessors Plat of the City of Onalaska, more fully described as follows:

Commencing at the southeast corner of Outlot 114;
Thence West along the South line of said Outlot 367.5 feet to the West right-of-way line of 11th Avenue South;
Thence North along said West right-of-way line 313.5 feet ;
Thence continuing 100 feet along said West right-of-way line to the Northeast corner a City of Onalaska easement recorded in Volume 772, page 447 as document number 983076 at the La Crosse County register of deeds;
Thence West 100 feet along the north line of said previously recorded easement to the Northwest corner of said easement;
Thence South 20 feet along the West line of said previously recorded easement to the point of beginning of this easement;

Thence West 20 feet to a point;
Thence South 80 feet to the Westerly extension of the south line of said previously recorded easement;
Thence East 20 feet along the South line extended of said previous easement to the southwest corner of said previous easement;
Thence North 80 feet along the Westerly line of said previously recorded easement to the point of beginning.

Said parcel contains 1600 square feet, more or less.

Subject to all other easements and restrictions, recorded and unrecorded.

Part of Tax ID: 18-998-0

S:\MAD\1100--1199\1107\020\Wrd\EASEMENT.DOCX

STAFF REVIEW SUMMARY

CITY OF ONALASKA
BOARD OF PUBLIC WORKS

January 6, 2015

Agenda Item: #6

Project/Item Name:	Well #9 Reconstruction
Location:	860 11th Ave. South
Requested Action:	Approval of resolution 2-2015
Staff Report/Description:	Resolution 2-2015 installs the Mayor as the authorized representative to sign the Safe Drinking Water Loan application for the Well #9 project.
Attachments:	Resolution 2-2015

RESOLUTION 2 - 2015

RESOLUTION TO AUTHORIZE A REPRESENTATIVE TO FILE APPLICATIONS FOR THE SAFE DRINKING WATER LOAN PROGRAM APPLICATION

WHEREAS, it is the desire of the City of Onalaska, a municipal corporation, to file an application for state financial assistance through the Safe Drinking Water Loan Program ("SDWLP"); and

WHEREAS, one of the requirements of such an application is that a representative be authorized by formal action of the City to sign and file applications including amendments and attachments on behalf of the City.

NOW, THEREFORE, BE IT RESOLVED, that the City of Onalaska authorizes the Mayor of the City of Onalaska to act as the City's representative and sign and file said applications and related documents on behalf of the City of Onalaska, and such representative is further authorized and empowered to do all things necessary in connection with said applications.

Dated this ____ day of January, 2015.

CITY OF ONALASKA

By:_____
Joe Chilsen, Mayor

By:_____
Caroline Burmaster, Clerk

PASSED:
APPROVED:
PUBLISHED:

STAFF REVIEW SUMMARY

CITY OF ONALASKA
BOARD OF PUBLIC WORKS

January 6, 2015

Agenda Item: #7

Project/Item Name:	Well #9 Reconstruction
Location:	860 11th Ave. South
Requested Action:	Approval of resolution 3-2015
Staff Report/Description:	Resolution 3-2015 declares that the Well #9 Reconstruction Project will use interim financing that will be paid once final financing is secured(Safe Drinking Water Loan).
Attachments:	Resolution 3-2015

RESOLUTION 3 - 2015

RESOLUTION DECLARING OFFICIAL INTENT TO REIMBURSE EXPENDITURES FROM PROCEEDS OF BORROWING

WHEREAS, the City of Onalaska, La Crosse County, Wisconsin (the "Municipality") plans to undertake improvements to the City's water system, including construction of a filtration plant (Well #9) (the "Project"); and

WHEREAS, the Municipality expects to finance the Project on a long-term basis by issuing tax-exempt bonds or promissory notes (the "Bonds"); and

WHEREAS, because the Bonds will not be issued prior to January 1 2015, the Municipality must provide interim financing to cover costs of the Project incurred prior to receipt of the proceeds of the Bonds; and

WHEREAS, it is necessary, desirable, and in the best interests of the Municipality to advance moneys from its funds on hand on an interim basis to pay the costs of the Project until the Bonds are issued.

NOW, THEREFORE, BE IT RESOLVED by the Common Council of the Municipality, that:

Section 1. Expenditure of Funds. The Municipality shall make expenditures as needed from its funds on hand to pay the costs of the Project until Bond proceeds become available.

Section 2. Declaration of Official Intent. The Municipality hereby officially declares its intent under Treas. Regs. Section 1.150-2 to reimburse said expenditures with proceeds of the Bonds, the principal amount of which is not expected to exceed $3,250,000.

Section 3. Unavailability of Long-Term Funds. No funds for payment of the Project from sources other than the Bonds are, or are reasonably expected to be, reserved, allocated on a long term basis, or otherwise set aside by the Municipality pursuant to its budget or financial policies.

Section 4. Public Availability of Official Intent Resolution. This Resolution shall be made available for public inspection at the City Clerk's office within 30 days after its approval in compliance with applicable State law governing the availability of records of official acts including Subchapter II of Chapter 19, and shall remain available for public inspection until the Bonds are issued.

Section 5. Effective Date. This Resolution shall be effective upon its adoption and approval.

Adopted and recorded January 13, 2015.

Approved January 13, 2015.

_____
Joe Chilsen
Mayor

(SEAL)

ATTEST:

_____
Caroline Burmaster
City Clerk

Quarles & Brady LLP

411 East Wisconsin Avenue
Suite 2350
Milwaukee, Wisconsin 53202-4426
414.277.5000
Fax 414.271.3552
www.quarles.com

Attorneys at Law in
Chicago
Indianapolis
Madison
Milwaukee
Naples
Phoenix
Tampa
Tucson
Washington, D.C.

December 29, 2014

VIA EMAIL

Mr. Fred Buehler
Financial Services Director/Treasurer
City of Onalaska
415 Main Street
Onalaska, WI 54650

Re: Reimbursement Resolution

Dear Fred:

Attached is a reimbursement resolution which the City should adopt to make sure that expenditures made for the project prior to the issuance of the Safe Drinking Water Loan Bonds (the "Bonds") can later be reimbursed with proceeds of the Bonds. Please note that any expenditures the City makes more than 60 days prior to adopting this resolution will not be eligible for reimbursement, unless they fit into the "preliminary expenditure" exception. Therefore, the City should be very careful to make sure that any expenditures it makes prior to adopting this resolution will qualify for that exception.

Preliminary expenditures are defined as including architectural, engineering, surveying, soil testing, and reimbursement bond issuance costs incurred prior to commencement of construction, but do not include land acquisition, site preparation and similar costs incident to commencement of construction. In addition, the aggregate of preliminary expenditures may not exceed 20% of the principal amount of the Bonds.

Please review the resolution and include it on the agenda for the next Common Council meeting. Please then post the agenda in at least three public places and provide it to the official newspaper of the City and requesting media at least twenty-four (24) hours prior to the meeting. If the resolution is adopted, please return an executed copies of the resolution to us.

If you have any questions or concerns regarding the attached, please do not hesitate to give me a call at (414) 277-5790.

Very truly yours,

QUARLES & BRADY LLP

Bridgette J. Keating

BJK:TAB
Enclosure
#720114.00032

cc: Mr. Jarrod Holter (w/enc. via email)
Mr. Aaron Heintz (w/enc. via email)
Ms. Mary E. Wagner (w/enc. via email)
Mr. Bradley Viegut (w/enc. via email)
Ms. Rebecca Freitag (w/enc. via email)
Ms. Rebecca Speckhard (w/enc. via email)

QB\32051880.1

STAFF REVIEW SUMMARY

CITY OF ONALASKA
BOARD OF PUBLIC WORKS

January 6, 2015

Agenda Item: #8

Project/Item Name:	Well #9 Reconstruction
Location:	860 11th Ave. South
Requested Action:	Approval of bidding project
Staff Report/Description:	Staff is requesting authorization to bid project. It is expected that bids will be brought forward to the March meeting cycle for possible action.
Attachments:	Project cost estimate

Holter, Jarrod

From: Mullendore, Andy <Andy.Mullendore@strand.com>
Sent: Monday, December 01, 2014 11:40 AM
To: Holter, Jarrod
Cc: Schubert, Kevin; Bilskemper, Justin
Subject: Well No 9 Opinion of Probable Cost
Attachments: PSC Cost Breakdown.pdf

Jarrod,

Attached is a summary of the opinion of probable cost for the Well No. 9 project. The major construction work into plant accounts used by the Wisconsin PSC. The amount presented in the attached document does not include any contingency amounts, engineering, or other costs.

We currently came up with the following:

Total Project Cost without contingency:	$2,972,000
Contingency at 15%:	$ 446,000
Total Project with Contingency:	$3,418,000

Let me know if you need further clarification. Justin worked on compiling this for me, so you could also bounce questions off him.

Thanks

Andy Mullendore
Strand Associates, Inc
Phone: 608-251-2129 ext 1108
Fax: 608-251-8655
STRAND ASSOCIATES
www.strand.com

Wisconsin PSC Opinion of Probable Construction Cost Breakdown
Well No. 9 Reconstruction and Filter Addition
City of Onalaska, Wisconsin

Acct. No.	Plant account	Estimated Major Construction Additions
	Intangible Plant	
301	Organization	-
302	Franchises and consents	-
303	Miscellaneous intangible plant	-
	Total Intangible Plant	-
	Source of Supply	
310	Land and land rights	-
311	Structures and improvements	-
312	Collecting and impounding reservoirs	-
313	Lake, river, and other intakes	-
314	Wells and springs	37,500.00
316	Supply mains	-
317	Other water source plant	-
	Total Source of Supply Plant	37,500.00
	Pumping Plant	
320	Land and land rights	-
321	Structures and improvements	294,300.00
323	Other power production equipment	187,300.00
325	Electric pumping equipment	187,300.00
326	Diesel pumping equipment	-
328	Other pumping equipment	-
	Total Pumping Plant	668,900.00
	Water Treatment Plant	
330	Land and land rights	-
331	Structures and improvements	1,177,000.00
332	Sand or Other Media Filtration Equip	846,400.00
333	Membrane Filtration Equipment	
334	Other Water Treatment Equipment	104,900.00
	Total Water Treatment Plant	2,128,300.00
	Transmission and Distribution Plant	
340	Land and land rights	-
341	Structures and improvements	-
342	Distribution reservoirs and standpipes	-
343	Transmission and distribution mains	26,800.00
345	Services	-
346	Meters	5,400.00
348	Hydrants	3,200.00
349	Other transmission and distr. plant	-
	Total Transmission and Distr. Plant	35,400.00
	General Plant	
389	Land and land rights	-
390	Structures and improvements	-
391	Office furniture and equipment	-
391.1	Office furniture & equip - Computers	-
392	Transportation equipment	-
393	Stores equipment	-
394	Tools, shop and garage equipment	-
395	Laboratory equipment	10,700.00
396	Power operated equipment	-
397	Communication equipment	10,700.00
397.1	SCADA equipment	80,300.00
398	Miscellaneous equipment	
	Total General Plant	101,700.00
	Total Plant In Service	2,971,800.00

STAFF REVIEW SUMMARY

CITY OF ONALASKA
BOARD OF PUBLIC WORKS

January 6, 2015

Agenda Item: #9

Project/Item Name:	Wis. DNR Sanitary Survey
Location:	Citywide
Requested Action:	Discussion on Sanitary Survey
Staff Report/Description:	Wis. DNR has completed a tri-annual review of the City of Onalaska water system. Staff has performed an outstanding job of delivering safe and reliable drinking water. Report findings will be discussed at the meeting.
Attachments:	Wis. DNR Sanitary Survey

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
La Crosse Service Center
3550 Mormon Coulee Road
La Crosse WI 54601

Scott Walker, Governor
Cathy Stepp, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

December 23, 2014

Ms. Cari Burmaster, City Clerk
City of Onalaska
415 Main Street
Onalaska, WI 54601

PWS ID# 63203272
Onalaska Waterworks
La Crosse County

Subject: Sanitary Survey of the Onalaska Waterworks

Dear Mr. Burmaster:

I would like to thank Mr. Jim Prindle and his staff for their assistance on the December 2, 2014 sanitary survey of the City's drinking water system. The City's cooperation helped with the success of the inspection. To meet federal requirements, the Department completes surveys on a 3-year schedule. The previous survey was completed April 19, 2012.

The purpose of the sanitary survey is to evaluate water source, conveyance/storage/treatment facilities, operation and maintenance, and management and financial capability as related to providing safe drinking water. The survey is also an opportunity to update the Department's records, provide technical assistance, and identify potential risks that may adversely affect drinking water quality in your community. This report includes an overview of the system, key findings as related to specific requirements, and a brief summary that includes response criteria for correcting deficiencies.

SYSTEM OVERVIEW

From water source to delivery, drinking water systems consist of many components. This includes infrastructure as well as source-water characteristics, operation and maintenance practices, and managerial and fiscal aspects. This section is a detailed overview of the entire system of providing water to your customers.

Ownership, Service Area, Geography, Personnel

Onalaska owns and operates a municipal, public water supply system having more than 25 year round residents and more than 15 service connections. Residential service population is approximately 18,066 people (2013 DOA estimate).

The City is located on the western boarder of La Crosse County. This is an area characterized by highly eroded, driftless topography, which is largely forested and agricultural outside City limits. The City itself sits on a glacial outwash, river valley prairie adjacent to Lake Onalaska. Elevation starts at about 700'

MSL (mean sea level) and rises to the reservoir overflow elevation of 883' MSL in the primary pressure zone and 1016' MSL overflow in the secondary pressure zone.

Onalaska Municipal Water Utility is governed by the Board of Public Works chaired by Mr. Bob Muth. City Mayor is Mr. Joe Chilsen. Public Works Director, Mr. Jarrod Holter, is senior manager of the utility while Mr. Jim Prindle, Water and Sanitary Sewer Manager, manages day to day operations. The utility has eleven other certified operators as well. Davy Laboratories of La Crosse Wisconsin performs both the Safe Drinking Water Act (SDWA) and bacteriological testing.

System History

The City of Onalaska was incorporated in 1887. Private wells were used for drinking water while fire protection came from two cisterns located at 2nd & Main and 3rd & Main. It was not until 1894 that the City drilled its first municipal wells and constructed a 165,000 gallon steel standpipe on the bluff at 2nd and Locust Street. The wells (MW 1, 2, and 3) were deep artesian wells with iron related problems. MW1 was located at Green & Court while MW2 and MW3 were located in the basement of the old meter shop building at Main & Court.

In 1932, MW4 was constructed at the meter shop building. It was not used regularly due to iron related problems. MW5 was constructed in 1944 and served as the primary well. Additional capacity was added in 1962 with the construction of MW6.

The City had reoccurring bacteria problems that were addressed in 1966 with the construction of a 600,000 gallon replacement reservoir (South Well Street) and chlorine disinfection (at MW5 and MW6) in 1970. Disinfection was also installed at MW7 when it was constructed in 1971. It should be noted that bacteriological problems were persistent up until July 1994 when the City began continuous chlorination disinfection.

To satisfy growth, additional infrastructure was added in the 1970s and 1980s. MW8 was constructed in 1978, 600,000 gallon Hauser Farm reservoir in 1980, and MW9 and the 750,000 gallon reservoir (North Well Street) in 1986. The high iron wells (MW1, 2, 3, and 4) were formally abandoned in 1987. Fluoridation began in 1989 as interest in dental protection grew.

MW9 had iron problems almost from the start. The city began phosphate sequestering at the well in 1991 and MW7 in 1993. Sequestering effectiveness was menial and periodic complaints persisted. The City has since (December 2012) discontinued sequestering and is planning on constructing an iron filtration plant at the well next year.

The City exceeded the copper standard in 1993 and obtained approval in 1994 for treatment using the same product as that was already being used for sequestering (ortho-polyphosphate blend). Continuous chlorine disinfection was required at the same time prevent biofilm growth in the water system. While copper levels never dropped appreciably over the course of several years, they fell low enough to allow the City to operate under the status quo until rebounding in 1997.

Follow-up studies, commissioned by the City over the last several years, demonstrated the ineffectiveness of the ortho-polyphosphate blend in controlling copper corrosion. Process Research Solutions recommended several approaches to control corrosion without phosphates. The Department required their implementation and asked the City to discontinue phosphate use. Investigative monitoring was completed in 2013 and 2014 following discontinuance of phosphates in December 2012.

Initial investigative results indicate that residents were leaving their water stagnate too long in their plumbing before sample collection. The City also observed elevated copper in cases of stray current in the plumbing lines. Levels dropped appreciably when stagnation time was controlled and current was removed. Compliance samples taken this summer were below the action level. While the City was addressing water quality issues, additional capacity was necessary to serve a growing community.

Booster stations and additional reservoirs were constructed in a period of rapid development. In 1991, the Elmwood booster station was constructed to support a subdivision. It was abandoned in 1998 when the 1,100,000 gallon Wild Rose reservoir and East Main (OS) booster station were constructed to serve a much broader area with commercial interests. About the same time, the 225,000 gallon County Club reservoir was constructed to serve the new East Main pressure zone service area. In 1999, the City constructed the Aspen Valley booster station to serve part of the Green Coulee service area. The City also replaced MW6 in 2007 with MW10 to increase capacity and improve water quality. In 2011, the Coachlite booster station was replaced to increase fire protection.

As for future improvements, the City is expecting to expand the water system into the French Road area and install iron removal at MW9 to improve water quality.

Geological, Source Water Characteristics, Well Recharge Zone, Potential Contaminants

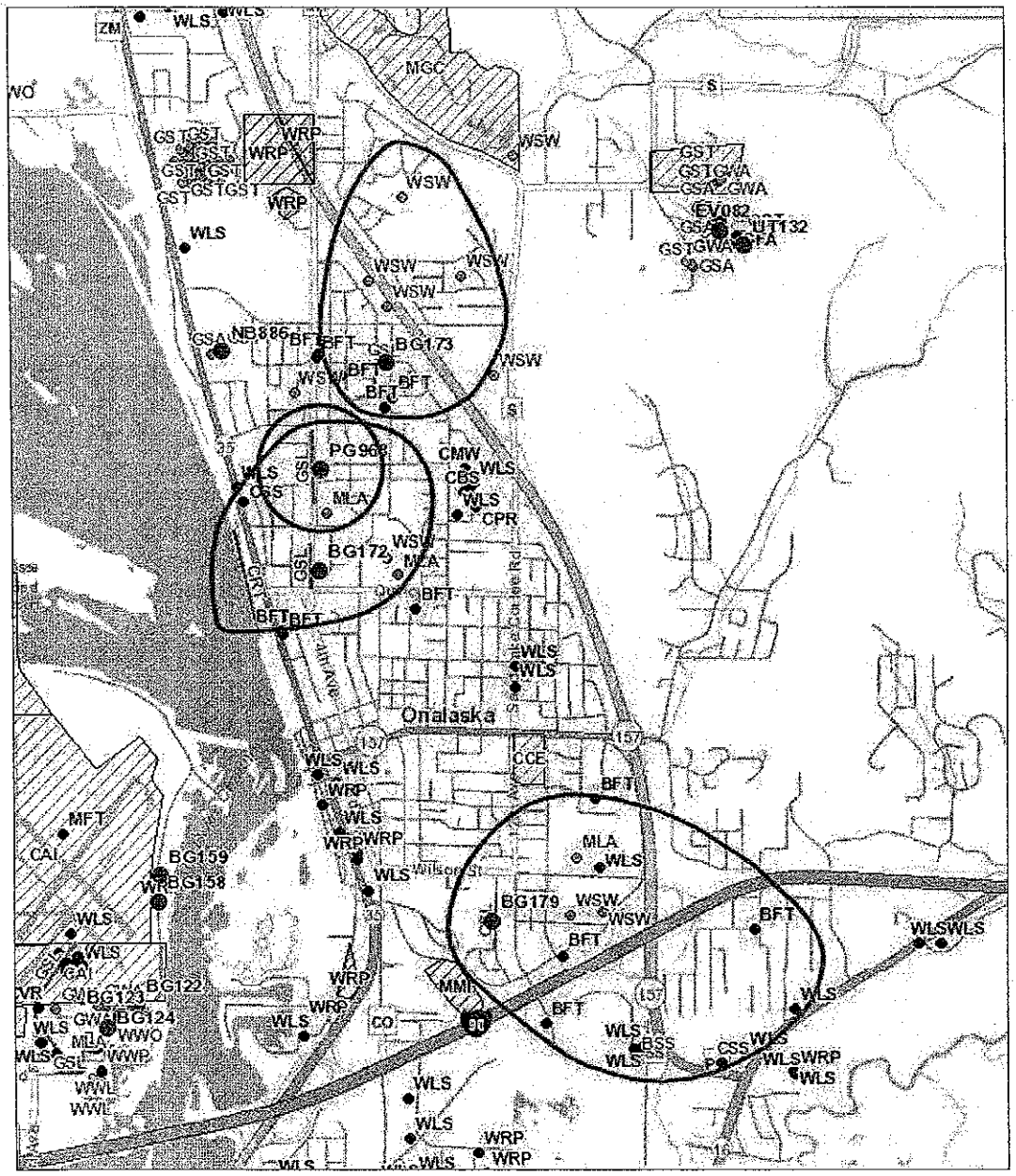
The City of Onalaska has four wells, with depths ranging from 160' to 169'. All four wells have grouted casings over 100' deep. The wells are drilled into glacial outwash material. This is a sand and gravel formation, alluvial in nature, formed after the last ice age. The aquifer is very permeable and capable of yielding large volumes of water with minimal drawdown. The unconsolidated wells are more susceptible to surface activities that can result in contamination. To illustrate the porosity of the geological unit, MW 9 and 10, had original well yields of about 125gpm per feet of drawdown.

Davy Engineering modeled the aquifer in 2002 using Modflow and revised the model in 2008 when MW10 was constructed. Capture zones were identified for each well on a one-year as well as a 5-year "time of travel" basis. As part of the La Crosse County Groundwater Study, the aquifer was also modeled in 2003 by the Wisconsin Geologic and Natural History Survey. The model incorporated USGS study results from their publication entitled "*Numerical Simulation of Ground-Water Flow in Onalaska County, Wisconsin, and into Nearby Pools of the Mississippi River*".

Modeling showed that some of the wells influence each other and share part of the same aquifer. This has not affected the quantity or quality of water. There are no other large capacity wells in the area to exert an influence on the municipal wells. All of the recharge zones are elliptical in geometry and predominantly pull from the north and east.

It is noted here that water characteristics of MW9 are somewhat different than the other wells. This well is located closer to the La Crosse River valley and draws some of this high iron water. This was the same problem experienced by some of the City's older, abandoned wells and the reason the City has decided to construct a filtration plant at MW9 next year.

To identify potential sources of contamination for the vulnerability analysis (VA), the City completed a "Contaminant Use Inventory" (CUI) report in 2013. Unfortunately, the new recharge zone for MW10 was not incorporated into the VA that was completed by the Department. A 1200' fixed radius was used for this well. CUI's and VA's are completed every 3 years and are used to determine whether monitoring waivers are granted. Potential contaminant sources within the capture zones are as follows:



Potential contaminant sites within the 5-year recharge zone are listed below:

Potential Contaminant Sources	
Petroleum Storage (BFT)	Sewer Line (GSL)
Road Salt Storage (BSS)	Laboratory (MLA)
Railroad Track (CRT)	**Leaking Underground Storage Tank (WLS)**
Gas Service Station (CSS)	Stormwater Retention Pond (WSW)

Note: bold font indicates the potential contaminant source affects monitoring waiver decisions.

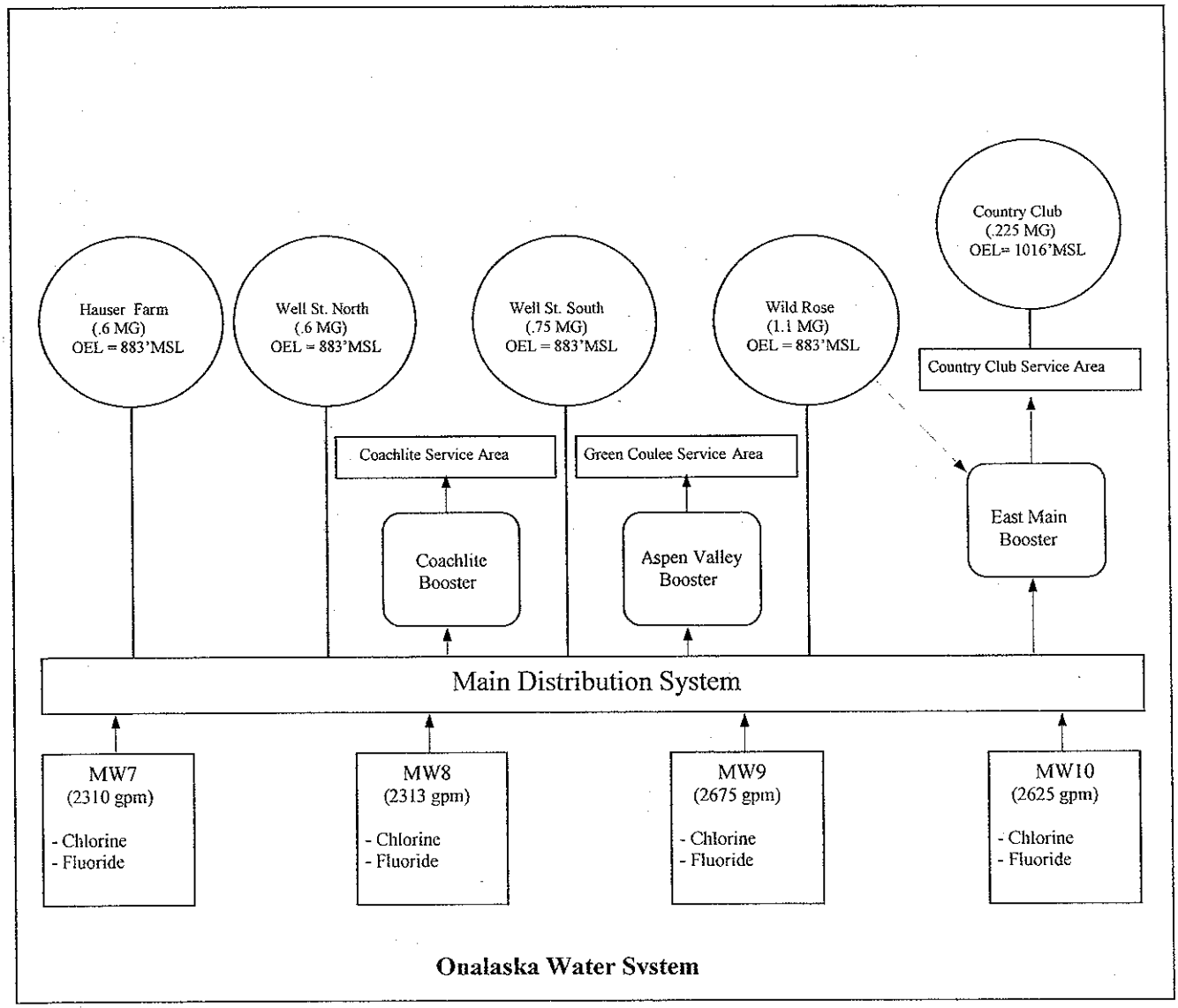
City wells do not meet the minimum setback criteria of 200' to the sanitary sewer collection system. This presents some vulnerability for virus contamination. Setbacks follow:

Well	Distance to Sewer System
MW7	155' to lined and 503' to unlined
MW8	72.5' to lined and 96' to unlined
MW9	55.5' to sanitary having water main class pipe
MW10	97' to lined and 189' to unlined

Code allows the separation distance to be less than 200' where sewer main is water main class material and pressure tested to meet AWWA C-600 criteria. Some of wells meet the variance requirement as lined pipe. Upgrades are not mandatory where the requirement is not met since the wells (except MW10) and sewer lines were constructed prior to the 1992 setback criteria. Since EPA's maximum contaminant level goal for viruses is zero (40 CFR Part 141 Section 141.52), the Department has encouraged the City on previous survey's to take voluntary action to reduce virus vulnerabilities until Federal/State legislation is enacted. Updating infrastructure around the wells to prevent sewage leaks, maintaining disinfection levels to achieve 4-log virus removal, and testing the water for virus' is recommended.

Infrastructure

City infrastructure consists of 4 wells, chlorination and fluoridation chemical feed systems, 5 storage reservoirs, 3 booster stations, and a distribution system network. Configuration follows:



Onalaska Water System

Well/Pump Facilities

Well pumps operate on daily basis except MW9 (which operates four days a week) and pump water directly into the distribution system. They are controlled by water elevation in four of the five reservoirs. Well pumps can be operated individually, in tandem, and can be set as lead/lag.

The three booster stations (Coachlite, Green Coulee, and East Main) pump water from the main distribution system into their respective high service areas. Water elevation in the Country Club Reservoir controls East Main Booster station pumps while the other booster station pumps are controlled by water pressure at the booster stations themselves.

MW7 was constructed in 1971 by Miller Well & Pump Company. Municipal Well & Pump pulled the well pump in 2014 due to bowl damage caused by corrosion to the pump parts. Previous to this, the pump was pulled and the screen was cleaned in 2008. Specific capacity (well yield) increased from 102 gpm per foot of drawdown to 107 gpm per foot of drawdown. Pumping rate at the end of the well test was reported to be 2142gpm @ 90' water elevation. Based on the current pumping rate of 2310gpm, yield is 107 gpm per foot of drawdown. This is the same as that reported in 2008 and close to that following original construction.

MW8 was constructed in 1978 by Layne Northwest Company. Municipal Well & Pump pulled the unit in 2014 out of concern on what had happened at MW7. Previous to this, the pump was pulled in 2008 and the screen cleaned. Well yield went from 100 gpm per foot of drawdown to 120 gpm per foot of drawdown. Pumping rate at the end of the well test was reported to be 2043gpm @ 92' water elevation. Based on the current pumping rate of 2313gpm, yield is 115 gpm per foot of drawdown. This is about the same as that reported in 2008 and much better than that following original construction.

MW9 was constructed in 1986 by Layne Northwest. The well has been subject to iron/manganese biofouling since. The City has used several strategies, with varying degrees of success, to address the problem.

Shock chlorination and phosphate injection were performed in December 1990. In May 1991, the Department approved AquaMag to sequester iron. With little success, in 1992, the Department granted a 6-month trail of anoxic blocking (using CO_2) to address biofouling. Yield continued to drop and was at 74% of original yield in April 1997. Air-bursting and chemical treatment was carried out and restored 79% of the original yield. This was repeated in March of 2000 and March 2004. Yield was measured by Municipal Well in 2007 and was 59% of original.

In June 2010, the City had Water Well Solutions use their HiRip rehabilitation technique to power surge the aquifer with acid. Yield increased to 113 gpm per foot of drawdown which is close to that following original construction.

The City hired Dr. Andrew Jacque in 2010 to evaluate the well problem. Microscopic analysis, before and after the HiRip process, indicated some sort of surface water connection and biofouling problems in the formation. To prevent further biological activity with aesthetic problems, Dr. Jacque advised the City to regularly add chlorine to the well and lower the pumping rate so that the well can be operated for longer periods of time. This reduces oxygen influx through the well vent and curtails the growth of certain bacteriological communities. The City has implemented the recommendations with some degree of success. Yield appears to be fairly stable and similar to the other wells; however, the well cannot be pumped very long because doing so would increase the amount of oxidized minerals. The City plans to construct an iron filter next year to address this problem.

Based on the current pumping rate of 2675gpm, yield is 109 gpm per foot of drawdown. This is about 4% less than that following the HiRip rehab process in 2010 and 13% of that following original construction.

MW10 was constructed in 2007 by Layne Christensen Company to replace MW6. The well was placed into service in 2008 and has been running well since. Based on the current pumping rate of 2625gpm, yield is 119 gpm per foot of drawdown. This is about the same as that following original construction.

The City is trying to maintain a 10 year inspection schedule for its well pumps with some being pulled sooner for urgent maintenance needs. Further well and pump information can be found in Table B of the Appendix.

Treatment Chemicals

The City chlorinates and fluoridates using NSF (National Sanitation Foundation) approved chemicals. Chemical delivery is on a monthly basis and sometimes more frequently. No dilution is necessary.

Chlorination began in 1970 for disinfection purposes. The City uses 100% chlorine gas. It is purchased from Hawkins Chemical of Minneapolis, MN. Chlorine is injected into the water main at the wells and measured gravimetrically. Solution is weighed using digital scales at tenth pound increments.

The City also pours ½ cup of 12.5% sodium hypochlorite product into MW9, through the well vent, on a weekly basis so as to minimize biofouling.

Fluoridation began in 1989 for dental purposes. The City uses 23% hydrofluorosilic acid. It is purchased from Hawkins Chemical of Minneapolis, MN. Fluoride is injected into the water main at the wells and measured gravimetrically. Solution is weighed using digital scales at tenth pound increments.

It is noted here that chlorine and fluoride are stored in the same rooms at some of the well houses even though they belong to different compatibility groups (Group I Acids and Group II Base/Oxidizers). This is a hazard that will need to be addressed during the next reviewable project at these wells.

Further information on the chemical feed system can be found in Table C of the Appendix.

Distribution and Storage

The distribution system is a multi-pressure zone piping network that moves water from the wells and reservoirs to individual service customers. Reservoir level at Hauser, North Well Street, South Well Street, and Wild Rose Reservoirs control system pressure in the main section of the distribution system.

Three booster stations move water from the main distribution system into three separate high service areas (Coachlite, Aspen Valley, and Country Club). The East Main booster station supplies water to the County Club high service zone; however, it does not maintain the pressure in this zone. Pressure is maintained by the Country Club reservoir. Pressure in the other two high service zones is maintained by the booster stations themselves. VFD pumps are used at the Coachlite booster station while a jockey pump is used at the Aspen Valley booster station. Infrastructure is identified on an outdated distribution system map.

The distribution system consists of 533,597 linear feet of water main, 1535 shutoff valves, 1093 fire hydrants, 0 flushing hydrants, three booster stations, five ground storage reservoirs, and 5817 service connections (2013 PSC Report). Additional distribution system facts include:

- Two interconnection with the City of La Crosse (South Kinney near Kwik Trip and George Street/2nd Ave. South across from Nutbush). Both are protected by two shutoffs (kept in closed position) that are exercised annually when the line is flushed.
- City serves limited areas in the City of La Crosse and Town of Campbell (City owns, operates, and maintains the infrastructure)
- No interconnections with owners of private wells
- 1 surface water crossing (buried @ Country Club area)
- 6 privately looped water mains (Pralle Center, Corridor PH/STH 16 which is the Shopko/Ciatti strip mall, Crossing Meadows, Jae Mobile Home Park, Northwest Hardwoods which is now called Weyerauser Lumber Yard, and Menards); all have check-valves with shutoffs.
- City has one wholesale customer (Lake Onalaska Mobile Home Park) that submeters
- All City owned dead-ends have flushing devices
- 2 automatic flushing hydrants (South Kinney Coulee Road and Crestwood) operating 20min/day during the summer
- 7227' of undersized water main (<6") in use

Booster Stations move water from three locations in the main distribution system to separate higher elevation service areas. The SCADA system monitors and controls pump operation at each of the stations. Pressure switches are used to control booster pump operation at Aspen Valley and Coachlite while water level at the Country Club reservoir controls the East Main booster pumps. Auxiliary generators at the Aspen Valley and Coachlite booster stations run automatically in the event of a power outage. This feature is not necessary at the East Main booster station since the Country Club reservoir serves the boosted zone. Specifications are as follows:

Aspen Valley Booster Station

Pump	Rate (gpm)	TDH (feet)	Suction Shutoff (psi)	Outlet Set Points (psi)	Motor	Size (h.p.)
Aurora, Centrifugal	100	150	20	95 to 105	US Motors	10
Aurora, Centrifugal	350	150		86 to 131	US Motors	30
Aurora, Centrifugal	350	150		86 to 131	US Motors	30
Aurora, Centrifugal	1500	150		60 to 131	US Motors	100

Coachlite Booster Station

Pump	Rate (gpm)	TDH (feet)	Suction Shutoff (psi)	Outlet Set Points (psi)	Motor	Size (h.p.)
Berkeley (VFD)	100	140	30	112 to 117 psi	Baldor	7.5
Berkeley (VFD)	100	140		111 to 114 psi	Baldor	7.5
Berkeley (VFD)	700	200		98 to 140 psi	Baldor	50

East Main Booster Station

Pump	Rate (gpm)	TDH (feet)	Suction Shutoff (psi)	Outlet Set Points (psi)	Motor	Size (h.p.)
Aurora, Centrifugal	850	175	20	Reservoir Controlled	Marathon	60
Aurora, Centrifugal	850	175			Marathon	60

Storage consists of five ground storage reservoirs located on the bluffs at various locations. Four of the reservoirs have the same overflow elevation and depth while the Country Club reservoir is constructed at a higher elevation to serve its own respective service area. Water is provided to this area through the East Main Booster Station.

It is noted here that the Hauser reservoir has a control valve that opens at 13' and closes at 13.5' to ensure that this reservoir does not fill too fast compared to the other reservoirs. This prevents premature overflows.

All five reservoirs are poured concrete units and have EPDM membrane liners that are covered with sod. Each reservoir is connected directly to the distribution system. The Well Street reservoirs are connected at two locations and share the connection. Wildrose is also connected directly to the East Main Booster Station but the shutoff valve is kept in the closed position. This reservoir also has a submersible, NSF61 approved, recirculating pump (Flotec Model 2850G) to improve turnover.

All the reservoirs have pressure transducers that are tied into the SCADA system. The operators use either the North or South Well Street reservoir as the control unit. Reservoir specifications follow:

Volume (gal)	Dimensions	Overflow	Pump Settings	Working Volume	Working Volume	Avg. Water Age
Hauser Design: 600,000 Operating: 400,000 to 486,000 Low Set Pt: 228,600	71' diam. 21' deep	21' @ 883'MSL	W: 8–14' S: 8 – 17'	171,400 to 257,400 gal	43 to 53%	23 to 28 hrs
North Well Street Design: 750,000 Operating: 500,000 to 607,000 Low Set Pt: 285,700	80' diam. 21' deep	21' @ 883'MSL		214,300 to 321,300 gal	43 to 53%	23 to 28 hrs
SouthWell Street Design: 600,000 Operating: 400,000 to 486,000 Low Set Pt: 228,600	71' diam. 21' deep	21' @ 883'MSL		171,400 to 257,400 gal	43 to 53%	23 to 28 hrs
Wildrose Design: 1,100,000 Operating: 733,000 to 891,000 Low Set Pt: 419,100	96' diam. 21' deep	21' @ 883'MSL		313,900 to 471,900 gal	43 to 53%	23 to 28 hrs
Country Club Design: 225,000 Operating: 195,000 to 210,000 Low Set Pt: 120,000	50' diam. 15' deep	15' @ 1016'MSL	W: 8 – 13' S: 8 – 14'	75,000 to 90,000 gal	38 to 43%	104 to 112 hours based on 45,000gpd

Water age in the Country Club reservoir is longer than that shown since this is a boosted system with some of the water being provided by the other reservoirs during drawdown. From a capacity standpoint, total storage operating volume in the main distribution system is 2,030,000 gallons during the winter, 2,470,000 gallons during the summer, and 1,162,000 gallons at its minimum operating range throughout the year.

The water main elevation at the highest service in the main distribution system is about 760' MSL and about 880'MSL in the Country Club service area. Corresponding pressures, when reservoir water level approaches empty, is 44psi in the main service area and 53psi in the Country Club service area. The system has no problem meeting the minimum static pressure requirement of 35psi.

SEH completed a comprehensive "Water System Evaluation" in November 2013 that included a hydraulic model. Water age is provided at various service areas and discusses important hydraulic

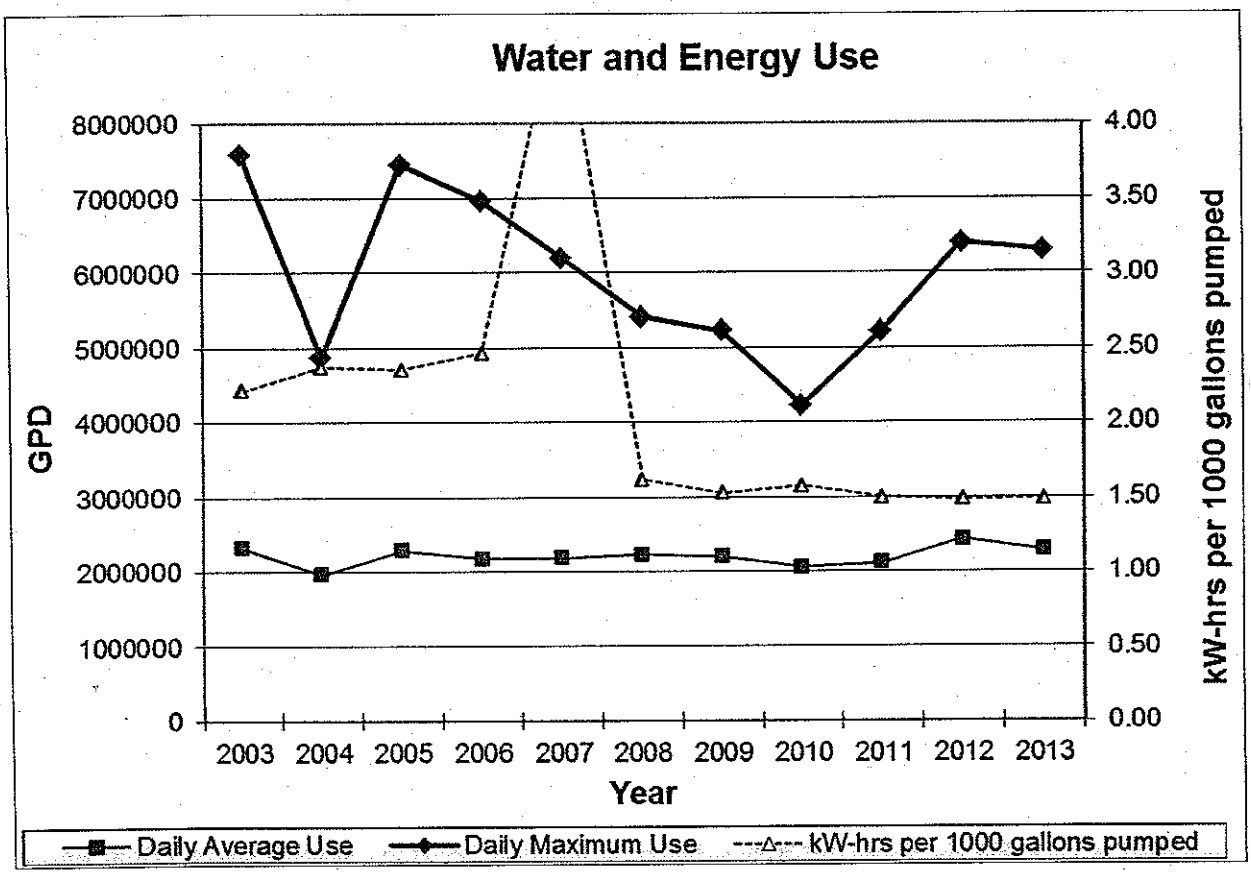
properties and recommendations of the system. These relate to improving water quality through looping, increasing reservoir turnover, and removing iron at MW9.

Emergency Power

The City has emergency generators for MW8, MW10, and each booster station. All the generators are located on-site. Diesel generators are used at MW8 and Aspen Booster while MW10, Coachlite, and East Main Booster station have natural gas generators. Generators are exercised under load monthly.

Connections, Water Use and Demands, and System Capacity

Average water use increased about 8% since the last survey as shown below (Table E in Appendix):



Averaged daily demand is 2,286,168gpd while maximum use, about 6MGD, occurs during system flushing. Daily use during the highest water use month, July 2012, was about 5MGD.

Energy use has been trending downward the past several years and averaged 1.49 kW-hrs per 1000 gallons of water pumped.

Unaccounted for water losses are low (<10%). They averaged 6% the last couple years.

Onalaska Fire Department provides City fire protection. They have three pumper trucks capable of pumping 1000, 1500, and 2000gpm of water. The last ISO fire flow study was completed in 2009. Pressure and flow rate is reported to be (Coachlite numbers come from the City Fire Dept):

Service Area	Static Range (psi)	Fire Flow Range (gpm) @ 20psi
Main System	75-80	3500
Coachlite	110	725
Aspen Valley	52	1750 Need/3500 Available
Country Club	105	750 Need/ 4000 Available

SEH Engineering evaluated fire flow performance in their 2013 report and determined that the system was well protected. The Department is in agreement. Most of the system is capable of providing fire flow rates of 3000 to 3500 gpm. Low flow areas are at higher elevations and near system extremities. SEH recommended looping the Aspen Valley and Country Club boosted zones to add redundancy and improve hydraulics.

Apart from distribution system hydraulics, storage and pumping capacity is evaluated to determine whether the water system can provide adequate storage and pumping volume to meet average daily demand, maximum daily demand, peak hourly demand, worst case fire flow demand, and demand during power outages. This analysis is performed with full capacity and firm capacity (loss of largest pumping unit). From design and water demand data over the last year, several observations are made concerning whether the City can safely meet the above demand situations:

First, the system is capable of meeting the average daily water demand of 2,286,168 gpd. Average run time for the pumps is about 4 hours over a 24-hour period.

Second, the system can meet the average daily water demand with MW9 out of service. The other well pumps would run about 5 hours over a 24-hour period.

Third, the system is capable of meeting the maximum daily water demand of 5mgd with the wells in service. The pumps would run about 8 hours over a 24-hour period.

Fourth, the system can meet the maximum daily demand if MW9 were out of service. The remaining well pumps would run about 11 hours over a 24-hour period.

Fifth, taking into consideration the worst case scenario (high use day, 90% storage volume available, and 2-hour duration fire event of 2,500 gpm), the City would have enough pumping and storage volume to meet the demand. In fact, there is enough water available at the low reservoir operating level to meet the demand with all the wells in service. The City has excellent pumping capacity.

Sixth, the water system is capable of operating during a power outage to maintain service. On-site generation is available at MW8 and MW10. The well pumps would run 17 hours per day during high water use days. The City would not be able to deliver higher fire flow volumes during this time however. Additional generator capacity, possibly at MW9, would resolve this.

Summarizing the capacity evaluation, the City has adequate pumping and storage capacity to meet all the service demands that can be expected except larger fire events during a power outage. Adding a generator at MW9 would address fire capacity concerns during power outages on high water use days.

Water Quality Monitoring and Reporting

To satisfy SDWA requirements and protect public health, the City performs rigorous water quality testing of its drinking water. A monitoring schedule is provided to the community each year, monitoring results are submitted to the Department electronically by the certified laboratory performing the analysis, and the results are provided to the public through the Annual Consumer Confidence Report. The monitoring

program is discussed in this section (reference Tables F and G in the Appendix for additional information).

Bacteriological Monitoring

The City's population increased the last few years and is at 18,066 people. 20 distribution system samples are required. Monitoring that was completed the last 12 months is as follows:

Address	ID	Total	Dec	Jan 2014	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
1311 MAIN ST.		10			1	1	1	1	1	1	1	1	1	1
1001 COMMERCIAL CT.	D8	3			1	1	1							
1501 WILSON ST.	D7A	3	1		1	1	1							
1580 MEDARY LN.	D18	8		1			1	1	1	1	1	1	1	
1831 EAST MAIN ST	D13	3	1	1	1	1								
1867 BEAR PAW PL.	D10	10	1	1	1	1	1		1	1	1	1	1	1
1953 FRANKLIN ST.		10	1	1	1		2	1	1	1	1		1	1
2047 GRANDVIEW BLVD.		8	1	1		1		1	1		1	1	1	1
2372 RYLLA ST.	D21	4						2	1	1				
2501 CEDAR CREEK LN.	D29	7					1		1	1	1	1	1	1
252 MASON ST.		10	1	1	1	1		1	1	1	1	1	1	1
255 RIDERS CLUB RD.	D3	8	1	1	1	1	1	1			1	1	1	
2600 CEDAR CREEK LN.	D1	7	1		1	1	1	1		1	1	1		
2858 MIDWEST DR.	D14	8	1	1		1		1	1	1	1	1	1	
3041 E. MAIN ST.	D15	10	1	1	1	1	1	1		1	1	1	1	1
3052 WILDROSE LN.	D24	10		1			1	1	1	1	1	1	1	2
3100 KINNEY COULEE	D7	2	1	1	1									
3745 CRESTWOOD PL.	D17	1							1					
419 SANDLAKE RD.	D9	6	1	1	1	1	1			1			1	
422 9TH AVE. NO.	D20	11	1	1	1	1	1	1	1	1	1	1	1	1
601 GILSTER ST.	D19	9	1	1			1	1	1	1	1	1	1	1
602 2ND AVE. NO.		11	1	1	1	1	1	1	1	1	1	1	1	1
700 WILSON ST.	D5	2			1	1								
711 QUINCY ST.	D4	1	1			1								
741 DOMKE ST.		11	1	1	1	1	1	1	1	1	1	1	1	1
784 STONEBRIDGE AVE.	D25	7					1	1	1	1	1	1	1	
829 COUNTRY CLUB RD.	D22	4		1				1	1			1		
906 ALPINE PL.	D23	6					1		1	1	1	1	1	
950 2ND AVE N	D2	2			1	1								
9515 HWY 16	D11	2	1	1	1									
LAUDERDALE NO.	D27	10	1	1	1	1		1	1	1	1	1	1	1
MEIER FARM PARK	D28	11	1	1	1	1	1	1	1	1	1	1	1	1
Total		215	20	20	20	20	20	20	20	20	20	20	20	15

Although sampling is generally representative of the distribution system and spread out during the month, there were a few problems with the City's bacteriological monitoring program. First, the City sampled from several locations prior to notifying the Department (1311 Main Street, 1953 Franklin Street, 2047 Granview Blvd, 252 Mason Street, 602 2nd Ave. North). Sites must be pre-approved. Second, it appears that the 740 Domke site should be 741 Domke. The City should verify the address so Department records are accurate. Third, the Cedar Creek and Midwest/Wildrose areas are being over-monitored while other areas are not being monitored as frequent (Woodmans/La Crosse Industrial Park area, 1001 Commercial

Street area, and Mary Drive site D16). Forth, the City periodically adds additional information to the site address block on the monitoring forms ("sampling station" and customer names). These blocks are reserved for just the street address.

The City's last positive distribution system result occurred in July 2010 at the 3745 Crestwood Place site. This was a confirmed total coliform positive. The cause was unknown. The City has since improved its flushing and disinfection programs to improve water quality and inspected plumbing systems in this area for cross-connections.

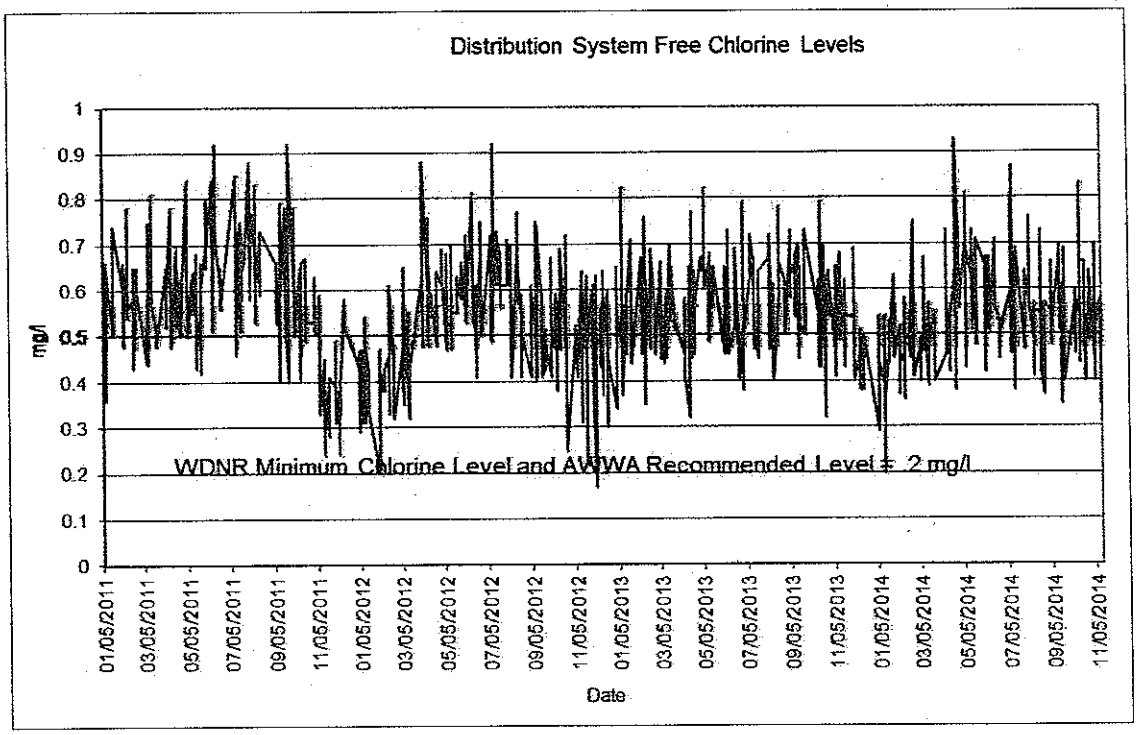
The wells are sampled quarterly. There has only been one positive bacteria sample at the wells. MW9 had a positive result in May 2004. Follow-up results were negative.

Chlorination

The City added chlorination systems in the 1970's but only used it when distribution system monitoring indicated bacteriological contamination. This was somewhat frequent. Although phosphate use began at a couple wells in 1991 for sequestering purposes, continuous chlorination disinfection was not required or implemented until 1994 when phosphate injection was installed at the remaining wells for corrosion control purposes. The City then bumped chlorine levels up a notch in 2010 after having total coliform positive test results in the distribution system.

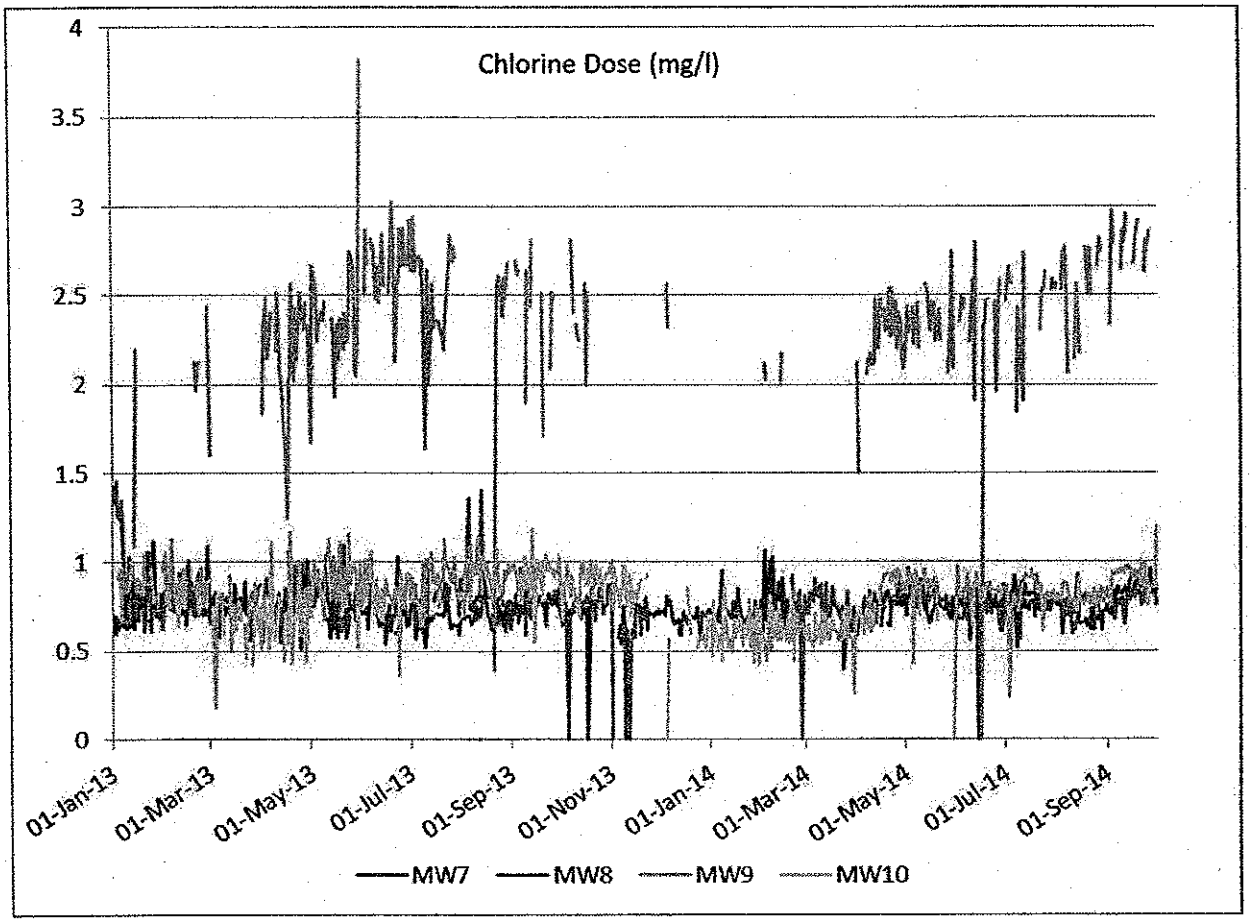
Disinfection, in general, is a 100 year-old practice in the United States and is used to maintain the sanitary quality of the water. It has led to significant reduction of waterborne illness. While everyone benefits, those with weak or compromised immune systems (i.e. formula fed infants, elderly, and those with pre-existing illnesses) receive important public health protection from this practice.

Distribution system free chlorine residual averages .55 mg/l. The City has met the Department's minimum recommended chlorine level (.2mg/l) almost 100% of the time over the last 3-years as shown below:



Besides testing chlorine at the bacteriological monitoring sites, the operator also tests distribution system chlorine throughout the system on a daily basis and reports the results in the monthly operating reports.

The City maintains a chlorine dose of about .76mg/l at wells 7, 8, and 10 and 2.34mg/l at MW9. Iron and manganese create a relatively high demand at well 9. Three of the four wells have excellent feed system performance as shown below:



Dose variability averaged 10% or less in September and is typically higher at MW9. Dosing consistency can be improved by replacing chlorine cylinders before they run out of chemical.

Chlorine tests are completed by the operator using the DPD test method. A new HACH digital colorimeter is used. The operator's testing protocol is as follows (bold font shows concerns):

- Glassware is clean and un-scratched
- Meter's sample compartment and optics are clean
- Meter is being zeroed with tap water
- Samples are tested at the monitoring site
- Meter is read within 1 minute of adding the test reagent
- Regent is within its expiration date
- Meter reads to the hundredth (.01) mg/l
- Chlorine standards are being run weekly to verify test method and meter accuracy
- Standard is within its expiration date
- Log book is kept on meter servicing but calibration checks (standards) are not being recorded

Lead and Copper

The City has an outdated lead and copper monitoring plan and completes sampling at Tier 1 sites (plumbing installed between 1983 to Sept 30, 1984 with possible lead based solder). Some of the sites are no longer and others have been picked up. Several monitoring events have occurred since 1992 as shown below:

Sample Date	Copper (ug/l)	Lead (ug/l)
1992	1210	7
1993	**1400**	3
1995	960	0
June 1996	930	1.6
December 1996	920	1.6
1997	1020	1.96
1998	1060	1.53
1999	1090	2.91
2002	1140	2.2
2005	1150	2.06
2008	950	0.6
2011	1060	1.54
2014	1230	1.78
MCL (ug/l)	**1300**	**15**

The City exceeded the copper action level (1300 ug/l) in the second monitoring round ~ 1993.

The Department requested a formal response on April 19, 1993. In June 1993, the City submitted monitoring results with its "Desktop Evaluation" on corrosion control. The report recommended phosphate treatment using AquaMag. Ironically, the City was using phosphates at two of the wells leading up to the action level exceedance but was not practicing continuous chlorination disinfection. The report stated: "The Kjell Corporation plans on doing a comprehensive corrosion control study for the City to show the benefits of copper reduction with polyphosphate." Kjell Corporation was the phosphate supplier.

On November 4, 1993, the Department approved the use of AquaMag at .75 mg/l orthophosphate, on an interim basis, until its effectiveness could be demonstrated. Continuous chlorine disinfection was required as well. Formal treatment began in early 1994.

Kjell Corporation completed the corrosion study in May 1995 but did not submit it until requested by the Department in 2009. It consisted of coupon tests performed during July 1993 to May 1995 and had a flawed design. The analysis was not performed by a Wisconsin certified lab, results were difficult to interpret since they did not contain a description of the study design, monitoring locations were poorly described, and there were no test results for orthophosphate or polyphosphate at the monitoring locations during the test period. Dose appeared to be set at .5mg/l but was not verified through testing. The study said that lead and copper concentrations decreased about 50% between March and August 1994 and remained low for the next two monitoring events. Regulatory test results, collected during the 1995 and 1996 monitoring events, appeared to agree with the study's findings ~ general reduction of about 30% in copper concentrations as measured by the 90th percentile results. Copper levels did not remain low though and began increasing towards the Federal action level.

Copper climbed during the next five monitoring rounds until reaching 1150ug/l in 2005. Orthophosphate was between 61% to a little over 100% of the target dose but did not appear to have much of an effect on reducing copper. Important questions were raised during the 2003 sanitary survey on whether phosphate was addressing corrosion or a contributing agent. The Department asked the City to re-evaluate its corrosion control program. The City hired Process Research Solutions (PRS).

The **first report** was completed in May 2007. It was a historical review of copper results and water quality monitoring. The report recommended a detailed study be carried out.

The **second report** was completed in March 2008 and included an evaluation on potential causes of elevated copper. It was noted that distribution system dirt/scale, inadequate disinfection, and microbial induced corrosion (MIC) may be contributing factors to high copper levels. Recommendations included:

1. Clean the distribution system (uni-direction flushing) and track cleanliness
2. Increase chlorine residual
3. Improve data management practices
4. Complete a study on the effect of pH, nitrate and assimilative organic carbon, and phosphate.

As related to existing treatment (ortho-polyphosphate blend), PRCs findings were ambiguous. Additional data was needed.

The City implemented some of the recommendations in the report and continued phosphate treatment. A source of assimilative organic carbon (AOC) was eliminated when the City replaced MW6 with MW10. The City also minimized the use of MW9 so that iron, manganese, nitrates, and iron/manganese bacteria were reduced. Finally, the City began uni-directional flushing. These actions may have had a positive influence on reducing copper levels during the 2008 monitoring event since copper levels dropped below 1000ug/l for the first time since 1996.

The **third report** was released in March 2010 and included additional data from bench top pipe-flow studies. One of the findings stood out. Phosphate was not effective in reducing corrosion. The report offered several recommendations:

- Keep MW9 off-line given its iron, manganese, and iron bacteria issues.
- Switch to a less expensive corrosion control chemical (orthophosphate).
- Continue uni-direction flushing.
- Improve disinfection practices to maintain consistent levels throughout the water system.
- Improve chemical feed delivery to ensure consistent dose.
- Lower phosphate use over time (wean) while monitoring copper levels.
- Continue studying the effects of the changes on copper levels.

The City implemented several of the recommendations, continued phosphate treatment, but copper levels jumped above the 1000ug/l point during the next monitoring event ~ 2011.

The Department completed its next sanitary survey in April 2012 and asked the City to discontinue phosphate treatment. Since phosphates were used leading up to the action level exceedance in the early 1990's and findings in the PRC reports did not see any benefit of its use and it was a significant variable that could influence corrosion, it was a prudent request.

The City hired Hawkins Chemical Company to evaluate the corrosion potential of City water before implementing the request. Raw water was tested again and Langelier indexes were calculated:

Well	Langelier
MW7	0.1
MW8	0.12
MW9	0.1
MW10	0.23

Langelier index analysis is an older evaluation technique meant to determine whether calcium carbonate will precipitate from the water and form pipe-protecting scale. Researchers are now questioning this thesis since the lattice structure of the scale is porous. Regardless, the City's Langelier index is slightly above zero which indicates that minor scaling is expected. If scale was being formed, it did not appear to be effective in reducing corrosion.

The Department met with the City and Hawkins and explained that the information they provided had no evidence of the effectiveness of phosphates or descaling problems if it were removed. Polyphosphate, which makes up 75% of the phosphate product the City used, is a sequesterant and de-scaler. This explains why the operators report clean water lines during main break repairs.

The City discontinued phosphate use on December 14, 2012 and began investigative monitoring in 2013 to evaluate the change. Initial monitoring results were high. The City interviewed homeowners and found that many of them had left their water stagnate for an unreasonable time frame (some over a week long). After instructing them to minimize stagnation times, copper levels dropped appreciably (30%). The City also discovered that some of the plumbing systems had electrical current and after the current was removed, copper levels dropped accordingly. Additional investigative monitoring was completed in the first half of 2014 leading up to the summer compliance samples and stagnation times and electrical current influenced results.

Compliance monitoring began in June and continued through September of this year. Copper was still high (90^{th} percentile = 1230 ug/l) but under the federal action level (1300ug/l). From discussions with City staff, it is likely that high stagnation times continue to be a problem. The City did not filter these out during the summer monitoring round.

The next monitoring round for compliance purposes is scheduled for 2017. Thirty samples will be required. The Department is, however, requesting additional investigative monitoring next year to further evaluate corrosion potential of City water and determine why copper levels are elevated.

Disinfection Byproducts (DBP) - Trihalomethanes (TTHM) and Haloacidic Acids (HAA5)

The City began monitoring disinfection byproducts in 2004 and has since completed several monitoring rounds. Systems over 10,000 people were initially required to monitor quarterly and dropped to annual if levels were low. The City moved to annual monitoring in 2005 and has since collected samples during the 3^{rd} quarter.

HAA5 was elevated at Cedar Creek during the initial monitoring round ~ annual average of 39ug/l HAA5 as compared to the 60ug/l HAA5 MCL standard. The City reported 75.5ug/l HAA5 at the club house during February 2004. Subsequent monitoring results have not only dropped, they seem to have normalized.

Stage II DPB monitoring took effect this year. The City completed monitoring at its two approved sites (3745 Crestwood Place and 4051 Mary Drive).

Since the sample results continue to be "less than or equal to" 40ug/l TTHM and 30ug/l for HAA5, monitoring will remain on the reduced schedule of two samples per year during the 3rd quarter. The next monitoring round is scheduled for 2015.

Radiological (RAD)

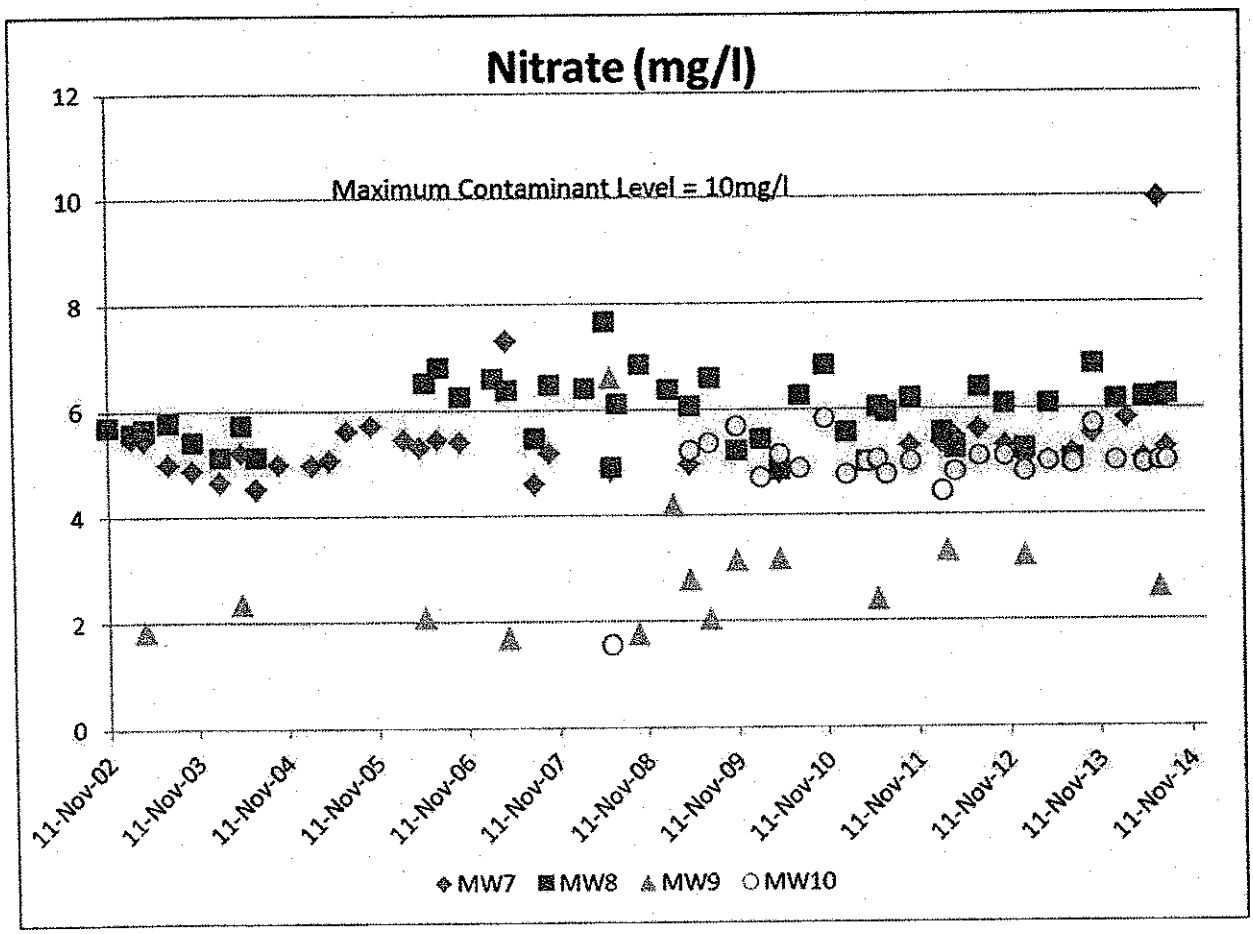
The City collected its first full round of radiological samples in 2009. All the radiological samples met Federal standards.

Future monitoring frequency depends on levels found in previous monitoring events. Radiologicals were detected above half the MCL at well 9 and below half the MCL at the other wells; therefore, monitoring is set at a 3-year frequency at MW9 and 6-year frequency at the other wells. The next monitoring event is scheduled for 2017 and MW9 and 2020 at the other wells.

Inorganic Contaminants

For SDWA purposes, IOC monitoring began in 1993. Since IOC monitoring is set at 3-years, several monitoring events have taken place.

The City has not had problems meeting IOC standards; however, nitrates have been elevated (>5mg/l) at three (MW7, 8, and 10) of the four City wells as shown below:



MW7's second quarter result, 9.95mg/l nitrate, may have been an anomaly worth watching. Poor fertilization practices on the ball fields near the wells could influence groundwater quality given the permeability of the formation.

Chloride levels appeared to have doubled through the years. Since the last test was completed in 2008, current information is not available to determine whether the trend continues.

Nitrate monitoring will remain on a quarterly schedule at MW7, MW8, and MW10 and annually at MW9. The remaining IOCs are set at a 3-year monitoring schedule. The next monitoring event is scheduled for 2017.

Volatile Organic Contaminants

VOC testing began in 2002 under the Federal SDWA. Several monitoring events have been completed to date. Tetrachloroethylene was recently detected at MW7 this previous summer. This is the first VOC detect in the history of the City's monitoring program.

Tetrachloroethylene (PCE) was detected in July and confirmed in two subsequent, follow-up tests as shown below:

Date	Result (ug/l)
7/8/2014	.696
8/6/2014	.648
11/6/2014	.653
MCL	**5 ug/l**
MCLG	**0**

This is unusual given the fact that there are no potential contaminant sources in the immediate area of the recharge zone and the well has not had VOC's in the past.

PCE is a dry cleaning chemical and solvent. The Department initially thought that it was from paint products since well equipment received new coatings this summer. However, subsequent monitoring results indicate a consistent source. All three monitoring results are well below the maximum contaminant level but above the MCL goal (MCLG). If there are no further releases to the environment and if the above concentration does not increase, it is expected to drop over time. It may break down into daughter products with the first being trichloroethylene and the last vinyl chloride. The MCL for vinyl chlorine is set very low - below the level of detect.

VOC monitoring is determined by previous monitoring results, well construction, and potential contaminant sources within the recharge zone. The City does not qualify for a "use waiver" because there are potential VOC contaminant sources within the recharge area of each well. Monitoring will remain on a three year frequency for wells 8, 9, and 10. The next monitoring event is 2017.

Well 7 will remain on quarterly monitoring until PCE is consistently (four quarters in a row) below .5ug/l. Once under, monitoring will be reduced to annual. If contaminants are not detected for three consecutive monitoring rounds, the frequency will revert back to the three-year schedule.

Synthetic Organic Contaminants

SOC monitoring began in 1993 under the SDWA. Several monitoring events have been completed to date. There was one SOC detect. Endothall was detected (.53 ug/l) at MW7 in 2005.

Endothall is used as a defoliant for a wide range of crops and as a herbicide for both terrestrial and aquatic weeds. It is used as a desiccant on lucerne and on potato, for the defoliation of cotton, to control aquatic weeds and as an aquatic algaecide growth regulator. It has been used for: sugar beets, turf, hops sucker suppression; alfalfa, clover desiccants; potato vine killers. The endothall concentration was too low to be

quantified (<LOQ) and fell below the codified limit of detection (LOD 9ug/l). It was not detected in subsequent monitoring events (2008 and 2011).

The Department granted a "use waiver" at the City wells. They have more than 60' of grouted casing, have no potential contaminant sources, and there have been no SOC detects at three of the wells and the SOC detected at MW7 was not in the quantifiable range and not detected during subsequent testing. As such, monitoring is reduced to a 6-year frequency. None of the wells qualify for a "susceptibility waiver" (9-year frequency) since the aquifer is unconfined. The next monitoring event is scheduled for 2017.

Aesthetics (Hardness, Color, Odor, Taste)

Aesthetic complaints in Western Wisconsin water systems are commonly associated with hardness, high iron/manganese minerals, and chlorine odors. A more detailed discussion follows.

Hardness

The City's drinking water is classified as "very hard". Hardness is between 297 and 374 mg/l as $CaCO_3$. Customers typically remedy this by softening the water when it enters their home. This practice not only removes excess scale but also reduces soap and detergent use.

Iron/Manganese

Iron and manganese are naturally occurring minerals in well water. City water contains the following amount of iron and manganese:

Well	Iron (mg/l)	Manganese (mg/l)
MW7	0	.03
MW8	.01	.01
MW9	.54	.07
MW10	0	0
Secondary MCL	**.3**	**.05**

Iron and manganese concentrations are above the secondary MCL at MW9 and almost non-existent at the other wells. Well 9 levels are high enough to cause aesthetic concerns as experienced by the City.

Well 9 had iron/iron bacteria problems and yield problems since construction. The City has tried well rehabilitation on several occasions, chlorinating the well, and anoxic blocking. The City also practiced sequestering from 1991 to 2012. Physical stain testing, completed just prior to the 2009 sanitary survey, found that sequestering was not preventing the oxidation of minerals. A microbial study completed in October 2008 indicated that about half of the total iron coming from the well was in its oxidized form for about the first 25 minutes of operation:

Minutes	Fe^{+2}	Fe^{+3}	Total Fe	$\%Fe^{+2}$	$\%Fe^{+3}$
0	0.016	1.304	1.32	1	**99**
1	0.017	0.659	0.676	3	**97**
2	0.041	0.204	0.245	17	**83**
4	0.065	0.199	0.264	25	**75**
6	0.117	0.147	0.264	44	**56**
12	0.142	0.166	0.308	46	**54**
24	0.176	0.144	0.32	55	**45**
60	0.288	0.071	0.359	80	20
125	0.358	0.05	0.408	88	12

Oxidized minerals cannot effectively be sequestered since they are already in their precipitated, colloidal form.

The City tried rehabilitating the well in 2010 using the HiRip process. Acidic water surges were used to clean the well and break down and remove biofilm in the formation. Well yield was restored to what it had been following construction. To keep biofilm at bay, the City treats its well weekly with a chlorine solution and runs the well four days a week. This has not reduced the amount of iron/manganese entering the distribution system nor reduces chlorine demand. It has, however, control biofilm problems.

The City completed an engineering evaluation in 2013 to determine whether nuisance minerals could be removed through filtration. The study was a success. The City plans to submit plans and specifications for construction of an iron removal plant next year. Construction is expected in 2015.

In the meantime, the City is managing MW9's high mineral content water by minimizing the amount of water pumped and removing sediments through its flushing program.

Chlorine

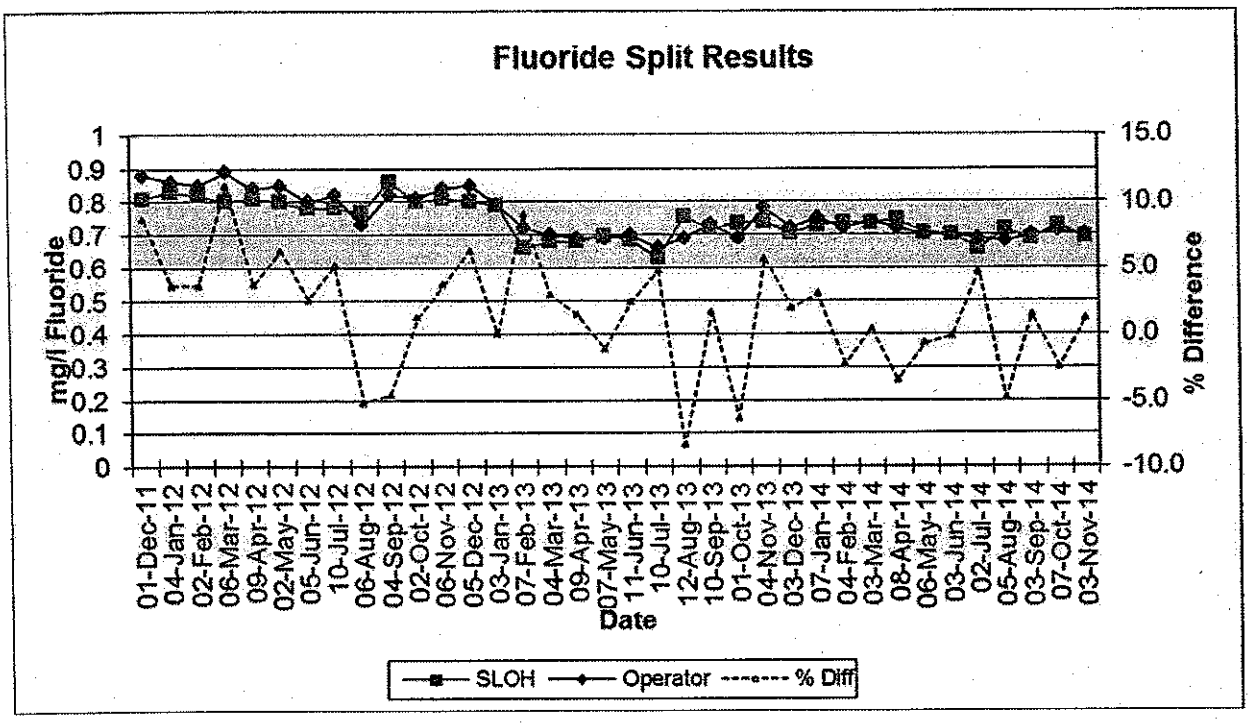
Chlorine related aesthetics, commonly reported as odor or taste, typically occur when breakpoint chlorination is not achieved, when solids collect in the pipes, or when chlorine depletes in stagnant dead-ends. Breakpoint chlorination occurs when adequate chlorine is added to the water to break the chlorine-ammonia molecule bond and to satisfy the demand of iron/manganese oxidation. Combined chlorine causes most taste and odor issues and is corrected by using enough chlorine to break this chlorine-ammonia molecular bond. Breakpoint chlorination determinations have not been carried out by the City.

Antidotaly, the City reports some water quality complaints in areas of high water age. This tends to be the eastern and northeastern area of the system where age can reach 96 to 120 hours. Water age may remain high until population increases in some of these service areas. SEH recommended reducing the water age in some of the reservoirs and connecting some of the service areas together.

Fluoridation

Fluoridation is practiced for dental purposes by a growing number of communities and has been practiced in Onalaska since 1989. Studies confirm that optimizing fluoride levels in drinking water reduces dental carries as well as short and long term expenses associated with correcting tooth decay. Most municipal wells in Wisconsin lack natural fluoride for dental benefit and require supplemental fluoride. Background fluoride levels in City water are too low for dental purposes. At .1 mg/l fluoride, it provides only 14% of the recommended fluoride dose. Dental protection requires a fluoride dose of .7mg/l (WDHS revised standard).

Fluoride is injected at each well house and monitored daily at the entry points and the utility lab. The operator samples a different entry point each day and reports the results on the monthly operating report. A split sample is collected once a month and sent to the Wisconsin State Laboratory of Hygiene (SLOH). Sample results show little variance between the testing agencies and are consistently within the recommended dental health range (.6 to .8 mg/l) as shown below:



The City has an excellent fluoride monitoring program with good quality assurance. Testing is peformed by the operator using the SPADNS test method and HACH digital colorimeter. Observations of testing protocol follow:

- Pipette method is used to measure reagents.
- SPADNS reagent is within its expiration date.
- Glassware and meter are clean and protected.
- Meter condition is in good and reads to the hundredth (.01) mg/l
- Operator runs the test when sample is at room temperature which is correct for this test method
- Lab-grade deionized water is used
- Standards are run monthly and within their expiration date.
- Meter log book is kept showing cleaning, servicing, and standards test results.

Programs Administered

Implementation of several mandatory programs at the local level is required by code. The status of their implementation follows.

Vulnerability Assessment and System Security

Municipal water systems serving more than 3,300 people were required to complete a vulnerability assessment by 2004. These are self-assessments consisting of a review of security related practices. The City completed its vulnerability assessment in 2004 and submitted a certification statement to the Department on March 2, 2004 stating it was complete.

The City completes "table top" security exercises on a regular basis with the last being October 2012. A cursory review of security was carried out on the day of the inspection. Facilities were locked and relatively secure.

Emergency Planning

The Department has current emergency plan on file for the City. Plan elements include:

- List of local and state emergency contacts.
- System for establishing emergency communications.
- Mutual aid agreements the utility may have with other communities for sharing personnel, equipment and other resources during an emergency.
- Standard procedures for emergency water production.

Wellhead Protection

Loss of a well due to groundwater contamination poses significant fiscal impacts on communities. Wellhead protection is a proactive tool for protecting the infrastructure investment by protecting source water quality. It does this by defining a well's recharge area, typically a 5-year recharge zone, and protecting the recharge zone through a local wellhead protection ordinance. The City has a wellhead protection plan and ordinance in place to enforce it.

Private Well Abandonment Permitting Program

The City has a current private well abandonment ordinance. The City permits private wells on a five year basis after meeting the following requirements:

- Well must meet the well construction/pump code,
- Has a history of producing safe water evidenced by 2 bacti tests 2 weeks apart,
- Has a justified use,
- Has a functioning pump system,
- Is not cross-connected with plumbing to the municipal water system.

Owners not meeting the above requirements are required to abandon their wells.

There are currently 62 known, active private wells in the City. Some of the well owners do not have current permits.

Cross-Connection Control Inspection Program

The City began its cross-connection inspection program in 2005.The City has a current cross-connection control ordinance and written plan on how the inspection program is administered.

Residential and low risk commercial customers are inspected on a 10-year frequency. The inspection is completed by City operator – Mr. Shane Stoner. The operator has extensive training and experience carrying out inspections and has provided training to newer operators in the water profession. Inspections include bath and kitchen areas and are documented on current inspection forms. Enforcement is timely. Customers that do not meet plumbing code are disconnected within 90 days following the initial inspection. There was only one unresolved violation beyond 90 days and the service has been turned off for several years now.

Coulee Region Mechanical (CRM) completes the high risk commercial inspections for the City and also functions as the enforcement agent for these units leading up to the disconnect decision. CRM is a private contractor who has been in the business for several years. They have a licensed master plumber (Dave Hanson) completing the inspections. The City is informed on inspection results in a timely manner. There are currently no unresolved violations for the commercial customers beyond 90 days.

City program manager is tracking registered backflow protection devices and working with customers to ensure tests are being completed annually. The City does this by sending a reminder letter to the customer 30 days before the test results are required by DSPS.

The status of the City's inspection program follows:

Status	Current # Customers	2005	2006	2007	2008	2009	2010	2011	2012	2013
Residential	5858	857	550	550	608	550	581	596	477	377
Low Risk CIP	321				8	15	38	76	55	21
High Risk CIP	187						93	89	85	99
Total	**6220**	**857**	**550**	**550**	**616**	**565**	**718**	**761**	**617**	**497**

The City has completed inspections at more than 92% of its service customers over the last 10 years. There are 770 residential inspections remaining. The City expects to do these by next summer. All the high risk commercials have been inspected within the last 2 years.

There is one loading station and it is located at MW10. Backflow protection is provided by a registered RPZ valve.

Distribution System and Storage Maintenance Practices

The City has a preventative maintenance program for ensuring the distribution system is in good working order and to maintain good water quality during conveyance. Conventional flushing is performed annually and dead ends monthly. The operators also use uni-direction flushing by flushing 1 or 2 of the 5 sections each year. Valves are exercised every five years with hydrant leads every 7. Flushing, valve exercising, and meter records are all current. The operator reports that all valves and hydrants function properly.

Real water losses have been low the last few years with 8% last year. The operator reports that all services are metered. Flushing/hydrant use is recorded as well.

The City tests its well meters every two years with the last being 2014. About 600 to 900 residential meters are replaced annually with the Sensus iPERL meter. The City is moving to a 20-year change out program following replacement. Oldest meters currently in use are from 1995.

Wildrose reservoir was cleaned and inspected by LiquiVision Technology Diving Services in 2009 and reported to be in good condition. Hauser and the Country Club reservoirs were cleaned and inspected by Water Tower Clean and Coat in 2011 and reported to be in good condition. The Well Street reservoirs were inspected by Water Tower Clean and Coat in 2013.

The North Well Street reservoir had cracks in the pre-stressed concrete roof panels with evidence of leaking and the South Well Street reservoir had failing roof expansion joints that were leaking. The Department required the City to bring three of its reservoirs (Hauser and the Well Street reservoirs) up to code by installing a membrane over their roofs. The City corrected the deficiencies by covering the Hauser reservoir with an EPDM membrane toward the end of 2013 and did the same with the Well Street reservoirs in 2014. New hatches and screens were also installed at the same time.

Water Reports

The City submits monitoring and operating reports on a timely basis. No discrepancies were noted in the submissions.

Consumer Confidence Reports (CCR)

The City completes a consumer confidence reports on an annual basis. These reports provide customers with general water system information and water quality results over the course of the year. The City publishes its reports. Reports contain all the required information.

System Operators

The City is required to have a water system "operator in charge" (OIC) with "Grade 1" certification in groundwater and distribution system. Mr. Jim Prindle meets the certification requirements.

Jim and his staff have an excellent understanding of water operations. Jim takes a proactive approach to ensure equipment is properly operated and to prevent premature failure. Jim also provides some regional leadership in the water field by coordinating training sessions for water operators and by participating on the DNR drinking water advisory group. Jim's staff have similar credo and are recognized as some of the best professionals in their area of expertise.

Fiscal

The water utility's financial officer is the Financial Services Director/Treasurer, Mr. Fred Budhler. The utility maintains separate journals and has an annual budgeting process. Independent financial audits are performed annually by Hawkins Ash CPAs of La Crosse Wisconsin.

Outstanding debt service includes the following instruments:

Instrument	Issued	Matures	Interest	Principle Remaining
2004 GO BOND	04/01/2004	10/01/2024	3.86	7,567
2005 MRB REFUND	03/15/2005	12/01/2015	3.55	124,598
2005 GO BOND	04/01/2005	10/01/2015	4.12	21,426
2006 MRB	04/01/2006	12/01/2027	4.74	2,201,525
2007 REFUNDING BONDS	01/05/2007	10/01/2021	3.97	72,249
2007 GO BOND	04/02/2007	10/01/2026	4.12	83,738
2008 GO BOND	04/02/2008	04/02/2027	3.4	292,272
2009 GO BOND	04/02/2009	04/02/2028	2.96	218,379
2012 GO BOND	04/01/2012	10/01/2031	2.98	490,000
2012 REFUNDING BONDS	07/02/2012	10/01/2023	2.98	42,848
2012 REFUNDING BONDS	12/27/2012	10/01/2027	2.98	65,411
2013 GO BOND	04/01/2013	10/01/2032	2.98	40,000

Including depreciation, cash flow has been positive the last several years. Ending balance has been decreasing though and ended at $97,135 in 2013.

Current rates are based on a fixed rate of $ 14.25/quarter for a 5/8" or 3/4" meter size and a declining volumetric rate that starts at $1.15/100ft^3 for the first 15,000 gallons.

The City does its own meter reading using radio automatic meter reading (AMR) technology.

Previous Enforcement Action

There have been two enforcement actions since the last survey as described below:

November 30, 2012 Notice of Violation and January 3, 2013 Enforcement Conference– leaking fluoride injector, oversized phosphate containers, not implementing corrosion control improvements, ineffective sequestering program, Well Street reservoir overflow distance, Hauser reservoir roof crack and no membrane to protect against leaks, poor weld job on new Hauser reservoir hatches, unprotected (no check valves) on privately looped water mains, outdated cross-connection control ordinance, and residential cross-connection inspection frequency was more than 10 years.

The City has resolved all the violations noted in the previous enforcement action except the residential cross-connection inspections. The City expects to have the residentials inspected by next summer.

SURVEY FINDINGS

A lot of information is gathered and reviewed during the survey process. Since surveys are completed on a 3-year basis, it's important that the inspection be carried out successfully and clearly documented so that issues can be resolved by the community in a timely manner. The section on key findings hopes to do just that in four sections: deficiencies, recommendations, accomplishments, and capacity development.

Deficiencies

During the course of the survey, deficiencies are identified. Deficiencies are problems in the drinking water system that cause or have the potential to cause operational problems, equipment failure, or short and long term health risks depending on changing conditions. Some of these may be related to new code requirements. Deficiencies usually indicate noncompliance with one or more of Wisconsin administrative codes which are largely based on Federal standards.

Violations may be classified as a deficiency, significant deficiency, or nonconforming feature (NCF). Nonconforming features are design deficiencies that were identified after the December 2010 code change (ch. NR811 Wis. Adm. Code) and are not significant in nature. They are corrected when projects go through formal plan review. Significant deficiencies are described in the Federal Ground Water Rule and defined under ch. NR809.04 Wisconsin Administrative code. They must be corrected in a timely manner. If uncorrected, EPA is notified and public notification is required (ch. NR809.960 Wis. Adm. Code). There were no significant deficiencies identified during the inspection. There were several deficiencies with some having been corrected since the inspection as will be noted.

Source Water, Pumping Facilities, and Treatment

1. NCF: Chemicals shall be located within a protective containment basin capable of receiving accidental spills, drainage, or overflows without an uncontrolled discharge outside of the containment basin. This is extremely important given the large volume of non-compatible chemicals being stored together in your well houses. While addressing the deficiency now is highly recommended, the City must address this deficiency during the next reviewable project. (ch. NR811.39(3d) Wis. Adm. Code)

2. NCF: the well houses do not have separate fluoride rooms. Historical etching of equipment is evident in some of the well houses. While addressing the deficiency now is highly recommended, the City must address this deficiency during the next reviewable project. (ch. NR811.51(2a and d) Wis. Adm. Code)

3. NCF: Fluoride (acid) and Chlorine (oxidizer gas) should be in a separate, ventilated room away from ignition sources. Since they are not of the same chemical compatibility group, they should

not be stored together (reference USEPA "Incompatible Chemicals Storage" guidance). While addressing the deficiency now is highly recommended, the City must address this deficiency during the next reviewable project. (ch. NR811.40(1l) Wis. Adm. Code)

4. The fluoride injector fitting at MW7 appeared to be leaking. The City indicates that this was resolved before the inspection report was published. (ch. NR810.13 Wis. Adm. Code)

5. Chemical injectors at MW7 and MW9 need to be moved above grade where they can be inspected on a regular basis and serviced if needed. (ch. NR810.13 and ch. NR811.39(3b,e) Wis. Adm. Code)

6. Seal the chlorine conduit at MW7 so the room is air tight leading to the well. The City indicates that this was resolved before the inspection report was published. (ch. NR811.48(5a) Wis. Adm. Code)

7. Label the fluoride pump's electrical outlet at MW7 (ch. NR811.39(4b) Wis. Adm. Code). The City indicates that this was resolved before the inspection report was published.

8. Some of the fluoride containers had black rubber material in the bottom. This was a problem in the past. The chemical supplier said it was from their fill hoses. You should be cleaning your solution containers more frequently. (ch. NR810.09(1f) Wis. Adm. Code)

9. Fluoride injection nozzle at MW8 needs to be inserted through a corporation stop so it can be removed for inspection and cleaning. (ch. NR811.39(7f) Wis. Adm. Code)

10. Bolts on the solenoid switch, that regulates chlorine feed water, were severely corroded at MW10. The City indicates that this was resolved before the inspection report was published. (ch. NR810.13 Wis. Adm. Code)

11. The Aspen Valley blowoff valve discharge line needs to be screened. (ch. NR811.72(1) Wis. Adm. Code)

Storage

1. Wildrose reservoir has not been inspected within the last 5 years. Its last inspection was the summer of 2009. (ch. NR810.14(1) Wis. Adm. Code)

Distribution System

1. NCF: continue to eliminate dead ends by looping water mains where practical. These can be addressed during other utility projects. (ch. NR 811.70(8) Wis. Adm. Code)

2. Please submit an updated copy of your distribution system map. Please be sure to label the check valves in the distribution system being used to protect against backflow from privately looped water main. (ch. NR810.26(2) Wis. Adm. Code)

Monitoring, Reporting, and Data Verification

1. Several problems were noted in your bacteriological monitoring program that will need to be corrected. First, when adding additional monitoring sites, obtain Department approval prior to using the sites. Second, some areas appear to be over-monitored and others are under-monitored.

For example, the Mary Drive site has not been used in over a year and there does not appear to be any monitoring in the La Crosse International Industrial Park served by your water system. Third, when filling out the monitoring forms, you are putting additional information in the address block (such as "sampling station"). This block is for just the street address. (ch. NR809.31(1a, b) Wis. Adm. Code)

2. Fluoride standards should be run at least weekly rather than monthly. Also, be sure to record calibration test results after running the chlorine standards. (ch. NR809.563 and .113 Wis. Adm. Code and Standard Methods by reference)

System Management and Operator Compliance

1. Some of the City's residential customers have not had a cross-connection inspection over the last 10 years as required by code. Please continue your inspection program so that all your customers have been inspected within a 10 year period. Also, Lake Onalaska MHP appears to be an unregulated consecutive water system at this time and will still need to have a cross-connection inspection. The City will need to enforce the inspections whether you or the owner contracts to have them completed. As explained on the inspection, you may skip kitchens and bathrooms in this area as long as you complete a 3-year public education program. If you go that route, you will need to submit an updated copy of your written cross-connection inspection program plan to the Department and include educational materials. (ch. NR 810.15 Wis. Adm. Code)

2. Several private well permits have expired under your private well abandonment permitting program. The City will need to develop a way to ensure the permits are reissued on a 5 year schedule. (ch. NR 810.16 Wis. Adm. Code)

3. The City will need to obtain a WPDES discharge permit for the discharges from your two automatic flush hydrants. You may contact the Department's wastewater engineer, Julia Stephenson, for the WDPES general permit application. (ch. NR 811.85 Wis. Adm. Code)

Fiscal

No deficiencies noted.

Significant Deficiency Response and Reporting Requirements

There were no significant deficiencies noted during the inspection.

Recommendations

During the course of the survey, several observations were made that can be considered recommendations. These can be energy, fiscal, O&M, or management related problems that can or will hinder the utility in consistently providing safe drinking water to customers. They are usually based on industry standards in the drinking water field. The following recommendations are made:

1. It is recommended that you add additional generator capacity to your water system. While wells 8 and 10 have generators, pumping capacity is not adequate at these wells to satisfy emergency demand during higher water use days. Adding additional generator capacity should be considered during your MW9 project.

2. Three of the City wells have elevated nitrates. The City should be working with owners of the ball fields that border the wells to ensure they are properly applying fertilizers. At a minimum, the City should ask them to complete soil testing so that agronomical application rates are not exceeded.

3. The City should consider ways to lower tetrachloroethylene at MW7 due to its health risks. While the well meets the MCL, it is above the federal MCL goal of zero. EPA has decided to lower the MCL for tetrachloroethylene and its breakdown product, trichloroethylene. Identifying the source of the contaminant would be a step in the right direction as well as limiting the use of the well.

4. It is recommended that you continue your copper corrosion studies to determine the effects of electrical current on corrosion and that you work with your electric utility or homeowner to ensure stray current issues are resolved.

5. The City should continue to improve lead and copper monitoring practices. You should not accept lead and copper samples from homeowners if they do not meet Federal sample collection guidelines. On page 28 of the 2010 EPA publication entitled Lead and Copper Rule Monitoring and Reporting Guidance for Public Water Systems:

   "Always collect a first-draw sample from a tap where the water has stood in the pipes for at least six hours (e.g., no flushing, showering, etc). However, make sure it is a tap that is used regularly, and not an abandoned or infrequently used tap."

   In other words, ensure the sample taps are faucets that see regular use and don't accept samples that have unusually high stagnation times (which could give metal levels of that having infrequent use). Reasonable stagnation times are 6 to 10 hours. It is recommended that you have homeowners document flushing and stagnation times so that you can reject samples not meeting this criteria.

6. Continue with your project to install iron and manganese treatment at your MW9.

7. It is recommended that you work toward replacing the asbestos lined pipe. You may want to sample the water for asbestos in areas served by this type of water main.

8. It is recommended that you adjust your water rates. Net operating income and net rate base have been dropping the last few years.

Accomplishments

The Department recognizes the City for the amount of hard work that has been done the last three years in updating your water system and improving its operation. Some of these projects were very difficult, as well as complex, but they were needed to safeguard and improve water quality as well as maintain the system's long-term integrity. Accomplishments include:

1. SEH completed a system evaluation in November 2013 that included a capital improvement plan.
2. Membrane liners were installed over three water reservoirs to address previous leaking problems.
3. Emergency preparedness exercises have been carried out with various agencies.
4. Phosphate use was discontinued. This is nutrient for biological growth and eventually ended up being discharged to the wastewater facility and river.
5. Studies were carried out to lower lead and copper levels.
6. Check valves were installed on privately looped water mains to prevent flow-back to the system.

7. Auto-shutoff valves were installed on the chlorine cylinders to prevent dangerous gas releases.
8. SCADA system was updated to provide better control and information for operational and management decisions.
9. Asset management program (InfraMap) is now being used for equipment servicing and replacement decisions.

Capacity Development

As required by Federal law (42 USC 300f to 300j-26), this survey serves as an evaluation of the capabilities of your water system. This is called "Capacity Development" assessment and is essentially a viability analysis. It's a determination of whether you have and can maintain adequate technical, managerial, and fiscal practices to deliver water to your customers that meets Safe Drinking Water Act requirements.

The City has adequate technical, managerial, and financial capacity to provide safe drinking water. The next survey is scheduled for 2017.

CONCLUSION AND RESPONSE

The City continues to deliver safe drinking water to its growing customer base. Operations and maintenance practices have been excellent and the City proactively tackles bigger issues that impact the Utility. Significant improvements have been implemented the last few years with the most significant being sealing the reservoir roofs and installing check valves on privately looped water mains.

Many of the deficiencies noted during the inspection were minor in nature. Several have already been addressed. It should be fairly easy to correct those that remain. The City will need to pay closer attention to its monitoring program to ensure bacteriological monitoring is more representative of the service areas. Some areas are over-monitored at the expense of others. These issues should not distract from the excellent work your staff are doing to manage the system including plans to install treatment at MW9 next year, identifying reasons for elevated copper levels, removing unnecessary treatment chemicals (phosphates), and improving equipment safety and long term viability.

As required by Federal and State code, unless otherwise noted in the above report or agreed to by the Department, the City has 120 days to address the deficiencies (April 22, 2015). Please provide a written response within 45 days (February 6, 2015) of receiving the report describing corrective action or proposed action that will be taken to resolve the deficiencies.

Thank you for your assistance during the inspection. I have enjoyed working with your community and your staff over the years. It's been rewarding to see the many improvements you have made.

I hope you find the above assessment a fair treatment of the issues facing the utility as well as providing solid guidance and a framework to move forward. Please feel free to contact me with any questions you may have. You may reach me at 608-785-9013 (charles.cameron@wisconsin.gov).

Sincerely,

Charlie Cameron, P.E.
Environmental Engineer

cc: DG Supervisor – WCR and Bureau of Drinking Water/Groundwater - DG/5

APPENDIX

Table A: Certified Operators

Name	License	Expires
FRANCIS FISCHER	34280	11/01/2017
ANTHONY HENTGES	33360	05/01/2016
JASON HILTON	33313	05/01/2016
STEVE JACKSON	33254	11/01/2015
THOMAS JOSTAD	31918	12/01/2016
DEAN LOEFFLER	33669	11/01/2017
GLENN MILLER	24612	06/01/2017
JAMES PRINDLE	32282	05/01/2017
COLLIN RADKE	35735	11/01/2015
SHANE STONER	33563	05/01/2017
JOHN WIATT	34352	05/01/2017

Table B: Specification of Wells and Pumps

	MW7 (172BG)	MW8 (BG173)	MW9 (BG179)	MW10 (PG968)
Location	504 Monica Lane	Oak Ave N & Grove St.	840 11TH Ave S.	504 Vilas St.
Construction Date	1971	1978	1986	2007
Geological Formation	Sand/Gravel	Sand/Gravel	Sand/Gravel	Sand/Gravel
Borehole (size/depth)	42" - 0 to 160'	42" – 0 to 169'	54" – 0 to 160'	48" – 0 to 10' 42" – 10 to 165'
Casing	26" - 0 to 105' 16" - +2 to 110'	26" – 0 to 114' 16" – +1.6 to 119'	36" – 0 to 100 26" – 0 to 110	26" – +1.5 to 125'
Screen	16" - 110 to 160'	16" – 119 to 169'	26" – 110 to 160'	26" - 125 to 165'
Grout	0 to 105'	0 to 111'	0 to 100'	0 to 104'
Gravel Pack	Yes	Yes	100 to 160'	104 to 165'
Original Static WL	75.5'	78'	68'	69'
Current Static WL	77'	79.1'	72.9	66.9'
Original Pumping WL	89.3' @ 1250 gpm	92' @ 1200 gpm	92' @ gpm	90' @ 2512 gpm
Current Pumping WL	98.5' @ 2310 gpm	99.3' @ 2313gpm	97.5' @ 2675gpm	88.9' @ 2625gpm
Original Specific Capacity	91gal/min/ft	86gal/min/ft	125 gal/min/ft	120 gal/min/ft
Current Specific Capacity	107 gal/min/ft	115 gal/min/ft	109 gal/min/ft	119 gal/min/ft
Top of Bowls	110'	120'	110'	120'
TDH	342'	330'	348'	330'
Last Rehab./Reconstruction	2008	2008	2010 (acid surge)	
Distance to Gravity Sewer	147'	70'	48'	87' to lined sewer 158' to unlined
Pump Manufacturer	Layne	Layne	Layne	Layne
Type	VT	VT	VT	VT
Age (Installed)	2000	2002	1987	2008
Motor (hp)	250 hp GE Motor	250hp US Motor	300hp US Motor	300hp, US Motor
Current Capacity (gpm)	2310 gpm	2313 gpm	2675 gpm	2625 gpm
Auxiliary Power	None	Diesel GenSet	None	Diesel GenSet
Latest Inspection	2008	2008	2010 Rebuilt	2008 new

Table C: Specifications of Chemical Feed System

Chlorination Disinfection purposes, using 100% gas chlorine, gravimetric measurement		
Well ID	**Rotimeter Make and Capacity**	**Rotimeter Setting**
MW 7	Capital Controls, 25 lbs/day	14 lbs/day
MW 8	Capital Controls, 25 lbs/day	12 lbs/day
MW 9	US Filter, 100 lbs/day	70 lbs/day
MW 10	Capital Controls, 100 lbs/day	Based on Flow Meter, Well has VFD Motor

Fluoridation Dental purposes, using 23% hydroflourosilic acid (H_2F_6Si), gravimetric measurement			
Well ID	**Solution Container Size (gal)**	**Pump Make and Capacity**	**Pump Setting (% Stroke / % Speed)**
MW 7	210	LMI, 38.4gpd	40 / 50
MW 8	210	LMI, 38.4gpd	40 / 40
MW 9	210	LMI, 38.4gpd	50 / 50
MW 10	160	LMI, 38.4gpd	40 / 40

Table D: Summary of Services and Meter Statistics

Service Type	Services			Meters		
	2011	**2013**	**% change**	**2011**		**% change**
Residential				5811	5959	**3**
Commercial				528	545	**3**
Industrial				7	7	**0**
Public Authority				47	54	**15**
Multi Family					0	**0**
Irrigation					0	**0**
Wholesale					9	**100**
Utility Use				11	0	**-100**
Total	**5761**	**5817**	**1**	**6407**	**6574**	**3**

Table E: Summary of Water Use Statistics

Year	Population (est. Cap)	Average (gpd)	Maximum (gpd)	Unaccounted (%)	Energy (total kwhr)
2013	18066	2288668	6305000	8	1245800
2012	18003	2435318	6410000	5	1319000
2011	17940	2116518	5227000	6	1159000

Table F: Summary of Water Quality Compliance (Bacteriological)

Year	Missed Samples	Wells		Distribution	
		Negative	**Positive**	**Negative**	**Positive**
2014		12		210	
2013		16		240	
2012		16		220	
2011		16		180	

Table G: Summary of Water Quality Compliance (Chemical and Radiological)

Sample Group	Year	Source ID	Samples Taken	Missed Samples	MCL Violations
2014	DBP		2	0	0
2014	RAD	7	1	0	0
2014	RAD	8	1	0	0
2014	IOC	7	4	0	0
2014	VOC	8	1	0	0
2014	RAD	10	1	0	0
2014	VOC	10	1	0	0
2014	VOC	9	1	0	0
2014	IOC	8	4	0	0
2014	FLUORIDE		10	0	0
2014	PBCU		35	30	0
2014	VOC	7	1	0	0
2014	RAD	9	1	0	0
2014	IOC	9	1	0	0
2014	IOC	10	4	0	0
2013	DBP		4	0	0
2013	NITRATE	7	4	0	0
2013	NITRATE	9	1	0	0
2013	NITRATE	8	4	0	0
2013	NITRATE	10	4	0	0
2013	FLUORIDE		12	0	0
2012	DBP		4	0	0
2012	NITRATE	7	4	0	0
2012	NITRATE	9	1	0	0
2012	NITRATE	8	4	0	0
2012	NITRATE	10	4	0	0
2012	FLUORIDE		12	0	0
2011	DBP		4	0	0
2011	SOC	8	2	0	0
2011	SOC	10	2	0	0
2011	IOC	7	1	0	0
2011	VOC	8	1	0	0
2011	NITRATE	7	1	0	0
2011	VOC	10	1	0	0
2011	VOC	9	1	0	0
2011	IOC	8	3	0	0
2011	NITRATE	8	2	0	0
2011	SOC	7	4	0	0
2011	NITRATE	10	2	0	0

2011	FLUORIDE		12	0	0
2011	PBCU		30	0	0
2011	IOC	9	1	0	0
2011	SOC	9	2	0	0
2011	IOC	10	3	0	0
2011	VOC	7	1	0	0

BOARD OF PUBLIC WORKS
MONTHLY ESTIMATES
January 6, 2015

Contractor	Original Contract Amount	Change Orders	Paid to Date	Due this Estimate
1. **STATE OF WI - DOT** San Sewer & Watermain Relocation Construction - I-90 Bike Trail *(1071-06-86)* Estimate #4	$ 591,046.00	$ -	$ 243,482.43	$ 24,004.62
2. **WAPASHA CONSTRUCTION** 2013 Reservoir Improvements Construction Estimate #12	$ 294,991.99	$ -	$ 277,681.51	$ 7,165.00
3. **STRAND ASSOCIATES** Well #9 - Reconstruct/Filter Design Estimate #4	$ 132,700.00	$ 19,800.00	$ 89,800.00	$ 26,400.00
4. **FAHRNER ASPHALT** Street Striping - City Wide Estimate #1	$ 15,000.00	$ -	$ -	$ 13,776.25
5. **AYRES ASSOCIATES** (02632) I-90 Sanitary Sewer Design Estimate #1	$ 48,600.00	$ -	$ -	$ 1,666.63
6. **STATE OF WI - DOT** STH 35 - 2nd Ave SW to Poplar St Enhancement Project - Construction *(5991-02-52)* Estimate #6	$ 269,406.00	$ -	$ 180,142.01	$ 160.00
7. **STATE OF WI - DOT** 2nd Ave / STH 35 - Design *(7190-05-00)* Estimate #23	$ 125,000.00	$ 50,000.00	$ 177,738.88	$ 688.47
8. **STATE OF WI - DOT** STH 35 - 2nd Ave SW to Poplar St Community Sensitive Design / Lighting Match - Construction *(7190-05-71)* Estimate #3	$ 50,176.00	$ -	$ 39,687.72	$ 1,444.33

EX:vb/S:eng/bopw mth est.1/6/15