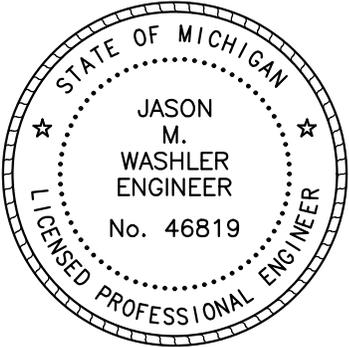


Preliminary Engineering Report

Water System Improvements

Prepared for
City of Buchanan
Berrien County, Michigan

October 2020
Revised August 2021
2190800



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1 INTRODUCTION

This Preliminary Engineering Report (PER) has been prepared for the United States Department of Agriculture Rural Development - Rural Utility Services Program. The City of Buchanan is located in the southeast portion of Berrien County in southwestern Michigan. The 2.57 square mile City relies on four wells as their source for water. Water is conveyed to system customers through a network of transmission and distribution mains. In 2018 a Water Asset Management Plan (WAMP) and a Water System Reliability Study were performed to fulfill specific requirements of Part 12 and Part 16 promulgated under Michigan's Safe Drinking Water Act, 1976, P.A. 399, as amended.

The 2018 WAMP and Water System Reliability Study several issues with the existing system. A series of recommended improvements were outlined in the Capital Improvement Plan, including:

1. Increase Pipe Capacity for 6-inch and smaller diameter main within the City
2. Replace Well No. 3
3. Replace Aging Pipe
4. Replace Lead Service Lines

Project completion will significantly improve the capacity, reliability and performance of the water distribution system.

2 PROJECT PLANNING

2.1 Location

Buchanan is a city located in Berrien County in southwest Michigan, approximately 50 miles southwest of the City of Kalamazoo and approximately 12 miles northwest of South Bend, Indiana. Figure 1 shows the service area and existing water system, which includes two pressure districts. Figure 2 contains a USGS quadrangle map showing the predominant natural features, elevation contours, rivers, lakes and natural dwellings within and around the City limits, as well as the proposed project locations.

2.2 Environmental Resources Present

The City of Buchanan and the service area are primarily developed into residential areas and commercial areas. The proposed improvement projects are confined to existing developed rights-

of-way and easements and will not impact any known environmental resources. In addition, all disturbed areas will be restored to their pre-construction condition.

2.3 Growth Areas and Populations Trends

The historical and projected population for the City of Buchanan is shown in Table 1. Population projections were made based on data available from the Michigan Department of Transportation (MDOT). The population of Buchanan is projected to decrease by about 1% percent annually from 2020 to 2040. As shown in the table the City's population has been decreasing since 1980. The projected Year 2020 population for the City of Buchanan is 4,278 persons.

2.4 Community Engagement

The City has followed USDA requirements for publishing public notices of the project process. They may also elect to hold a public meeting during a regular council meeting to provide more detail of the projects to interested citizens.

3 EXISTING FACILITIES

3.1 History

The City of Buchanan currently obtains water from groundwater using four wells, labeled 1A, 3, 4A, and 5 in Figure 1. Wells 1A, 3, and 4A were all installed prior to 1970 and are located just north of McCoy Creek Drive. Well 5 was drilled in 2009 and is located at the west end of McCoy Creek Trail. Water treatment is provided at the Water Treatment Plant just downstream of the wells. Well capacities and data are provided in Table 2. The firm capacity of the supply wells is estimated to be 1,500 gpm, which accounts for the drawdown of the water table when more than one pump is operating.

All well fields are hydraulically connected to McCoy Creek which flows east through the City to the St. Joseph River. The well houses are located in the floodplain of McCoy Creek, and the well casings extend two feet higher than the 100-year flood elevation.

The City of Buchanan has a complex network of water mains providing transmission and distribution to City and surrounding Township customers. The service area covers approximately 3.2 square miles and is supplied through a water distribution network consisting of approximately 37 miles of water mains ranging from 3 to 15 inches in diameter.

3.2 Condition of Existing Facilities

The following condition assessments are based on results of the 2018 WAMP and Water Reliability Study.

3.2.1 General

The City of Buchanan's water system transmission capacity needs improvement with transmission main looping and older main replacement. In many areas, the available fire flows are less than suggested due to undersized distribution main and inadequate transmission looping. The 4- and 6-inch diameter mains, particularly those with dead ends, restrict the available fire flows at some locations in the system.

3.2.2 E. Dewey Street Area

The E. Dewey Street Area includes Main Street (Dewey to Third), E. Third Street (Main to Red Bud Trail) and W. Fifth Street (Moccasin to Main). Much of the existing water main in this area was installed in 1930 and is 4- to 6-inches in diameter cast iron pipe.

3.2.3 Red Bud Trail

The water main on Red Bud Trail between Front Street and Elizabeth Street was installed in 1920. The water main is cast iron pipe from 4- to 6-inches in diameter. The Water Reliability Study indicated the water main between Fifth Street and Elizabeth Street has low fire flow.

3.2.4 Front Street

The water main on Front Street between Red Bud Trail and Chippewa Street was installed in 1950. The water main is cast iron pipe from 4- to 6-inches in diameter.

3.2.5 Oak Street

The water main on Oak Street between Alexander Street and Fourth Street ranges in diameter from 4-inch to 10-inch. This water main was installed between 1920 and 1950 and is primarily cast-iron pipe.

3.2.6 Water Supply Well

Well 3 was installed in 1951. Based on the Water System Reliability Study, this well has a “high” susceptibility rating to contaminants as well as a “high” sensitivity rating, which refers to the ability of contaminants to travel vertically through the soil above the well field.

3.3 Financial Status of Existing Facilities

3.3.1 Current Rate Schedule

The current rate schedule for water and wastewater systems for the City of Buchanan is included in Appendix A.

3.3.2 Annual Operation and Maintenance Costs

The City’s O&M budget for the 2019-2020 fiscal year was approximately \$687,000.

3.3.3 Other Capital Improvement Programs

The City updated their Water System Reliability Study (WSRS) in May of 2020.

3.3.4 Existing Debts and Reserve Accounts

At the end of the 2019 fiscal year, the City had water system liabilities totaling \$1,301,000 as shown in the June 2019 Balance Sheet of which, \$1,050,000 is related to outstanding bonds.

At the end of the 2019 fiscal year, the City had total reserves/balances of \$3,058,000 for the water fund as shown in the June 2019 Balance Sheet.

The June 2019 Balance sheet has been provided as part of this application to accompany the 2019 Financial Statement.

4 NEED FOR PROJECT

4.1 Health, Sanitation, and Security

The City of Buchanan’s water system is subject to reduced health, sanitation, and security due to less than desirable fire flows, maintenance issues, and lower reliability due to capacity restrictions.

4.1.1 Reliability Issues

Portions of the City's water system are 4-inch water mains which restrict available fire flows and overall capacity and pressures in the system. The 4-inch water main is also no longer permitted by MDEQ in new installations and is recommended that it be replaced with 8-inch water main to meet MDEQ standards and address fire flow and capacity issues.

4.1.2 Fire Protection Issues

The Insurance Services Office (ISO) provides suggested fire demands for various structures and land uses. ISO also suggests that fire hydrants in single family residential areas produce a fire supply of 1,500 gpm. One of the primary functions of a municipal water system is to supply water in case of an emergency, such as a fire. These fire flow rates should be provided while maintaining a water pressure of at least 20 psi throughout the system. Community residents receive better insurance ratings and rates the closer the system is to providing these fire flows.

Based on the Water System Reliability Study, the system transmission capacity needs improvement with transmission main looping and older main replacement. In many areas, the available fire flows are less than suggested due to undersized distribution main and inadequate transmission looping. The 4- and 6-inch diameter mains, particularly those with dead ends, restrict the available fire flows at some locations in the system.

4.1.3 Resolution of Health, Sanitation, and Security Problems

The proposed water system improvement projects would eliminate some of the low fire flow areas and increase reliability by providing greater capacity throughout the system.

4.1.4 Maintenance Issues

The suggested improvements will replace aging water mains within the system, significantly reducing the potential for water main breaks.

4.1.5 Proposed Well and Water Treatment

4.1.5.1 New Well

The City of Buchanan desires to install a new well near its existing Well No. 5. The new well will provide additional capacity and ultimately replace Well No. 3, which is in a shallow aquifer that has no protection from surface contamination. Well No. 3 is approaching 70 years old and has reached the end of its useful life.

Based on information from the existing Well No. 5, the new well would be set at a depth of approximately 300 feet. Based on the anticipated depth of the well and the layers of clay above the zone where the well would be screened, providing a more protected water supply than in the Well No. 3 area.

The new well is targeted to produce 900 gallons per minute (gpm) capacity and is anticipated to be a 12 or 16-inch diameter well, approximately 300 feet deep. The well would be equipped with a vertical turbine pump, approximately 100 HP pump, and variable speed drive motor.

Typically, the City has a separate well house for each well; however, because the City is intending to build a water treatment plant for iron removal, the well house will be combined with the treatment plant. This will provide cost savings in construction and maintenance by reducing the water main and electrical service between buildings, reducing the total square footage of building needed, and reducing maintenance of multiple buildings.

4.1.5.2 Water Treatment Plant

Due to high iron concentration in the well field area for Well No. 5 and the new proposed well, the City intends to build a water treatment plant to remove iron. Iron in this well occurs at 0.5 to 0.7 mg/l. Although not a health concern, concentrations of iron above 0.3 mg/L cause staining of water fixtures, laundry, and other surfaces that the water comes into contact with.

The treatment process will consist of iron oxidation followed by removal of the oxidized iron, which can then be removed by filtration of the precipitated iron particles.

The treatment process will be designed to treat both 900 gpm wells in this well field. The treatment equipment will consist of chemical feed pumps and multi-cell, horizontal pressure filters. Each filter will have three sand/anthracite cells to provide redundancy in the treatment process and to allow backwashing of filters while continuing to treat raw water. A backwash basin will also need to be constructed. Based on the sand and gravels near the ground surface, the backwash water can be an infiltration basin permitted through a Part 22 groundwater discharge permit.

The proposed Water Treatment Plant will be located near the existing DPW Building as shown in Figure 3.

4.1.5.3 Generator

An onsite propane-fired generator is planned for the Water Treatment Plant and wells so that operation can continue in the event of a power outage.

4.2 Aging Infrastructure

The City of Buchanan has distribution mains as old as 100 years, and approximately half of the system mains were constructed prior to 1950. Well 3 was installed in 1951. While still operable, the Well is in a high-risk area and is nearing the end of its expected useful life.

4.3 Reasonable Growth

Although there is not significant future growth anticipated at this time, the City of Buchanan is looking to maintain buildable properties for potential future growth.

5 ALTERNATIVES CONSIDERED

5.1 Design Criteria

The primary reason for the proposed projects is to address aging infrastructure, improve transmission capacity and have a more reliable community water supply well. The projects proposed in this report correspond with sanitary sewer projects proposed in a parallel USDA RD application. All the proposed underground projects are to be performed in the same location as, or adjacent to, the existing underground infrastructure. For this reason, no alternatives were considered for water main replacement projects.

The treatment process chosen for iron removal in the water supply consists of iron oxidation followed by removal of the oxidized iron, which can then be removed by filtration of the precipitated iron particles. Air is also sometimes used to oxidize iron but requires an additional treatment process in the form of aeration equipment, a detention tank as the oxidation process is typically slower than with chlorine. This process would also require additional pumps to repump the water. In this case, this would require change out of the existing pump in Well No. 5 as well. Overall, this would be more expensive alternative in both construction and on-going maintenance and equipment costs. Therefore, this alternative was not considered further.

5.2 Map

Figure 3 is a map of the proposed water system improvements described below as Alternative 1.

5.3 Proposed Project (Alternative 1)

5.3.1 Environmental Impacts

Because the proposed projects include removing and replacing existing infrastructure, the projects in this alternative will have no permanent significant environmental impacts. The only area that will include new construction is for the new Well 3 and the accompanying well house that will be installed adjacent to the existing Well 5 on vacant City owned property. An Environmental Report has been prepared as part of this application. All required permits will be obtained and storm water control best management practices will be implemented to minimize sediment runoff.

The noise and air pollution inherent to the construction process will be minimized by requiring the contractor to keep a strict timetable and use equipment that is within regulatory emission standards for vehicle emissions.

5.3.2 Land Requirements

Projects to be performed are within the limits of property that is owned by the City.

5.3.3 Potential Construction Problems

As the improvement projects consist of replacing the water main at or near the existing locations, no construction problems are anticipated.

5.3.4 Sustainability Considerations

This combination of projects is intended to replace aging infrastructure and increase the capacity of the water supply system.

5.3.5 Cost Estimates

Construction is estimated to cost \$8,415,000 for the proposed improvements. Full costs including engineering, legal, and administrative costs are provided in the application. Operations and maintenance costs are expected to increase due to the increased capacity of the well pumps as well as the new well treatment system and building. Operations and maintenance costs are discussed further in section 7.5.2. A full life cycle cost analysis for Alternative 1 is included in Table 3.

5.4 Alternative 2: No Action

5.4.1 Description

Another alternative is the “No Action” alternative. This alternative consists of no action and would not address any of the issues identified in 2018 Water System Reliability Study.

5.4.2 Environmental Impacts

No environmental impacts would be incurred with this alternative.

5.4.3 Land Requirements

No additional land or easements would be required for this alternative.

5.4.4 Potential Construction Problems

No construction problems would be anticipated with this alternative.

5.4.5 Sustainability Considerations

No significant water or energy savings are anticipated with this alternative.

5.4.6 Cost Estimates

As this alternative consists of no action, there would be no cost for construction. Operations and maintenance costs would not immediately increase. However, over time as some of the

maintenance issues addressed by other alternatives are not solved would cause maintenance costs to increase.

6 SELECTION OF AN ALTERNATIVE

6.1 Life Cycle Cost Analysis

Life cycle costs for each of the alternatives are shown in Table 3. An analysis period of 20 years was used.

6.2 Non-Monetary Factors

The alternatives were developed to address the main issues presented in the 2018 Water System Reliability Study. Those issues represent the safety and dependability of the system.

7 PROPOSED PROJECT (RECOMMENDED ALTERNATIVE)

Alternative 1 is the best alternative to address the issues raised in the 2020 Water System Reliability Study.

7.1 Preliminary Project Design

Alternative 1 includes the following projects:

1. Remove and replace 4-inch water main with 8-inch water main within the E. Dewey Street area.
2. Remove and replace 4-inch water main with 8-inch water main on Red Bud Trail from Chicago Street to Elizabeth Street.
3. Remove and replace 4-inch and 6-inch water main with 8-inch water main on Front Street from Chippewa Street to Red Bud Trail.
4. Remove and replace 4-inch and 10-inch water main with 8-inch and 10-inch water main Oak Street from Alexander Street to W. Fourth Street.
5. Install a new water supply well and wellhouse in the southwest region of the City – (replace well 3).
6. Construct a new Water Treatment System and Building near the existing DPW Building.

7. Replace galvanized and lead goosenecks within the water project areas.

7.2 Project Schedule

The following is a tentative schedule for the progression of the overall project:

<i>Milestone</i>	<i>Estimated Completion Date</i>
Submit Application	10/16/2020
USDA Approval	11/30/2020
Complete Design	01/15/2022
Permit Approval	02/01/2022
Authorization to Bid	03/01/2022
Bid Opening	04/01/2022
Loan Closing	05/01/2022
Contract Award	06/01/2022
Construct Start	07/01/2022
Construction Completion	11/30/2023

7.3 Permit Requirements

The following permits will need to be obtained for this project prior to construction:

- EGLE Community Water Supply Permit
- Sediment and Erosion Control Permit from Berrien County Drain Commission
- Road Permit from Road Commission of Berrien County

7.4 Total Project Cost Estimate (Engineer’s Opinion of Probable Cost)

The total project cost is approximately \$10,738,000. The details, including costs for construction, legal counsel, bond counsel, engineering and contingencies are provided in the application materials.

7.5 Annual Operating Budget

The projected 2022 annual operating budget for the City of Buchanan water system is provided in the application materials. The City’s O&M budget for the 2019-2020 fiscal year was approximately \$679,000. The City’s operating income for the water system for the 2019-2020 fiscal year was approximately \$947,000.

7.5.1 Income

A detailed current rate schedule for water users is included in Appendix A. The City has been increasing rates by 8% each year as shown in the table below:

	FY 2018-2019	FY 2019-2020	FY 2020-2021	FY 2021-2022 (Proposed)
City				
Water	\$4.50/1,000 gal.	\$4.86/1,000 gal.	\$5.25/1,000 gal.	\$5.67/1,000 gal.
Sewer	\$7.38/1,000 gal.	\$8.72/1,000 gal.	\$9.42/1,000 gal.	\$10.17/1,000 gal.
RTS (Residential)	\$36.08 Monthly	\$31.21 Monthly	\$33.70 Monthly	\$36.40 Monthly
Township				
Water	\$5.27/1,000 gal.	\$5.70/1,000 gal.	\$6.16/1,000 gal.	\$6.65/1,000 gal.
Sewer	\$9.00/1,000 gal.	\$10.22/1,000 gal.	\$11.04/1,000 gal.	\$11.92/1,000 gal.
RTS (Residential)	\$30.44 Monthly	\$36.45 Monthly	\$39.37 Monthly	\$42.52 Monthly

The projected fiscal year 2021-2022 water fund operating income (\$1,026,000) is derived from the rate increases above.

Available data indicate there are approximately 2,091 connections to the City's water system. The proposed project will not change the number of customers on the system. See Appendix C for a breakdown of connections and flows.

7.5.2 Annual Operations and Maintenance Costs

The City's O&M budget for the 2019-2020 fiscal year was approximately \$679,000. Projected O&M expenses for 2024 are \$740,000.

Anticipated increases to the current O&M expenses are due to the larger pump for the new well, as well as the addition two new buildings and a treatment system.

7.5.3 Debt Repayments

At the end of the 2019 fiscal year, the City had water system liabilities in the amount of \$1,050,000 under one bond issue which matures April 1, 2030 from a DWRP loan.

It is anticipated that the proposed project will result in a loan from the USDA Rural Development of \$10,738,000 at an interest rate of 1.25-percent amortized over 40 years. The corresponding annual debt service including principal and interest will average approximately \$343,000 over the life of the loan.

7.5.4 Reserves

The reserves that are necessary to ensure that adequate funds are being generated to pay for water system expenses and the proposed project will be assumed as 10-percent of the annual debt payment requirement. Therefore, the debt service reserve used for the proposed project is \$34,000 per year.

The reserves associated with the short-lived assets will be approximately \$34,000. This includes assets associated with the water system that have an expected useful life of 15 years or less.

The following is a summary of the annual operation, maintenance, and reserve information:

O&M	\$740,000
RRI	\$34,000
Existing Debt	\$121,000
New Debt	\$343,000
Debt Reserve	\$34,000
Total	\$1,272,000

7.6 Conclusions and Recommendations

The aging water main within the City of Buchanan's water system needs to be replaced to accommodate demand and fire flows. Due to the current state of the system, it is recommended that the City improve the quality of the water system as described in this report. This will

improve the health and security of the system in addition to providing adequate capacity for future and current water needs.

The total estimated cost of the water system improvements project is \$10,738,000. Therefore, the City of Buchanan is applying for USDA Rural Development funding in the amount of \$10,738,100 for the recommended improvements.

Tables

Table 1 – Ultimate Growth Projections

Table 2 – Water Summary

Table 3 – Present Worth Analysis

Ultimate Growth Projections

Year	Population / Projection
1980 ¹	5,142
1990 ¹	4,992
2000 ¹	4,681
2010 ¹	4,458
2015 ²	4,362
2018 ²	4,294
2020 ³	4,278
2025 ³	4,253
2030 ³	4,242
2035 ⁴	4,231
2040 ⁴	4,220

¹ Population through 2010 based on United States Census data.

² Population estimate from United States Census data

³ Population projections based on MDOT

⁴ Interpolated from MDOT projections

Existing Water System Summary

Community Name: City of Buchanan

MDEQ Water Supply Number (WSSN): 00960

Water Demand (MGD)

Firm Capacity:	1,500	MGD
Avg. Day Demand:	0.59	MGD
Max Day Demand:	1.045	MGD
Peak Hour:	2.090	MGD
Avg Monthly Billing:	15.5	MG

Well	Rated Capacity (gpm)	Current Capacity (gpm)	Date of Completion	Date of Last Insp.	TDH (ft)	Pump Type
Well #1A	1,000	960	1966	2007	192	Vert. Turbine
Well #3	800	680	1951	2007	175	Vert. Turbine
Well #4A	700	800	1963	2007	190	Vert. Turbine
Well #5	800	800	2009	2009	410	Vert. Turbine

Storage

Elevated Tank		
ID:	Moccasin	Front Street
Volume (gal):	250,000	500,000
Construction:	Steel	Steel
Const Date:	1957	1961
Last Inspection:	2007	2007
Last Painted (interior):	1995	1995

Booster Station	Pump #1	Pump #2	Pump #3
Year Constructed:	1995	1995	1995
Pump Type:	Variable Speed	Horizontal Centrifugal	Horizontal Centrifugal
Capacity (gpm):	850	850	25

Distribution System:

	Material	Footage	Age	No. Hydrants	No. Valves
<4" watermain	Copper	1350 lf	8-75 yr	276	406
3" watermain	Cast Iron	2,700 lf	70-100 yr		
4" watermain	Cast Iron	42,700 lf	60-100 yr		
6" watermain	Cast Iron	55,000 lf	15-100 yr		
6" watermain	PVC	3,600 lf	40 yr		
8" watermain	Cast Iron	12,500 lf	55-100 yr		
8" watermain	Ductile Iron	24,700 lf	10-30 yr		
8" watermain	PVC	3400 lf	10-40 yr		
10" watermain	Cast Iron	6,000 lf	60-100 yr		
12" watermain	Cast Iron	15,000 lf	40-85 yr		
12" watermain	Ductile Iron	16,700 lf	10-40 yr		
12" watermain	PVC	15,500 lf	20-40 yr		
15" watermain	HDPE	250 lf	7 yr		

Present Worth Analysis

Community Name: City of Buchanan

Federal Discount Rate for Water Resources Planning (Interest Rate) i = 0.04875
Number of Years, n = 40 years

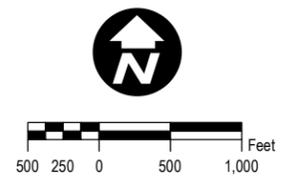
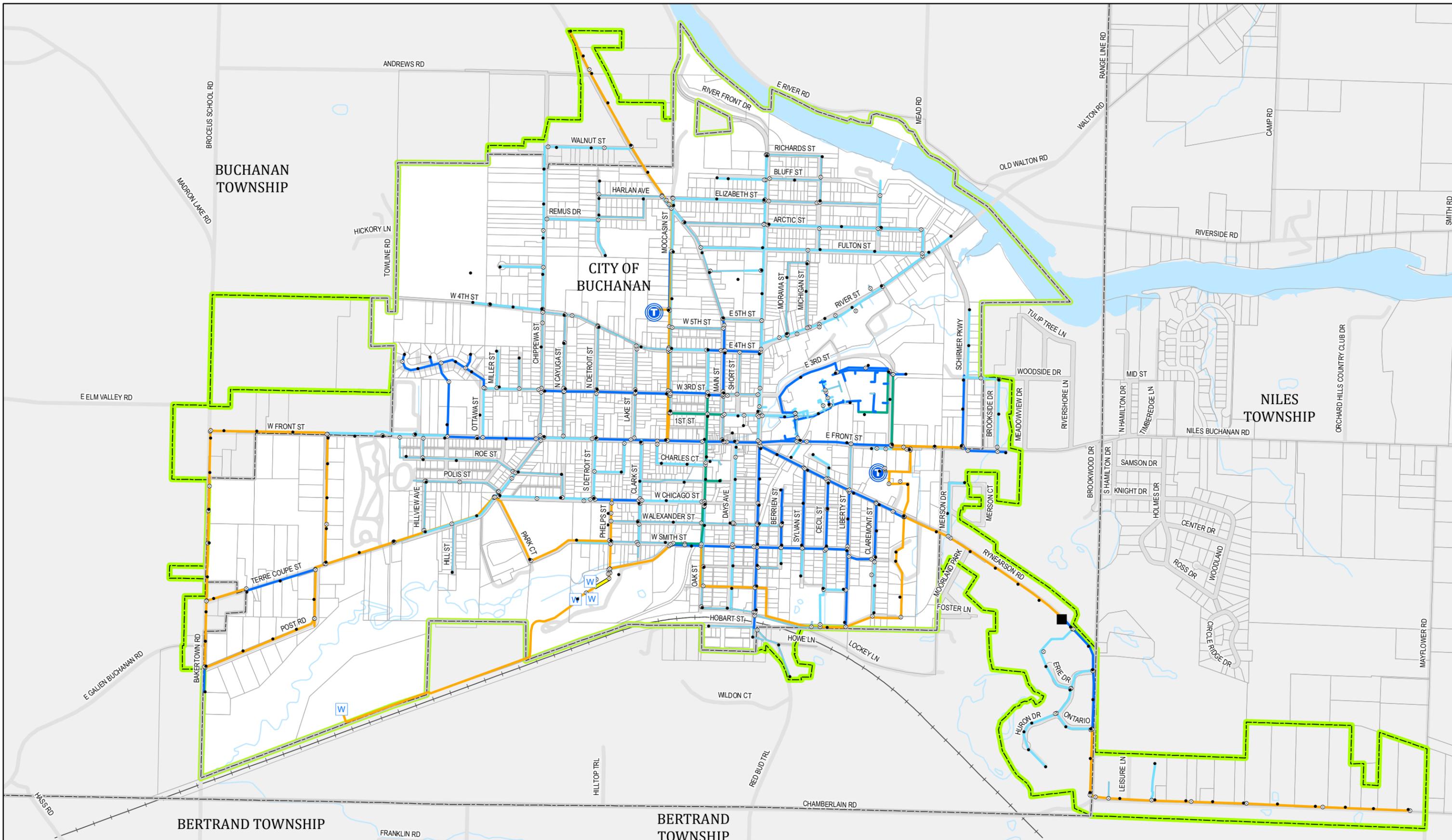
Alt. 1: Proposed Project	Alt. 2: Do Nothing
Initial Capital Costs = \$10,738,000	Initial Capital Costs = \$0
Annual Operations & Maintenance Costs = \$740,000	Annual Operations & Maintenance Costs = \$740,000
Future Salvage Value =	Future Salvage Value =
Present Worth of 20 years of O & M = \$12,918,083	Present Worth of 20 years of O & M = \$12,918,083
PW = $\text{Annual OM} \frac{(1+i)^n - 1}{i(1+i)^n}$	
Present Worth of 20 yr Salvage Value = \$0	Present Worth of 20 yr Salvage Value = \$0
PW = $\text{FSV} \frac{1}{(1+i)^n}$	
Alternate 1 Total Present Worth = \$23,656,083	Alternative 2 Total Present Worth = \$12,918,083

Figures

Figure 1 – Existing Water System & Service Area

Figure 2 – USGS Quadrangle Map and Proposed Improvements

Figure 3 – Proposed Project Locations

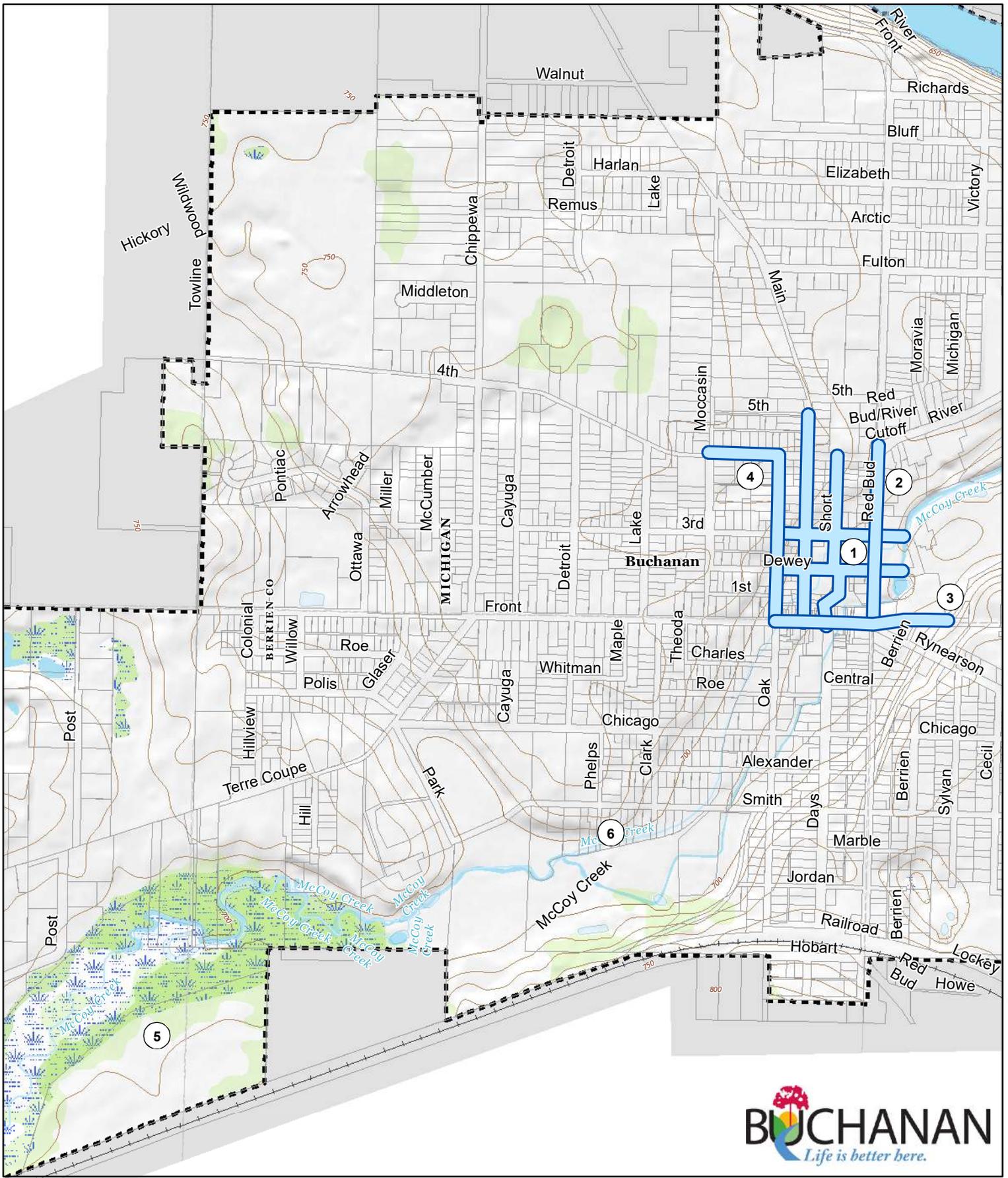


LEGEND

• Hydrant	Water Main Diameter	— 8"	■ Booster Station
○ Valve	— 4" and Smaller	— 10"	▭ Existing Service Area
W Well	— 6"	— 12"	— Railroad
⊕ Water Tower	— 15"	— 15"	▭ Municipal Boundary

City of Buchanan
 Berrien County, Michigan
USDA RD Engineering Report
Figure 1: Water System
 Prein & Newhof
 March 2020
 2190800

J:\GIS_Client\Berrien-GD\Buchanan-GD\City_Plan\Projects\2190800_SRF_Project\Plan\USDA Water\Figure 1 Water System Layout.mxd - apeacy - 2/27/2020 8:33:47 AM



J:\GIS_Client\Berrien-GD\Buchanan-GD\City_Projects\2190800_USDA\USDA Water\Figure 2 USGS Project Locations.mxd - jlenia - 10/12/2020 4:21:26 PM



CITY OF BUCHANAN
USDA RD ENGINEERING REPORT

FIGURE 2: USGS PROJECT LOCATIONS

OCTOBER 2020

Prein&Newhof

2190800



0 500 1,000
Feet

SCALE: 1" = 1,000'

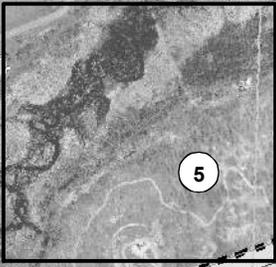
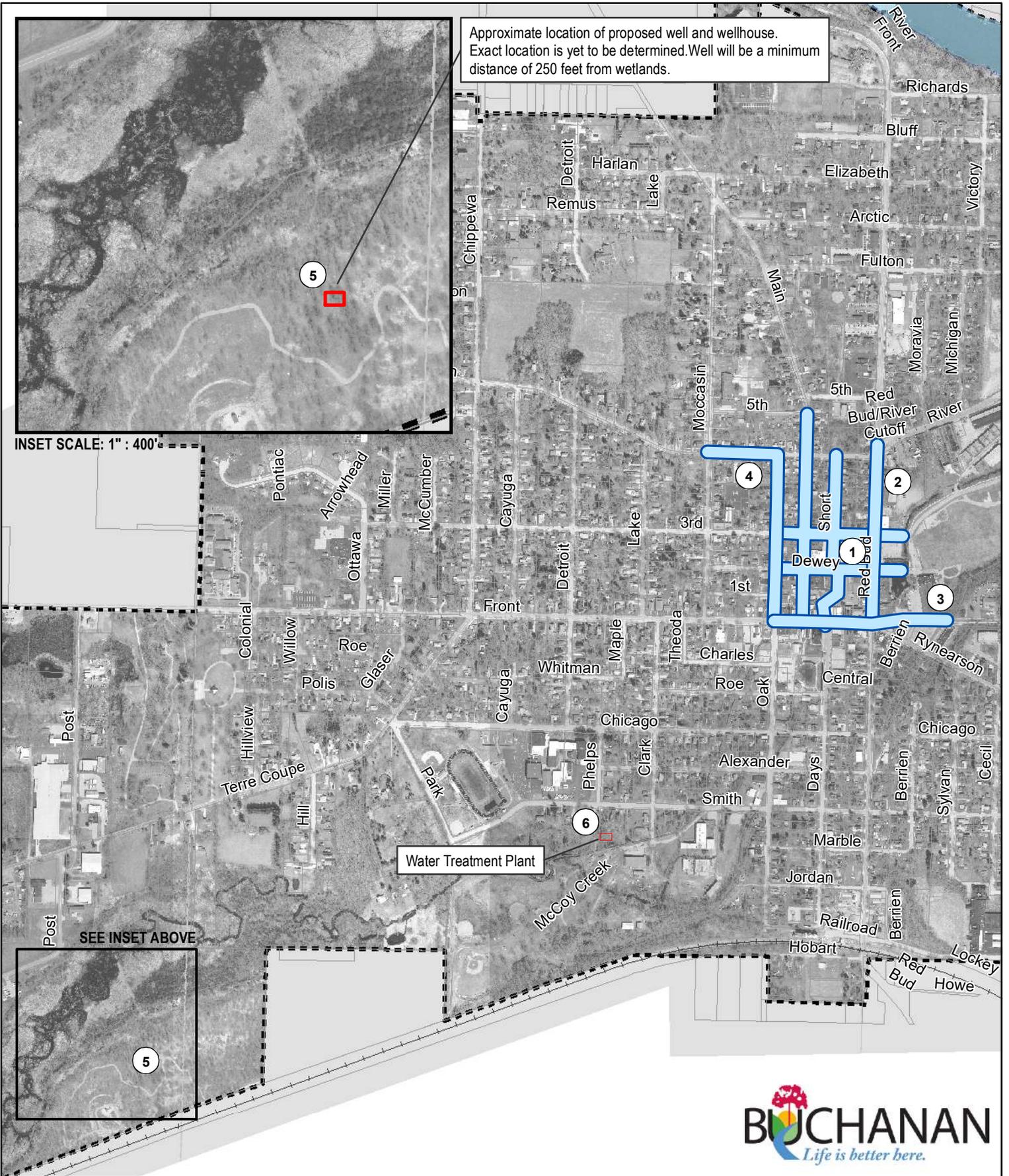
LEGEND

 Project Area

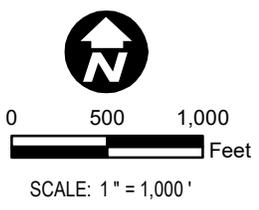
Approximate location of proposed well and wellhouse.
Exact location is yet to be determined. Well will be a minimum distance of 250 feet from wetlands.



INSET SCALE: 1" = 400'



SEE INSET ABOVE



LEGEND
 Project Area

CITY OF BUCHANAN
 USDA RD ENGINEERING REPORT
FIGURE 3: PROPOSED PROJECT LOCATIONS

OCTOBER 2020
 Prein & Newhof
 2190800

Appendix A

Water and Sewer Customer Rates

Billing Type	Amount of RTS Accts as of 1/6/16	Amount of RTS Accts as of 1/1/17	Amount of RTS Accts as of 1/1/18	Amount of RTS Accts as of 1/1/19	Amount of RTS Accts as of 1/1/2020	RTS Fee as of 7/1/20
City Residential 5/8" (CRS)	1605	1598	1590	1589	1584	\$33.70
City Water Only 5/8" (CWS)	39	37	38	37	37	\$14.09
City Sewer Only 5/8" (CSS)	1	2	2	2	2	\$19.61
City 1.5" (BW2)	16	16	16	16	16	\$168.48
City 2" (BW3)	16	18	17	16	17	\$269.57
City 2" Water Only (BW1)	3	3	3	3	3	\$112.75
City 3" (BW4)	3	3	4	4	4	\$539.15
City 4" (BW5)	2	2	2	2	2	\$842.42
City 6" (BW6)	1	1	1	1	1	\$1,684.84
TWP Residential 5/8" (TRS)	91	95	95	95	95	\$39.37
TWP Water Only 5/8" (TW1)	71	71	70	70	70	\$16.43
TWP Sewer Only 5/8" (TS1)	80	78	78	79	80	\$22.94
TWP 2" (TR4)	2	2	2	3	2	\$314.93
TWP 2" Water Only (TWS)	2	2	2	2	3	\$131.41
TOTAL:	1932	1928	1920	1919	1916	

THERE ARE 6 ACCTS WITH NO METERS THAT ARE FLAT RATES AND HAVE RTS & FP THEY ARE INCLUDED IN THESE TOTALS AND LISTED IN THE RIGHT BOTTOM CORNER

<u>Billing Item #'s</u>	<u>Billing Codes</u>	<u>Account Status</u>
1 – Water	0 – Do Not Bill	0 – Normal/Active
2 – Sewer	1 – Usage Based	1 – First Bil
3 – RTS – water & sewer	3 – Ongoing Flat	2 – No Bill
4 – RTS – water only		3 – Final Bill
5 – RTS – sewer only	<u>Cyle Code</u>	4 – Inactive with Balance
7 – BT – Buchanan Township	1 – All Accounts	5 – Inactive - Paid
8 – FP – future plant		6 – Inactive – No Bill

New Buchanan Township fee (BT): \$4.17 monthly to all Buchanan Township accounts

FP7 has one less than RTS because 16739 Huron has two accounts for the same meter. The Landfill is paying the water and the resident is paying the sewer. Therefore they have two separate RTS on chart, one for water only account and one for sewer only account. They only have one FP because we charge that per meter.

AS OF JANUARY 1, 2020	
Types of Accounts	Number of Accounts
Water & Sewer	1721
Water Only	113
Sewer Only	82
Sprinkler	201
Total	2117
Total Accts minus Sprinklers = RTS Accts Billed (2117-201=1916) (We do not bill RTS/FP on Sprinkler Accts)	
1916	

Future Plant	
CRS, CWS, CSS (1628)	FP1: \$.00
BW2 (16)	FP2: \$.00
BW3, BW1 (19)	FP3: \$.00
BW4 (4)	FP4: \$.00
BW5 (2)	FP5: \$.00
BW6 (1)	FP6: \$.00
TRS, TW1, TS1 (244)	FP7: \$.00
TR4, TWS (5)	FP8: \$.00

RATE CODES AND PRICES							
City or Township and Meter Equiv.	Type of Service	Rate Code	July 1 2016	July 1 2017	July 1 2018	July 1 2019	July 1 2020
City	Water	WC1	\$3.94	\$4.10	\$4.50	\$4.86	\$5.25
City	Sewer	SC1	\$7.10	\$7.38	\$7.68	\$8.72	\$9.42
Township	Water	WT1	\$4.59	\$4.77	\$5.27	\$5.70	\$6.16
Township	Sewer	ST1	\$8.32	\$8.65	\$9.00	\$10.22	\$11.04
City (1)	RTS 5/8",3/4", 1"	CRS	\$20.34	\$21.16	\$26.08	\$31.21	\$33.70
City (1)	RTS Water Only	CWS	\$9.41	\$9.79	\$12.08	\$13.05	\$14.09
City (1)	RTS Sewer Only	CSS	\$10.93	\$11.37	\$14.00	\$18.16	\$19.61
City (5)	RTS 1.5"	BW2	\$101.76	\$105.83	\$130.18	\$168.48	\$168.48
City (8)	RTS 2"	BW3	\$162.79	\$169.30	\$208.25	\$269.57	\$269.57
City (8)	RTS 2" Water Only	BW1	\$75.22	\$78.23	\$96.52	\$112.75	\$112.75
City (16)	RTS 3"	BW4	\$325.59	\$338.61	\$416.50	\$539.15	\$539.15
City (25)	RTS 4"	BW5	\$508.75	\$529.10	\$650.80	\$842.42	\$842.42
City (50)	RTS 6"	BW6	\$1,017.50	\$1,058.20	\$1,301.60	\$1,684.84	\$1,684.84
City (115)	RTS 10"	BW7	\$2,339.10	\$2,433.40	\$2,999.00	\$3,875.50	\$3,875.50
Township (5)	RTS 1.5"	TR2	\$118.95	\$123.70	\$152.20	\$196.85	\$196.85
Township (25)	RTS 4"	TR3	\$594.75	\$618.50	\$761.00	\$984.25	\$984.25
Township (1)	RTS 5/8",3/4", 1"	TRS	\$23.79	\$24.74	\$30.44	\$39.37	\$39.37
Township (1)	RTS Water Only	TW1	\$11.00	\$11.44	\$14.08	\$16.43	\$16.43
Township (1)	RTS Sewer Only	TS1	\$12.79	\$13.30	\$16.37	\$22.94	\$22.94
Township (8)	RTS 2"	TR4	\$190.34	\$197.95	\$243.52	\$314.93	\$314.93
Township (8)	RTS 2" Water Only	TWS	\$87.99	\$91.51	\$112.64	\$131.41	\$131.41

FLAT RATES:

BACK-4779-01	Sewer Only	9 units	TS1 (RTS)	FP7 (FP)
BACK-4801-01	Sewer Only	9 units	TS1 (RTS)	FP7 (FP)
FROW-1031-01	Sewer Only	6 units	CSS (RTS)	FP1 (FP)
MEAD-15845-01	Sewer Only	9 units	TS1 (RTS)	FP7 (FP)
RIVS-16030-02	Sewer Only	9 units	TS1 (RTS)	FP7 (FP)
TULI-4711-01	Sewer Only	4 units	TS1 (RTS)	FP7 (FP)

Appendix B

Engineer's Opinion of Probable Costs

Description	2019 Construction	2023 Construction Costs			
	Costs	Total	Sanitary	Water Main	Road/General
Project #100 - Interceptor to WWTP	\$1,259,000	\$1,417,000	\$1,417,000	\$0	\$0
Project #110 - E Dewey Street Area (Main Street, Short Street, E Third	\$3,626,000	\$4,082,000	\$1,799,000	\$1,247,000	\$1,036,000
Project #120 - Red Bud Trail (From Chicago to Elizabeth)	\$1,622,000	\$1,826,000	\$854,000	\$675,000	\$297,000
Project #130 - Front Street (From Chippewa to East of Red Bud)	\$1,575,000	\$1,773,000	\$770,000	\$681,000	\$322,000
Project #140 - Days Avenue (From Front to Carroll)	\$0	\$0	\$0	\$0	\$0
Project #150 - Oak Street (From Alexander to W Fourth St)	\$1,499,000	\$1,687,000	\$837,000	\$850,000	\$0
Forcemain	\$130,000	\$146,000	\$146,000	\$0	\$0
Well No 3 and Iron Removal WTP	\$4,409,000	\$4,962,000	\$0	\$4,962,000	\$0
Total	\$14,120,000	\$15,893,000	\$5,823,000	\$8,415,000	\$1,655,000

Owner:

City of Buchanan

Project Title:

Project #100 - Interceptor to WWTP

Date:

July 2020

Project #:

M19094

Item No.	Description	Quantity	Unit	Unit Price	Total Amount
<u>Sanitary Sewer</u>					
1	Remove Sanitary Structures	11	EA	\$500.00	\$5,500.00
2	Abandon Sanitary Sewer	1,960	LF	\$12.00	\$23,500.00
3	5' Sanitary Manhole	13	EA	\$6,000.00	\$78,000.00
4	Sanitary Sewer, 24 inch	2,100	LF	\$175.00	\$367,500.00
5	Connect to headworks	1	LS	\$10,000.00	\$10,000.00
6	Connect Adjacent Sewers	2	EA	\$10,000.00	\$20,000.00
7	Creek Crossing	2	EA	\$20,000.00	\$40,000.00
8	Permanent Dewatering System	1,900	LF	\$30.00	\$57,000.00
9	Bypass Pumping	21	Days	\$3,500.00	\$73,500.00
Sanitary Subtotal					\$675,000.00
<u>Misc. / Restoration</u>					
10	Mobilization / General Conditions (5%)	1	LS	\$60,000.00	\$60,000.00
11	Remove Concrete Sidewalk	100	SYD	\$7.00	\$700.00
12	Remove Concrete Curb and Gutter	3,400	LF	\$7.00	\$23,800.00
13	Remove HMA Pavement	6,178	SY	\$4.00	\$24,700.00
14	Subgrade Undercutting	200	CY	\$20.00	\$4,000.00
15	Subbase, CIP	2,059	CY	\$12.00	\$24,700.00
16	Machine Grading Modified	18	STA	\$3,000.00	\$52,800.00
17	6" HMA (Primary Streets)	2,243	TON	\$90.00	\$201,800.00
18	8" Aggregate Base, Modified	6,178	SYD	\$12.00	\$74,100.00
19	Concrete Curb & Gutter	3,460	LF	\$15.00	\$51,900.00
20	Pavement Striping	1	LS	\$3,520.00	\$3,500.00

Owner:

City of Buchanan

Project Title:

Project #100 - Interceptor to WWTP

Date:

July 2020

Project #:

M19094

Item No.	Description	Quantity	Unit	Unit Price	Total Amount
21	Concrete Sidewalk	900	SF	\$6.00	\$5,400.00
22	ADA Plates	50	SF	\$40.00	\$2,000.00
23	Restoration (topsoil, seed, mulch)	20	STA	\$750.00	\$15,000.00
24	SESC	1	LS	\$5,000.00	\$5,000.00
25	Tree Removal	500	LF	\$40.00	\$20,000.00
26	Traffic Control	1	LS	\$15,000.00	\$15,000.00
	Restoration Subtotal				\$584,400.00
Subtotal					\$1,259,400.00
Project Total					\$1,259,400.00
Project Costs by Funding Source					
Percentage of Restoration Allocated to Funding Source					
100.00%				Sanitary Water Road/General	\$1,259,400.00

Owner:

City of Buchanan

Project Title:

Project #110 - E Dewey Street Area (Main Street, Short Street, E Third Street)

Date:

July 2020

Project #:

M19094

Item No.	Description	Quantity	Unit	Unit Price	Total Amount
<u>Sanitary Sewer</u>					
1	Remove Sanitary Structures	16	EA	\$500.00	\$8,000.00
2	Abandon Sanitary Sewer	3,139	LF	\$12.00	\$37,700.00
3	4' Sanitary Manhole	16	EA	\$5,000.00	\$80,000.00
4	Sanitary Sewer, 10 inch	1,123	LF	\$90.00	\$101,100.00
5	Sanitary Sewer, 12 inch	920	LF	\$115.00	\$105,800.00
6	Sanitary Sewer, 18 inch	1,096	LF	\$125.00	\$137,000.00
7	Sanitary Lateral	40	EA	\$2,750.00	\$110,000.00
8	Creek Crossing	1	LS	\$30,000.00	\$30,000.00
9	Connect Adjacent Sewers	2	EA	\$10,000.00	\$20,000.00
10	Permanent Dewatering System	2,721	LF	\$30.00	\$81,600.00
11	Bypass Pumping	20	Days	\$3,500.00	\$70,000.00
Sanitary Subtotal					\$781,200.00
<u>Storm</u>					
12	Remove Storm Structures	40	EA	\$500.00	\$20,000.00
13	Abandon Storm Sewer	4,235	LF	\$12.00	\$50,800.00
14	2' Dia. Storm Sewer Inlet	31	EA	\$2,000.00	\$62,000.00
15	4' Dia. Storm Sewer Catch Basin	5	EA	\$3,000.00	\$15,000.00
16	6' Dia. Storm Sewer Catch Basin	4	EA	\$4,000.00	\$16,000.00
17	12" Storm Sewer	1,674	LF	\$45.00	\$75,300.00
18	15" Storm Sewer	988	LF	\$55.00	\$54,300.00
19	18" Storm Sewer	796	LF	\$75.00	\$59,700.00
20	24" Storm Sewer	552	LF	\$115.00	\$63,500.00

Owner:

City of Buchanan

Project Title:

Project #110 - E Dewey Street Area (Main Street, Short Street, E Third Street)

Date:

July 2020

Project #:

M19094

Item No.	Description	Quantity	Unit	Unit Price	Total Amount
21	42" Storm Sewer	225	LF	\$150.00	\$33,800.00
	Storm Subtotal				\$450,400.00
	<u>Water Main</u>				
22	Remove Hydrants	8	EA	\$500.00	\$4,000.00
23	Abandon Water Main	3,025	LF	\$12.00	\$36,300.00
24	8" DI Water Main	3,025	EA	\$90.00	\$272,300.00
25	8" Valve and Box	20	EA	\$2,000.00	\$40,000.00
26	5" Hydrant, Complete	8	LF	\$4,000.00	\$32,000.00
27	Water Services	45	EA	\$2,500.00	\$112,500.00
28	Creek Crossing	1	EA	\$20,000.00	\$20,000.00
29	Connections to Existing Main	10	EA	\$2,500.00	\$25,000.00
	Water Main Subtotal				\$542,100.00
	<u>Misc. / Restoration</u>				
30	Mobilization / General Conditions (5%)	1	LS	\$173,000.00	\$173,000.00
31	Remove Concrete Sidewalk	5,667	SY	\$7.00	\$39,700.00
32	Remove Concrete Curb and Gutter	10,200	LF	\$7.00	\$71,400.00
33	Remove HMA Pavement	17,000	SY	\$4.00	\$68,000.00
34	Subbase, CIP	5,667	CY	\$12.00	\$68,000.00
35	Subgrade Undercutting	550	CY	\$20.00	\$11,000.00
36	Machine Grading Modified	51	STA	\$3,000.00	\$153,000.00
37	4" HMA (Local Streets)	4,114	TON	\$90.00	\$370,300.00
38	8" Aggregate Base Modified	17,000	SY	\$12.00	\$204,000.00
39	Concrete Curb & Gutter	10,200	LF	\$15.00	\$153,000.00
40	Pavement Striping	1	LS	\$10,200.00	\$10,200.00
41	Concrete Sidewalk	51,000	SF	\$6.00	\$306,000.00

Estimate of Probable Cost

Owner:

City of Buchanan

Project Title:

Project #110 - E Dewey Street Area (Main Street, Short Street, E Third Street)

Date:

July 2020

Project #:

M19094

Item No.	Description	Quantity	Unit	Unit Price	Total Amount
42	ADA Plates	320	SF	\$40.00	\$12,800.00
43	Driveway	28	EA	\$1,500.00	\$42,000.00
44	Restoration (topsoil, seed, mulch)	51	STA	\$750.00	\$38,300.00
45	SESC	1	LS	\$13,000.00	\$13,000.00
46	Traffic Control	1	LS	\$30,000.00	\$30,000.00
47	Decorative Sidewalk Premium	3,000	SF	\$3.00	\$9,000.00
48	Streetscape (Main St.) Allowance	200	FT	\$400.00	\$80,000.00
	Restoration Subtotal				\$1,852,700.00
Subtotal					\$3,626,400.00
Project Total					\$3,626,400.00
Project Costs by Funding Source					
Percentage of Restoration Allocated to Funding Source					
		44%	Sanitary		\$1,597,200.00
		31%	Water		\$1,108,300.00
		25%	Road/General		\$920,900.00

Estimate of Probable Cost

Owner:

City of Buchanan

Project Title:

Project #120 - Red Bud Trail (From Chicago to Elizabeth)

Date:

July 2020

Project #:

M19094

Item No.	Description	Quantity	Unit	Unit Price	Total Amount	First Phase	Second Phase
<u>Sanitary Sewer</u>							
1	Remove Sanitary Structures	14	EA	\$500.00	\$7,000.00	\$2,500.00	\$4,500.00
2	Abandon Sanitary Sewer	3,645	LF	\$12.00	\$43,700.00	\$15,800.00	\$27,900.00
3	4' Sanitary Manhole	14	EA	\$5,000.00	\$70,000.00	\$25,300.00	\$44,700.00
4	Sanitary Sewer, 10 inch	3,645	LF	\$90.00	\$328,100.00	\$118,500.00	\$209,600.00
5	Sanitary Lateral	52	EA	\$2,750.00	\$143,000.00	\$51,600.00	\$91,400.00
6	Connect Adjacent Sewers	10	EA	\$10,000.00	\$100,000.00	\$36,100.00	\$63,900.00
7	Creek Crossing	1	EA	\$30,000.00	\$30,000.00	\$10,800.00	\$19,200.00
8	Permanent Dewatering System	1,345	LF	\$30.00	\$40,400.00	\$14,600.00	\$25,800.00
9	Bypass Pumping	19	Days	\$3,500.00	\$66,500.00	\$24,000.00	\$42,500.00
Sanitary Subtotal					\$828,700.00	\$299,200.00	\$529,500.00
<u>Storm</u>							
10	Remove Storm Structures	58	EA	\$500.00	\$29,000.00	\$10,500.00	\$18,500.00
11	Abandon Storm Sewer	5,000	LF	\$12.00	\$60,000.00	\$21,700.00	\$38,300.00
12	2' Dia. Storm Sewer Inlet	34	EA	\$2,000.00	\$68,000.00	\$24,600.00	\$43,400.00
13	4' Dia. Storm Sewer Catch Basin	18	EA	\$3,000.00	\$54,000.00	\$19,500.00	\$34,500.00
14	6' Dia. Storm Sewer Catch Basin	6	EA	\$4,000.00	\$24,000.00	\$24,000.00	
15	12" Storm Sewer	1,184	LF	\$45.00	\$53,300.00	\$19,200.00	\$34,100.00
16	15" Storm Sewer	1,097	LF	\$55.00	\$60,300.00		\$60,300.00
17	18" Storm Sewer	498	LF	\$75.00	\$37,400.00		\$37,400.00
18	21" Storm Sewer	1,171	LF	\$100.00	\$117,100.00	\$19,500.00	\$97,600.00
19	24" Storm Sewer	669	LF	\$115.00	\$76,900.00	\$76,900.00	
20	30" Storm Sewer	358	LF	\$125.00	\$44,800.00	\$44,800.00	
21	42" Storm Sewer	22	LF	\$150.00	\$3,300.00	\$3,300.00	
Storm Subtotal					\$628,100.00	\$264,000.00	\$364,100.00
<u>Water Main</u>							
22	Remove Hydrants	8	EA	\$500.00	\$4,000.00	\$1,400.00	\$2,600.00
23	Abandon Water Main	3,510	LF	\$12.00	\$42,100.00	\$15,200.00	\$26,900.00
24	8" DI Water Main	3,510	EA	\$90.00	\$315,900.00	\$114,100.00	\$201,800.00
25	8" Valve and Box	25	EA	\$2,000.00	\$50,000.00	\$18,100.00	\$31,900.00
26	5" Hydrant, Complete	8	LF	\$4,000.00	\$32,000.00	\$11,600.00	\$20,400.00
27	Water Services	52	EA	\$2,500.00	\$130,000.00	\$46,900.00	\$83,100.00
28	Creek Crossing	1	EA	\$20,000.00	\$20,000.00	\$7,200.00	\$12,800.00

Estimate of Probable Cost

Owner:

City of Buchanan

Project Title:

Project #120 - Red Bud Trail (From Chicago to Elizabeth)

Date:

July 2020

Project #:

M19094

Item No.	Description	Quantity	Unit	Unit Price	Total Amount	First Phase	Second Phase
29	Connections to Existing Main	10	EA	\$2,500.00	\$25,000.00	\$9,000.00	\$16,000.00
	Water Main Subtotal				\$619,000.00	\$223,500.00	\$395,500.00
	<u>Misc. / Restoration</u>						
30	Mobilization / General Conditions (5%)	1	LS	\$195,000.00	\$195,000.00	\$70,400.00	\$124,600.00
31	Remove Concrete Sidewalk	4,050	SY	\$7.00	\$28,400.00	\$10,300.00	\$18,100.00
32	Remove Concrete Curb and Gutter	7,290	LF	\$7.00	\$51,000.00	\$18,400.00	\$32,600.00
33	Remove HMA Pavement	17,820	SY	\$4.00	\$71,300.00	\$25,700.00	\$45,600.00
34	Subbase, CIP	5,940	CY	\$12.00	\$71,300.00	\$25,700.00	\$45,600.00
35	Subgrade Undercutting	600	CY	\$20.00	\$12,000.00	\$4,300.00	\$7,700.00
36	Machine Grading Modified	36	STA	\$3,000.00	\$109,400.00	\$39,500.00	\$69,900.00
37	6" HMA (Primary Streets)	6,469	TON	\$90.00	\$582,200.00	\$210,200.00	\$372,000.00
38	8" Aggregate Base Modified	17,820	SY	\$12.00	\$213,800.00	\$77,200.00	\$136,600.00
39	Concrete Curb & Gutter	7,290	LF	\$15.00	\$109,400.00	\$39,500.00	\$69,900.00
40	Pavement Striping	1	LS	\$7,290.00	\$7,300.00	\$2,600.00	\$4,700.00
41	Concrete Sidewalk	36,450	SF	\$6.00	\$218,700.00	\$79,000.00	\$139,700.00
42	ADA Plates	560	SF	\$40.00	\$22,400.00	\$8,100.00	\$14,300.00
43	Driveway	52	EA	\$1,500.00	\$78,000.00	\$28,200.00	\$49,800.00
44	Restoration (topsoil, seed, mulch)	36	STA	\$750.00	\$27,300.00	\$9,900.00	\$17,400.00
45	SESC	1	LS	\$10,000.00	\$10,000.00	\$3,600.00	\$6,400.00
46	Traffic Control	1	LS	\$30,000.00	\$30,000.00	\$10,800.00	\$19,200.00
47	Decorative Sidewalk Premium	4,000	SF	\$3.00	\$12,000.00	\$12,000.00	
48	Streetscape Allowance	400	FT	\$400.00	\$160,000.00	\$160,000.00	
	Restoration Subtotal				\$2,009,500.00	\$835,400.00	\$1,174,100.00
	Subtotal				\$4,085,300.00	\$1,622,100.00	\$2,463,200.00
	Project Total				\$4,085,300.00	\$1,622,100.00	\$2,463,200.00
	Project Costs by Funding Source						
	Percentage of Restoration Allocated to Funding Source						
		55%	Sanitary		\$1,933,900.00	\$758,700.00	\$1,175,300.00
		45%	Water		\$1,523,300.00	\$599,400.00	\$923,800.00
			Road/General		\$628,100.00	\$264,000.00	\$364,100.00

Estimate of Probable Cost

Owner:

City of Buchanan

Project Title:

Project #130 - Front Street (From Chippewa to East of Red Bud)

Date:

July 2020

Project #:

M19094

Item No.	Description	Quantity	Unit	Unit Price	Total Amount	First Phase	Second Phase
<u>Sanitary Sewer</u>							
1	Remove Sanitary Structures	14	EA	\$500.00	\$7,000.00	\$1,800.00	\$5,300.00
2	Abandon Sanitary Sewer	3,114	LF	\$12.00	\$37,400.00	\$9,400.00	\$28,100.00
3	4' Sanitary Manhole	14	EA	\$5,000.00	\$70,000.00	\$17,500.00	\$52,500.00
4	Sanitary Sewer, 8 inch	310	LF	\$80.00	\$24,800.00	\$6,200.00	\$18,600.00
5	Sanitary Sewer, 12 inch	2,804	LF	\$115.00	\$322,500.00	\$80,600.00	\$241,900.00
6	Sanitary Lateral	69	EA	\$2,750.00	\$189,800.00	\$47,500.00	\$142,400.00
7	Connect Adjacent Sewers	8	EA	\$10,000.00	\$80,000.00	\$20,000.00	\$60,000.00
8	Permanent Dewatering System	980	LF	\$30.00	\$29,400.00	\$7,400.00	\$22,100.00
9	Bypass Pumping	16	Days	\$3,500.00	\$56,000.00	\$14,000.00	\$42,000.00
Sanitary Subtotal					\$816,900.00	\$204,400.00	\$612,900.00
<u>Storm</u>							
10	Remove Storm Structures	51	EA	\$500.00	\$25,500.00	\$9,400.00	\$16,100.00
11	Abandon Storm Sewer	5,237	LF	\$12.00	\$62,800.00	\$23,100.00	\$39,700.00
12	2' Dia. Storm Sewer Inlet	34	EA	\$2,000.00	\$68,000.00	\$12,500.00	\$55,500.00
13	4' Dia. Storm Sewer Catch Basin	13	EA	\$3,000.00	\$39,000.00	\$7,200.00	\$31,800.00
14	6' Dia. Storm Sewer Catch Basin	4	EA	\$4,000.00	\$16,000.00	\$16,000.00	
15	12" Storm Sewer	1,306	LF	\$45.00	\$58,800.00	\$7,700.00	\$51,100.00
16	15" Storm Sewer	997	LF	\$55.00	\$54,800.00		\$54,800.00
17	18" Storm Sewer	100	LF	\$75.00	\$7,500.00		\$7,500.00
18	24" Storm Sewer	2,189	LF	\$115.00	\$251,700.00	\$125,900.00	\$125,900.00
19	36" Storm Sewer	645	LF	\$130.00	\$83,900.00	\$83,900.00	
Storm Subtotal					\$668,000.00	\$285,700.00	\$382,400.00
<u>Water Main</u>							
20	Remove Hydrants	6	EA	\$500.00	\$3,000.00	\$800.00	\$2,300.00
21	Abandon Water Main	3,200	LF	\$12.00	\$38,400.00	\$9,600.00	\$28,800.00
22	8" DI Water Main	3,200	EA	\$90.00	\$288,000.00	\$72,000.00	\$216,000.00
23	8" Valve and Box	17	EA	\$2,000.00	\$34,000.00	\$8,500.00	\$25,500.00
24	5" Hydrant, Complete	10	LF	\$4,000.00	\$40,000.00	\$10,000.00	\$30,000.00
25	Water Services	69	EA	\$2,500.00	\$172,500.00	\$43,100.00	\$129,400.00
26	Creek Crossing	3	EA	\$20,000.00	\$60,000.00	\$60,000.00	
27	Connections to Existing Main	14	EA	\$2,500.00	\$35,000.00	\$8,800.00	\$26,300.00
Water Main Subtotal					\$670,900.00	\$212,800.00	\$458,300.00
<u>Misc. / Restoration</u>							
28	Mobilization / General Conditions (5%)	1	LS	\$212,000.00	\$212,000.00	\$53,000.00	\$159,000.00
29	Remove Concrete Sidewalk	5,211	SY	\$7.00	\$36,500.00	\$9,100.00	\$27,400.00

Estimate of Probable Cost

Owner:

City of Buchanan

Project Title:

Project #130 - Front Street (From Chippewa to East of Red Bud)

Date:

July 2020

Project #:

M19094

Item No.	Description	Quantity	Unit	Unit Price	Total Amount	First Phase	Second Phase
30	Remove Concrete Curb and Gutter	7,580	LF	\$7.00	\$53,100.00	\$13,300.00	\$39,800.00
31	Remove HMA Pavement	16,462	SY	\$4.00	\$65,800.00	\$16,500.00	\$49,400.00
32	Subbase, CIP	5,487	CY	\$12.00	\$65,800.00	\$16,500.00	\$49,400.00
33	Subgrade Undercutting	550	CY	\$20.00	\$11,000.00	\$2,800.00	\$8,300.00
34	Machine Grading Modified	38	STA	\$3,000.00	\$113,700.00	\$28,400.00	\$85,300.00
35	6" HMA (Primary Streets)	5,976	TON	\$90.00	\$537,800.00	\$134,500.00	\$403,400.00
36	8" Aggregate Base Modified	16,462	SY	\$12.00	\$197,500.00	\$49,400.00	\$148,100.00
37	Concrete Curb & Gutter	7,580	LF	\$15.00	\$113,700.00	\$28,400.00	\$85,300.00
38	Pavement Striping	1	LS	\$7,580.00	\$7,600.00	\$1,900.00	\$5,700.00
39	Concrete Sidewalk	46,900	SF	\$6.00	\$281,400.00	\$70,400.00	\$211,100.00
40	ADA Plates	540	SF	\$40.00	\$21,600.00	\$5,400.00	\$16,200.00
41	Driveway	48	EA	\$1,500.00	\$72,000.00	\$18,000.00	\$54,000.00
42	Restoration (topsoil, seed, mulch)	38	STA	\$750.00	\$28,400.00	\$7,100.00	\$21,300.00
43	SESC	1	LS	\$10,000.00	\$10,000.00	\$2,500.00	\$7,500.00
44	Traffic Control	1	LS	\$30,000.00	\$30,000.00	\$7,500.00	\$22,500.00
45	Decorative Sidewalk Premium	10,000	SF	\$3.00	\$30,000.00	\$7,500.00	\$22,500.00
46	Streetscape Allowance (Front St.)	1,000	FT	\$400.00	\$400,000.00	\$400,000.00	
Restoration Subtotal					\$2,287,900.00	\$872,200.00	\$1,416,200.00
Subtotal					\$4,443,700.00	\$1,575,100.00	\$2,869,800.00
Project Total					\$4,443,700.00	\$1,575,100.00	\$2,869,800.00
Project Costs by Funding Source							
Percentage of Restoration Allocated to Funding Source							
	55.00%		Sanitary	\$2,075,245.00	\$684,100.00	\$1,391,800.00	
	45.00%		Water	\$1,700,455.00	\$605,300.00	\$1,095,600.00	
			Road/General	\$668,000.00	\$285,700.00	\$382,400.00	

Owner:

City of Buchanan

Project Title:

Project #140 - Days Avenue (From Front to Carroll)

Date:

July 2020

Project #:

M19094

Item

No.	Description	Quantity	Unit	Unit Price	Total Amount
<u>Sanitary Sewer</u>					
1	Remove Sanitary Structures	9	EA	\$500.00	\$4,500.00
2	Abandon Sanitary Sewer	2,545	LF	\$12.00	\$30,500.00
3	4' Sanitary Manhole	9	EA	\$5,000.00	\$45,000.00
4	Sanitary Sewer, 8 inch	165	LF	\$80.00	\$13,200.00
5	Sanitary Sewer, 10 inch	880	LF	\$90.00	\$79,200.00
6	Sanitary Sewer, 12 inch	1,500	LF	\$115.00	\$172,500.00
7	Sanitary Lateral	52	EA	\$2,750.00	\$143,000.00
8	Connect Adjacent Sewers	3	EA	\$10,000.00	\$30,000.00
9	Permanent Dewatering System	880	LF	\$30.00	\$26,400.00
10	Bypass Pumping	13	Days	\$3,500.00	\$45,500.00
Sanitary Subtotal					\$589,800.00
<u>Storm</u>					
11	Remove Storm Structures	1	EA	\$500.00	\$500.00
12	Abandon Storm Sewer	400	LF	\$12.00	\$4,800.00
13	4' Dia. Storm Sewer Catch Basin	1	EA	\$3,000.00	\$3,000.00
14	24" Storm Sewer	400	LF	\$115.00	\$46,000.00
Storm Subtotal					\$54,300.00
<u>Misc. / Restoration</u>					
15	Mobilization / General Conditions (5%)	1	LS	\$76,000.00	\$76,000.00
16	Remove Concrete Sidewalk	707	SY	\$7.00	\$4,900.00
17	Remove Concrete Curb and Gutter	5,770	LF	\$7.00	\$40,400.00

Owner:

City of Buchanan

Project Title:

Project #140 - Days Avenue (From Front to Carroll)

Date:

July 2020

Project #:

M19094

Item No.	Description	Quantity	Unit	Unit Price	Total Amount
18	Remove HMA Pavement	8,259	SY	\$4.00	\$33,000.00
19	Subbase, CIP	2,753	CY	\$12.00	\$33,000.00
20	Subgrade Undercutting	250	CY	\$20.00	\$5,000.00
21	Machine Grading Modified	29	STA	\$3,000.00	\$86,600.00
22	4" HMA (Local Streets)	1,999	TON	\$90.00	\$179,900.00
23	8" Aggregate Base Modified	8,259	SY	\$12.00	\$99,100.00
24	Concrete Curb & Gutter	5,770	LF	\$15.00	\$86,600.00
25	Pavement Striping	1	LS	\$5,770.00	\$5,800.00
26	Concrete Sidewalk	6,363	SF	\$6.00	\$38,200.00
27	ADA Plates	220	SF	\$40.00	\$8,800.00
28	Driveway	52	EA	\$1,500.00	\$78,000.00
29	Restoration (topsoil, seed, mulch)	29	STA	\$750.00	\$21,600.00
30	SESC	1	LS	\$8,000.00	\$8,000.00
31	Traffic Control	1	LS	\$15,000.00	\$15,000.00
32	Decorative Sidewalk Premium	1,000	SF	\$3.00	\$3,000.00
33	Streetscape Allowance (Front St.)	300	FT	\$400.00	\$120,000.00
	Restoration Subtotal				\$942,900.00
Subtotal					\$1,587,000.00
Project Total					\$1,587,000.00
Project Costs by Funding Source					
Percentage of Restoration Allocated to Funding Source					
100%				Sanitary	\$1,532,700.00
				Water	
				Road/General	\$54,300.00

Estimate of Probable Cost

Owner:

City of Buchanan

Project Title:

Project #150 - Oak Street (From Alexander to W Fourth St)

Date:

October 2019

Project #:

M19094

Item No.	Description	Quantity	Unit	Unit Price	Total Amount	First Phase	Second Phase
<u>Sanitary Sewer</u>							
1	Remove Sanitary Structures	10	EA	\$500.00	\$5,000.00	\$3,100.00	\$1,900.00
2	Abandon Sanitary Sewer	2,865	LF	\$12.00	\$34,400.00	\$21,500.00	\$12,900.00
3	4' Sanitary Manhole	10	EA	\$5,000.00	\$50,000.00	\$31,300.00	\$18,800.00
4	Sanitary Sewer, 10 inch	2,450	LF	\$90.00	\$220,500.00	\$137,800.00	\$82,700.00
5	Sanitary Sewer, 12 inch	415	LF	\$115.00	\$47,700.00	\$29,800.00	\$17,900.00
6	Sanitary Lateral	42	EA	\$2,750.00	\$115,500.00	\$72,200.00	\$43,300.00
7	Connect Adjacent Sewers	4	EA	\$10,000.00	\$40,000.00	\$25,000.00	\$15,000.00
8	Creek Crossing	1	EA	\$20,000.00	\$20,000.00		\$20,000.00
9	Permanent Dewatering System	1,685	LF	\$30.00	\$50,600.00	\$31,600.00	\$19,000.00
10	Bypass Pumping	15	Days	\$3,500.00	\$52,500.00	\$32,800.00	\$19,700.00
Sanitary Subtotal					\$636,200.00	\$385,100.00	\$251,200.00
<u>Water Main</u>							
11	Remove Hydrants	6	EA	\$500.00	\$3,000.00	\$1,900.00	\$1,100.00
12	Abandon Water Main	3,100	LF	\$12.00	\$37,200.00	\$23,300.00	\$14,000.00
13	12" DI Water Main	3,100	EA	\$115.00	\$356,500.00	\$222,800.00	\$133,700.00
14	12" Valve and Box	16	LF	\$3,500.00	\$56,000.00	\$35,000.00	\$21,000.00
15	5" Hydrant, Complete	10	LF	\$4,000.00	\$40,000.00	\$25,000.00	\$15,000.00
16	Water Services	42	EA	\$2,500.00	\$105,000.00	\$65,600.00	\$39,400.00
17	Creek Crossing	1	EA	\$20,000.00	\$20,000.00		\$20,000.00
18	Connections to Existing Main	15	EA	\$2,500.00	\$37,500.00	\$23,400.00	\$14,100.00
Water Main Subtotal					\$655,200.00	\$397,000.00	\$258,300.00
<u>Storm</u>							
19	Remove Storm Structures	12	EA	\$500.00	\$6,000.00		\$6,000.00
20	Abandon Storm Sewer	690	LF	\$12.00	\$8,300.00		\$8,300.00
21	2' Dia. Storm Sewer Inlet	7	EA	\$2,000.00	\$14,000.00		\$14,000.00
22	4' Dia. Storm Sewer Catch Basin	6	EA	\$3,000.00	\$18,000.00		\$18,000.00
23	12" Storm Sewer	580	LF	\$45.00	\$26,100.00		\$26,100.00
24	18" Storm Sewer	110	LF	\$75.00	\$8,300.00		\$8,300.00
Storm Subtotal					\$80,700.00		\$80,700.00
<u>Misc. / Restoration</u>							
25	Mobilization / General Conditions (5%)	1	LS	\$120,000.00	\$120,000.00	\$75,000.00	\$45,000.00
26	Remove Concrete Sidewalk	3,567	SY	\$7.00	\$25,000.00	\$15,600.00	\$9,400.00
27	Remove Concrete Curb and Gutter	6,420	LF	\$7.00	\$44,900.00	\$28,100.00	\$16,800.00
28	Remove HMA Pavement	10,127	SY	\$4.00	\$40,500.00	\$25,300.00	\$15,200.00
29	Subbase, CIP	3,376	CY	\$12.00	\$40,500.00	\$25,300.00	\$15,200.00

Estimate of Probable Cost

Owner:

City of Buchanan

Project Title:

Project #150 - Oak Street (From Alexander to W Fourth St)

Date:

October 2019

Project #:

M19094

Item No.	Description	Quantity	Unit	Unit Price	Total Amount	First Phase	Second Phase
30	Subgrade Undercutting	300	CY	\$20.00	\$6,000.00	\$3,800.00	\$2,300.00
31	Machine Grading Modified	32	STA	\$3,000.00	\$96,300.00	\$60,200.00	\$36,100.00
32	4" HMA (Local Streets)	2,451	TON	\$90.00	\$220,600.00	\$137,900.00	\$82,700.00
33	8" Aggregate Base Modified	10,127	SY	\$12.00	\$121,500.00	\$75,900.00	\$45,600.00
34	Concrete Curb & Gutter	6,420	LF	\$15.00	\$96,300.00	\$60,200.00	\$36,100.00
35	Pavement Striping	1	LS	\$6,420.00	\$6,400.00	\$4,000.00	\$2,400.00
36	Concrete Sidewalk	32,100	SF	\$6.00	\$192,600.00	\$120,400.00	\$72,200.00
37	ADA Plates	640	SF	\$40.00	\$25,600.00	\$16,000.00	\$9,600.00
38	Driveway	42	EA	\$1,500.00	\$63,000.00	\$39,400.00	\$23,600.00
39	Restoration (topsoil, seed, mulch)	32	STA	\$750.00	\$24,100.00	\$15,100.00	\$9,000.00
40	SESC	1	LS	\$9,000.00	\$9,000.00	\$5,600.00	\$3,400.00
41	Traffic Control	1	LS	\$15,000.00	\$15,000.00	\$9,400.00	\$5,600.00
Restoration Subtotal					\$1,147,300.00	\$717,200.00	\$430,200.00
Subtotal					\$2,519,400.00	\$1,499,300.00	\$1,020,400.00
Project Total					\$2,519,400.00	\$1,499,300.00	\$1,020,400.00
Project Costs by Funding Source							
Percentage of Restoration Allocated to Funding Source							
		50%	Sanitary		\$1,209,900.00	\$743,700.00	\$466,300.00
		50%	Water		\$1,228,900.00	\$755,600.00	\$473,400.00
			Road/General		\$80,700.00		\$80,700.00

Estimate of Probable Cost

Owner:

City of Buchanan

Project Title:

PROJECT #350: Glaser - Forcemain Replacement Project

Date:

July 2020

Project #:

2130386

Item No.	Description	Quantity	Unit	Unit Price	Total Amount
1	Mobilization / General Conditions (5%)	1	LS	\$6,000.00	\$6,000.00
2	Forcemain, 8-inch	545	LF	\$85.00	\$46,325.00
3	Remove HMA Pavement	100	SY	\$4.00	\$400.00
4	HMA patch, 4-inch	100	SY	\$40.00	\$4,000.00
5	Gravel patch, 6-inch	100	SY	\$12.00	\$1,200.00
6	Driveway Replacement	4	EA	\$1,500.00	\$6,000.00
7	Restoration (Topsoil, seed and mulch)	5.45	STA	\$750.00	\$4,087.50
8	Remove Concrete Curb and Gutter	40	LF	\$7.00	\$280.00
9	Concrete curb and gutter	40	LF	\$15.00	\$600.00
10	Remove Concrete Sidewalk	250	SY	\$7.00	\$1,750.00
11	Concrete Sidewalk	2,600	SF	\$6.00	\$15,600.00
12	ADA Plates	20	SF	\$40.00	\$800.00
13	Traffic Control	1	LS	\$5,000.00	\$5,000.00
14	Soil Erosion Control	1	LS	\$2,500.00	\$2,500.00
15	Bypass - Pumping (300 gpm)	4	Day	\$3,500.00	\$14,000.00
16	FM Abandonment	545	LF	\$12.00	\$6,540.00
17	FM - reconnection at LS	1	LS	\$10,000.00	\$10,000.00
18	FM - reconnection at discharge MH	1	LS	\$5,000.00	\$5,000.00
Subtotal					\$130,100.00
Project Total					\$130,100.00

All work quantities and costs are estimated for preliminary planning purposes only.
 Costs estimated in 2019 Dollars

Estimate of Probable Cost

Owner:

City of Buchanan

Project Title:

Water Treatment Plant and Wellhouse

Date:

September 10, 2020

Project #:

2190800

Item No.	Description	Quantity	Unit	Unit Price	Total Amount
1	General Requirements (prime contractor mark up, bonds,mobilization, etc.	1.0	Isum	\$300,000.00	\$300,000.00
2	Site Work/onsite piping	1.0	Isum	\$600,000.00	\$600,000.00
3	Water Treatment, Process	1.0	Isum	\$1,600,000.00	\$1,600,000.00
4	Foundations/Concrete Work	1.0	Isum	\$170,000.00	\$170,000.00
5	Structural Steel, Misc. Metals, FRP	1.0	Isum	\$50,000.00	\$50,000.00
6	Architectural (40 x 60 ' block building with 14' to ceiling)	1.0	Isum	\$460,000.00	\$460,000.00
7	Plumbing	1.0	Isum	\$80,000.00	\$80,000.00
8	HVAC	1.0	Isum	\$70,000.00	\$70,000.00
9	Electrical	1.0	Isum	\$300,000.00	\$300,000.00
10	Site work/fill and mitigation/fencing	1.0	Isum	\$100,000.00	\$100,000.00
11	Backwash tank and pumping	1.0	Isum	\$150,000.00	\$150,000.00
Construction Total					\$3,880,000.00
Allowance for contingencies (10%)					\$390,000.00
Total					\$4,270,000.00

Estimate of Probable Cost

Owner:

City of Buchanan

Project Title:

New Well and Wellhouse

Date:

September 4, 2020

Project #:

2190800

Item No.	Description	Quantity	Unit	Unit Price	Total Amount
I. Phase I - Soil Borings					
1	Phase I Mobilization	1.0	lsum	\$2,000.00	\$2,000.00
2	Drilling and Sampling in Unconsolidated Soils from 0 to 300 feet- Soil Boring Including Abandonment	600.0	v.f.	\$25.00	\$15,000.00
3	Sieve Analysis	30.0	each	\$25.00	\$750.00
Phase I Subtotal					\$17,750.00
II. Phase II - Observation Wells					
4	Phase II Mobilization	1.0	lsum	\$4,000.00	\$4,000.00
5	Drilling and Sampling in Unconsolidated Soils - Observation Wells	600.0	v.f.	\$25.00	\$15,000.00
6	Sieve Analysis	30.0	each	\$25.00	\$750.00
7	Furnishing and Installing 6" (min.) Dia. Casing including Cement Grout (2 wells)	600.0	v.f.	\$60.00	\$36,000.00
8	Furnishing and Placing 6" (min.) Screens (2 wells)	40.0	v.f.	\$200.00	\$8,000.00
9	Developing 6" Observation Well (per well)	2.0	each	\$2,000.00	\$4,000.00
10	Disinfection and Bacteriological Testing	2.0	each	\$1,000.00	\$2,000.00
11	Furnishing, Installing and Removing Test Pump and Disc	1.0	each	\$3,000.00	\$3,000.00
12	Preliminary Test Pumping - Well #1	4.0	hrs.	\$200.00	\$800.00
13	Water Quality Testing	1.0	lsum	\$1,500.00	\$1,500.00
14	Furnishing and Installing Locking Protective Covers	2.0	each	\$800.00	\$1,600.00
Phase II Subtotal					\$76,650.00
III. Phase III- Test/Production Well					
15	Phase III Mobilization	1.0	lsum	\$4,000.00	\$4,000.00
16	Drilling and Sampling in Unconsolidated Soils - 12" Test/Production Well	300.0	v.f.	\$50.00	\$15,000.00
17	Furnishing and Placing 12" Diameter Casing including Cement Grout	300.0	v.f.	\$100.00	\$30,000.00
18	Furnishing and Installing Screen, Including Gravel Pack	50.0	v.f.	\$300.00	\$15,000.00
19	Well Alignment and Plumbness Testing	1.0	each	\$2,000.00	\$2,000.00
20	Developing Test/Production Well	50.0	hrs.	\$200.00	\$10,000.00
21	Well Disinfection	2.0	each	\$1,000.00	\$2,000.00
22	Bacteriological Testing	1.0	lsum	\$500.00	\$500.00
23	Furnishing, Installing, and Removing Test Equipment and Temporary Discharge Piping	1.0	each	\$4,500.00	\$4,500.00
24	Step-drawdown Test	6.0	hrs.	\$200.00	\$1,200.00
25	Aquifer Performance Test (Pumping Phase)	72.0	hrs.	\$200.00	\$14,400.00
26	Aquifer Performance Test (Recovery Phase)	24.0	hrs.	\$50.00	\$1,200.00

Item No.	Description	Quantity	Unit	Unit Price	Total Amount
27	Well Pump	1.0	each	\$60,000.00	\$60,000.00
28	Furnishing and Installing Temporary Cap or Plug	1.0	each	\$300.00	\$300.00
29	Abandon Well 3	1.0	each	\$10,000.00	\$10,000.00
Phase III Subtotal					\$170,100.00
IV. Phase IV - Wellhouse and Site Work					
30	Block Wellhouse Building (approx. 300 sf)	1.0	lsum	\$90,000.00	\$90,000.00
31	Security Fence and gate	150.0	l.f.	\$30.00	\$4,500.00
32	Site piping	1.0	lsum	\$50,000.00	\$50,000.00
33	Site work and drive to building	1.0	lsum	\$50,000.00	\$50,000.00
34	Propane fired generator	1.0	lsum	\$70,000.00	\$70,000.00
Phase IV Subtotal					\$264,500.00

Construction Total **\$529,000.00**

Allowance for contingencies, etc. (10%) \$53,000.00

Total **\$582,000.00**

Appendix C

Drinking Water Connections

Summary of Customer Data		
WATER		
	#	Flow/Year
Total Number of Water System Connections	2091	104,296,000
Total Number of Water System Connections - City	1924	93,886,000
Total Number of Water System Connections - Township - both Townships	167	10,410,000
Niles Township	17	1,423,000
Buchanan Township	150	8,987,000
City - Single Family Connections	1696	83,646,000
City - Other Connections	228	10,240,000
Total	1924	93,886,000
Buchanan Township - Single Family Connections	142	8,881,000
Buchanan Township - Other Connections	8	106,000
Niles Township - Single Family Connections	17	1,423,000
Niles Township - Other Connections	0	0
Total	167	10,410,000
City - Single Family Connections	1696	83,646,000
Buchanan Township - Single Family Connections	142	8,881,000
Niles Township - Single Family Connections	17	1,423,000
Total	1855	93,950,000
City - Other Connections	228	10,240,000
Buchanan Township - Other Connections	8	106,000
Niles Township - Other Connections	0	0
Total	236	10,346,000