City Council

COMMITTEE OF THE WHOLE

City of Belvidere, Illinois

Alderman Sheryl Prather	Chairman Building
Alderman Natalie Mulhall	Vice-Chairman Building
Alderman Ric Brereton	Chairman Finance and Personnel
Alderman Wendy Frank	Vice -Chairman Finance and Personnel
Alderman Tom Porter	Chairman Planning & Zoning
Alderman Mike McGee	Vice-Chairman Planning & Zoning
Alderman Clayton Stevens	Chairman Public Safety
Alderman Matthew Fleury	Vice-Chairman Public Safety
Alderman Marsha Freeman	Chairman Public Works
Alderman Daniel Snow	Vice-Chairman Public Works

AGENDA

February 28, 2022
6:00 p.m.
City Council Chambers
401 Whitney Blvd., Belvidere, Illinois

Call to Order:

Roll Call:

Public Comment:

Public Forum:

Reports of Officers, Boards, and Special Committees:

1. Other:
   (A) Appointment of Dawn Brooks to the Belvidere Historic Preservation.
   (B) Appointment of Jack Barnes to the Police Pension Fund.
   (C) Public Works – Extension of Intergovernmental Agreement for Annual Painted Pavement Marking Program.
   (D) Public Works – PFAS Evaluation Report for Wells #3 and #4.

2. Public Safety, Unfinished Business: None.

3. Public Safety, New Business:
   (A) Police Department – Update.
   (B) Police Department – Request to approve the contract sale of Belvidere Police K-9 Shep.
   (C) Police Department – Request to accept a $15,000.00 donation for the purchase of a new police canine.
   (D) Fire Department – Update.
   (E) Fire Department – Request to accept a $20,000 donation from General Mills Public Safety Grant for the purchase of an animated sign.
   (F) Fire Department – Roofing Administration Side Station #1.
   (G) Fire Department – Plastering and Maintenance repair of Station #1.

4. Finance & Personnel, Unfinished Business: None.

5. Finance & Personnel, New Business:

   (A) Finance Department – Update.
   (B) FY 2023 – Fire Budget.
   (C) FY 2023 – Police Budget.

6. Adjournment:

MEMO

DATE: January 31, 2022

TO: City Council and Clerk

FROM: Mayor Clinton Morris

RE: Appointment of Dawn Brooks

The Belvidere Historic Preservation Commission is comprised of seven (7) members, each serving a 3-year term. Dawn Brooks, who is a community volunteer and lives in Belvidere has submitted a letter of interest in being appointed to fill one of the vacant seats (term ending May 2024).

Requested Motion: Motion to consent to and approve the appointment of Ms. Brooks to the Belvidere Historic Preservation Commission for a three-year term, ending in May 2024.

To Whom It May Concern,

My name is Dawn Brooks. I am so honored to be considered for a position on the Historic Preservation Commission. I moved to Belvidere in 2005 and have enjoyed being a part of this wonderful community that is so rich with history. I frequently visit the Boone County Museum of History with my children. My son, in particular, is very interested in the history of our community and I like to do anything to help further their educational interests.

I am an active volunteer in our community. I have been a volunteer in the schools for many years. I began back in 2012 as a classroom helper when my son was in kindergarten at Washington Academy. In 2013 I helped in the classroom as well as helped run the 'buddy bag' program for the 1st grade classes. In 2014, in addition to helping in the classroom, I became involved with the PTO group at Washington and was Spirit Wear Coordinator. 2015, 2016 and 2017 I was the Vice President of the PTO board at Washington Academy and helped with all the fundraisers and bring fun, family activities and events to the school. In 2018, my son moved up to Belvidere South Middle School where I served as PVO secretary.

I continue to serve on the PVO board at BSMS as Vice President. I have also worked with various volunteer efforts with the PTCO at Perry Elementary where my daughter attends school.

I have also been a member of the Ida Public Library Board of Trustees since 2019. I am currently the Secretary and chair of Expansion and Policy Committees.

As a mom with young children, it is very important to me to be involved in our community and show my kids how much richer life can be when you give back to the community you live in. I am excited to be expanding my volunteer opportunities in other areas of our community.

Thank you for your consideration,
Dawn Brooks

Sarah Turnipseed

From: Clint Morris
Sent: Tuesday, February 22, 2022 5:21 PM
To: Sarah Turnipseed
Cc: Mike Drella
Subject: Jack Barnes Appt. - Police Pension Fund Board

Please add to the next agenda the appointment of Jack Barnes to the Police Pension Fund Board.

Thank you,

Clint

401 Whitney Boulevard
Belvidere, IL 61008
815-544-9256
banderson@ci.belvidere.il.us

Public Works Department

Memo

To: Mayor and City Council

From: Brent Anderson, Director of Public Works

Date: 2/23/2022

Re: Extension of Intergovernmental Agreement for Annual Painted Pavement Marking Program

---

Our Intergovernmental Agreement with the City of Rockford for a single contract for our annual painted pavement marking program includes provisions for two one-year extensions. The result of combining our projects has been a nearly 50% reduction in our unit pricing for painted pavement markings.

I would recommend approval of the final one-year extension of our Intergovernmental Agreement with the City of Rockford for our annual Painted Pavement Marking Program.

401 Whitney Boulevard, Suite 200
Belvidere, Illinois 61008
815-544-9256 Fax: 815-544-4255

Belvidere Public Works

Memo

To: Mayor and City Council

From: Brent Anderson, Director of Public Works

Date: 2/23/2022

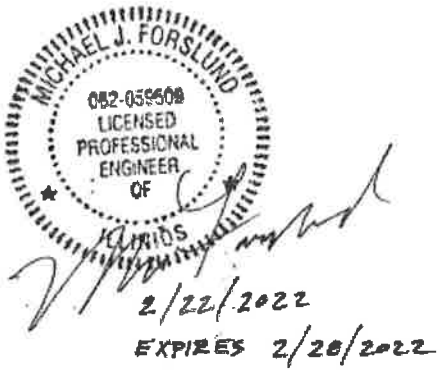
Re: PFAS Evaluation Report for Wells #3 and #4

Attached to this memo is the PFAS Evaluation Report for Wells #3 and #4. and the preliminary design for new well #11. The report recommends that Wells #3 and #4 be decommissioned and new well #11 be constructed. We will apply for IEPA Public Water Supply Loan Program financing for the construction of the new well.

Report for

City of Belvidere, Illinois

Per- and Polyfluoroalkyl Substances Evaluation and Well No. 11 Preliminary Design



Prepared by:

STRAND ASSOCIATES, INC.®
910 West Wingra Drive
Madison, WI 53715
www.strand.com

February 2022

STRAND ASSOCIATES®

TABLE OF CONTENTS

TABLE OF CONTENTS Continued

SECTION 1
INTRODUCTION

1.01 PURPOSE OF STUDY

The City of Belvidere (City) recently sampled each water supply well for per- and polyfluoroalkyl substances (PFAS) and found levels in Well Nos. 3 and 4 that exceed the health advisory guidance level set by the Illinois Environmental Protection Agency (IEPA). The City is also experiencing water quality issues at Well No. 4 related to positive bacterial tests. The purpose of this study is to review the options available for reducing PFAS levels, addressing the bacterial issue, or installing a new deep well to replace Well Nos. 3 and 4.

This report is structured to include information needed to comply with the Project Plan requirements of the IEPA Public Water Supply Loan Program (PWSLP).

The following tasks are summarized in this report.

1. Review of the existing system and water quality data.
2. Develop a 20-year projection of water demands.
3. Evaluate the feasible treatment options for reducing PFAS levels coming from Well Nos. 3 and 4.
4. Evaluate the potential abandonment of Well Nos. 3 and 4.
5. Evaluate the new well facility treatment options.
6. Develop the preliminary design concepts for a new deep well and well facility.
7. Develop the opinions of probable construction cost (OPCC) for each feasible option.
8. Prepare the preliminary loan application documents for the PWSLP.

1.02 DEFINITIONS

City	City of Belvidere, Illinois
GAC	granular activated carbon
gpcd	gallons per capita per day
gpm	gallons per minute
IEPA	Illinois Environmental Protection Agency
ISO	Insurance Services Office
IX	ion exchange
MCL	maximum contaminant level
MGD	million gallons per day
mg/L	milligrams per liter
MRL	minimum reporting levels
OPCC	opinions of probable construction cost
PFAS	per- and polyfluoroalkyl substances
PFBS	perfluorobutanesulfonic acid
PFHxS	perfluorohexanesulfonic acid
PFHxA	perfluorohexanoic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid

ppt	parts per trillion
PWSLP	Public Water Supply Loan Program
RO	reverse osmosis
U.S.	United States
USEPA	United States Environmental Protection Agency
Utility	Belvidere Water Utility
UV	ultraviolet
VOC	volatile organic compounds
WTP	water treatment plant

SECTION 2
EXISTING WATER SYSTEM

2.01 EXISTING INFRASTRUCTURE

A. Groundwater Sources

Seven wells (Well Nos. 3, 4, 5, 7, 8, 9, and 10) provide all the water produced by the Belvidere Water Utility (Utility). Well No. 6 was permanently taken out of service in 2012 because of unsafe bacterial samples. Table 2.01-1 shows the average supply provided by each well. This table shows the well supply capabilities in gallons per minute (gpm) and million gallons per day (MGD) for each well, total well capacity, and firm well capacity, which is defined as well capacity with the largest well out of service.

Groundwater is sourced from the Glenwood-St. Peter (Ordovician age), Ironton-Galesville (Cambrian age), and Elmburst-Mt. Simon (Cambrian age) sandstone formations. Because of the thickness and wide extent of the sandstone formations in the region, adequate quantities of water from these aquifers are expected to supply all the water the City needs well into the future.

Well No.	Average Flow (gpm)	Average Flow (mgd)
3	470	0.68
4	1,026	1.48
5	358	0.52
7	982	1.41
8	1,829	2.63
9	912	1.31
10	979	1.41
Total Capacity	6,556	9.44
Firm Capacity*	4,727	6.81

*Assumes Well No. 8 is out of service.

Table 2.01-1 Well Capacity

1. Well No. 3

Well No. 3 was drilled in 1908 to a depth of 1,803 feet. The well is located at 210 Whitney Boulevard and is adjacent to the 435,000-gallon, ground-level reservoir at the Main Plant. A 16-inch diameter hole was drilled to a depth of 90 feet, with a 10-inch hole from 90 to 640 feet, and an 8-inch hole from 640 to 1,803 feet. The well pump at Well No. 3 is reported to be a Goulds 3-stage, model 8ROHC rated at 770 gpm at 181 feet. Based on recent flow data, the pump is operating below its design capacity. The pump is housed in a wooden building with a sloped shingled roof.

Before 1993, Well No. 3 had been noted by the IEPA as having high levels of volatile organic compounds (VOC). Packed tower aeration equipment was installed at the Main Plant site in 1995 which has been successful in reducing VOC levels. Historic water quality data shows that the VOC levels in the raw water from Well No. 3 have declined likely because of continued use of the well gradually removing the VOCs from the aquifer.

2. Well No. 4

Well No. 4 is located at 317 North Main Street. The well was drilled in 1942 to a depth of 1,801 feet. The well is cased with 16-inch iron pipe to a depth of 152 feet and is grouted in place. The well pump is a report to be a Goulds 8-stage, model CHC11. A separate chemical feed facility is adjacent to the building, which houses the chlorine and fluoride chemicals and feed equipment. Recently, bacterial contamination has been detected at this well.

3. Well No. 5

Well No. 5 is located at 324 West Fifth Street. The well was drilled in 1945 to a depth of 610 feet. An 18-inch diameter upper hole was drilled to a depth of 152 feet and a 12-inch-diameter lower hole extends from 152 to 610 feet. The well is cased with 18-inch pipe to a depth of 45 feet and with 12-inch pipe from 1.5 feet aboveground to a depth of 152 feet. The 12-inch casing is grouted in place. The well pump is a Goulds 12-stage submersible pump, model 9THC. There is a separate chemical facility building located directly behind the well house in which the chlorine and fluoride chemicals and feed equipment are housed.

4. Well No. 7

Well No. 7 is located at 1106 East Second Street and is adjacent to a 300,000-gallon elevated tank. The well was drilled in 1962 to a depth of 969 feet. The well is cased with a 24-inch pipe from 1 foot above the pump house floor to a depth of 163 feet, and an 18-inch casing pipe from 1 foot above the floor to a depth of 192 feet with the casing grouted in place. The well pump is a Goulds 8-stage pump, Model 11CHC-GP. Water is pumped from the well to the yard piping where a tee allows the well to fill the elevated tank and connect directly to the distribution system. Chlorine and fluoride feed equipment and chemicals for injection to the system are located inside the facility. The site is protected by a locked chain-link fence.

5. Well No. 8

Well No. 8 is located on United States (U.S.) Business Route 20 directly across from the Chrysler Corporation on the City's southwest side. The well was drilled in 1964 to a depth of 1,393 feet. The ground-level reservoir and booster station were constructed in 1995. The well is 26-inches in diameter from grade to 27 feet, then 25 inches in diameter from 27 to 363 feet, reduced to 19 inches from 362 to 994 feet, and finally finished as a 16-inch-diameter hole from 994 to 1,393 feet. The well is cased with 26-inch-diameter pipe from 1 foot abovegrade down to 27 feet with 20-inch-diameter pipe from 1 foot abovegrade to 362 feet and is grouted in place. The well also has a 16-inch liner from 875 to 995 feet. The well pump is an American Marsh 4-stage, rated at 1,940 gpm based on information provided by the City. Water from Well No. 8 is pumped to a 1,500,000-gallon reservoir and booster pumps are used to pump water into the distribution system. All booster pumps are American Turbine Pump 3-stage rated at 1,294 gpm. Sodium hypochlorite and fluoride feed systems are housed in the booster station building. The site is protected by a locked chain-link fence.

6. Well No. 9

Well No. 9 is located at 8747 Beloit Road. The well was drilled in 1969 to a depth of 122 feet. A 48-inch hole was drilled to a depth of 10 feet and from there a 36-inch hole extends to a depth of 122 feet. The well is cased with a 16-inch galvanized iron pipe from 2 feet above grade to 70 feet, a 16-inch-diameter screen extends from 70 to 90 feet, a 16-inch galvanized iron pipe from 90 to 115 feet and is finished with a 16-inch screen from 115 to 120 feet. The annular space is grouted from 32 to 35 feet. From the surface to the grout, the annulus is filled with sand and bentonite; below the grout, it is filled with No. 3 Muscatine gravel. The well pump is a Byron Jackson, water lubricated, line-shaft turbine pump. The well house also houses chlorine and fluoride for addition to the system. The site is surrounded by a lockable chain-link fence.

7. Well No. 10

Well No. 10 is located at 4371 North Valley Ridge Drive in the far northwestern part of the City. The well was drilled in 2013 to a depth of 1,500 feet. A 25-inch outer hole was drilled to a depth of 500 feet and a 19-inch inner hole extends to a depth of 1,500 feet. The well is cased with a 26-inch casing from 2 feet above grade to 327 feet. The annular space is grouted from ground level to a depth of 500 feet. The well pump is a Goulds Model 11CLC deep well vertical turbine pump. The well facility includes iron filtration, fluoride addition, and sodium hypochlorite disinfection.

B. Storage

Water storage volume in the City totals 3,035,000 gallons and consists of a ground-level storage tank at the Main Plant (Well No. 3), a bolted steel reservoir at Well No. 8, and three elevated tanks located at the old Well No. 6 site, Well No. 7, and the Southwest Tank on Newburg Road. Table 2.01-2 summarizes the storage facilities.

Storage Facility	Capacity (gallons)
Main Plant Reservoir	435,000
Well No 8 Reservoir	1,500,000
Well No. 6 Elevated Tank	300,000
Well No. 7 Elevated Tank	300,000
Southwest Elevated Tank	500,000
Total Capacity	3,035,000

Table 2.01-2 Storage Capacity

2.02 WATER QUALITY

Water quality information was gathered from records provided by the City and the Illinois Drinking Water Watch Web site. In general, groundwater quality in the City wells is good, however, recent sample results showing presence of PFAS in Well Nos. 3 and 4 and positive bacterial tests at Well No. 4 need to be addressed and are the focus of this report.

The following paragraphs discuss known water quality parameters of concern for the City. Where applicable, analytical data is compared with the United States Environmental Protection Agency (USEPA) primary and secondary drinking water standards for each chemical. The primary drinking water standards are established to protect public health while the secondary standards set maximum limits for aesthetic purposes.

A. Bacteriological Contamination

Recent samples taken from Well No. 4 have shown coliform contamination, which the USEPA has designated as a primary contaminant with a maximum contaminant level (MCL) at 0. This bacteria is seen as an indicator that other potentially harmful chemicals are in the water and needs to be addressed.

B. Organic Chemical Data

Sampling at Well No. 3 specifically has shown concentrations of trichloroethylene, vinyl chloride, and tetrachloroethylene greater than the MCL. Certain concentrations of these organic chemicals in the water stream can have long term health effects on the consumers of the City's water.

C. PFAS Concentrations

PFAS chemicals have been identified as a potential source of concern to the public's health. The USEPA has yet to set an MCL on any PFAS chemical but has placed two specific chemicals, perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS), on the Contaminant Candidate List, which may lead to them being regulated in the future. Due to the lack of Federal actions, several states have been developing their own regulations for PFAS.

The IEPA has set minimum reporting levels (MRL) for many PFAS compounds as well as health guidance levels for six common PFAS chemicals. Health advisory guidance levels are non-enforceable and non-regulatory but are intended to provide information to public health officials on potential health effects of drinking water contaminants. A summary of the results showing the six PFAS chemicals with a health advisory guideline for the most recent samples taken from Well Nos. 3 and 4 is shown in Table 2.02-1.

PFAS Analyte	MRL (ppt)	Health Advisory Guidance Level (ppt)	Well No. 3 Sample Contaminant Level (ppt)	Well No. 4 Sample Contaminant Level (ppt)
Perfluorononanoic acid (PFNA)	2.0	21	<2.0	<2.0
Perfluorooctanesulfonic acid (PFOS)	2.0	14	11	2.4
Perfluorobutanesulfonic acid (PFBS)	2.0	2,100	8.7	<2.0
Perfluorooctanoic acid (PFOA)	2.0	2	6.9	3.0
Perfluorohexanesulfonic acid (PFHxS)	2.0	140	45	<2.0
Perfluorohexanoic acid (PFHxA)	2.0	560,000	7.3	2.5

ppt=parts per trillion

Table 2.02-1 PFAS Concentrations

D. Inorganic Chemical Data

Iron is considered a secondary contaminant as it is an aesthetic contaminant rather than harmful to health. The USEPA sets a non-enforceable MCL for iron at 0.3 milligrams per liter (mg/L) to assist public water systems in managing their drinking water for aesthetic considerations. IEPA has established an enforceable level of 1.0 mg/L for combined iron and manganese concentrations in raw water. The concentration of iron in the most recent finished water sample for each well is shown in Table 2.02-2. Of these tests, only Well Nos. 8 and 9 were found to be greater than 0.3 mg/L. Well No. 10 currently uses filtration to treat iron and manganese to remove them from the water supply.

Well No.	Date	Iron Concentration (mg/L)
3	January 27, 2021	0.024
4	October 19, 2019	0.11
5	February 21, 2018	0.00
7	March 2, 2021	0.28
8	October 22, 2019	0.36
9	February 2, 2021	0.62
10	July 13, 2021	0.01

Table 2.02-2 Well Iron Concentrations

2.03 POPULATION

Figure 2.03-1 presents U.S. Census Bureau population data from 1980, 1990, 2000, 2010, and 2020, and the population projections developed as part of the City's Comprehensive Land Use Plan for the time period between now and the design year, 2041. The census data shows the population of the City increasing at a fairly consistent rate between 1980 and 2010, then slightly declining between the years 2010 and 2020. The 2020 census population is 25,339.

For water system planning purposes, the growth rate proposed by the City's Land Use Plan will be used. The land use plan projects the population growth will increase at a rate most similar to the growth experienced between 1980 and 2010. The population used for the present day and the design year will be 25,339 and 36,436, respectively, based on these projections. The actual population growth within the water service area should be monitored from year to year.

2.04 COMMUNITY BACKGROUND

The Utility provides water to a variety of different customers. The largest sector by total gallons consumed in the year 2020 was residential use. Currently, the Utility provides water to 7,479 residential connections at a cost of $1.57 per 1,000 cubic feet. The full rate structure and billing information for the average user can be found in Appendix A. A breakdown of the 2020 water use by sector is shown in Table 2.04-1. The largest water use sector by total amount is residential use.

Sector	Gallons	Billed Amount
Residential	400,645,000	$1,116,287.61
Multi-Family	38,331,000	$86,629.67
Institutional	13,727,000	$28,449.44
Commercial	114,366,000	$258,509.44
Industrial	188,352,000	$398,100.86

Table 2.04-1 2020 Water Usage Breakdown

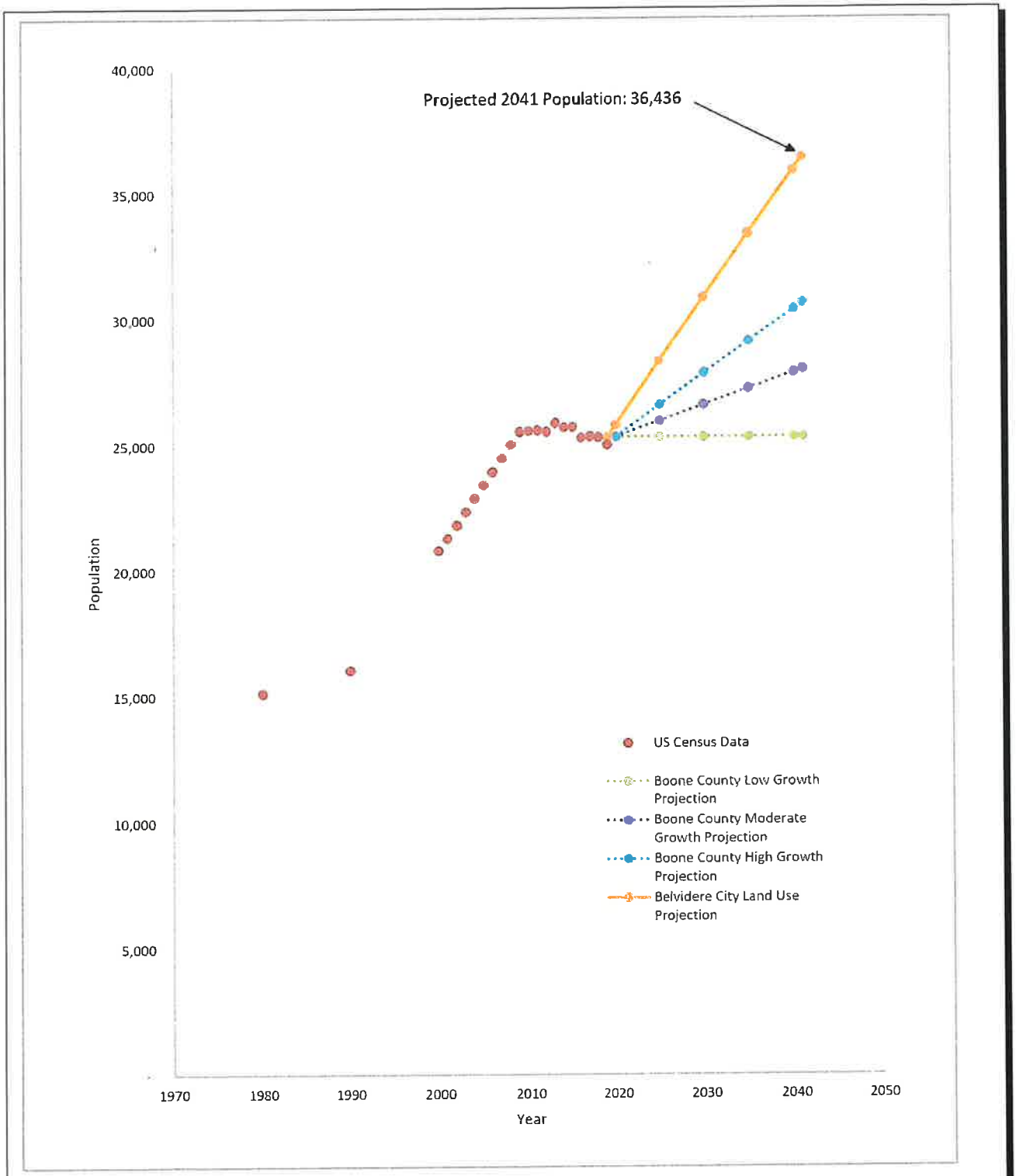


Figure 2.03-1 Population and Population Projections

SECTION 3
WATER DEMANDS

3.01 GENERAL

Water demand rate terminology used in this section is defined as follows:

Average day: The total volume of water pumped in a year divided by the number of days in the year.

Maximum day: The day of the year on which the maximum amount of water is pumped.

Maximum hour: The maximum rate of demand for any hour on the maximum day.

Fire demand: Estimate of the amount of water required in a community to fight a fire. This demand is generally specified as a rate of flow (in gpm) for a given period of time (in hours). The Insurance Services Office (ISO) has prepared a guide for determining fire demand. The calculated fire demand is added to the average domestic demand during the maximum day to obtain the demand on a day that a major fire occurs. Fire demand generally increases the volume of storage that must be available on the maximum day.

It is difficult to make precise estimates of future water demand. The forecast for future demands in this report was developed by projecting per capita demand, multiplying by the projected population, and then adding these individual demands to obtain the total demand. Future maximum day demands were estimated by multiplying the future average day by a maximum day factor. This maximum day factor was determined from historical ratios of maximum day to average day.

Prudent operation of a water system requires system capacity always be in excess of maximum system demands. Therefore, recommended future improvements may be deferred until rising water demand makes them necessary or they may have to be implemented sooner if demands increase at a rate faster than projected.

3.02 WATER SALES AND PUMPAGE

A. Utility Trends

This section presents recent water use trends that will be used to estimate future water demands.

1. Sales-to-Pumpage Ratio

Table 3.02-1 presents the sales-to-pumpage ratios for the past four years. Sales is always less than pumpage because of meter losses, leakage, water main breaks, and hydrant flushing. This ratio has ranged from as high as 87 percent to as low as 81 percent. The water use data from 2017 to 2020 was consistent with previous data points presented in the 2012 Water System Study Update for the years 2002 to 2012. This value represents the efficiency in which a water system operates and can provide a baseline for the expected

rates of water sales efficiency in the future. Any deviation from this in this ratio would most likely represent an increase in water main leaks or breaks and should be addressed.

Year	Sales (gallons)	Pumpage (gallons)	Ratio
2017	833,679,039	111,454,417	81%
2018	835,438,956	111,689,700	82%
2019	804,017,720	107,489,000	87%
2020	758,755,799	101,437,941	81%

Table 3.02-1 Water Sales-to-Pumpage Ratio

2. Maximum Day to Average Day Ratios

Figure 3.02-1 presents ratios of maximum day to average day since 2001. The values generally range from 1.36 to 2.16. The data points from 2017 to 2020 are consistent with the range of the historic data. For estimation of future maximum day demands, a value of 1.8 will be used for future projections. This represents the upper end of the recent historic range and will account for the occasional spike in maximum day use. Previous water system studies used a value of 2.0 but the City has not seen a value this high in the past 10 years.

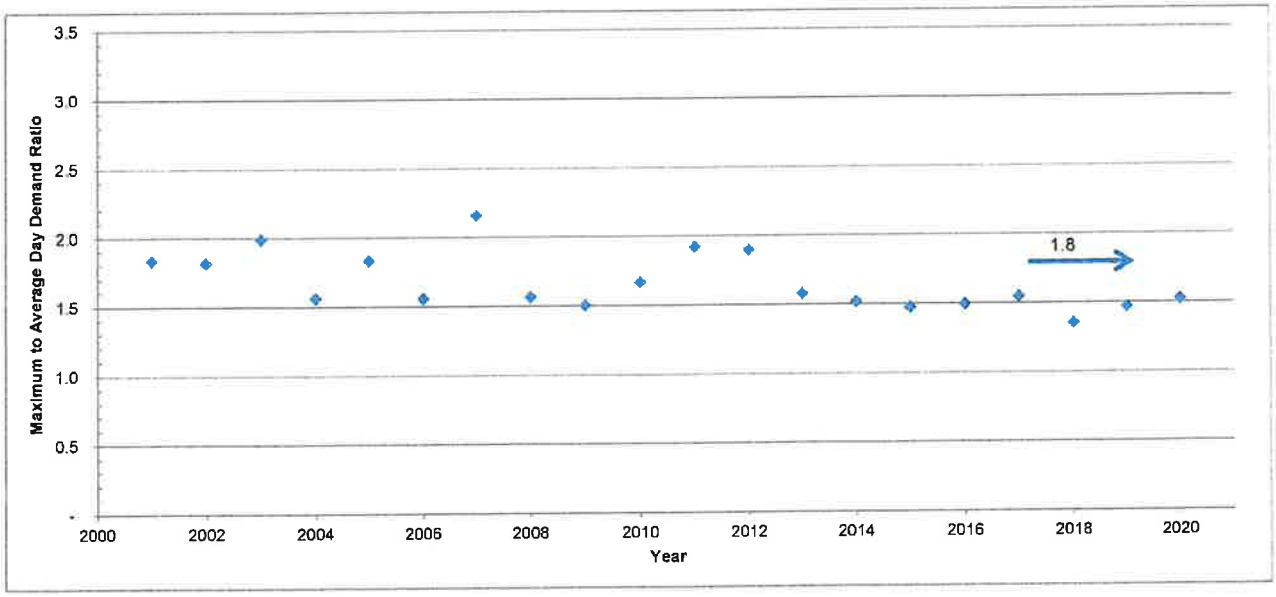


Figure 3.02-1 Maximum to Average Day Ratios

3. Total Pumpage per Capita

Figure 3.02-2 presents the total water pumpage in gallons per capita per day (gpcd) since 2001. The values range from a maximum of 171 gpcd in the year 2004 to a minimum of 103 gpcd in 2020. For estimation purposes a value of 115 gpcd will be used for future projections. The decline in per capita water usage over the past 20 years is typical of trends observed in similar systems. The decline is likely due to water conservation efforts and increased awareness of water resources.

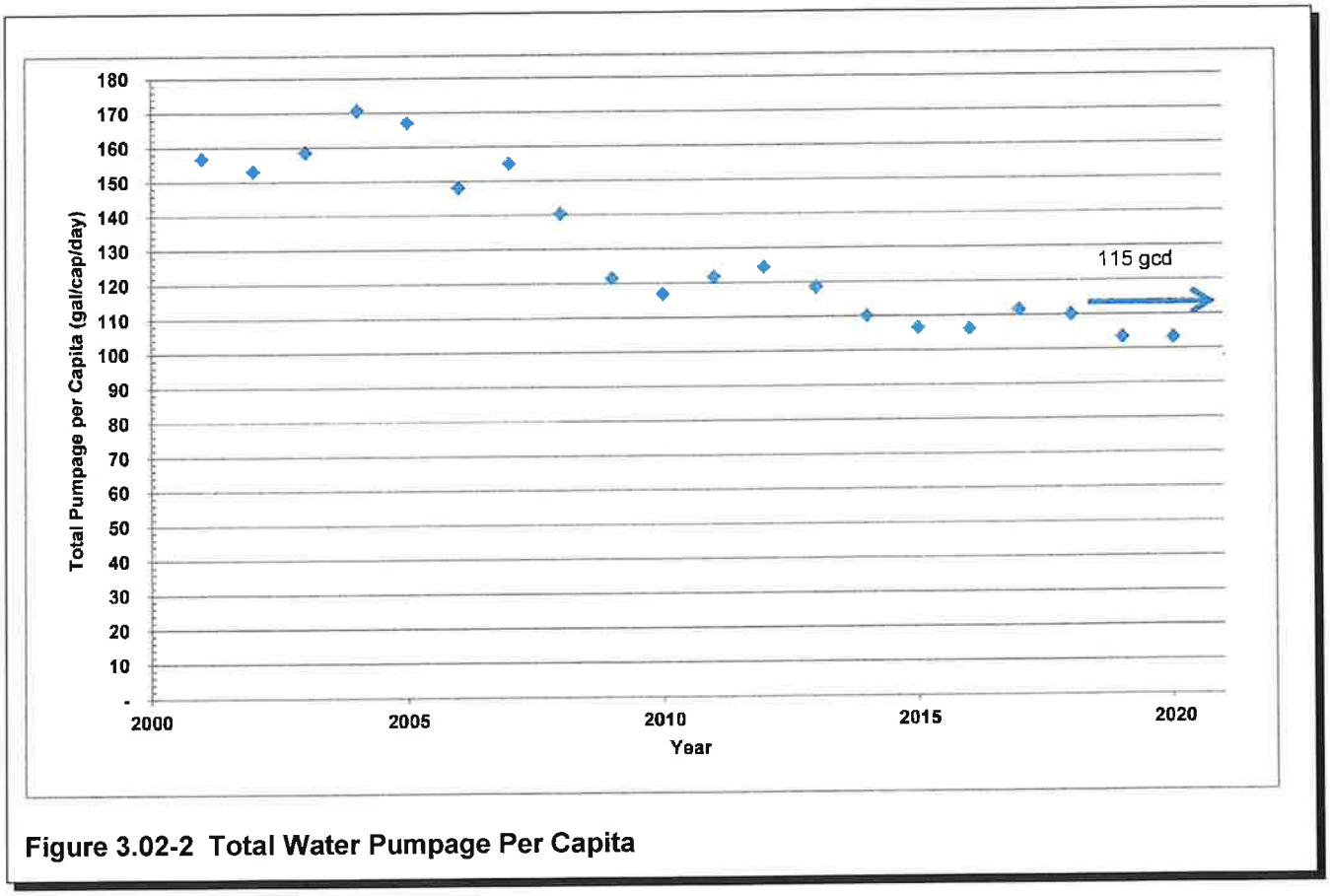


Figure 3.02-2 Total Water Pumpage Per Capita

3.03 PRESENT DAY DEMANDS

A. Present Average Day

Present average day pumpage was estimated by multiplying the 2020 population of 25,339 by the total pumpage per capita number. As previously discussed, pumpage per capita encapsulates all non-revenue water as well as purchased water so this provides an estimate of the total water pumpage for the system. The estimated average daily pumpage for the present day is 2.91 MGD.

Figure 3.03-1 presents the historic and projected average day and maximum day pumpage demands for the City.

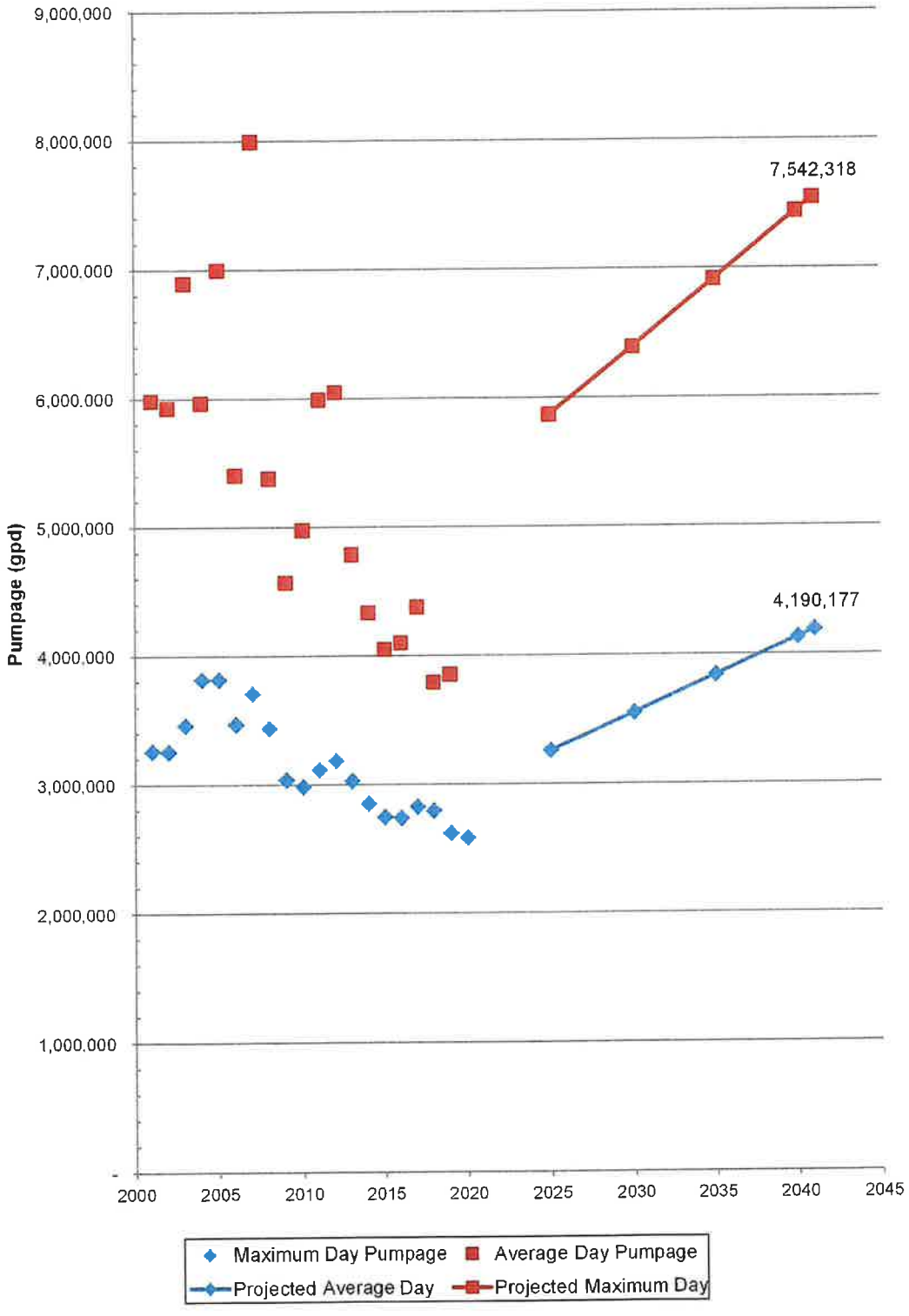


Figure 3.03-1 Historic and Projected Average and Maximum Day Pumpage

B. Present Maximum Day

1. Domestic

The present-day maximum demand is estimated at 5.25 MGD (3,642 gpm) by applying the maximum to average day factor of 1.8 to the projected average day demand of 2.91 MGD for the year 2020.

2. Domestic Plus Fire

The ISO in Chicago, Illinois, has indicated the City should be capable of supplying basic flow of 3,500 gpm for three hours. Basic fire flow requirements are based upon the amount of water the City should be able to supply from all sources in addition to domestic demands on the maximum day. Water for fighting fires can come from pumped supply, storage, or a combination of both.

The total volume of water required to fight a fire on the maximum day would be:

Domestic	5.25 MGD
Fire (three hours at 3,500 gpm)	0.63 MGD
Total	5.88 MGD

The average rate at which this water would be used during the fire would be:

Domestic	3,642 gpm
Fire (three hours at 3,500 gpm)	3,500 gpm
Total	7,142 gpm

C. Maximum Hour

Figure 3.03-2 presents a diurnal curve representing the hourly demands on the maximum day for the present year. To produce this curve, a unitless diurnal curve that models typical hourly demand distribution for communities similar in size to the City was multiplied by the total use on the maximum day to provide an estimate of hourly water use. The figure also shows the firm well capacity distributed evenly over a 24-hour period. During higher water use periods of the day, when the hourly demand exceeds the firm well capacity, water must come from the storage facilities. The total volume of water above the firm supply line is equivalent to the volume of storage needed to satisfy daily domestic demands.

Based on the current firm supply capacity of 4,727 gpm, the system has a total storage requirement of 930,000 gallons to satisfy daily domestic needs.

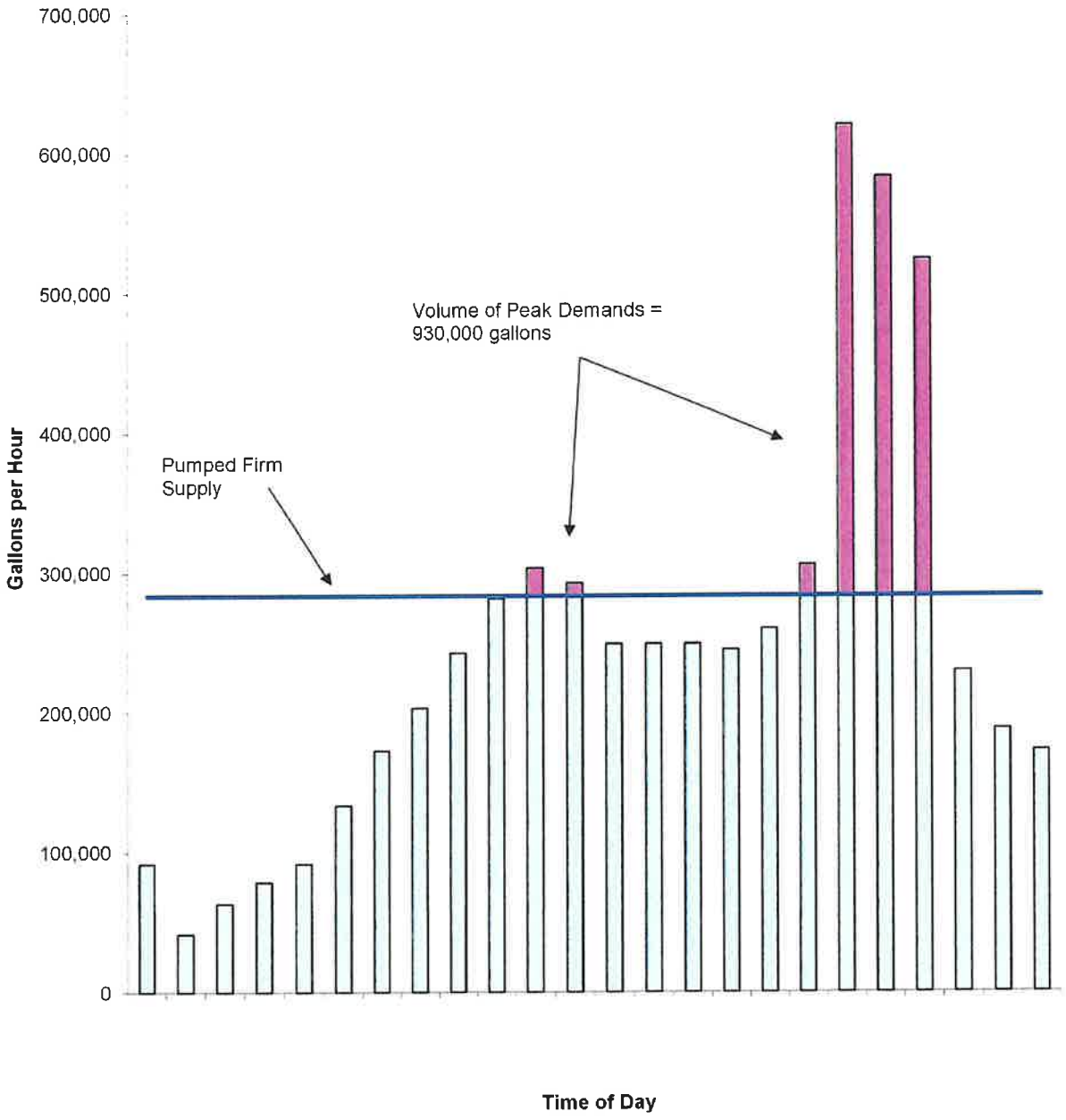


Figure 3.03-2 Current Maximum Day Diurnal Curve

3.04 2041 DEMANDS

A. 2041 Average Day

The projected water use was estimated by multiplying the projected population in the City's Land Use Plan by the per capita pumpage developed in Section 3.02. The resulting average day pumpage is 4.19 MGD (2,910 gpm).

B. 2041 Maximum Day

1. Domestic

The projected 2041 maximum day pumpage was estimated by taking the projected average day pumpage of 4.19 MGD in the design year and multiplying by the maximum day to average ratio of 1.8. The projected maximum day pumpage for the year 2041 is 7.54 MGD (5,238 gpm) and is plotted in Figure 3.03-1.

2. Domestic Plus Fire

The basic fire flow demand of 3,500 gpm for a three-hour duration was used for calculation purposes as indicated by the ISO. Basic fire flow requirements are based on the amount of water the City should be able to supply on the day of maximum domestic demand.

The total volume of water required to fight a fire on the maximum day would be:

Domestic	7.54 MGD
Fire (three hours at 3,500 gpm)	0.63 MGD
Total	8.17 MGD

The average rate at which this water would be used during the fire would be:

Domestic	5,238 gpm
Fire (3 hours at 3,500 gpm)	3,500 gpm
Total	8,738 gpm

C. 2041 Maximum Hour

Figure 3.04-1 presents the projected hourly domestic demands on the day of maximum demand of the design year 2041. This figure assumes that there will be no adjustment to the well capacity before that time. The total volume of storage required under this scenario is 1.8 million gallons.

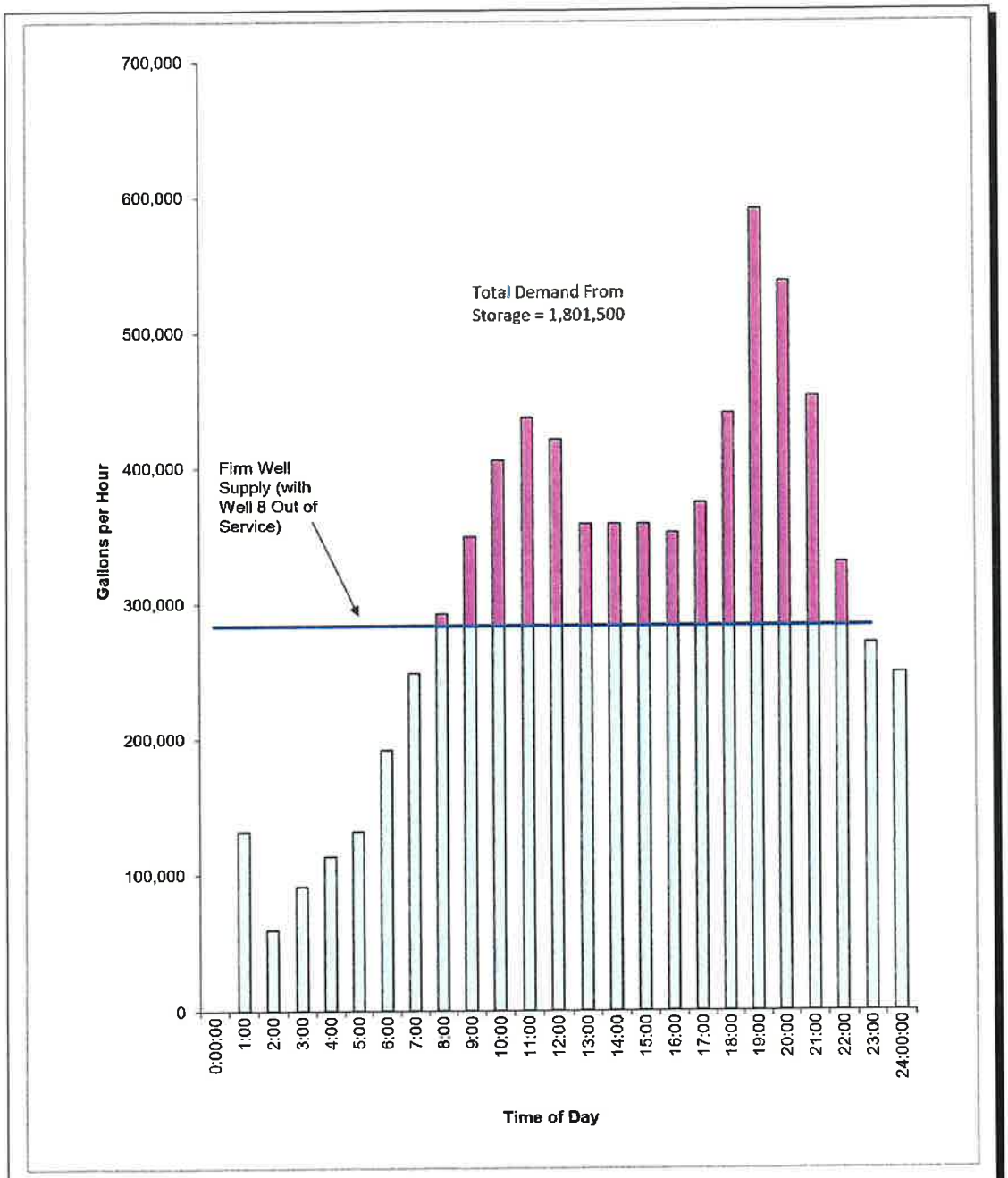


Figure 3.04-1 2041 Maximum Day Diurnal Curve

D. 2041 Maximum Hour Without Wells No. 3 and 4

As discussed in Section 2, Well Nos. 3 and 4 have shown levels of contamination in recent years. Figure 3.04-2 presents the projected hourly domestic demands during the 2041 design maximum day assuming the firm well supply is increased to meet the maximum day demand rate. The resulting storage requirement is 2 million gallons which can be satisfied by the existing storage facilities.

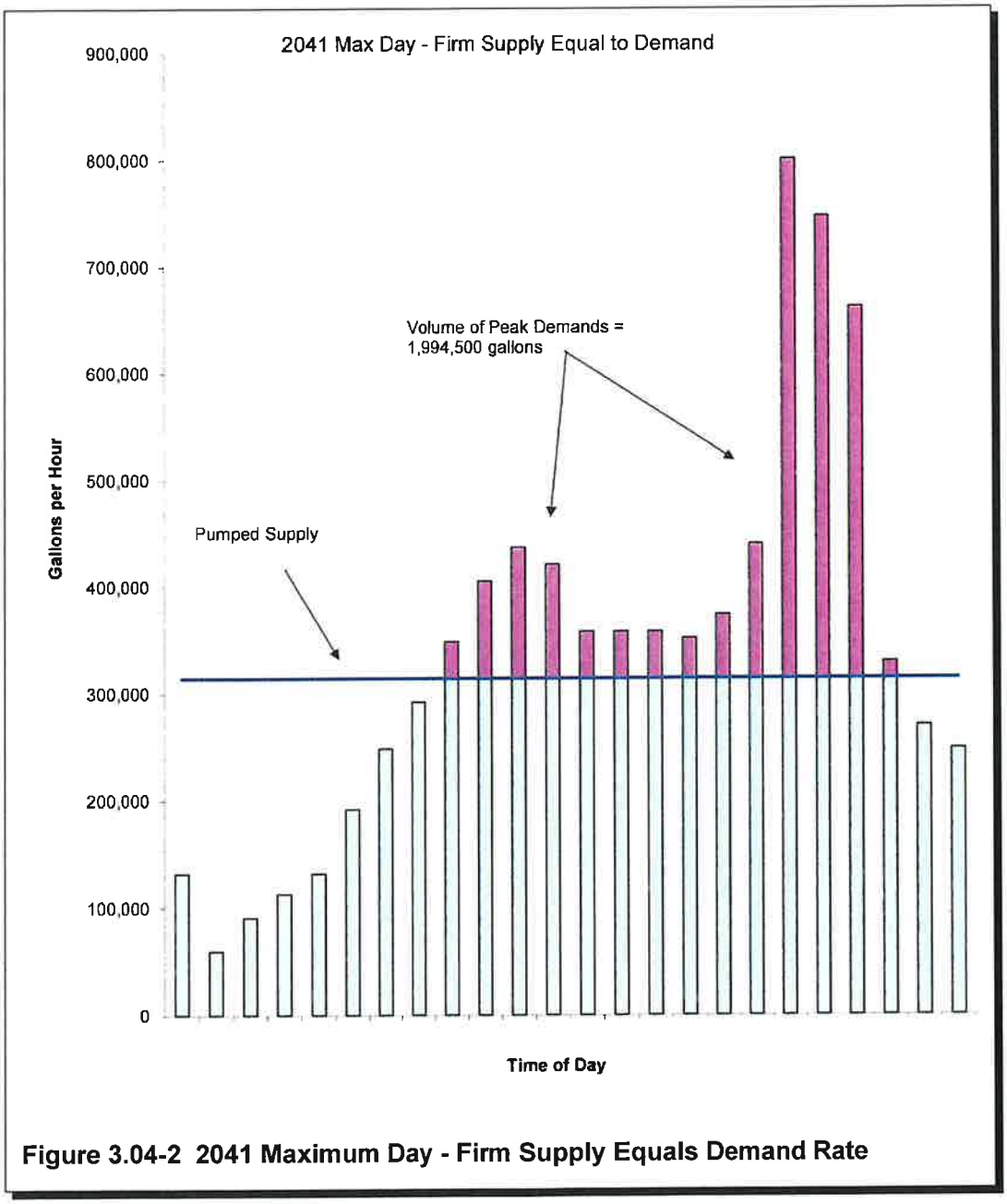


Figure 3.04-2 2041 Maximum Day - Firm Supply Equals Demand Rate

SECTION 4
WATER SUPPLY AND TREATMENT OPTIONS

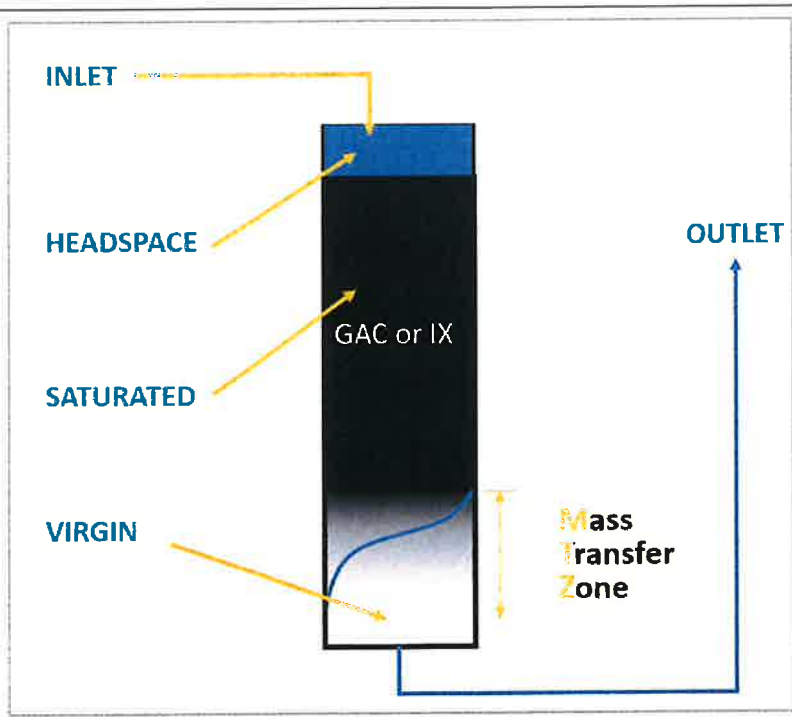
This section presents alternatives evaluated for treating PFAS in the existing wells, addressing ongoing bacterial contamination, and replacing the impacted wells with a new well and well facility.

4.01 PFAS TREATMENT EVALUATION

There were three methods of treating PFAS contamination evaluated for this report. All were evaluated for their compatibility with the existing contaminated wells. Factors considered when comparing these options were PFAS removal capabilities, opinions of capital and lifecycle costs, treatment footprint size, and maintenance requirements.

A. Granular Activated Carbon (GAC) Treatment

GAC treatment is a process of passing water through a bed of carbon that has been activated by superheating it to allow for the medium to trap and adsorb contaminants. GAC vessels can be added to other treatment processes or act as a standalone treatment. The basic process for a vessel system is shown in Figure 4.01-1. Raw water is piped in at the top of the vessel and allowed to pass down through the media. Vessels are sized to provide an empty bed contact time that allows the water sufficient contact time with the media to react and remove chemicals in the water stream. The treated water then flows out of the bottom of the vessel.

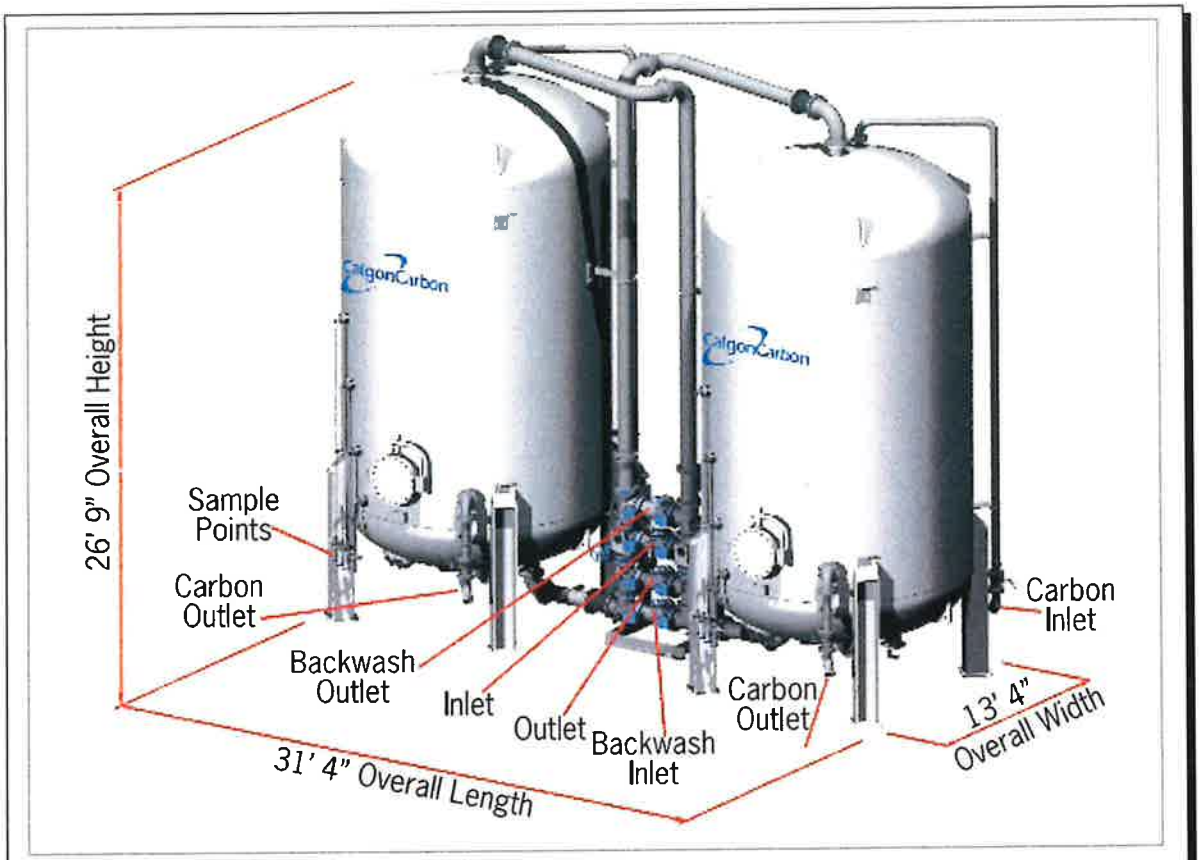


Source: Calgon Carbon–A Kuraray Company

Figure 4.01-1 GAC and IX Gravity Filtration

One drawback of GAC adsorption is the need to reactivate or replace the spent GAC after a certain volume of treatment. Once the selection sites on the surface of the GAC media are filled, they must either be heated to high temperatures (greater than 1,500 degrees Fahrenheit) to destroy contaminants or be replaced with fresh media. Regeneration of GAC for water treatment use is not recommended due to the restored media losing much of its absorption capacity after repeated regeneration cycles. For most water systems, it is preferable to have a third-party vendor replace media at the end of its useful life rather than attempting to reactivate the media.

Adsorption vessels (shown in Figure 4.01-2) have relatively low friction loss through the media and thus do not have the high energy costs of some other treatment processes. Probable operation and maintenance costs for this type of treatment include the costs of replacing media on a regular basis. Because the lifespan of the media is directly related to the concentration of contaminants in the water stream, it is difficult to provide an accurate estimation of the frequency of replacement without knowing the contaminant concentration levels of the water to be filtered. Based on water sampling from other wells in the City's system, the estimated media replacement frequency will be once every 30 to 107 months. A comparison of the resulting cost for media replacement and other operational costs in comparison to the costs of the other treatment methods is shown in Table 4.02-1.



Source: Calgon Carbon–A Kuraray Company

Figure 4.01-2 Calgon Carbon Model 12-40 Treatment Vessel

B. Ion Exchange (IX)

The process of IX is similar to that of GAC but differs in the media that is used. Rather than passing the water through activated carbon, the water is passed through a resin designed to react with certain chemicals in the water and absorb them inside a vessel system. In the case of this system, the resins would be designed to remove the most prevalent PFAS chemicals in the raw groundwater. Typical resins that have been designed to target PFAS target negatively charged anions from the water supply. The process of selective ion exchange allows for targeted removal of the specified contaminants at the exclusion of others. This leads to shorter contact times and smaller volumes of IX media necessary to achieve reduction of PFAS levels in the water. However, because the IX media only reacts with negatively charged ions, positively charged or neutral ions will not be removed by this method of filtration as they would be in GAC adsorption.

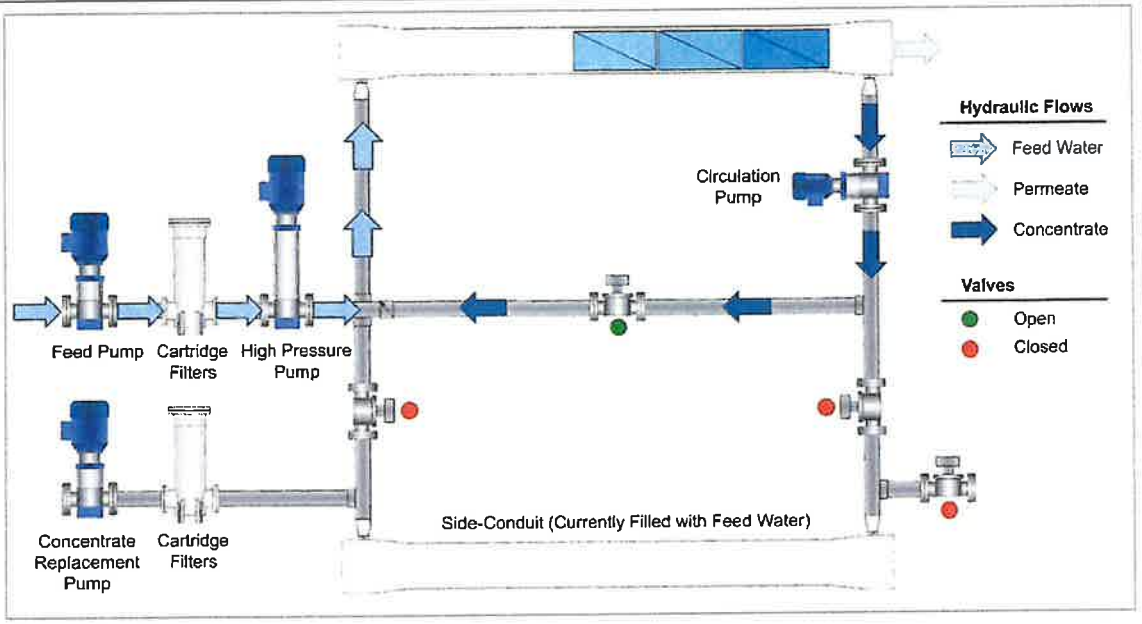
The capital cost for the IX equipment is similar to GAC, the vessels used for GAC are similar to those used for IX, but the media cost is significantly higher. This leads to a higher lifecycle cost as IX media must either be regenerated or replaced over time. Regeneration can be performed by using a mixture of an organic solvent and brine solution but presents the added difficulty of disposing the spent brine solution. Resins can also be disposed of and replaced in processes similar to GAC replacement. For this water system, replacement of the media is recommended. When considering these factors, IX does not provide a significant advantage over GAC for this water system. Table 4.02-1 presents an opinion of probable costs for water treated with an IX system.

C. Reverse Osmosis (RO)

The process of RO filtration involves forcing water through a semipermeable membrane designed to prevent salts, inorganic molecules, and organic molecules greater than a certain size from passing through. A diagram of this process is shown in Figure 4.01-3. The process has been shown to be effective at removing many different types of PFAS and has the ancillary benefit of removing other contaminants including hardness causing minerals. RO filtration does not rely on a media that must be recharged but rather membranes acting as filters. Prefiltration of the water supply is necessary to prolong the life of the membranes by preventing excessive membrane fouling. Iron and other metal complexes must be removed before RO filtration to prevent damage to the membranes. Membrane fouling is a process that occurs over the life of the system as molecules that are filtered out of the water stream collect on the membranes, resulting in the need to replace the RO modules.

One drawback of RO treatment is that it does not isolate the PFAS chemicals and other contaminants, rather it concentrates them into a wastewater stream and discharges this stream of water separately. This lowers the output percentage of treated water and requires additional treatment or disposal for the wastewater stream. One option that can be implemented to recover a portion of this stream would be to install a GAC treatment for the wastewater stream to recover the portion of the water that contains the contaminants and isolate the contaminants in the GAC media for removal.

Of the treatment options evaluated, RO has the highest capital and operational costs. This will also require the largest footprint of the treatment methods considered.



Source: Dupont

Figure 4.01-3 Reverse Osmosis Filtration

4.02 PROBABLE TREATMENT COST

An opinion of the cost per treated gallon of water is shown in Table 4.02-1. Probable treatment costs for GAC adsorption and IX represent the net present value of the capital and media costs. Additional energy costs are not considered for the GAC and IX systems as preserve provided by the well pump(s) is sufficient to drive the process. The RO filtration cost estimate includes capital costs, ongoing maintenance, membrane replacement, and energy costs due to the higher pressure needed to drive filtration. Based on the estimated treatment costs per thousand gallons, GAC filtration will be the most cost-effective method of treatment.

Treatment Method	Cost Per Thousand Gallons
GAC Filtration*	$0.12 to $0.16
Ion Exchange Filtration*	$0.14 to $0.24
RO Filtration	$.46

*Treatment costs were estimated based on samples taken at multiple wells and are presented as a range based on the contaminant concentration.

Table 4.02-1 Probable Treatment Cost

4.03 ULTRAVIOLET (UV) DISINFECTION

This alternative is presented as a potential disinfection process that might be added to existing or new facilities to address bacterial concerns, primarily at Well No. 4 which has experienced ongoing positive bacterial results.

According to the Ten States Standards, UV disinfection can be used as the primary disinfectant for public water systems that need to address microbiologically unsafe water. UV disinfection works by deactivating DNA of microorganisms in the water stream with UV light. It is most effective in treating microorganisms that are resistant to chlorination or other disinfectant procedures. Typically, however, UV disinfection is used as a finishing process meant to introduce redundancy in the treatment train. UV disinfection could be used in addition to any of the treatment methods outlined previously. It would be particularly beneficial to combine this method with iron filtration as it is beneficial to include particulate removal before UV treatment to avoid damaging the lamps and improve UV light exposure.

All UV disinfection systems include a reactor component that water flows through where it is dosed with UV radiation. This reactor is shown in Figure 4.03-1. The radiation is measured in units of millijoules per centimeter squared and there is a minimum dose set to ensure inactivation of target pathogens. Sensors must be placed in the water stream to determine whether the lamps deliver the required dosage. Lamps can be dimmed over time because the water stream wipers are often installed to clean the tubes surrounding the lamp to increase the percentage of the radiation that enters the water stream. Additional sampling of finished water is recommended to ensure proper disinfection is occurring.

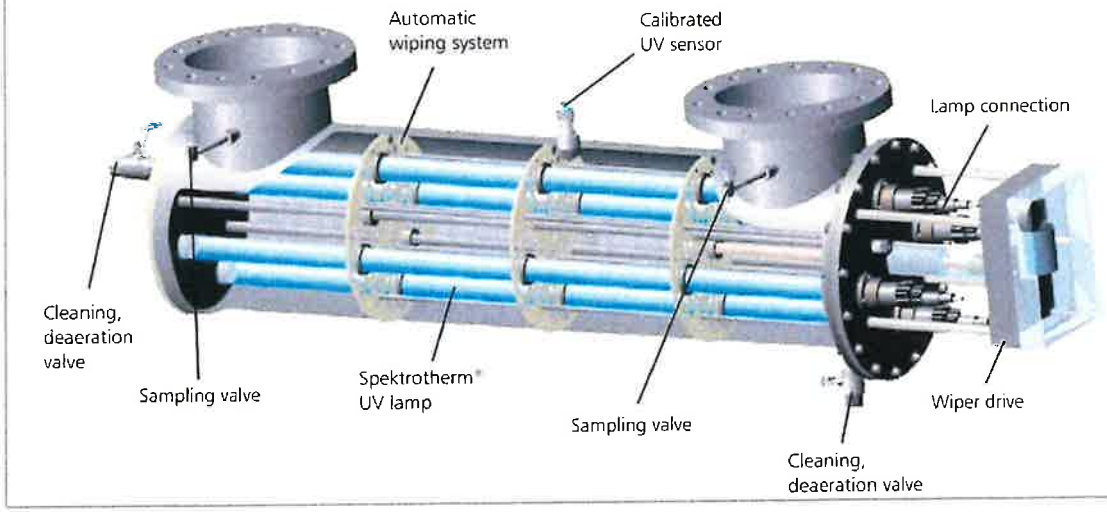


Figure 4.03-1 Xylem UV Treatment Reactor

4.04 REPLACEMENT WELL

As an alternative to construction one of the above treatment technologies to treat water from Well No. 3 and Well No. 4, a replacement well could be drilled to replace both wells. Well No. 3 is 114 years old and Well No. 4 is 80 years old. Both facilities are nearing the end of their expected useful life. A replacement well sized to replace both wells would provide the City a new source of supply expected to last another 80 to 100 years.

A new well facility is expected to resemble the City's Well No. 10. A deep aquifer well sized for approximately 2,000 gpm with iron filtration is assumed in the following sections for the replacement well alternative.

SECTION 5
DESIGN CRITERIA

5.01 PROJECT ALTERNATES

Given the water quality issues at Well Nos. 3 and 4, the City needs to determine whether continued use and treatment of the wells is feasible, or if the wells should be abandoned and replaced with a new deep aquifer well and well facility. This section discusses those options in more detail.

A. Unit Treatment of Well Nos. 3 and 4

Well Nos. 3 and 4 have been identified as sites of contamination due to levels of PFAS greater than the Illinois health-based guidance level and bacterial contamination at Well No. 4. Although there is no currently defined MCL, if either site is to continue to remain in operation, it would likely require additional treatment. The most cost-effective method of treatment at either facility would be GAC Adsorption as described in Section 4. The two existing wells have approximately the same capacity and would require a water treatment plant (WTP) of the same size. Adding GAC vessels at either location would require a building footprint of approximately 20 feet by 40 feet to house the necessary equipment.

Well No. 3 is located on an approximate one-half acre site containing the well, aeration tower, storage reservoir, utility office, garage, and a parking lot, leaving little room for additional structures. Figure 5.01-1 shows an aerial view of the site with the approximate property borders outlined in blue. The figure shows that it would be difficult to add a treatment building on the existing lot. The most viable option for building a new WTP associated with this site would be to purchase the vacant lot to the northeast of the site. The proposed location for the WTP is shown outlined in red on Figure 5.01-1.

Further evaluation would be needed to determine the impact of adding GAC on the continued use of the existing aeration tower. The schematic assumes GAC would be installed upstream of the aeration tower, however GAC could serve to replace the aeration tower as GAC will remove the organic compounds targeted by the aeration tower.

The capital costs for building a WTP at this site would include the land acquisition cost, GAC vessels, site utility work, and associated site work. Lifecycle costs will consist of purchasing GAC media and increased power consumption. A breakdown of the OPCC for treatment and associated building and site upgrades along with the annual cost for additional filter media is shown in Table 5.01-1

Well No. 4 is located on an approximate one-half acre site in a residential area. The site contains the well house and chemical storage buildings, which leaves ample room on-site to build a WTP of adequate size to treat the current amount of water produced by the well. Figure 5.01-2 shows an aerial view of the site. The proposed area for building upgrades and new GAC treatment is outlined in red.

The capital costs for building a WTP at this site would include the cost to purchase GAC vessels, building improvements, site utility work, and associated site work. Lifecycle costs will consist of purchasing additional GAC media and increased power consumption. Because of the different concentrations of PFAS and other contaminants in the groundwater at each well, there is a difference in the lifespan of the filter media between the two wells, leading to different annual media costs. A breakdown of the OPCC for treatment and associated building and site upgrades is shown in Table 5.01-1. When comparing the two existing well houses, Well No. 4 is the more economically viable option both in terms of initial

WELL NO. 3 TREATMENT ADDITIONS

PER- AND POLYFLUOROALKYL SUBSTANCES AND WELL NO. 11 PRELIMINARY DESIGN
CITY OF BELVIDERE
BOONE COUNTY, ILLINOIS

STRAND ASSOCIATES

Figure 5.01-1
1387.021

WELL NO. 4 TREATMENT ADDITIONS

PER- AND POLYFLUOROALKYL SUBSTANCES AND WELL NO. 11 PRELIMINARY DESIGN
CITY OF BELVIDERE
BOONE COUNTY, ILLINOIS

STRAND ASSOCIATES

Figure 5.01-2
1387.021

investment and annual cost, however, both would need to be upgraded to maintain the Utility's current level of service.

	Well No. 3	Well No. 4
GAC System and Media	$530,000	$530,000
WTP	$750,000	$750,000
Electrical and Controls	$150,000	$150,000
Land Acquisition	$50,000	$0
Building Upgrades	$20,000	$20,000
Site Utilities	$25,000	$25,000
Site Work	$10,000	$10,000
Subtotal	$1,535,000	$1,485,000
30% Contingency	$460,500	$445,500
Total OPCC	**$1,995,500**	**$1,930,500**
Total Well No. 3 and Well No. 4	**$3,926,000**	
Annual Media Cost	$30,000	$10,000

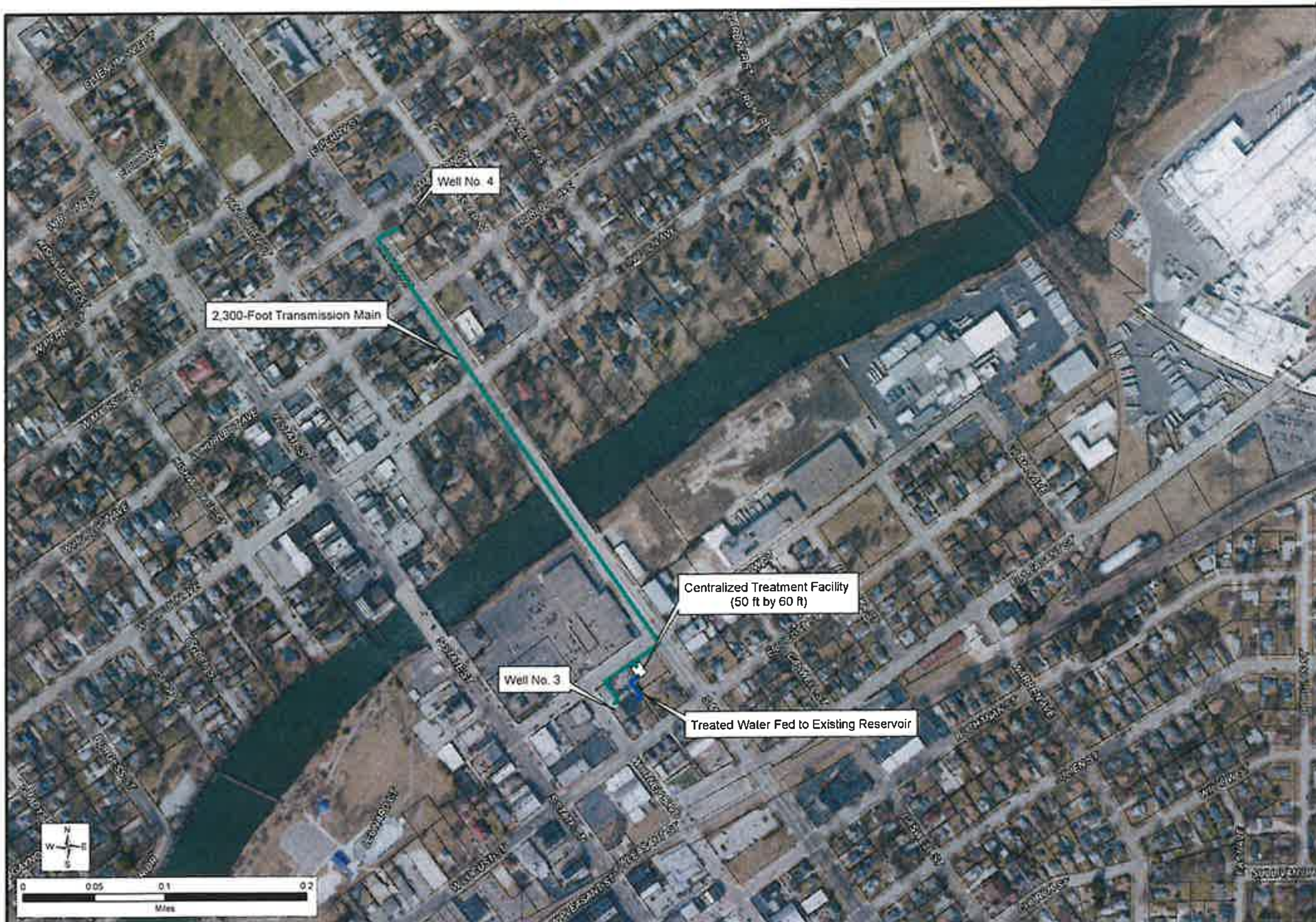
Table 5.01-1 OPCC For Treatment at Well Nos. 3 and 4

B. Centralized Treatment of Well Nos. 3 and 4

In lieu of building a new WTP at each existing well, water could be pumped from each well site to be treated in a centralized location. For this alternative, it is assumed that the City can acquire the vacant lot adjacent to the Well No. 3 (Main Plant) site. A transmission main would be needed between Well No. 4 and the treatment site. This would include approximately 2,000 feet of main and a crossing of the Kishwaukee River.

Groundwater would be produced at each well and pumped to the centralized WTP as raw water. As GAC treatment can reduce the chlorine residual and the chlorine can reduce the lifespan of GAC media, it is preferable to dose the water with disinfectant chemicals after the water has been filtered. Aeration of the water at Well No. 3 would no longer be required as GAC removes VOCs from the water as well as PFAS. A building sized to house GAC filtration, iron filtration, and chemical feeds would require a footprint of roughly 50 feet by 60 feet. Water would flow from the treatment building to the existing reservoir and the existing booster pumps would feed the existing distribution system. Figure 5.01-3 shows a schematic diagram of how this system could be implemented into the existing distribution system. If this option is pursued, the City may want to consider constructing a new reservoir and pumping system to replace the existing reservoir and pumps which are nearing the end of their useful life. This is expected to add $1 million to the following OPCC.

Construction costs for this alternative would include water main installation, construction of a centralized treatment facility including GAC system, chemical feed, and associated site work. In addition, there would be increased annual costs for replacement of filter media and additional chemical dosage. Table 5.01-2 shows a breakdown of the OPCC for this option. This option presents an alternative to treating both wells, but the cost savings of implementing one larger facility in lieu of two smaller ones is partially offset by the cost of constructing the transmission main.



CENTRALIZED GAC TREATMENT FACILITY

PER- AND POLYFLUOROALKYL SUBSTANCES AND WELL NO. 11 PRELIMINARY DESIGN

CITY OF BELVIDERE

BOONE COUNTY, ILLINOIS

STRAND ASSOCIATES

FIGURE 5.01-3

1387.021

	Centralized Treatment
GAC System and Media	$1,060,000
WTP	$750,000
Electrical and Controls	$200,000
Land Acquisition	$50,000
Site Utilities	$40,000
Site Work	$25,000
Water Main Construction	**$800,000**
Subtotal	**$2,925,000**
30% Contingency	**$877,500**
OPCC	**$ 3,802,500**
Annual Media Replacement Cost	$40,000

Table 5.01-2 OPCC For Centralized Treatment at Well No. 3

C. Replace Well Nos. 3 and 4 with New Deep Well Facility

Rather than attempting to reuse and upgrade aging facilities at Well Nos. 3 and 4, the City could build a new well facility with treatment to replace the aging contaminated wells. The need for a new well facility has been laid out in previous water system plans including the 2019 *Southeast Area Water System Modeling Report*. Providing a new well facility would also offer the City an opportunity to consolidate its water supply and treatment in addition to removing the two aging facilities.

A new well and facility is expected to be similar to the Well No. 10 facility including a deep sandstone aquifer well, iron filter, and chemical feed. Given the uncertainty surrounding potential PFAS contamination, the facility and site would be configured to accommodate future addition of a GAC system. The well site would be located at 3081 Huntington Drive in the southeast part of the City. The City previously acquired this lot as a future well site.

Final facility design criteria would be determined during well drilling when water quality samples can confirm the need for treatment. The well capacity would be sized for approximately 2,000 gpm to account for the abandonment of Well Nos. 3 and 4 (total capacity of 1,500 gpm) and provide for some growth in water demands.

As noted in Section 3, a replacement well that meets or exceeds the capacity of Wells No. 3 and 4 will ensure that the system maintains a surplus in storage capacity over the 20-year planning horizon of this report.

Probable construction cost for the replacement well project will include well drilling, building construction, treatment installation, Supervisory Control and Data Acquisition (SCADA) installation, site work and utilities, and the abandonment/demolition of Well Nos. 3 and 4. Table 5.01-3 shows a breakdown of these costs. One cost that was not considered as part of the construction cost but may be necessary is PFAS treatment. If PFAS is encountered, there will be a greater capital cost to increase the size of the building and to add GAC vessels as well as higher life cycle costs due to the need to replace GAC media. Final facility design will incorporate PFAS treatment if initial well sampling indicates PFAS concentrations above MRLs for the state of Illinois.

Item	Cost
Well Drilling	$800,000
Well and Treatment Facility Building	$2,000,000
Iron Filter and Associated Equipment	$800,000
Electrical and Controls	$200,000
Site Work	$100,000
Abandonment of Wells Nos. 3 and 4	$50,000
Subtotal	$3,950,000
30% Contingency and Engineering	$1,185,000
Total	$5,135,000

Table 5.01-3 OPCC for Construction of Well No. 11

SECTION 6
RECOMMENDATIONS

6.01 PROPOSED ALTERNATIVE

The recommended alternative is to construct a new well and facility to replace Wells No. 3 and 4 as discussed in Section 5. This addresses two needs as outlined by Illinois Standard 662.130 Projects and Activities Eligible for Assistance. First, it addresses a potential health hazard by abandoning two existing wells that have a history of contamination and recent sample results showing PFAS levels exceeding the Illinois health-based guidance levels. Decommissioning the contaminated wells and implementing proper treatment at the new facility is expected to provide the most cost-effective approach to providing safe drinking water. Secondly, this consolidates the City's water supply. By operating one larger facility in place of two smaller aging facilities, the City now only needs to maintain one modern facility.

A layout of the proposed facility is shown in Figure 6.01-1. The facility is designed to incorporate iron removal and chemical disinfection. There is additional space on-site to build a facility to house GAC treatment system in case PFAS is encountered in the future. Upon completion of the well drilling, water quality should be assessed to confirm the required treatment processes. An overall site plan is shown in Figure 6.01-2 that shows the proposed facility location as well as the space designated for the future development space.

6.02 LOCATION INFORMATION

The proposed new well facility will be located in the City, located in Boone County, Illinois. The site of the new well facility is proposed to be at 3081 Huntington Drive, which is currently a vacant lot owned by the City designated for future use as a water supply site. The coordinates of this site are 42°14'29.86"N 88°48'13.89"W. This location was discussed in the *2019 Southeast Area Water System Modeling Report* and hydraulic modeling was performed to help predict the performance of the water system with a well located in this area. Figure 6.02-1 shows the proposed well site location.

An investigation was performed in accordance with the IEPA Loan Application Environmental checklist to determine whether any protected environmental conditions are present on-site.

- Rare and Endangered Species
- Historical or Cultural Resources
- Prime Agricultural Land
- Air and Water Quality Concerns
- Recreational Areas
- Rivers and Stream Crossings
- Wetlands and Floodplains
- Sensitive Environments

No environmental conditions that will influence the construction of this facility were identified.

6.03 FINANCING

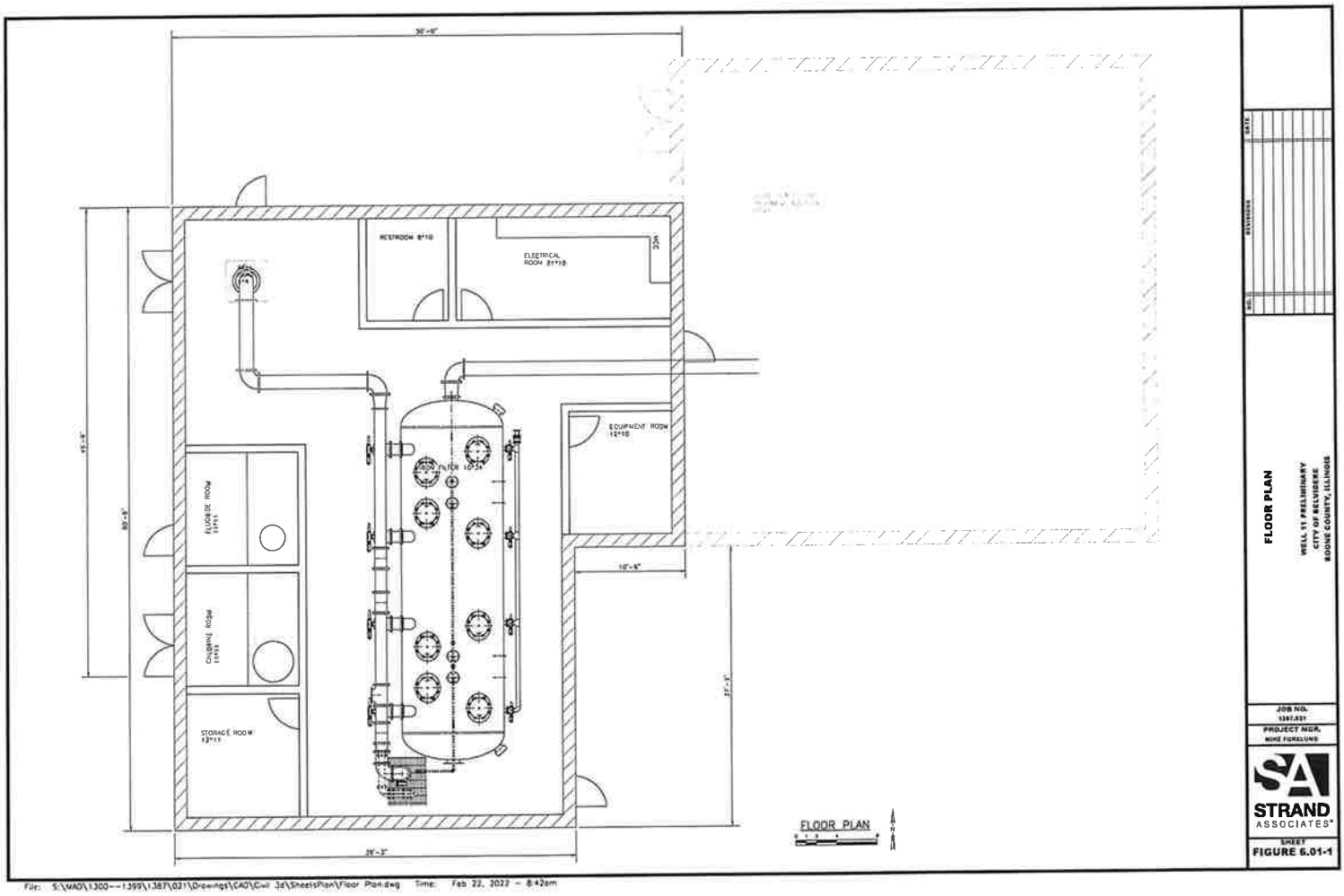
This project is expected to be financed by the IEPA PWSLP. Because of the structure of this loan, the project will be paid off over the course of a 20-year loan with semi-annual payments. The current interest rate is 1.11 percent. This corresponds to an average repayment amount of approximately $135,000 twice per year. If the loan were paid using an increase in water rates, the existing rate is estimated to increase by approximately 14 percent based on the 2021 billing rate.

6.04 PROJECT SCHEDULE

The proposed start date for well drilling is early March 2022 and drilling will extend into September 2022. Facility design will begin in April 2022 and project documents will be sent to IEPA for approval in January 2023. The project could then be bid in February 2023 with contract execution in March 2023. If construction begins immediately thereafter, the facility is expected to be completed in spring 2024. A breakdown of the full project schedule is shown in Table 6.04-1.

Task	Start Date	Completion Date
Well Drilling	April 2022	September 2022
Water Quality Testing	August 2022	September 2022
Preliminary Facility Design	April 2022	September 2022
Final Facility Design	September 2022	January 2023
IEPA Review of Facility Design	January 2023	February 2023
Facility Bidding	February 2023	March 2023
Facility Construction	March 2023	June 2024

Table 6.04-1 Tentative Project Schedule



FLOOR PLAN

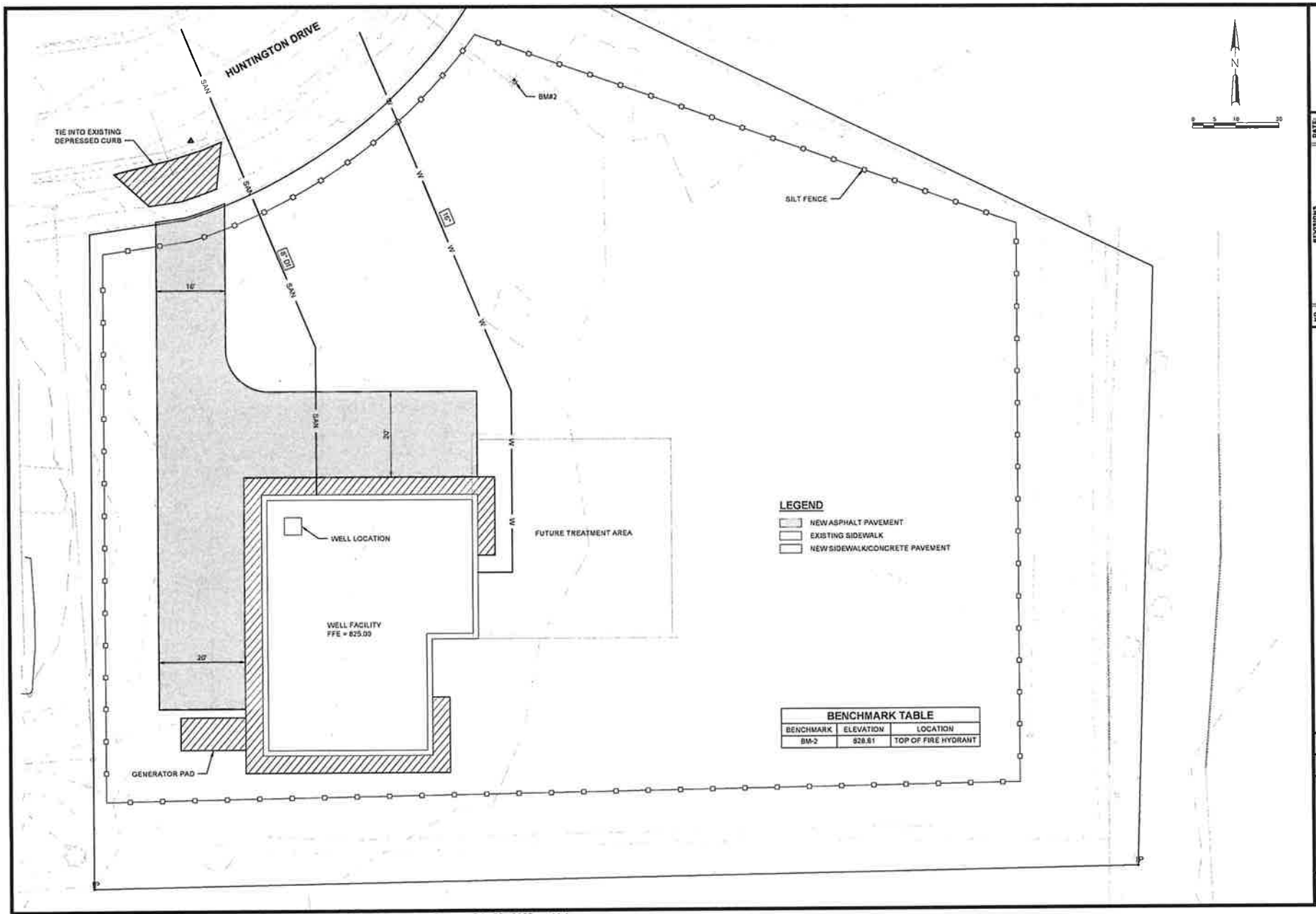
WELL 11 PRELIMINARY
CITY OF BELVIDERE
BOONE COUNTY, ILLINOIS

JOB NO. 1387.021
PROJECT MGR. MIKE FORELUND

STRAND ASSOCIATES®

SHEET
FIGURE 6.01-1

File: S:\MAD\1300--1399\1387\021\Drawings\CAD\Civil 3d\Sheets\Plan\Floor Plan.dwg Time: Feb 22, 2022 - 8:42am



NO. | REVISIONS | DATE:

SITE PLAN

WELL 11 PRELIMINARY
CITY OF BELVIDERE
BOONE COUNTY, ILLINOIS

JOB NO. 1387.021
PROJECT MGR. MIKE FORSLUND

STRAND ASSOCIATES®

SHEET
FIGURE 6.01-2

File: S:\MAD\1300—1399\1387\021\Drawings\CAD\Civil 3d\SheetsPlan\Site Plan.dwg Time: Feb 23, 2022 11:17am

SITE LOCATION MAP

PFAS TREATMENT EVALUATION
CITY OF BELVIDERE
BOONE COUNTY, ILLINOIS

STRAND ASSOCIATES

FIGURE 6.02-1
1387.021

Path: S:\WAD\1300-1399\1387.021\Drawings\GIS\Maps\Site Locations Map.mxd User: mwdn Date: 1/7/2022 Time: 2:03:43 PM

APPENDIX
EXISTING USER CHARGE AND O, M, AND R CERTIFICATION SHEET

Illinois Environmental Protection Agency

1021 North Grand Avenue East • P.O. Box 19276 • Springfield • Illinois • 62794-9276 • (217) 782-3397

Existing User Charge and O, M, and R Certification Sheet

7,479 Number of current residential customers served by the system.

1,194 CF Actual average residential water use per customer per month (based on historical billing data)

$22.00 Current average monthly residential bill

Provide details that apply to your specific user rate charges:

Water use charges: _____ per _____ gallons

$1.57 per 100 cubic feet

Flat Fee or Monthly User Charge: $3.25

Debt Service Charge: _____

Capital Improvement Charge: _____

Wholesale Charge: _____

Meter Service Fee (average-sized meter): $22.50

Other Charge: _____ Explain: _____

Other Charge: _____ Explain: _____

1. Is the water/sewer fund annually operating in a positive or negative balance at this time? (select one)

   ⦿ Positive ○ Negative

2. Based upon your most recent annual budget please indicate the net operating income for your water/sewer fund:

   $16,919.00

   - **Net Operating Income = Total Revenue - Total Cost of Providing Service**
   - **Total Revenue = Revenue from user charges, commercial, residential, or wholesale, plus any other dedicated water/sewer fund revenue**
   - **Total Cost of Providing Service = All Operation and Maintenance costs (including replacement fund) plus dedicated water/sewer fund debt**

3. Will a rate increase or other revenue generating action be necessary to pay for this project? (select one)

   ⦿ Yes ○ No

4. If a rate increase (or other cost increase) is necessary, please provide the proposed user rate charges and proposed average monthly residential water bill as an attachment.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))

Brent Anderson	Director of Public Works
Authorized Representative (Printed)	Title
Signature	Date

Belvidere Police Department

Shane Woody - Chief of Police
Matthew Wallace - Deputy Chief, Investigations
Patrick Gardner - Deputy Chief, Patrol

615 N. Main Street - Belvidere, IL 61008 - Phone 815-544-9626 - Fax 815-544-9603 - www.ci.belvidere.il.us

TO: Mayor Morris and City Council

FROM: Chief Shane Woody

DATE: February 28, 2022

RE: Request to approve the contract sale of Belvidere Police K-9 Shep

October 2020 Belvidere Police K-9 Shep was diagnosed with a ligament tear in his hind right leg. Shep was treated at UW Veterinary Clinic and performed the recommended rehabilitation.

During rehabilitation, due to compensation for the injured and surgically repaired right leg Shep was diagnosed with a damaged ligament in his left hind leg.

May 2021 Shep received treatment at UW Veterinary Clinic to surgically repair his damaged left ligament. The recovery this time presented several issues with infection which caused numerous health issues for Shep. Over the last 6-8 months Shep has battled infection, nausea, diarrhea, and vomiting. Due to the severe infection Shep had to have the metal plate that was surgically placed in the leg to hold the ligament removed. During this time Shep has not been able to rehab the current ligament and has ceased any rehabilitation in the previously repaired leg.

At this point in the recovery process Shep has shown an ability to do basic tasks but there is a probability that Shep will not recover to the point that he could perform as a "working dog".

There is still a probability that Shep may have to have an additional surgery to remove the plate in the other leg in the future.

To date, Shep has incurred medical bills in excess of $10,800.00.

Based on this information I would recommend selling K-9 Shep to Shawn Ryall, who is a friend of K-9 Officer Zach Reese, for $300.00.

Belvidere Police Department

Shane Woody - Chief of Police

Matthew Wallace - Deputy Chief, Investigations

Patrick Gardner - Deputy Chief, Patrol

615 N. Main Street - Belvidere, IL 61008 - Phone 815-544-9626 - Fax 815-544-9603 - www.ci.belvidere.il.us

Motion: **Authorize the contract sale of Belvidere Police K-9 Shep to Shawn Ryall for $300.00.**

Bill of Sale

STATE OF ILLINOIS)
)ss.
COUNTY OF BOONE)

The City of Belvidere (Seller), in consideration of ($300.00) and other valuable consideration in hand paid, receipt of which is hereby acknowledged, does hereby sell, assign, transfer, and set over to Shawn Ryall (Buyer), the following personal property, to wit:

(1) Canine Police Dog
Name- Shep
Breed-German Shepard
Sex- Male
Color- Black/Brown
Birthdate- Sept. 20, 2018

Seller hereby represents and warrants to Buyer that Seller is the absolute owner of said property and said property is free and clear of all liens, charges, and encumbrances, and that Seller has full right, power, and authority to sell said personal property and to make this Bill of Sale. All warranties of quality, fitness, and merchantability are hereby excluded.

If this Bill of Sale is signed by more than one person, all persons so signing shall be jointly and severally bound hereby.

In witness whereof, Seller has signed and sealed this Bill of Sale at the City of Belvidere, State of Illinois, this _____day of _____, 2022

_____ _____
Seller Buyer

Subscribed and Sworn to before me this _____day of _____, 2022.

_____
Notary Public

Belvidere Police Department

Shane Woody - Chief of Police

Matthew Wallace - Deputy Chief, Investigations

Patrick Gardner - Deputy Chief, Patrol

615 N. Main Street - Belvidere, IL 61008 - Phone 815-544-9626 - Fax 815-544-9603 - www.ci.belvidere.il.us

TO: Mayor Morris and City Council

FROM: Chief Shane Woody

DATE: February 28, 2022

RE: Request to accept a $15,000 donation

I present to you a request to accept a $15,000 donation to assist in the purchase of a new police canine for the Belvidere Police Department. The donor wishes to remain anonymous. As the council previously requested the identity has been disclosed to the Mayor.

If approved, Sergeant Bird and K-9 handler Kozlowski will be researching different vendors to find the right dog for our department.

Motion: To approve accepting a $15,000 donation for the purchase of a new police canine for the Belvidere Police Department.

Respectfully,

Chief Shane Woody

BELVIDERE FIRE DEPARTMENT
123 S. State St.
Belvidere, IL 61008

Fire Chief and Administration Offices
(815)544-2242
Fax (815)544-2278

To: Mayor Morris and City Council

From: Chief Al Hyser

Date: February 15, 2022

Re: For February 28, 2022, Committee Meeting:

$20,000 General Mills Grant:

We applied for a grant with General Mills for money to purchase an animated sign for Belvidere Fire Station #2. I have been trying to fund the purchase of such a sign since 2017. We have finally received a significant amount of money to cover the bulk of the cost. We anticipate it will cost an additional $7-$10,000 to install a professional sign that will allow us to educate and inform our public. Messages such as fire prevention safety tips, health awareness, our open house, and other services that we offer.

We feel Station #2 is a great location due to the fact that there are six schools in that general area with a lot of car and foot traffic.

Chief Al Hyser


Crains Creek
FIRE DEPARTMENT
Station 23

BELVIDERE FIRE DEPARTMENT

123 S. State St.
Belvidere, IL 61008

Fire Chief and Administration Offices
(815)544-2242
Fax (815)544-2278

To: Mayor Morris and City Council

From: Chief Al Hyser

Date: February 15, 2022

Re: For February 28, 2022, Committee Meeting:

Roofing Administration Side Station #1:

The Belvidere Fire Department needs to address the roof on the administration side of station #1. Enclosed are 3 bids which include material, equipment, labor and warranty:

a. Freeport Industrial Roofing $29,470
b. McDermaid Roofing $29,560
c. H. C. Anderson Roofing $34,900

If you will recall Freeport Industrial was the contractor that did our emergency roof work this past January. For consistency of product and warranty I would recommend Freeport Industrial Roofing to complete the reroof of station #1.

Chief Al Hyser

FREEPORT INDUSTRIAL ROOFING INC.

3507 RT. 26 SOUTH
FREEPORT, ILLINOIS 61032

815/235-5350
FAX/235-4382
www.freeportindustrialroofing.com
License #104-000049

February 16, 2022

Attn: Chief Al Hyser
Belvidere Fire Department
123 S. State Street
Belvidere, Illinois 61008

In Re: Station 1 - Updated Roof Proposal 18-107
Administrative Roof

Dear Chief Hyser:

Per your request we have updated our prior roof proposal for the Administrative roof of your facility in Belvidere. We will furnish labor, material, equipment and insurance to complete the following work:

1. All loose pea gravel, dirt and debris will be cleaned from the roof.
2. 1.0" isocyanurate insulation will be installed.
3. A mechanically fastened, 060 mil TPO roof system with heat welded seams will be installed.
4. All wall flashings, penetration flashings and perimeter edge details will be installed per manufacturer's specifications.
5. This application carries a 15 year manufacturer's warranty.

Cost:	Administrative Building	$21,250.00
	Gutters and Downspout	$ 2,595.00
	Coping Cap with Receiver	$ 2,975.00
	Roof Hatch	$ 2,650.00
	Total:	$29,470.00

Special Conditions and Possible Additional Costs:
1. This proposal does not include any masonry, plumbing, electrical, HVAC or additional sheet metal work.
2. Protective walkway pads will be installed at a cost of $23.50 per running foot.

Thank you for this opportunity to be of service. If you have any additional questions, please don't hesitate to call.

Sincerely,

Paul Hoefer

Paul Hoefer

McDermaid
Roofing and Insulating Company
Tel 815-963-8458
Fax 815-963-9044
Rockford, IL
"Above All, A Good Roof."
EST. 1934
mcroof@mcdermaidroofing.com

February 11, 2022

Chief Al Hyser
City of Belvidere Fire Chief
123 S. State Street
Belvidere, IL 61008

Re: Fire Station #1
Belvidere, IL

Dear Chief Hyser,

Per your request and McDermaid Roofing and Insulating Co.'s on site survey we are pleased to offer the following reroofing proposal.

1. Sweep loose gravel and dispose of all debris in a licensed landfill.
2. Overlay existing roof system with 1.5" isocyanurate insulation (R-Value = 8) mechanically fastened to existing deck.
3. Furnish and install .060 mil fully adhered TPO roof system.
4. Furnish and install one (1) new 3' x 3' roof hatch.
5. Tie-in to existing TPO roof to the north.
6. Flash east and south walls up and over with TPO membrane.
7. Provide manufacturer's fifteen (15) year roofing system warranty.
8. Field measure, fabricate and install 24-gauge prefinished steel coping, gutter and one (1) downspout in standard color.
9. Provide the City of Belvidere Building permit

For the sum of **$29,560.00**

The lights and conduit at flagpole will need to be disconnected/reconnected by others.

Please note that the alley on the south side of the building will need to be utilized for staging (crane and dumpster) during reroofing from 7 a.m. to 4 p.m. Estimated duration is +/- 3 days.

Please call if you have any questions or if McDermaid Roofing and Insulating Co. may be of further assistance.

Respectfully Submitted,

Mark R. Faber

The parties acknowledge that some materials and products to be used and installed in the construction of this project may become unavailable, delayed in shipment and/or subject to price increases due to circumstances beyond the control of the contractor, including the COVID-19 pandemic. If a specified product is unavailable or shipment is delayed, contractor shall provide written notice to customer and shall be afforded additional time and substitute products may be considered. If there is an increase in price of materials, equipment, or products between the date of this Agreement and the time when the project is ready for installation of the affected material, the contract sum shall be increased to reflect the additional cost to obtain the materials, provided that the contractor gives the customer written notice and documentation of the increased costs.

H. C. Anderson Roofing Co., Inc.
12388 Old River Rd. Rockton, IL 61072
Office: 815-624-4129 FAX: 624-4119
Certified Minority Owned & Operated Business Enterprise

Proposal

Date: 02/10/2022
Attn: Chris Letourneau
Phone: 815-979-3920
E-mail: cletourneau@belviderefire.com
Project Name/Location: 123 S State St. Belvidere IL
Addendums reviewed: NA

The H. C. Anderson Roofing Company proposes to provide labor, material, & equipment to complete the following scope of work:

Roofing Scope of Work: Reroof over existing roofing system

- Clean existing loose gravel and mechanically attach .5" HD iso. This will create a smooth surface to except new roofing system.
- Supply and install 50mil Duro-Last, Rhino-Bond attached Roofing System per manufactures specifications.
- Flash all penetrations per manufactures specifications.
- Terminate membrane over face of parapet with 1 ¾" termination bar and mastic.
- We will terminate into existing gutter.
- Supply and install a S20 Roof Hatch.
- Clean up roofing debris daily.
- Provide Manufactures 15yr Labor and Material warranty.

Roofing Excludes: *Anything other than what is described in the above scope.*

The above roofing scope of work to be completed for the sum of: **$34,030.00**

Note: HVAC, gas pipe, electrical disconnect or re-connect will be the responsibility of the owner if required.

Note: Due to steady material cost increases, this proposal may be withdrawn by H C Anderson Roofing if not accepted within 30 days

---

All work to be completed in a professional manner according to standard practices. Any alteration or deviation from above specifications involving extra costs will be executed only upon written orders and will become an extra charge over and above the estimate. All agreements are contingent upon strikes, accidents or delays beyond our control. All HC Anderson Roofing Co. Inc. workers are covered by Workmen's Compensation Insurance.

This proposal may be withdrawn by H C Anderson Roofing if not accepted within two weeks

Proposal Acceptance: The cost, terms and conditions are satisfactory and are hereby accepted. You are authorized to perform the work specified.

BELVIDERE FIRE DEPARTMENT

123 S. State St.
Belvidere, IL 61008

Fire Chief and Administration Offices
(815)544-2242
Fax (815)544-2278

To: Mayor Morris and City Council

From: Chief Al Hyser

Date: February 15, 2022

Re: For February 28, 2022, Committee Meeting:

Plaster, Repair and Maintenance of Ceilings and Walls at Station #1:

Belvidere Station #1 apparatus side is a 105-year-old building. The interior walls are made of plaster and lath. Due to a leaking roof, we have numerous water stains and missing plaster on our ceilings. In addition, the interior walls have many cracks and holes from years of normal wear and tear and natural settling.

Plaster and lath is a dying art and contractors that do this work are hard to find; especially local ones. We reached out to three contractors for bids but only received two back.

a. Gordon Johnson Plastering $3,977
b. Patriotic Plastering $4,700

I would recommend the low bid from Boone County Contractor Gordon Johnson to do this work. He lives and works in the community and comes with many good customer reviews. This work will be paid from line item 01-5-220-6010 (repair/maintenance-building).

Chief Al Hyser

Gordon C. Johnson Plastering, Inc

223 Bounty Dr NE
Poplar Grove, IL 61065
815-739-8391 (cell)

Estimate

Date	Estimate #
1/20/2022	519

Name / Address
City of Belvidere Fire Department 123 S. State Street, Belvidere 815-544-2242 Captain Chris Letourneau cletourneau@belviderefire.com

Project

Description	Qty	Cost	Total
I will supply necessary scaffolding I will apply bonding agent, fiberglass tape, Kal-kote base coat and sand finish with texture to match existing in various rooms throughout the fire station This bid includes all material and labor Total Thank you for giving me the opportunity to bid your project, if you have any questions, please feel free to contact me anytime. Please sign and date _____ _____		3,977.00	3,977.00

123 S State St
Belvidere

Total $3,977.00

Patriotic Plastering

RECIPIENT:

Chief Hyser
123 South State Street
Belvidere, Illinois 61008

Quote #34

Sent on Feb 11, 2022

Total $4,700.00

PRODUCT / SERVICE	DESCRIPTION	QTY.	UNIT PRICE	TOTAL
Plaster repairs at fire station.	Plaster repairs in areas shown in pictures. Also some minor holes in various areas of the building.	1	$4,700.00	$4,700.00

Total **$4,700.00**

This quote is valid for the next 30 days, after which values may be subject to change.