AGENDA
Blackduck City Council - Work Session Meeting

6:00 PM - Monday, March 20, 2023
City Hall, 8 Summit Drive, Blackduck MN

Crunden Electrical and Heating upgrade Quote for City Hall

5. ADJOURNMENT

PROPOSAL
POLAR INSULATING LLC
51041 STATE HWY 46
SQUAW LAKE, MN 56681
218 659 4351 OFFICE
218 659 4641 FAX
218 244 1297 CELL
3/16/23

City of Blackduck

Bid # 2474

Attention: Mike Schwanke
8 Summit Ave E
Blackduck, MN 56630
218 407 4084 Mike cell
218 835 4803 office

Job: 197 Industrial Ln NW Blackduck, MN

Grind floor

Apply base coat with chips

Apply 2 top wear coats of polyaspartic

Total $ 10,680.00

	Blackduck Change
Remove steel railing	-5009
Additional framing at both fire walls	3320
Added drywall includes deduct from behind metal panels	11392
Add for updated and new doors, includes deduct door	6850
Hvac Dampers	2068
Build two new attic access	1328
Delete fire suppression	-65909
Extend upper landing to stairs	1200
Delete 1" spray foam New R value 21 add fire coating	-2000
Remove all flooring	-13032
Remove metal lockers	-4084
Change metal panels	-5899
modify casework	-13032
Change Di Pipe to Pvc and Use ads N12 in lieu of 15" and 12" sdr 40 pvc	-11000
Remove Interior wall	-950
Delete 4 windows	-2849
Delete Painting	-22785
Delete Dumpsters	-10000
Delete Temp Heat	-5000
Delete Final Cleaning	-3000

-138,391.00

WiDSETH

ARCHITECTS ▪ ENGINEERS
SCIENTISTS ▪ SURVEYORS

Preliminary Engineering Report
for
City of Blackduck, MN

Prepared For:

USDA Rural Development, Minnesota

Prepared By:

Lynn C. Eaton, PE

Widseth, Smith, Nolting & Assoc., Inc.

315 5th Street NW
Bemidji, MN 56601

www.widsethsmithnolting.com

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Preliminary Engineering Report

For

City of Blackduck
Assessment of All City Water & Sewer Utilities

County of Beltrami
State of Minnesota

Prepared for City of Blackduck

By

Lynn C. Eaton, PE

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly licensed Professional Engineer under the laws of the State of Minnesota.

Lynn C. Eaton, PE, December 21, 2020 License No. 19607

1. Project Planning

1.1. Location

A. City of Blackduck is in North Central Minnesota roughly 26 miles North East of Bemidji. Its latitude and longitude are 47.73935-N & 94.58446-W, respectively. Refer to Figure-1-1 on Page 4. A topographic perspective of Blackduck can be found in Figure 1-2 on Page 5. A Zoning Map of Blackduck, MN can be found in Figure 1-3 on Page 6.

B. Vertically, the highest ground elevations of the central part of the City are just under 1,410 feet above sea level—the high point of all water and wastewater services. The City's wastewater lagoons lie roughly 9,000 WNW of City center in a straight-line distance at an elevation of 1,390 feet. The topography is very flat, and City relies heavily on pump stations to manage its wastewater effluent.

1.2. Environmental Resources Present

Refer to Appendix D – Environmental Checklist beginning on Page 57 for a detailed list of social, environmental, and economic impacts work to improve City's water and wastewater systems might have on these resources.

A. An inventory of environmental resources in and near City of Blackduck include:

1. Numerous wetlands. Refer to Figure 1-2 on Page 5 to scan the various wetlands within and near City Limits.
2. Nearby lakes include:
    a. Blackduck Lake (west of City) receives surface waters from within City Limits as well as the two lakes noted below. Blackduck Lake drains to Lower Red Lake and is ultimately outlet through Lake Winnipeg to Hudson Bay.
    b. Stoner Lake (south of City)
    c. Crandall Lake (west of City)
3. Rivers and streams.
    a. Coburn Creek (west and south of City). Coburn Creek is the micro drainage area of Blackduck with its outlet at Blackduck Lake.
4. Forests.
    a. City's southern boundary coincides with the northern boundary of Chippewa National Forest. City of Blackduck was founded because of the great logging potential of the area.
    b. Blackduck State Forest is a state forest near (south and east) the town of Blackduck, located in Beltrami and Itasca counties in Minnesota. It is adjacent to the Buena Vista State Forest and the federally managed Chippewa National Forest. It is managed primarily by the Minnesota Department of Natural Resources and the counties. The landscape is hilly and mixed soils are a result of the area's glacial history. Aspen and northern hardwoods dominate the upland sites, and black spruce, tamarack, and northern white cedar cover lowland sites.
5. Parks and recreation.
    a. Pine Tree Park Municipal Campground is west of City on the east shore of Blackduck Lake. Pine Tree Park offers 9 primitive camping sites, 10 sites with electric, 13 RV sites with electric and water, and 2 picnic shelters that can be reserved.
    b. Blackduck Municipal Golf Course is located west of City, adjacent to Pine Tree Park.

c. Blackduck Wayside Rest Area.

d. Blue Ox Voyager Trail passes through City. The Blue Ox-Voyageur Trail is a multi-use trail that permits ATV's and snowmobiles. It also accommodates mountain bikers, hikers, and equestrians along the former railroad right-of-way between International Falls and Lake Bemidji State Park. The 107-mile trail travels through remote stretches of sub-alpine forest, spruce swamps, and upland stands of aspen, linking towns along the way. The trail incorporates beautiful railroad trestles across the Little Fork and Big Fork rivers. At its southern end in Lake Bemidji State Park, the Blue Ox Trail-Voyageur Trail connects to the Paul Bunyan State Trail at County Road 20. The latter, carries on for another 110 miles and is paved

e. City of Blackduck Trail begins in the Wayside Rest Stop and is a 2.25-mile walking and biking trail partially looping City. A second phase of construction would complete the loop.

f. Camp Rabideau is located six miles south of Blackduck. The camp is one of the 2,650 camps President Franklin D. Roosevelt opened during his New Deal Program. The camp is a National Historic Landmark and is well preserved. The camp was opened to give jobs to young men between the ages of seventeen and twenty-one in hopes of helping the country get out of the depression.

6. Floodplains.

a. City of Blackduck is in Beltrami County. None of Beltrami County has been officially mapped for floodplains.

1.3. Population Trends

A. History

1. The village of Blackduck was organized in October 1900, and the town was incorporated in December 21, 1900. The first settlers of this community came from Crookston, Minnesota. The town was founded because of the great logging potential of the area. The Continental Divide is located near the area and provided good drainage which resulted in good logging because the land was not wet. The community was named for Blackduck Lake

B. Geography

1. According to the United States Census Bureau, the city has a total area of 1.71 square miles (4.43 km2), of which, 1.67 square miles (4.33 km2) is land and 0.04 square miles (0.10 km2) is water.

C. 2010 Census (per Wikipedia)

1. As of the census of 2010, there were 785 people, 338 households, and 185 families living in the city. The population density was 470.1 inhabitants per square mile (181.5/km2). There were 372 housing units at an average density of 222.8 per square mile (86.0/km2). The racial makeup of the city was 89.4% White, 0.4% African American, 4.6% Native American, 0.5% Asian, 0.1% Pacific Islander, 0.8% from other races, and 4.2% from two or more races. Hispanic or Latino of any race were 2.0% of the population.

2. There were 338 households of which 32.8% had children under the age of 18 living with them, 33.1% were married couples living together, 16.9% had a female householder with no husband present, 4.7% had a male householder with no wife present, and 45.3% were non-families. 41.1% of all households were made up of individuals and 22.1% had someone living alone who was 65 years of age or older. The average household size was 2.22 and the average family size was 2.97.

3. The median age in the city was 37.1 years. 27.1% of residents were under the age of 18; 9.3% were between the ages of 18 and 24; 23.1% were from 25 to 44; 19.6% were from 45 to 64; and 20.9% were 65 years of age or older. The gender makeup of the city was 45.9% male and 54.1% female

D. Population Forecast

1. The table below documents each US Census with a project of the next three Census based on Blackduck's population trends.

Table 1-1; Population Trends, Forecast

Census	Pop.	% Chg.
1910	942	…
1920	788	-16%
1930	704	-11%
1940	753	7%
1950	732	-3%
1960	765	5%
1970	595	-22%
1980	653	10%
1990	718	10%
2000	696	-3%
2010	785	13%
2020	816	4%
2030	852	4%
2040	890	4%

1.4. Community Engagement

A. Form of Government.

1. The Blackduck City Council is a governing board of five councilors including a Mayor, all who must reside within the city limits of Blackduck. City employs an Administrator to manage the day-to-day operations.

B. Public Works.

1. City's has an organized Public Works staff led by a licensed Public Works Supervisor with a staff two full-time and several part-time employees that vary with the season.

C. Governing Ordinances and Other Public Information.

1. City has a comprehensive set of ordinances that residents can access online.
2. City posts its annual budget on its website for resident access and invites feedbacks throughout the year and hosts an annual Truth in Taxation Hearing that is open to the public.
3. City posts its most recent drinking water report on its website for public access. The report shows test results for treatment of contaminants. These include lead, copper, barium, trihalomethanes, haloacetic acids, chlorine, fluoride sodium, and sulfate.

D. Public Hearings.

1. City offers opportunities for public involvement on matters that affect the health, safety, and financial well-being of its residents. Large scale expenditures are open to public comment prior to enactment by City Council.

Figure-1-1; Project Location

Figure 1-2; Topographic Map of Blackduck & Surrounding Area

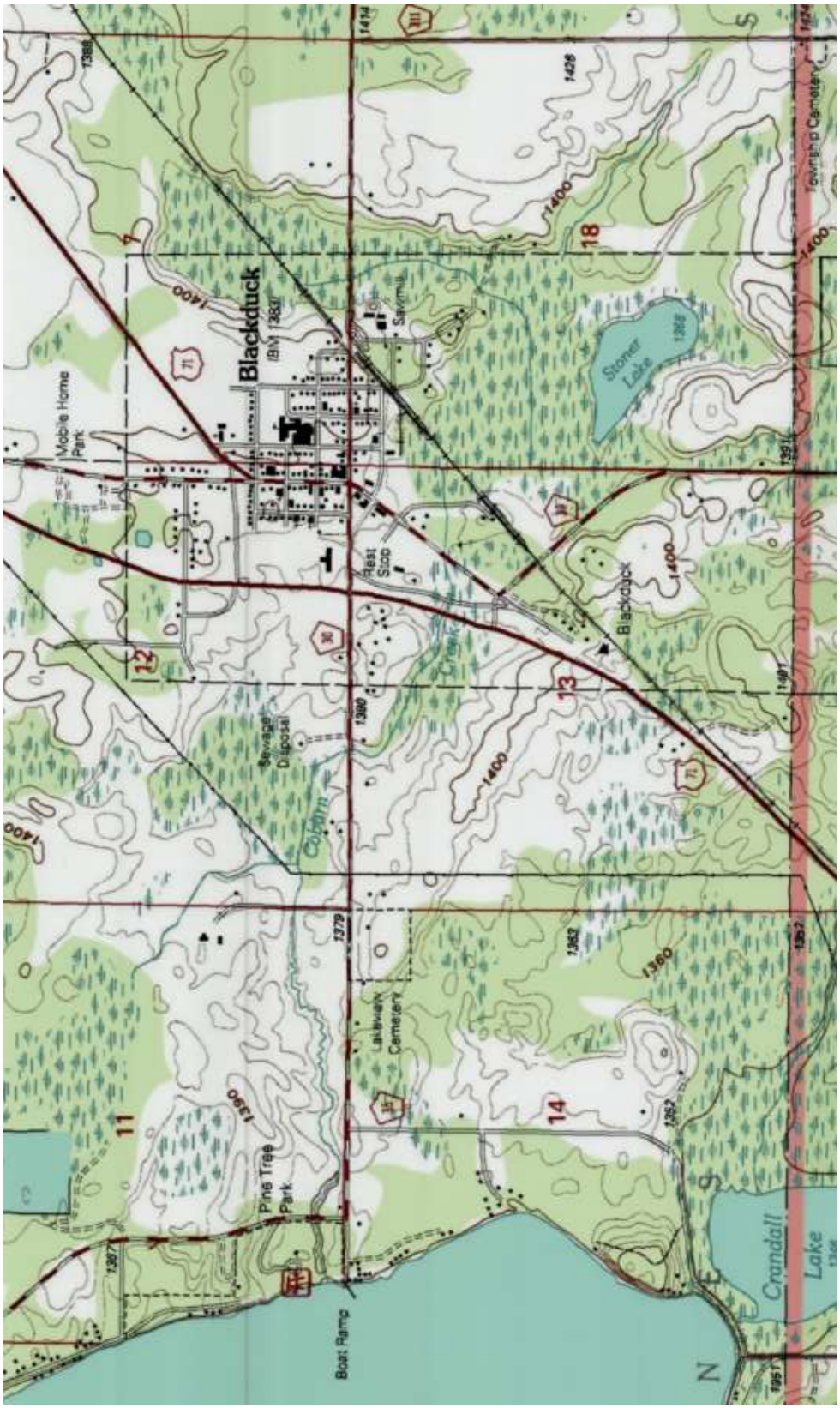


Figure 1-3; Zoning Map of Blackduck, MN

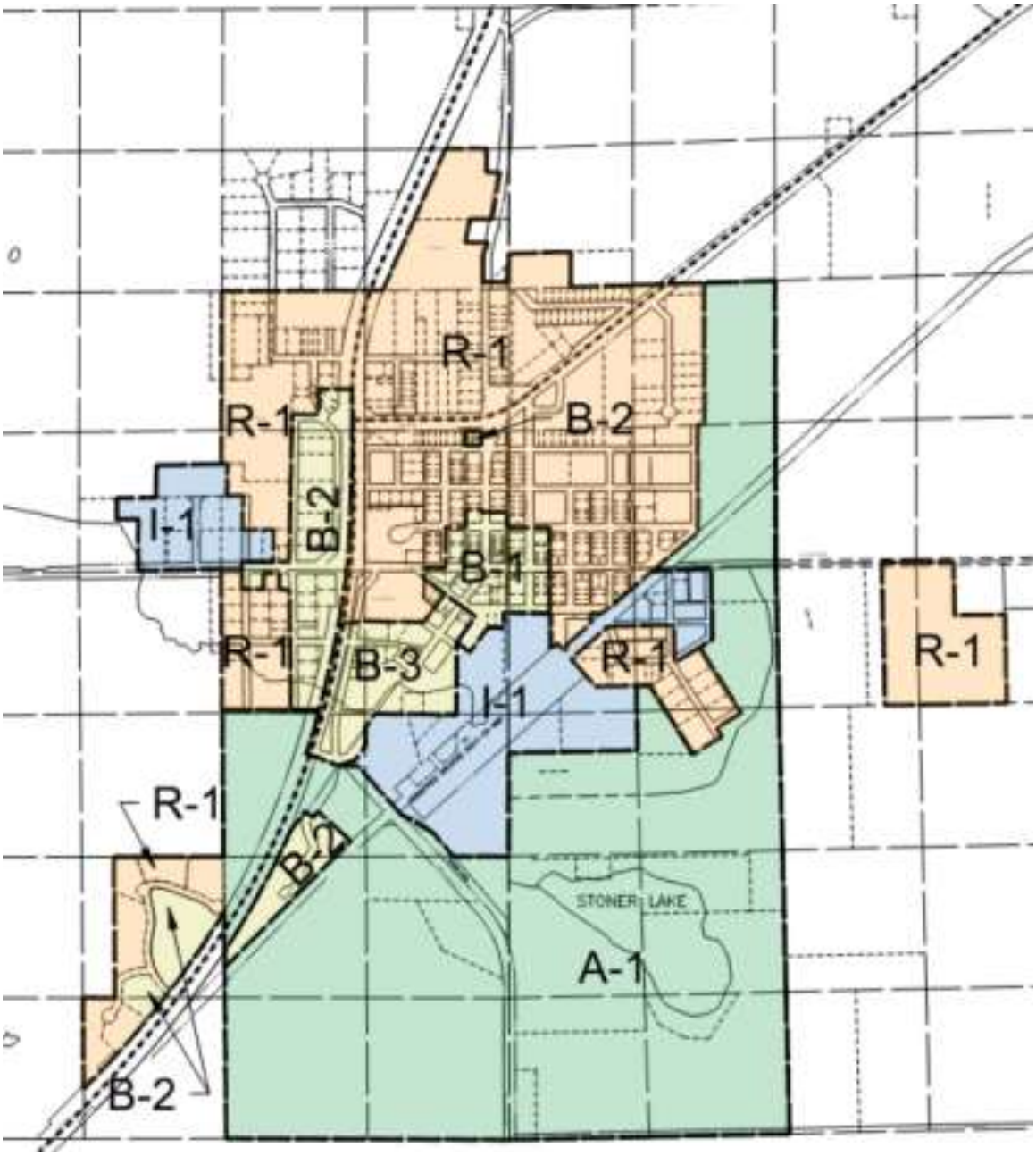
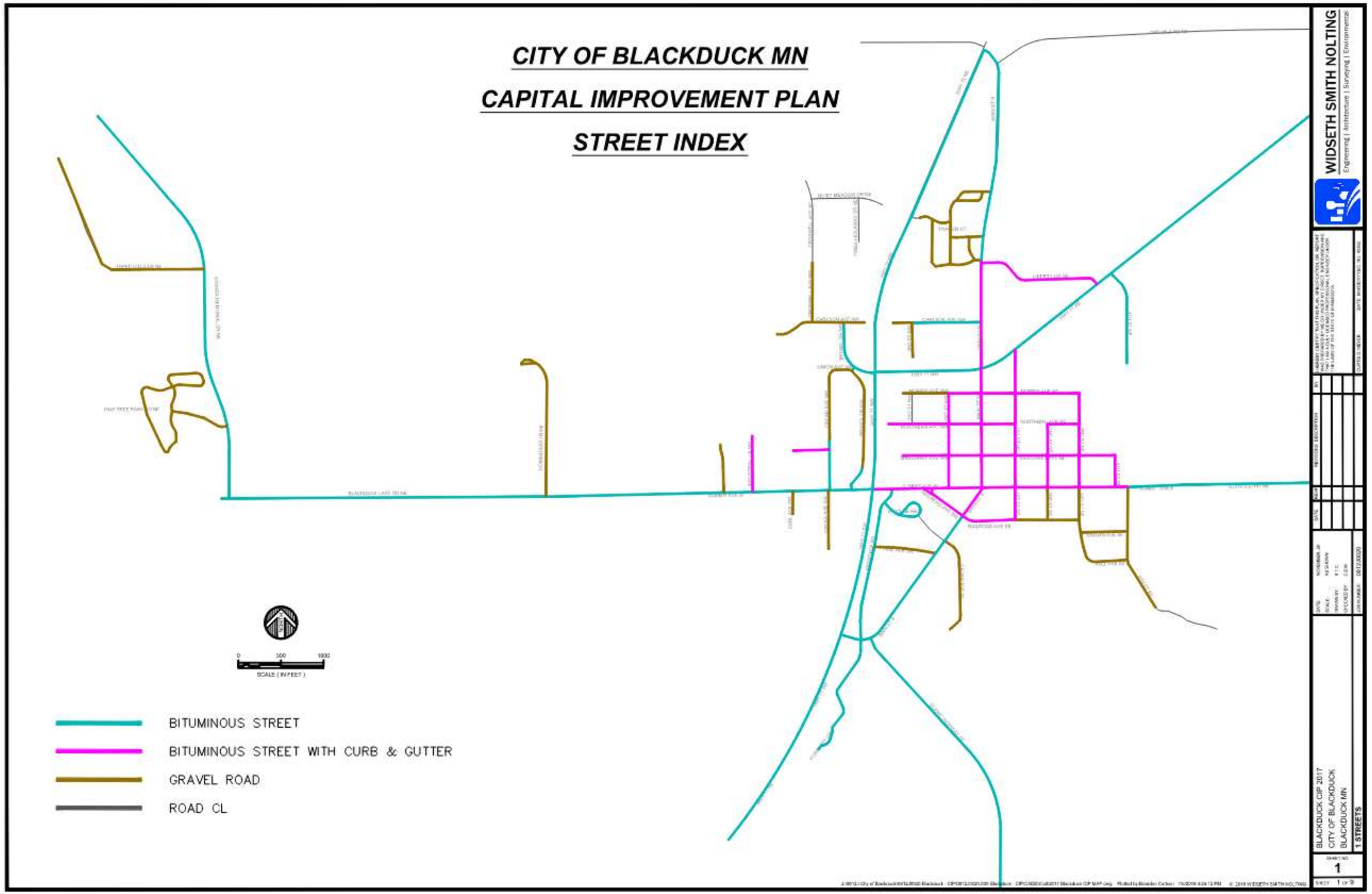


Figure 1-4; Layout of City Streets



2. Existing Facilities

2.1. Location Maps

A. A map depicting the water distribution network is shown in Figure 2-5 on Page 20.

B. A map depicting the sanitary sewer network is shown in Figure 2-6 on Page 21.

C. A view of the lagoon complex is shown in Figure 2-7 on Page 22.

2.2. Condition of Existing Facilities

A. Potable Water System

1. Wells. There are two active wells: Well #5 is the back up well that is used periodically to exercise the components. Well #8 is the main well at approximately 130gpm. When the wells are switched chemical adjustments are made. The wells are currently in good working condition

2. Water Treatment Plant. WTP was constructed in approximately 2002 and was refurbished in 2017. The facility includes pressure vessels for iron and manganese removal, chlorine addition and a Filtronics control system. WTP produces approximately 50,000 gallons per day, this is not expected to change in the future and an additional well is not needed for the PER planning period. Sodium Hypochlorite is the current disinfection method and is desired to continue this use in the future. A new permanent generator is need to meet back up power requirements

3. Water Storage. The water storage tank is currently in good working order.

4. Water Distribution Network. The original distribution network is of cast iron watermains and are over 50 years old. A significant amount of the existing water distribution system is constructed of 4" cast iron pipe and 4" PVC (thin wall) pipe. City repaired two watermain breaks on Morris Avenue and one watermain break on Margaret Avenue. As this pipe ages, more breaks can be anticipated.

5. Fire protection is a major concern. There are currently 15 hydrants within the city limits that are fed off 4" watermains. Per 10 State Standards, these watermains should be upsized to 6" or 8" diameter, improving the pressure and flow within the system.

6. Typical water services consist of 1" copper or galvanized pipe. There are 112 water services currently being served with 4" watermains. There are 92 water services within the project planning area that warrant rehabilitation. Service pipes were typically installed with the watermains and are likely over 50 years old. If watermains are replaced, services should be replaced to the curb stop. This will eliminate unneeded joints within the service line. Replacing water services while the street is being reconstructed will significantly reduce the risk of costly failures in the future.

B. Sanitary Sewer System

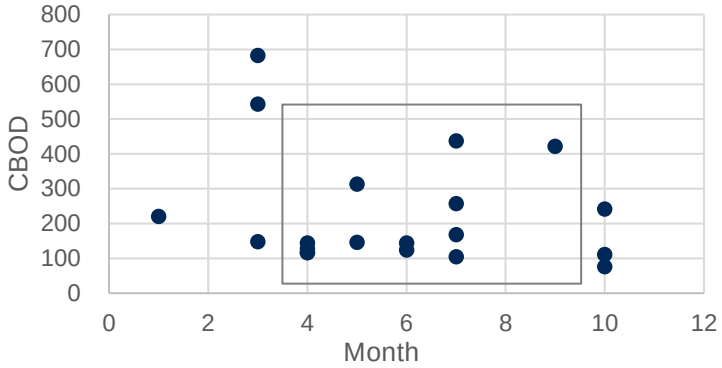
1. Effluent limitations. City operates their sewage disposal system under State Disposal System (SDS) Permit No. MN 0052302. Table 2-1 summarizes key limitations and how City is performing in 2019. City has not had an MPCA violation in the last five years.

Table 2-1; Current SDS Permit Limitations & 2019 Values

Substance or Characteristics	Limiting Concentration or Range Controlled Discharge	2019 Values
5-Day Carbonaceous Biochemical Oxygen Demand	Monitor Only	144 – 682
Total Suspended Solids	Monitor Only	54 – 294
Fecal Coliform Organisms	<200 Organisms per 100 ml	12 - 138
pH (Standard Unit)	Monitor Only	7.7 – 7.8
Effluent Flow	<45.8 MGD	0.030 – 0.844

2. Wastewater Hydraulic and Organic Loading
    a. An analysis of the daily discharge monitoring reports for the years 2015 – 2019 can be found in Appendix A – Determination of Design Flows that begins on Page 47 of this report. Key observations include:
        i. Peak flows are in the months of April and May as the Spring thaw completely releases upper groundwater flows.
        ii. Infiltration to the collection system is very evident and understandable given that 43% of the collection system conduit is of vitrified clay pipe.
        iii. The mean daily flow to the pond system is 0.0805 MGD. When one considers the current population of Blackduck to be very near 816, and that a design use of 100 gallons per capita day, then a daily flow of 0.0805 MGD can be reasonably expected.
        iv. 96% of the daily flow volumes are under 0.1500 MGD with the most reported daily flow volume being 0.0610 MGD.
        v. There are 86 daily reports (4.72% of all daily reports) that exceed 0.1500 MGD. 67 of those daily reports took place during the wet months of April through September. The other daily reports took place during the dry months. 12 of the daily reports in the dry months took place in the month of October 2019 (October 11 – October 27). During this time City received nearly four inches of precipitation and took place before the ground froze so the system behaved similarly to a wet month.
        vi. The range of reported CBOD loadings is shown in Table 2-1 (above). See Figure 2-1 (below) to appreciate the distribution of reported values by month sampled (for years 2015-2019). Higher concentrations are reported during the dry months and lower concentrations in wet months when flow rates are higher.

Figure 2-1; CBOD by Month



b. Refer to Appendix A – Determination of Design Flows, beginning on Page 47, for an analysis of the daily flow information for years 2015 – 2019. See Table 10-3 on Page 49 for Project Design Flows.

c. Effluent Irrigation Volumes. See Figure 2-2 (below) for a summary of annual effluent applied to irrigated lands for years 2015 – 2019. See Figure 2-3 (below) to see monthly irrigation volumes. Irrigation is carried out during the wet months (April – September) and the irrigation is sometime extended into October as weather permits.

Figure 2-2; Irrigation by Year

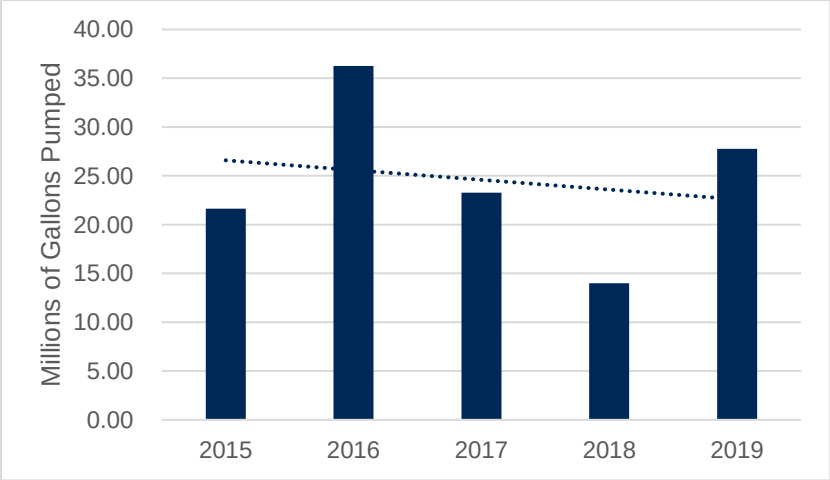
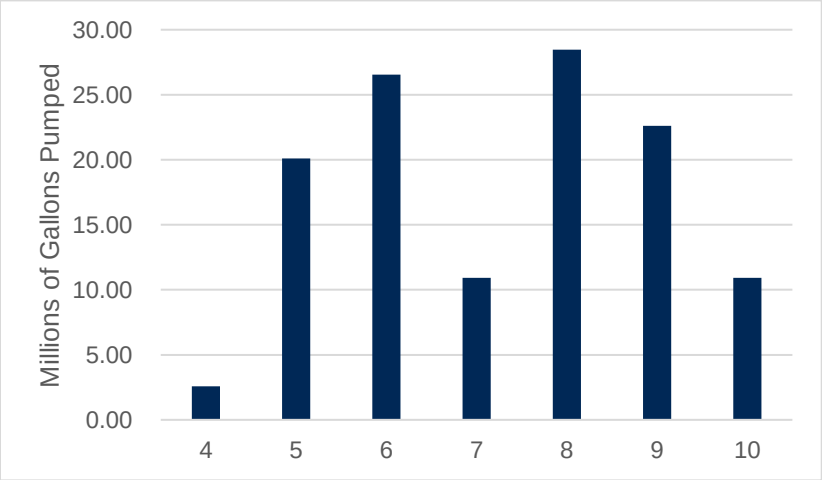


Figure 2-3; Irrigation by Month



d. The current hydraulic load on the land application system is taken to be the annual influent flow. average annual design flow, which is 80,500-gpd. The area irrigated is 158 acres. The current annual hydraulic loading on the land application system is 29.4 Mgal well under permit limitations of 45.8 Mgal. Note that 2016 was a peak year for irrigation but that 36.2 Mgal is under permit limitations.

3. Collection System

a. Collection system is shown in Figure 2-6 on Page 21. The collection system consists of:

i. five pump stations,

ii. 90-manholes,

iii. 2,600 feet of 6" clay tile (VCP) sewer,

iv. 9,500 feet of 8" clay tile (VCP) sewer,

v. 16,370 feet of 8" PVC sewer,

vi. 2,600 feet of 4" PVC force main and

vii. 11,620 feet of 8" PVC force main.

b. The clay tile sewer pipes are estimated to be 60-years or older. Televised clay tile sewer lines identified excessive cracking, holes, and blockages. There are approximately a dozen brick manholes remaining in the city. The brick manholes are poorly sealed, resulting in a significant amount of infiltration.

c. MPCA describes excessive infiltration to be that greater than 120 gpcd. Given City's current population of 816 that daily flow amount is 0.0979 MGD. Between the year 2015 & 2019 (1,836 occurrences), City experienced "excessive infiltration" 22% of the time.

d. As discussed earlier, inflow and infiltration within the collection system is a major flow contributor in wet years. It is estimated that wet weather flows can be reduced nearly 39,000 GPD (refer to Appendix A – Determination of Design Flows) by rehabilitating the failing collection system. Reducing inflow and infiltration will extend the serviceability of the stabilization ponds, irrigation system and pump station pumps. The existing clay tile sewer pipes and the brick manholes warrant replacement.

e. Figure 2-4Error! Reference source not found. (below) typifies what takes place each year. The plot is for the year 2019, which was a wet year. One can expect the influence of precipitation during the Summer months however, the greatest influence on infiltration is during the Spring thaw period. Peaks flows repeatedly occur in April and May. See Table 2-2; Summary of Five-Year System Inflows (below).

Figure 2-4; Precipitation Influence on Influent

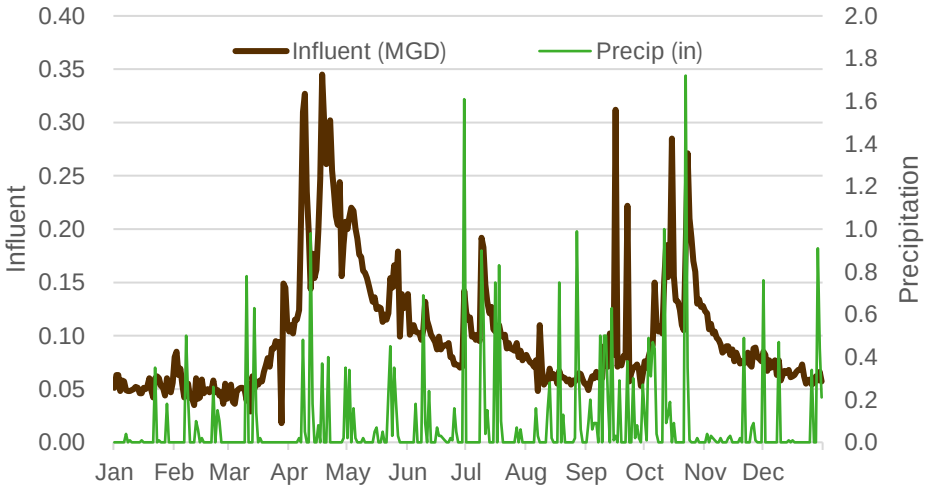


Table 2-2; Summary of Five-Year System Inflows

Month	Mean	Min	Max
1	0.056	0.042	0.073
2	0.058	0.036	0.092
3	0.078	0.046	0.123
4	0.116	0.074	0.176
5	0.116	0.073	0.202
6	0.094	0.073	0.137
7	0.082	0.059	0.127
8	0.068	0.046	0.113
9	0.070	0.050	0.140
10	0.085	0.051	0.137
11	0.076	0.055	0.126
12	0.066	0.046	0.088

f. Consider also that City on average, City pumps 0.0575 MGD[1] of potable water. Given the values shown in Table 2-3; Summary of Wet & Dry Period Flows (below) note the system collects 33,500 GPD of infiltration during wet months[2] and no less than 13,200 GPD during dry months[3].

1 2019 average daily
2 Apr, May. Jun, Jul, Aug, Sep
3 Oct, Nov, Dec, Jan, Feb, Mar

Table 2-3; Summary of Wet & Dry Period Flows (MGD)

Period	Mean	Min	Max
Wet	0.0910	0.0625	0.1491
Dry	0.0707	0.0462	0.1102

g. Repetitive sewer backups occur at the Drake Motel pump station. The pump station contains a Meyer, 110 volt, 0.5-horsepower, submersible sewage pump and control panel. The pump discharges into a 2-in forcemain. The pump does not contain a grinder and becomes clogged several times a year. The pump station is located at a low point of the sewer line and the clog causes a backup at the pump station location. The Drake Motel pump station warrants replacement.

h. Within the southeast quadrant of the city limits there are 10 existing homes and seven marketable lots not connected to the central sewer system. The existing homes are use Individual Sewer Treatment Systems (ISTSs) for wastewater treatment and disposal. The typical lot size is less than one acre. The area is surrounded by wetland and the water table is estimated to be between 0' and 10'. Based on the lot density and the high-water table, it is expected that these systems are not in compliance with MPCA guidelines. The City of Blackduck wishes to eliminate these onsite systems rather than proceed with the expensive efforts of regulating the systems. It appears feasible to expand the gravity collection system to service these lots.

4. Condition of Existing Wastewater Treatment Facility

a. Figure 2-7 on Page 22 shows the configuration of the existing wastewater treatment facility to the northwest of the City. The facility was constructed in 1987 and consists of a three-cell stabilization pond with a land application system outlet. The two primary cells are 5.0-acres each and the secondary cell is 13.1-acres. The pond is connected to the collection system via an eight (8) inch PVC forcemain. The pond discharges into a twelve (12) inch forcemain to a land application site that is 158-acres. The irrigation system consists of four center pivot spray irrigation units and two solid set irrigation guns. The land application site was constructed with a tile drainage system that outlets to a low land area to the southeast of the land application site. The effluent limits for the site are 45.8-Mgal of flow and 200 organisms per 100-ml for fecal coliform.

b. The stabilization ponds and control structures are in satisfactory condition.

c. The effluent pumping station warrants rehabilitation. The pump station transfers effluent to the spray irrigation system is located at the northeast corner of the secondary pond. Effluent from either the secondary pond or primary pond number 1 may be transferred to the pump station through gravity lines. Operator uses one of two vertical turbine pumps to transfer wastewater effluent from the wet well to the center pivot irrigation systems through a 12" diameter force main.

d. Per original construction plans, an "angle pressure relief valve" and "pressure switch" were shown for returning pump flow back to the wet well. The purpose of this equipment was to control the pressure and related flow to the center pivot irrigation system.

e. Actual installation of the vertical turbine pumps varied from the original plans which had both pump discharge flanges facing east. Pumps were orientated with the discharge flanges facing opposite directions (north south). Each of the vertical turbine pumps discharge directly into a side outlet elbow to turn the flow 90 degrees to the east. Air vacuum valves are located on top of the side outlet elbows. This type

of fitting was likely selected (verses a 90-degree bend) to save a tee fitting which the air vacuum valves were to be located per original drawings.

f. Use of a side outlet elbow directly off a pump discharge flange to change flow direction is not recommended by pump manufacturers or pumping system design guidelines. Additionally, the air vacuum valves located on top of the side outlet elbows likely never worked properly due to the turbulent flow conditions at this location and currently are not functional.

g. Existing check valves, pressure relief valves and other equipment associated with the effluent pump station are currently not functional or operating correctly. City of Blackduck staff use hand operated isolation valves while operating one pump at a time to "control" flow and pressure to the center pivot irrigation system as best as possible.

h. No flow measurement of effluent to the irrigation system was provided in the original design. Operators control pressure to the center pivot irrigation system units being used by hand setting of valve(s) for recycling of pumped flow back into the wet well. Effluent flow pumped to the irrigation system is then estimated by the published center pivot irrigation unit capacity of 16,500 gph times the number of hours operated each season. This provides the city with an effluent total irrigated each year that is likely plus or minus 20% of the actual amount.

i. Deteriorated conditions of the effluent pump station system and lack of true flow measurement need to be addressed as part of any general renovations completed on the overall wastewater collection, treatment, and irrigation systems. This would allow the City of Blackduck to document irrigation flows and application rates in more detail to allow maximization of existing irrigation system capacity.

j. Wastewater Irrigation Filed. See Appendix C – USCS Classification of Wastewater Irrigation Field beginning on Page 55 for a description of the characteristics of the irrigation field.

k. Proposed improvements include:

   i. Complete replacement of discharge piping, valves and fittings from pump discharge flanges to the 12" diameter force main connection.

   ii. Flow meters would be added to the discharge piping of each pump to record actual amount of effluent being sent to the irrigation system depending on the pump used.

   iii. Since the original installation of the vertical turbine pumps in the late 1980's the use of variable frequency drives in golf course and agricultural irrigation systems has become quite common. This is done for both energy savings and allows for a more uniform flow / pressure to be maintained, depending on the number if irrigation units operating at any given time. Rather than continue with the original pressure relief valve design the existing control panels for pump 1 and 2 should be replaced with control panels utilizing VFD's. While the energy savings will be modest ($1,400 to $1,600 per year since the pumps run about 1,000 hours each year total) the VFD's will reduce the waste of excess horsepower associated with the old recirculation system. The major benefit of the VFD's will be the uniform flow and pressure that pivot irrigators will see and provide for a uniform coverage / application rate on the agricultural crops.

   iv. The center pivot irrigators were constructed in 1987 and are showing signs of deterioration. Center pivot irrigators continue to require more and more maintenance each year. To avoid costly operation and maintenance with stop gap fixes, it is recommended that the four center pivot irrigators be overhauled with new control panels, electric motors, switches, tires, and sprinkler heads.

2.3. Financial Status of any Existing Facilities

City undergoes a formal financial audit and the most recent audit is the source for much of the data presented in this section. That 100-page audit is not attached to this report but is available upon request.

A. City Revenue & Expenses (Overall Budget)

Table 2-4; 2019 City Revenue

Fund	Amount
Local Government Aid	$254,282
Property Tax	$179,373
protection	$78,979
Fines, Forfeits	$5,000
State Aids (Police, Fire)	$34,500
Liquor Store Transfer	$65,000
Charges for Services	$8,000
Miscellaneous	$15,233
Total	$640,367

Table 2-5; 2019 City Expenses

Department	Amount
Council	$8,850
City Administration	$133,852
General Government & Bldgs.	$15,050
Public Safety	$297,878
Streets	$125,583
Street Lighting	$17,500
Parks	$19,795
Library	$21,859
Total:	$640,367

B. Annual Operating & Maintenance Costs, Including Energy Costs

1. The table below is an average of the actual five-year operating income or loss. The Municipal Water Enterprise consistently operated with a positive outcome while the Municipal Sewage Enterprise operated at a loss each of the previous five years except 2019. See Part 2.3.B.2 below for an explanation.

Table 2-6; Operation, Maintenance Costs; Summary 2015-2019

Description	Water	Sewage	Total
Operating Revenues			
Charges for Services	$200,500	$148,940	$349,440
Operating Expenses			
Personnel Services	$74,150	$77,330	$151,480
Utilities	$10,270	$21,480	$31,750

Description	Water	Sewage	Total
Supplies & Materials	$8,880	$2,730	$11,610
Repairs & Maintenance	$7,550	$7,310	$14,860
Contracted Services	$4,230	$4,260	$8,490
Insurance	$3,630	$5,380	$9,010
Depreciation & Amortization	$74,090	$66,670	$140,760
Other Expenses	$9,100	$4,710	$13,810
Total Operating Expenses	$191,900	$189,870	$381,770
Operating Income (Loss)	$8,600	-$40,930	-$32,330

2. There was an operating income / loss improvement for the Sewage Enterprise in 2019. See the Table 2-7 below. The Depreciation & Amortization line had averaged $79,740 for years 2015-2018 then the amount dropped to $14,374 in 2019. This improved the Operating Expense line for that year and instead of the Sewage side operating at a loss (-40,930 for years 2015-2019), for year 2019 the Sewage Enterprise had income over expenses of $6,139.

   a. The reason for the improvement was that in 2019 a previous project on Summit & Main was closed and the amount of the amortization for that project no longer appeared as a liability for City.

   b. Since the Operating and Maintenance Costs is a historical look at City operating costs, this analysis will not project a large reduction in the Sewage Enterprise Depreciation and Amortization. Reviewers are reminded that the liability is indeed reduced enabling City an improved financial outlook.

   Table 2-7; Detail of Sewage Enterprise O&M Costs (2015-2019)

Description	Sparkline	2015	2016	2017	2018	2019
Operating Revenue		$135,208	$137,252	$157,536	$159,514	$155,182
Operating Expenses						
Personnel Services		$68,193	$78,611	$80,921	$76,712	$82,189
Utilities		$16,197	$26,331	$21,603	$16,701	$26,588
Supplies & Materials		$3,060	$2,495	$2,656	$2,912	$2,526
Repairs & Maintenance		$6,776	$7,868	$5,535	$7,612	$8,773
Contracted Services		$2,847	$3,556	$4,304	$7,206	$3,393
Insurance		$6,815	$3,646	$5,060	$5,745	$5,620
Depreciation & Amortization		$78,462	$78,463	$80,895	$81,140	$14,374
Other Expenses		$4,435	$3,859	$4,208	$5,491	$5,580
Total Operating Expenses		$186,785	$204,829	$205,182	$203,519	$149,043
Net Operating Income (Loss)		($51,577)	($67,577)	($47,646)	($44,005)	$6,139

C. Capital Improvement Plan

1. The City has a capital improvement plan (CIP) to repair failing street, sewer, and water infrastructure. A summary of the improvement plan's anticipated costs is shown in Table 2-8. The total amount includes contingencies and engineering costs. The work of the CIP includes:

   a. 15,810 linear feet of watermain

   b. 9,550 linear feet of sanitary sewer

c. 10,236 linear feet of street reconstruction

d. 6,772 feet of new street construction

Table 2-8; CIP Costs

Plan Year	Amount
2018-2023	$2,143,942
2024-2028	$719,661
2029-2033	$973,971
2034-2038	$882,099
Total	$4,719,674

D. Tabulation of Users

Category	Accounts	Water (base)	Sewer (base)	Water (per gallon)	Sewer (per gallon)
Residential	208	$15	$15	$0.0066	$0.0042
Multi Family	156	$10	$10	$0.0066	$0.0042
Commercial	78	$25	$25	$0.0066	$0.0042

E. Current Debt Service

1. In 2019 City had $1,522,500 in bonds, notes, and capital leases and retired a total of $253,029. The annual principal plus interest paid in 2019 was $207,774.

2. . These liabilities are tabulated in Table 2-9 below.

Table 2-9; Long-Term Debt as of December 31, 2019

Description	Interest Rate	Issue Date	Maturity Date	Amount Authorized & Issued	Balance 12/31/2019	Principal Due 2019	Interest Due 2019
General Obligation Issues:							
2016 G.O. Equipment Certificate	2.50	9/15/16	2/1/25	$93,000	$81,000	$13,000	$1,863
Special Assessment Bonds with Governmental Commitment:							
G.O. Bonds, Series 2006A	4.100-4.650	8/17/06	2/1/22	$495,000	$110,000	$35,000	$4,301
G.O. Refunding Bonds, Series 2009A	3.000-4.250	12/28/09	1/1/24	$445,000	$60,000	$15,000	$2,426
G.O. Disposal System Bonds, Series 2014A	3.00	10/20/14	2/1/25	$105,000	$64,000	$10,000	$1,770
Total Net Special Assessment				$1,045,000	$234,000	$60,000	$8,497
General Obligation Revenue Bonds:							
G.O. Refunding Revenue Bonds, Series 2012A	0.750-2.550	12/27/12	2/1/35	$1,075,000	$825,000	$45,000	$17,793
2012A Equipment Bond	0.750-2.550	12/27/12	2/1/35	$25,000	$15,000	$3,000	$244
2012A Club House Refunded	0.750-2.550	12/27/12	2/1/35	$65,000	$35,000	$7,000	$569
Total G.O. Revenue Bonds				$1,165,000	$875,000	$55,000	$18,606
Notes Payable:							
2017 G.O. Disposal System Note	2.95	11/1/17	2/1/28	$180,000	$71,644	$16,000	$1,877
2016 G.O. Water Revenue Note	1.00	8/22/16	8/20/41	$148,293	$168,163	$7,000	$1,076
Industrial Lane Internal Note		12/7/11	2/1/22	$171,492	$24,915	$9,967	
Frontage Road Improvements Note		12/31/15	1/1/29	$54,837	$51,484	$4,850	$1,538
Total Notes Payable				$554,622	$316,206	$37,817	$4,491
Capital Lease Payable:							
GM Financial	10.00	3/23/17	3/23/21	$38,620	$15,800	$7,705	$795

F. Reserve Account

1. City asset reserve account accounts for infrastructure replacement at the end of 2019. See Table 2-10 (below).

Table 2-10; Capital Reserve Funds

Fund	Sewer & Water Related	Other Purposes
Sewer Maintenance Sinking	$69,214	
Sewer Replacement	$8,681	
Fire Hall Maintenance		$226,829
Water Sinking	$121,156	
Public Works Reserve	$17,397	
Fire Dept. Equipment		$227,397
Subtotal by Purpose	$216,448	$454,226
Total all Purposes	$670,674	...

G. City has not conducted any water, energy, or waste audits.

Figure 2-5; Water, Energy, Waste Audits

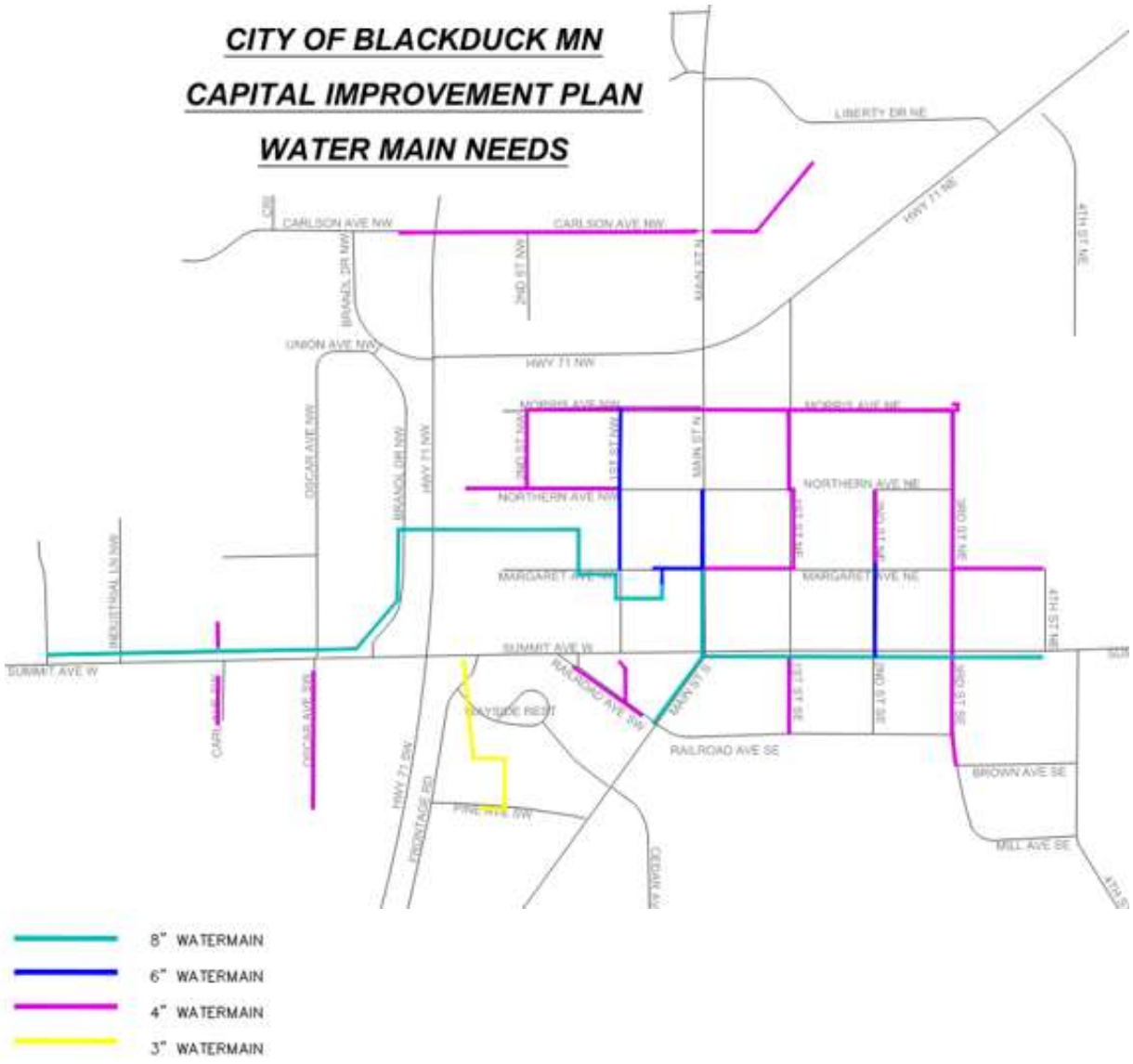


Figure 2-6; Sanitary Sewer Needs

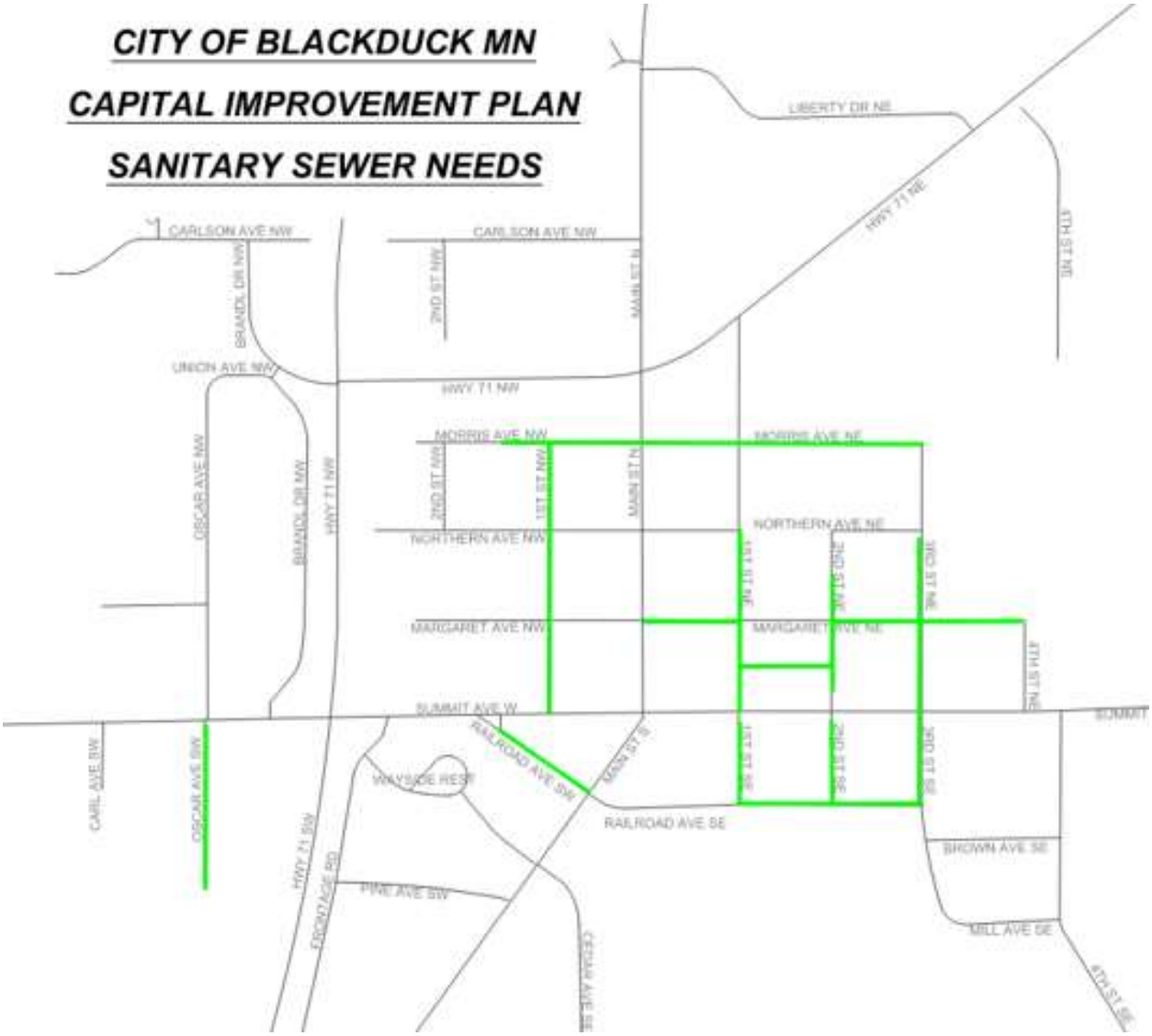
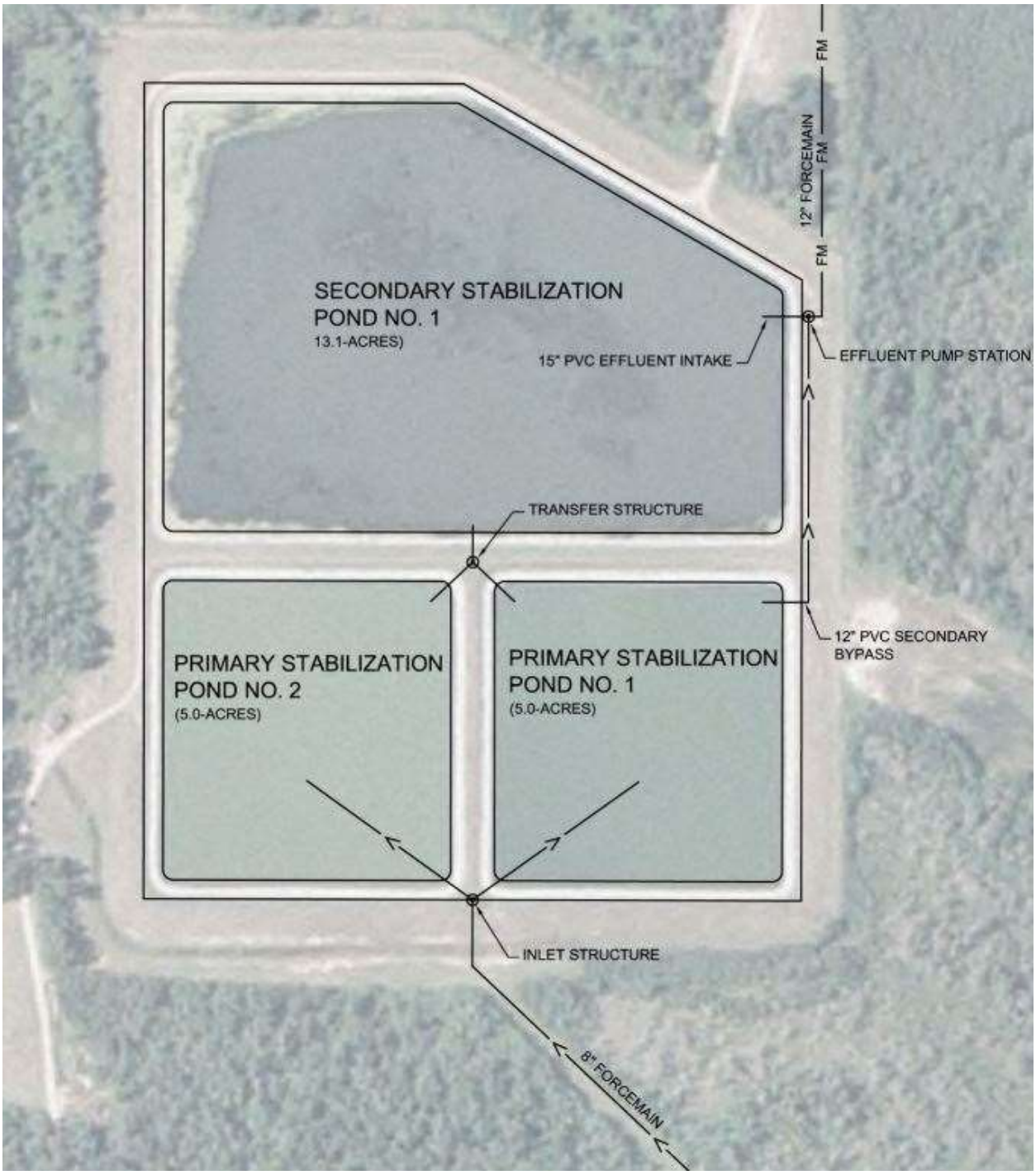


Figure 2-7; Lagoon Complex



3. Need for Project

Section 2 “Existing Facilities” offered details of the need for replacement and rehabilitation of City’s system components. Table 3-1 (below) summarizes the infrastructure components with the greatest needs. The table summarizes the construction cost and offers a projection of total project cost that includes a construction contingency, engineering, and financing costs.

A. Alternate A replaces the network of VCP is located within the core of the City. The network is estimated to be at least 60 years of age. Replacement includes trench width removals and replacement and replacement of all service wyes. Alternate also includes replacement of brick manholes.

B. This alternate replaces all 4” watermain, most of which is very old cast iron pipe.

C. Alternate C is to reline the VCP network with cured in place liner. It includes replacing at least eight brick manholes. This alternate is less intrusive and disruptive but has a shorter life as well.

D. Alternate D includes costs to refurbish all five pump stations.

E. Alternate E isolates the costs to refurbish the pump station at the Drake Motel.

F. Alternate F isolates the cost to extend sanitary sewer services to the Mill Avenue neighborhood. The construction cost includes the addition of a prepackaged lift pump station.

G. Alternate G estimates the cost to add a SCADA control system for improved management of the water and sanitary networks.

H. Alternate H estimates the cost of replacing the four irrigators currently in service with a single, full circle irrigator.

I. Alternate I is an estimate of the cost of replacing the four irrigators currently in service with a two, half circle irrigators.

J. Alternate J estimates the cost to refurbish the piping, pumps, and pump controls that supply the irrigator(s). This includes costs to improve the conduit between the lagoons and the irrigator(s).

K. Alternate is an estimate of cost for a 15-kW portable generator. Currently, City has no backup equipment to deal with a prolonged power outage.

Table 3-1; Summary of Project Alternates & Costs

Alt	Description	Const Cost	Project Cost
A	Replace all VCP	$1,440,000	$2,024,640
B	Replace all 4" Watermain	$1,008,000	$1,417,240
C	Reline VCP	$647,528	$910,418
D	Refurbish all Pump Stations	$437,500	$615,120
E	Refurbish Drake Motel Pump Station	$64,400	$90,550
F	Extend Sanitary Services to Mill Ave Neighborhood	$191,200	$268,810
G	Provide SCADA Control System	$60,000	$84,360
H	Replace Agricultural Irrigators (Single Full Circle)	$79,850	$112,280
I	Replace Agricultural Irrigators (Two Half Circle)	$86,125	$121,095
J	Refurbish Effluent Pumps & Controls for Irrigator	$81,000	$113,870
K	Provide Portable Generator	$30,000	$42,190

3.2. Health, Sanitation, and Security

A. Federal and State agencies have not cited City for infrastructure or operational failures in the last ten years.

B. City's 9,700 feet of 4" watermain has hydrants that do not meet "10 State Standards" and pose a risk to adequate fire suppression.

C. City's 9,600 feet of VCP sewer main not only accept infiltration during wet months but leak untreated sewage during dry months.

3.3. Aging Infrastructure

A. City has 6,300 feet of 4" cast iron watermain that is more than 60 years old.

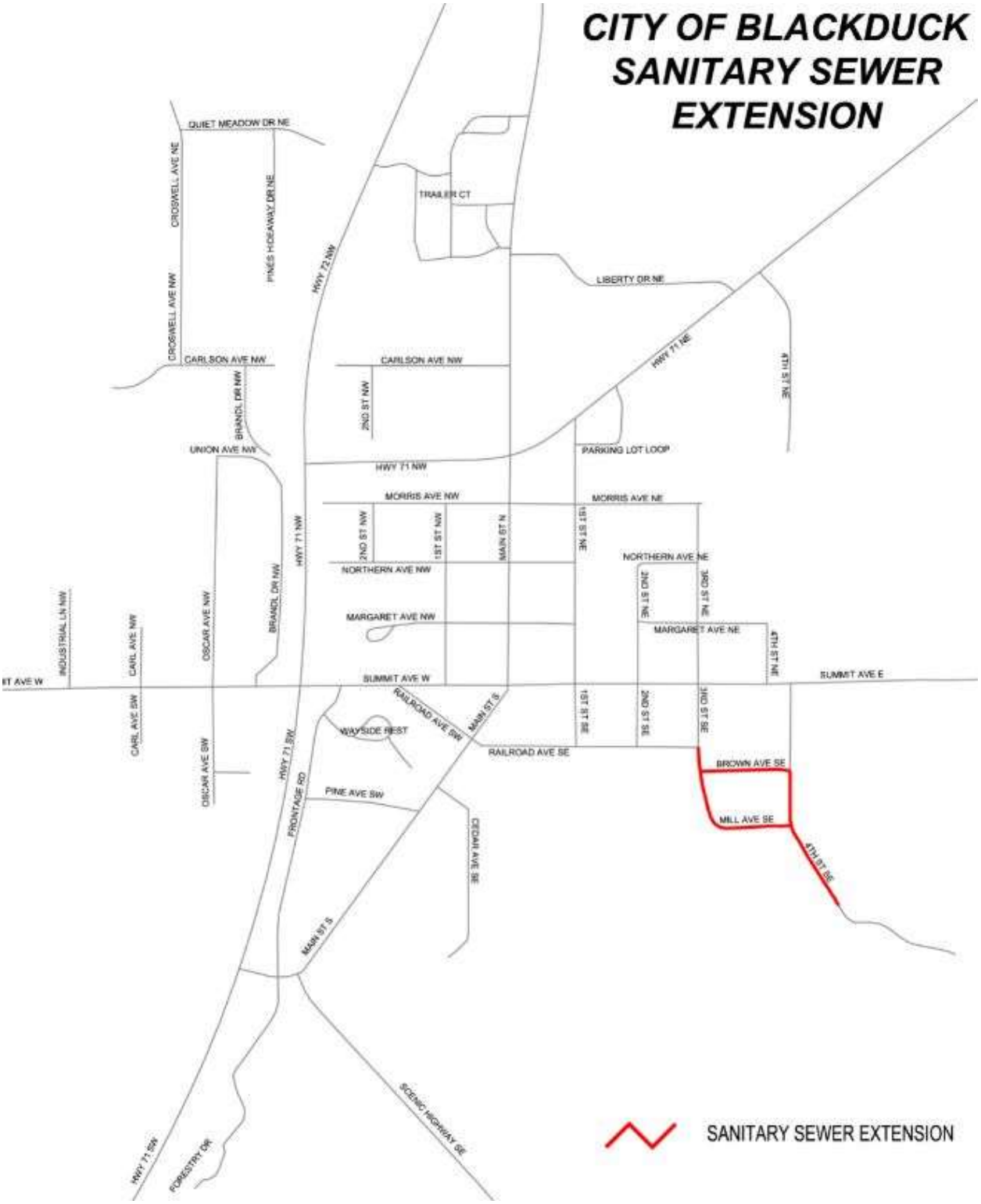
B. City has 9,600 feet of VCP sewer main and a dozen brick manholes that are more than 60 years old.

3.4. Reasonable Growth

A. Blackduck has potential for moderate growth on the next 20 years. It has a good school system and small manufacturing businesses located here need a capable workforce.

B. Unserved neighborhood. See Figure 3-1 of Page 25 to see the neighborhood that would be served by an extension of the current collection system. Again, this neighborhood has ten homes and seven marketable lots.

Figure 3-1; Sewer Extension



4. Alternatives Considered

A. Each of the needs identified in Table 3-1; Summary of Project (Page 23) would qualify as a stand-alone or separate project. However, economies of scale point to combining these needs. For example, it makes little sense to replace the VCP portion of the collection system and not replace the cast iron watermain lying within the same street corridor. It would make sense to replace the brick manholes and all hydrants within those same corridors.

B. This report discusses the flowing alternatives:

   1. Do nothing
   2. Comprehensive Reconstruction replace all VCP Sanitary Mains and 4" Watermains ($4,692,000).
   3. CIPP & Selected Improvements

4.1. Do Nothing

A. The "Do Nothing" alternative will postpone warranted upgrades to the wastewater system. Stop gap maintenance needs will continue to increase, raising the operation and maintenance cost of the system.

B. The "Do Nothing" alternative will prohibit future development. Current records indicate that the land application system has exceeded capacity twice in the last 10 years. The MPCA has expressed concerns about permitting any future sewer extensions until the capacity issue is addressed. These concerns can likely be rectified by establishing a more accurate method of measuring the effluent flow, however without upgrading the effluent pump system, flows will continue to be measured with the current system. Second, the collection system is generating 20,000 to 40,000 gallons per day of additional wastewater during wet periods. This drastically reduces the capacity of the wastewater ponds and land application system. The current system is at 88% capacity, without reducing the inflow and infiltration, future expansion will need to be analyzed on a case by case basis.

C. The "Do Nothing" alternative will reduce viability of existing homes and businesses that utilize the failing collection system. It is inevitable that the failing collection system will need to be improved. Due to the high cost of this improvement and the possibility of a costly assessment, marketability and value of these properties may be impacted negatively.

D. The "Do Nothing" alternative raises several environmental issues. The current system is wasting energy to operate pumps and irrigators, which have to handle an additional 20,000 to 40,000 gallons per day of inflow and infiltration. The current system is at risk for untreated wastewater bypasses at the failing pump station. The current system is at risk of a sewer backup. The offset joints, pipe fractures and under sized pipe associated with the clay tile sewer significantly increases the City's risk of a sewer back up. Sewer backups will damage private property, raise insurance rates and is a health and safety concern.

E. The "Do nothing" alternative is not acceptable

F. Cost Estimates

   1. Since the "Do Nothing" alternative makes no investment in improvements, annual operating and maintenance costs will remain the same in the near-term and increase in the long-term as repairs and the need for external services increases.

Table 4-1; Projected O&M Costs for a Do Nothing Alternative

Description	Water	Sewage	Total
Personnel Services	$74,150	$77,330	$151,480
Utilities	$10,270	$21,480	$31,750
Supplies & Materials	$8,880	$2,730	$11,610
Repairs & Maintenance	$7,550	$7,310	$14,860
Contracted Services	$4,230	$4,260	$8,490
Insurance	$3,630	$5,380	$9,010
Depreciation & Amortization	$74,090	$66,670	$140,760
Other Expenses	$9,100	$4,710	$13,810
Total Operating Expenses	$191,900	$189,870	$381,770

4.2. Comprehensive Reconstruction

A. Description

1. This alternative:
    a. Replaces all 4” watermain with 6” watermain, including all cast iron and PVC of that size.
    b. Replaces all VCP sanitary collection mains.
    c. Extends sanitary sewage collection to the Mill Avenue neighborhood. This requires the addition of a prepackage pump station.
    d. Refurbishes all five pump stations.
    e. Replaces the four wastewater irrigators with a single center pivot irrigator.
    f. Provides new wastewater pumping components to supply the irrigator.
    g. Adds a SCADA control to manage the wastewater systems.

B. Design Criteria

1. See Appendix B – Design Criteria beginning on Page 53 for a comprehensive list of design criteria.

C. Map

1. See Appendix F - Comprehensive Reconstruction Estimate of Probable Cost
2.
3. Appendix G – Map of Proposed Improvements, and Affected Services on Page 59 for a map that shows the location of proposed improvements and existing infrastructure components as well as serves locations affected by the proposed improvements.

D. Environmental Impacts

1. Specific environmental impacts relate only to the construction activities to implement the project. Control of dust control, erosion, and traffic will be implemented while keeping affected residents informed of project progress. A comprehensive list of environmental impacts can be found in Appendix D – Environmental Checklist beginning on Page 57.

E. Land Requirements

1. The bulk of this work will take place within City rights of way or permanent easements. Exceptions are service connections to residences and commercial properties. In these cases, City and contractor will work together to inform residents and business owners of work progress and the contract will include work to restore all affected properties to their preconstruction condition or in most cases improve the preconstruction condition.

F. Potential Construction Problems

1. Traffic control may limit through traffic to a single lane and at times cause temporary street closure. Contract language will require contractors to keep emergency service entities apprised of project progress to coordinate public safety.
2. Non-City utilities like electrical, natural gas, internet, etc. may be affected by project progress or where permanent utility relocation is needed to improve the long-term lie of a specific utility. Engineer will provide utility companies with design plans at the 60% and 90% completion stages for affected utilities to prepare for temporary and permanent changes.

3. The Blackduck area lies somewhat low and the soils are on the heavy clay side with groundwater potentially a construction problem. The contract will call for dewatering if necessary.
4. Residences and businesses will be supplied with temporary water supplies per contract language.

G. Sustainability Considerations

1. Water and Energy Efficiency
   a. City distributes its treated sewage effluent on farmland in lieu of direct discharge into nearby Blackduck Lake. Though more expensive this approach is a more environmentally acceptable one.
   b. Upgrading City pump stations to three phase lessens equipment stress and is a bit more energy efficient than single phase.
2. Green Infrastructure
   a. Gravity sewers require pump stations that use standard grid power—they are not a green infrastructure. Through use of soft starters and variable frequency drives, the stations can provide improved energy use over the existing components.
3. Other
   a. None.

H. Cost Estimates

1. The construction cost estimate for the comprehensive reconstruction is tabulated below (Table 4-2). Values are rounded to the nearest $100.

Table 4-2; Construction Cost Estimate for Comprehensive Reconstruction

Spec No	Description	Project Cost	20 Year Salvage Value	20 Year Remaining Value	Annual 20 Year Depreciation
01 3000	Mobilization	$214,000			
01 5526	Traffic Control	$40,000			
01 5713	Storm Drain Inlet Protection	$8,000			
01 5713	Temporary Erosion Control	$15,000			
02 4100	Remove Manhole (Sanitary)	$12,000			
02 4100	Remove Catch Basin	$1,500			
02 4100	Remove Hydrant	$7,200			
02 4100	Remove Gate Valve & Box	$6,900			
02 4100	Remove Curb & Gutter	$8,600			
02 4100	Remove Pipe Sewer (Storm)	$2,400			
02 4100	Remove Bituminous Pavement	$128,000			
02 4100	Remove Concrete Driveway Pavement	$500			
02 4100	Remove Concrete Walk	$1,500			
31 2200	Common Excavation (8' depth)	$925,300			
31 2200	Select Granular Embankment (CV) (12" Depth)	$192,800			
32 1123	Aggregate Base (CV) Class 5 (8" Depth)	$171,400			
32 1216	Bituminous Material for Tack Coat	$4,200			
32 1216	Type SP 9.5 Wearing Course Mixture (3,B)	$296,800			
32 1216	Type SP 9.5 Non Wear Course Mixture (3,B)	$296,800			
32 1500	Aggregate Surfacing (CV) Class 5 (4" Depth)	$10,500			

Spec No	Description	Project Cost	20 Year Salvage Value	20 Year Remaining Value	Annual 20 Year Depreciation
32 1600	4" Concrete Walk	$34,500			
32 1600	Concrete Curb & Gutter Design B618	$22,100			
32 1600	8" Concrete Valley Gutter	$3,500			
32 8600	Agricultural Irrigator, Full Circle	$79,900			
32 8600	Irrigator Piping, Wiring & Controls	$81,000			
32 9219	Turf Establishment	$75,000			
33 1000	6" Watermain	$355,400	$213,200	$142,200	$7,100
33 1000	1" Water Service Pipe	$21,100	$12,700	$8,400	$400
33 1000	6" Gate Valve & Box	$69,000	$41,400	$27,600	$1,400
33 1000	1" Corporation Stop	$25,000	$15,000	$10,000	$500
33 1000	2" Corporation Stop	$300	$200	$100	
33 1000	1" Curb Stop & Box	$35,000	$21,000	$14,000	$700
33 1000	2" Curb Stop & Box				
33 1000	Hydrant (9.5' Bury)	$108,000	$64,800	$43,200	$2,200
33 1000	Ductile Iron Fittings (AWWA C153)	$39,800	$23,900	$15,900	$800
33 1000	Connect to Existing Watermain	$13,000			
33 3100	8" Sanitary Sewer Main	$344,500	$206,700	$137,800	$6,900
33 3100	Sanitary Sewer Manhole (0'-8')	$114,000	$68,400	$45,600	$2,300
33 3100	Connect to Existing Sanitary Sewer Main	$2,500	$1,500	$1,000	$100
33 3100	4" Sanitary Sewer Service Pipe	$78,100	$46,900	$31,200	$1,600
33 3100	8"X4" Sanitary Sewer Service Wye	$19,200	$11,500	$7,700	$400
33 3100	4" Sanitary Sewer Cleanout Assembly	$38,400	$23,000	$15,400	$800
33 3213	Refurbish Main Lift Station	$67,300	$22,210	$45,090	$2,300
33 3213	Refurbish Frenzel Lift Station	$22,400	$7,390	$15,010	$800
33 3213	Refurbish Forestry Lift Station	$31,500	$10,400	$21,100	$1,100
33 3213	Refurbish Mallard Lift Station	$31,300	$10,330	$20,970	$1,000
33 3213	Refurbish West End Lift Station	$31,300	$10,330	$20,970	$1,000
33 3213	Prepackaged Lift Station (Mill Ave Addition)	$55,000	$18,150	$36,850	$1,800
33 3213	Furnish & Install SCADA System	$60,000	$19,800	$40,200	$2,000
33 3213	Refurbish Irrigator Pumps, Controls & Panels	$35,000	$11,550	$23,450	$1,200
33 4211	8" PVC Pipe Sewer (Storm)	$11,300	$6,800	$4,500	$200
33 4211	Connect to Existing Storm Sewer	$1,200			
33 4211	Const Drainage Structure Design SD	$20,000	$12,000	$8,000	$400
48 1000	Portable Generator (15 KW Trailer Mounted Diesel)	$25,000	$8,250	$16,750	$800
	Total Costs	**$4,294,000**	**$887,410**	**$752,990**	**$37,800**

2. Refer to Appendix E – Needs / Alternate Costs & Alternatives, on Page 59, for a complete tabulation of estimated constructions costs for all needs and alternatives with projected contingencies and related fees. Note that full project costs are roughly 140% of project cost.

3. Table 4-3 (below) reflects projected savings in operating and maintenance costs due to efficiencies gained through improved utility costs, personnel efficiencies, and reductions in repairs.

Table 4-3; Projected O&M Costs for Comprehensive Reconstruction

Operation and Maintenance | Comprehensive Reconstruction					
Description					Annual Cost
Personnel Services					$136,332
Utilities					$28,575
Supplies & Materials					$11,610
Repairs & Maintenance					$11,888
Contracted Services					$7,641
Insurance					$9,010
Depreciation & Amortization					$140,760
Other Expenses					$12,429
				Total Annual O&M =	$358,245
Short Lived Asset Reserve					
Description	Quantity	Unit Value	Total Value	Life Expectancy (Yr.)	Annual Cost
Main Pump Station	1	$67,250	$67,250	15	$4,480
Frenzel Pump Station	1	$22,400	$22,400	15	$1,490
Forestry Pump Station	1	$31,520	$31,520	15	$2,100
Mallard Pump Station	1	$31,340	$31,340	15	$2,090
West End Pump Station	1	$31,330	$31,330	15	$2,090
Mill Avenue Pump Station	1	$55,000	$55,000	15	$3,670
Effluent Pumps	2	$16,000	$32,000	15	$2,130
Air Release Valves	2	$1,300	$2,600	15	$170
Agricultural Irrigator(s)	1	$79,900	$79,900	15	$5,330
Maintenance Vehicle	1	$42,000	$42,000	15	$2,800
Portable Generator	1	$25,000	$25,000	15	$1,670
Irrigator Pump Station	1	$35,000	$35,000	15	$2,330
SCADA Control System	1	$60,000	$60,000	15	$4,000
				15	
				Total Annual Short Lived Asset Reserve =	$34,350
Debt Repayment					
Description				Estimated Total	Annual Cost
Existing Debt Payment					
Proposed Debt (Assume 40 yrs. @ 3.5%)				$6,037,380	$282,730
Debt Service Reserve (5% of Proposed Debt)					$14,140
				Total Annual Debt Repayment =	$296,870
Total Estimated Operating Cost for Comprehensive Reconstruction					$689,465

4. The projected reductions in operating costs are based on the following:
    a. SCADA controls should reduce manual monitoring and operation of key infrastructure components (10% improvement)
    b. Modernization of pump components including potentially upgrading pumps from single-phase to three-phase should reduce power requirements (10% improvement)
    c. Modernization of so many infrastructure components should reduce repairs and maintenance costs (20% improvement)
    d. Modernization of so many infrastructure components should reduce need for contracted services (10% improvement)

e. Modernization of so many infrastructure components should reduce other expenses (10% improvement)

4.3. CIPP & Selected Improvements

A. Description

1. The difference between CIPP & Selected Improvements and Comprehensive Reconstruction is that CIPP & Selected Improvements does not include extension of sewage collection to the Mill Avenue neighborhood. The project cost savings is roughly $177,250.
2. The strategy driving this alternative is to use a cured in place pipe lining approach to improve the VCP mains and then undertake complete replacement of 4" watermains, VCP sanitary lines, and related improvements over the next 20 years. City has a capital improvement program identified that incorporates these improvements.
3. The discussion of this section limits future capital improvements to only those streets and underground infrastructure discussed in the "comprehensive reconstruction" alternative.
4. This alternative:
    a. Improves VCP sanitary collection mains through use of cured in place pipe lining.
    b. Refurbishes all five pump stations.
    c. Replaces the four wastewater irrigators with a single center pivot irrigator.
    d. Provides new wastewater pumping components to supply the irrigator.
    e. Adds a SCADA control to manage the wastewater systems.

B. Design Criteria

1. See Appendix B – Design Criteria beginning on Page 53 for a comprehensive list of design criteria.

C. Map

5. See Appendix F - Comprehensive Reconstruction Estimate of Probable Cost

1. Appendix G – Map of Proposed Improvements, and Affected Services on Page 59 for a map that shows the location of proposed improvements and existing infrastructure components as well as serves locations affected by the proposed improvements.

B. Environmental Impacts

1. Specific environmental impacts relate only to the construction activities to implement the project. Control of dust control, erosion, and traffic will be implemented while keeping affected residents informed of project progress. A comprehensive list of environmental impacts can be found in Appendix D – Environmental Checklist beginning on Page 57.

C. Land Requirements

1. The bulk of this work will take place within City rights of way or permanent easements. Exceptions are service connections to residences and commercial properties. In these cases, City and contractor will work together to inform residents and business owners of work progress and the contract will include work to restore all affected properties to their preconstruction condition or in most cases improve the preconstruction condition.

D. Potential Construction Problems

1. Traffic control may limit through traffic to a single lane and at times cause temporary street closure. Contract language will require contractors to keep emergency service entities apprised of project progress to coordinate public safety.

2. Non-City utilities like electrical, natural gas, internet, etc. may be affected by project progress or where permanent utility relocation is needed to improve the long-term lie of a specific utility. Engineer will provide utility companies with design plans at the 60% and 90% completion stages for affected utilities to prepare for temporary and permanent changes.
3. The Blackduck area lies somewhat low and the soils are on the heavy clay side with groundwater potentially a construction problem. The contract will call for dewatering if necessary.
4. Residences and businesses will be supplied with temporary water supplies per contract language.

E. Sustainability Considerations

1. Water and Energy Efficiency
   a. City distributes its treated sewage effluent on farmland in lieu of direct discharge into nearby Blackduck Lake. Though more expensive this approach is a more environmentally acceptable one.
   b. Upgrading City pump stations to three phase lessens equipment stress and is a bit more energy efficient than single phase.
2. Green Infrastructure
   a. Gravity sewers require pump stations that use standard grid power—they are not a green infrastructure. Through use of soft starters and variable frequency drives, the stations can provide improved energy use over the existing components.
3. Other
   a. None.

F. Cost Estimates

1. The construction cost estimate for CIPP & Selected Improvements is tabulated below (Table 5-3. Values are rounded to the nearest $100.

Table 5-1; Construction Cost Estimate for CIPP & Selected Improvements

Spec.	Description	Project Cost	20 Year Salvage Value	20 Year Remaining Value	Annual 20 Year Depreciation
01 3000	Mobilization	$50,000			
01 5526	Traffic Control	$4,440			
01 5713	Erosion Control	$5,000			
02 4100	Remove Existing Manhole	$2,960			
02 4100	Remove Bituminous Pavement	$1,500			
02 4100	Remove Curb & Gutter	$2,500			
31 2200	Common Excavation	$2,000			
32 1123	Aggregate Base (CV) Class 5	$6,000			
32 1216	Bituminous Pavement	$13,500			
32 1600	Concrete Walk	$2,000			
32 1600	Concrete Curb & Gutter Design B618	$7,500			
32 8600	Agricultural Irrigator, Full Circle	$79,850			
32 8600	Irrigator Piping, Wiring & Controls	$81,000			
32 9219	Turf Establishment	$8,100			
33 3100	4" PVC SDR 35 Pipe Sewer	$7,500	$4,500	$3,000	$200

Spec.	Description	Project Cost	20 Year Salvage Value	20 Year Remaining Value	Annual 20 Year Depreciation
33 3100	8" PVC SDR 35 Pipe Sewer	$4,000	$2,400	$1,600	$100
33 3100	8"X4" PVC Wye	$1,800	$1,100	$700	
33 3100	4" Cleanout Assembly	$1,760	$1,100	$660	
33 3100	CIPP Sewer Lining	$522,000	$313,200	$208,800	$10,400
33 3100	Connect To Existing San. Sewer	$8,800	$5,300	$3,500	$200
33 3100	Sanitary Manhole Design F	$29,600	$17,800	$11,800	$600
33 3100	Casting Assembly	$5,920	$3,600	$2,320	$100
33 3213	Refurbish Main Lift Station	$67,250	$22,190	$45,060	$2,300
33 3213	Refurbish Frenzel Lift Station	$22,400	$7,390	$15,010	$800
33 3213	Refurbish Forestry Lift Station	$31,520	$10,400	$21,120	$1,100
33 3213	Refurbish Mallard Lift Station	$31,340	$10,340	$21,000	$1,100
33 3213	Refurbish West End Lift Station	$31,330	$10,340	$20,990	$1,000
33 3213	Furnish & Install SCADA System	$60,000	$19,800	$40,200	$2,000
33 4211	Storm Sewer Improvements	$2,500	$1,500	$1,000	$100
48 1000	Portable Generator (15 KW Trailer Mounted Diesel)	$25,000	$8,250	$16,750	$800
	Total Costs	$1,119,070	$439,210	$413,510	$20,800

2. Refer to Appendix E – Needs / Alternate Costs & Alternatives, on Page 59, for a complete tabulation of estimated constructions costs for all needs and alternatives with projected contingencies and related fees. Note that full project costs are roughly 140% of project cost.

3. A downside to this alternative is that it simply delays the eventual replacement. The table below (Table 5-3) estimates future, and eventual, replacement of watermain and VCP (relined VCP) using the same unit pricing in today's dollars. This would be the present value of these constructions.

   This means the present value of this alternative is $1,119,200 plus the present value of future constructions $6,683,400 ($7,802,600). Adding to this value is the full project cost additive of 140% the present value is $10,923,640.

   An additional burden is the need to undertake refinancing five times.

Table 5-2; CIP Estimate of Future Reconstructions

Spec	Description	2032	2037	2042	2047
01 3000	Mobilization	$48,400	$112,600	$44,500	$52,400
01 5526	Traffic Control	$9,700	$22,500	$8,900	$10,500
01 5713	Erosion Control	$5,600	$12,900	$5,100	$6,000
02 4100	Removals	$40,200	$93,400	$36,900	$43,500
31 2200	Excavation	$266,300	$618,900	$244,800	$288,100
32 1123	Aggregate Base	$40,800	$94,900	$37,500	$44,200
32 1216	Bituminous Paving	$142,400	$330,900	$130,900	$154,100
32 1500	Aggregate Surfacing	$2,600	$5,900	$2,300	$2,800
32 1600	Concrete Paving	$14,600	$33,800	$13,400	$15,700
32 8600	Agricultural Irrigation				
32 9219	Turf Establishment	$11,000	$25,600	$10,100	$11,900

33 1000	Watermain Improvements	$153,500	$353,100	$149,400	$139,700
33 3100	Sanitary Main Improvements	$149,300	$350,800	$128,100	$190,400
33 3213	Refurbish Pump Stations				
33 4211	Storm Sewer Improvements	$7,900	$18,300	$7,200	$8,500
48 1000	Portable Generator				
	Estimated Construction Cost	$892,300	$2,073,600	$819,100	$967,800
	Estimated Future Construction Cost	$1,087,700	$2,790,800	$1,217,100	$1,587,800
	Sum of all Future Construction Costs	$6,683,400			

4. The table below reflects projected savings in operating and maintenance costs due to efficiencies gained through improved utility costs, personnel efficiencies, and reductions in repairs.

Table 5-3; Projected O&M Costs for CIPP & Selected Improvements

Operation and Maintenance | CIPP & Selected Improvements					
Description					Annual Cost
Personnel Services					$139,362
Utilities					$29,210
Supplies & Materials					$11,610
Repairs & Maintenance					$12,631
Contracted Services					$7,811
Insurance					$9,010
Depreciation & Amortization					$140,760
Other Expenses					$12,705
				Total Annual O&M =	$363,099
Short Lived Asset Reserve					
Description	Quantity	Unit Value	Total Value	Life Expectancy (Yr.)	Annual Cost
Main Pump Station	1	$67,250	$67,250	15	$4,480
Frenzel Pump Station	1	$22,400	$22,400	15	$1,490
Forestry Pump Station	1	$31,520	$31,520	15	$2,100
Mallard Pump Station	1	$31,340	$31,340	15	$2,090
West End Pump Station	1	$31,330	$31,330	15	$2,090
Mill Avenue Pump Station		$55,000		15	
Effluent Pumps	2	$16,000	$32,000	15	$2,130
Air Release Valves	2	$1,300	$2,600	15	$170
Agricultural Irrigator(s)	1	$79,900	$79,900	15	$5,330
Maintenance Vehicle	1	$42,000	$42,000	15	$2,800
Portable Generator	1	$25,000	$25,000	15	$1,670
Irrigator Pump Station	1	$35,000	$35,000	15	$2,330
SCADA Control System	1	$60,000	$60,000	15	$4,000
				15	
				Total Annual Short Lived Asset Reserve =	$30,680
Debt Repayment					
Description				Estimated Total	Annual Cost
Existing Debt Payment					
Proposed Debt (Assume 40 yrs. @ 3.5%)				$1,673,150	$78,350
Debt Service Reserve (5% of Proposed Debt)					$3,920
				Total Annual Debt Repayment =	$82,270
Total Estimated Operating Cost for CIPP & Selected Improvements					$476,049

5. The projected reductions in operating costs are based on the following:
   a. SCADA controls should reduce manual monitoring and operation of key infrastructure components (8% improvement)
   b. Modernization of pump components including potentially upgrading pumps from single-phase to three-phase should reduce power requirements (8% improvement)
   c. Modernization of so many infrastructure components should reduce repairs and maintenance costs (15% improvement)
   d. Modernization of so many infrastructure components should reduce need for contracted services (8% improvement)

e. Modernization of so many infrastructure components should reduce other expenses (8% improvement)

6. Selection of an Alternative

6.1. Decision-Making Factors

A. .Table 6-1 (below) lays out the key factors primarily related to project costs. The Comprehensive Reconstruction" is a more favorable alternative, given these considerations.

B. Choosing the "CIPP & Selected Improvements" has short term value conserving initial construction but only delays the eventual replacement of water and sanitary infrastructure.

C. To be clear, City will need to improve other streets through a capital improvement planning and action. However, both alternatives address improvements to those streets with very old underground utilities. These alternatives examine two approaches to modernizing all existing underground utilities to the extent that all existing underground infrastructure is reasonably new.

Table 6-1; Alternatives Decision Matrix

Decision Consideration	Comprehensive Reconstruction	✓	CIPP & Selected Improvements	✓
Initial construction cost	$4,294,000		$1,119,070	✓
Total project cost	6,037,380		$1,673,150	✓
Future cost for parity improvements[4]	$0	✓	$9,356,760	
Present value for parity improvements	$10,331,380	✓	$12,148,980	
Projected O&M costs	$358,245	✓	$363,099	
Financing iterations	1	✓	5	
Annual debt payment[5]	$296,870	✓	$568,940	

6.2. Non-Monetary Factors

A. Comprehensive Reconstruction is comprehensive in nature and replaces networks and components that are beyond normal service life expectations. It is the preferred alternative.

B. Choosing the CIPP & Selected Improvements alternative prolongs replacement of the oldest underground infrastructure in the City. This prolonged replacement cycle has the downside of higher operating and maintenance costs.

[4] Including full projects costs: contingencies, engineering, etc. of 140%
[5] Debt service of full parity improvements over 40 years at 3.5% interest

7. Proposed Project

The proposed project is Comprehensive Reconstruction as described in Section 5. This alternative:

A. Replaces all 4" watermain with 6" watermain, including all cast iron and PVC of that size. All hydrants now supplied by 4" watermains will be replaced with 6" hydrants and gate valves on each hydrant lead. Presently there are:
   1. 9,350 linear feet of 4" cast iron watermain
   2. 3,343 linear feet of 4" PVC watermain
   3. 24 hydrants supplied by 4" watermain
   4. 46 gate valves on 4" watermain; and
   5. 100 service locations served by 4" watermain.

B. Replaces all VCP sanitary collection mains. Presently there are:
   1. 6,500 linear feet of 8" VCP and
   2. 290 linear feet of 16" VCP.

C. Extends sanitary sewage collection to the Mill Avenue neighborhood. This requires the addition of a prepackage pump station and sanitary manholes.
   1. Adds 820 linear feet of 8" PVC sewer main
   2. Adds 3 sanitary sewer manholes.
   3. Adds 1 prepackage pump station.

D. Refurbishes all five pump stations.

E. Replaces the four wastewater irrigators with a single center pivot irrigator.
   1. An alternate irrigator system could be added comprised of two half circle irrigators. This alternate is roughly $1,500 (78,405) and irrigates a combined 120 acres, 9 acres less than the recommended full circle system.

F. Provides new wastewater pumping components to supply the irrigator.

G. Adds a SCADA control to manage the wastewater systems.

H. Provides for a 15-kW portable, diesel power generator for City emergency use—primarily at their pump stations.

7.2. Preliminary Project Design

A. Drinking Water
   1. Water Supply. No plans to change the network of wells supplying water to City. A new well was added in the last ten years.
   2. Treatment. No plans to alter the water treatment plant. These components were refurbished in the previous ten years.
   3. Storage. No plans to alter or refurbish the water storage tank. This component was refurbished in the previous ten years.
   4. Distribution Layout. This project is replacing watermain that has reached the end of its useful life or is of substandard design. These existing watermains will be removed and replaced with new watermains, hydrants, gate valves, corporation stops and services lines (if necessary).

B. Wastewater

1. Collection System. This project will replace all the VCP that is still in service.
2. Pumping Stations. This project will refurbish all five existing pump stations and add a prepackaged pump station to the Mill Avenue neighborhood.
3. Storage. This project makes no alterations to the two primary lagoons or the single secondary lagoon.
4. Treatment. This project will retrofit the pumping components necessary to push treated sewage effluent to the agriculture irrigator.

C. Solid Waste

1. This project does not address any of City's solid waste management systems or components.

D. Stormwater

1. Collection System Layout. Stormwater collection components disrupted by water supply or sewage collection services will be removed and replaced, as necessary. The stormwater collection components within Morris Avenue between Main Street and 1st Street East will be removed and replaced entirely as Morris Avenue is narrow and replacing both water and sewage conduits there will negatively affect the stormwater collection components, including all the curb and gutter. There are eight stormwater catch basins between Main Street and 1st Street East and at least five will be removed and replaced.

E. Green Infrastructure

1. This project will not address any green infrastructure. There is no green infrastructure in place, and none will be added.

7.3. Project Schedule

A. This project's schedule is dependent on securing adequate funding. Construction cannot take place without firm funding in hand. Optimistic project milestones are tabulated below.

Table 7-1; Preliminary Project Schedule

PER & ER Submittal:	March 2020
PER & ER Approval:	June 2020
Funding Approval:	September 2020
Easement Acquisition:	March 2021
Final Plan & Specification Submittal:	September 2021
Permit Submittal:	September 2021
Final Plan & Specification Approval:	November 2021
Permit Approval:	November 2021
Advertisement for Bids:	January 2022
Contract Award:	March 2022
Initiation of Construction:	May 2022
Substantial Completion:	June 2023
Initiation of Operation:	June 2023
Loan Closing:	October 2023
Final Completion:	June 2024

7.4. Permit and Review Requirements

Table 7-2; Likely Permit Requirements

MPCA NPDES/SDS Construction Stormwater Permit
MNDOT Utility Permit on MNDOT Right-of-Way
Beltrami County Utility Permit on County Right-of-Way
MNDNR Water Appropriation Permit Amendment
MN DOLI Plumbing Permit
MDH Plan Review
MPCA Plan Review
MDH Watermain Permit

7.5. Sustainability Considerations

A. Water and Energy Efficiency

1. There are no sustainability considerations incorporated into the selected alternative.

B. Green Infrastructure

1. There are no green infrastructure features e incorporated into the selected alternative.

C. Other

1. There are no features such as resiliency or operational simplicity incorporated into the selected alternative.

7.6. Total Project Cost Estimate

A. See Appendix F - Comprehensive Reconstruction Estimate of Probable Cost on Page 60 for a itemized statement of probable cost. See Table 4-2; Construction Cost Estimate for Comprehensive Reconstruction on Page 29 has a similar itemization plus salvage values.

7.7. Annual Operating Budget

A. Table 7-3 (below) displays cash flows for calendar year 2019 and summarizes the average cash flows for years 2015 through 2019.

B. Additional financial information can be found in Section 2.3 beginning on Page 16 of this document.

Table 7-3; City Cash Flows

Description	2019 Sewage	2019 Total	5-Yr Ave Water	5-Yr Ave Sewage	5-Yr Ave Total
Charges for Services	$155,182	$362,633	$200,500	$148,940	$349,440
Operating Expenses					
Personnel Services	$82,189	$160,264	$74,150	$77,330	$151,480
Utilities	$26,588	$38,211	$10,270	$21,480	$31,750
Supplies & Materials	$2,526	$10,377	$8,880	$2,730	$11,610
Repairs & Maintenance	$8,773	$19,465	$7,550	$7,310	$14,860
Contracted Services	$3,393	$12,156	$4,230	$4,260	$8,490
Insurance	$5,620	$9,372	$3,630	$5,380	$9,010
Depreciation & Amortization	$14,374	$84,380	$74,090	$66,670	$140,760
Other Expenses	$5,580	$15,599	$9,100	$4,710	$13,810
Total Operating Expenses	$149,043	$349,824	$191,900	$189,870	$381,770
Operating Income (Loss)	$6,139	$12,809	$8,600	-$40,930	-$32,330
Non-Operating Revenues (Expenses)					
Interest Income	$4,720	$12,866	$1,890	$1,130	$3,020
Property Taxes	$8,147				
Intergovernmental Grants & Aids	$51,383	$81,548	$92,310	$98,530	$190,840
Special Assessments			$35,870	$20,870	$56,740
Miscellaneous	$989	$1,016	$260	$320	$580
Fiscal Agent Fee	-$16	($16)		-$770	-$770
Interest Expenses	-$5,885	($25,431)	-$19,900	-$4,070	-$23,970
Total Non-Operating Revenues & Expenses	$59,338	$69,983	$110,430	$116,010	$226,440
Net Income (Loss) Before Operating Transfers	$65,477	$82,792	$119,030	$75,080	$194,110
Operating Transfers					
Transfers to Other Funds			-$7,000	-$10,630	-$17,630
Transfers to Other Funds			$7,730	$11,590	$19,320
Total Operating Transfers			$730	$960	$1,690
Net Income (Loss)	$65,477	$90,939	$119,760	$76,040	$195,800
Net Position, Beginning of Year	$799,529	$1,571,323	$431,780	$571,130	$1,002,910
Net Position, End of Year	$865,006	$1,654,115	$551,540	$647,170	$1,198,710

C. Annual O&M Costs

1. See Table 4-3 on Page 31.

D. Debt Repayments

1. In 2019 City had $1,522,500 in bonds, notes, and capital leases and retired a total of $253,029. The annual principal plus interest paid in 2019 was $207,774.
2. . These liabilities are tabulated in Table 2-9 on Page 18.

E. Reserves

1. Debt Service Reserve
   a. See Table 2-10 of Page 19 for City's capital reserve accounts.
2. Short-Lived Asset Reserve
   a. See Table 4-3 on Page 31.

8. Conclusions & Recommendations

Provide any additional findings and recommendations that should be considered in development of the project. This may include recommendations for special studies, highlighting of the need for special coordination, a recommended plan of action to expedite project development, and any other necessary considerations.

[Normal]

9. Glossary

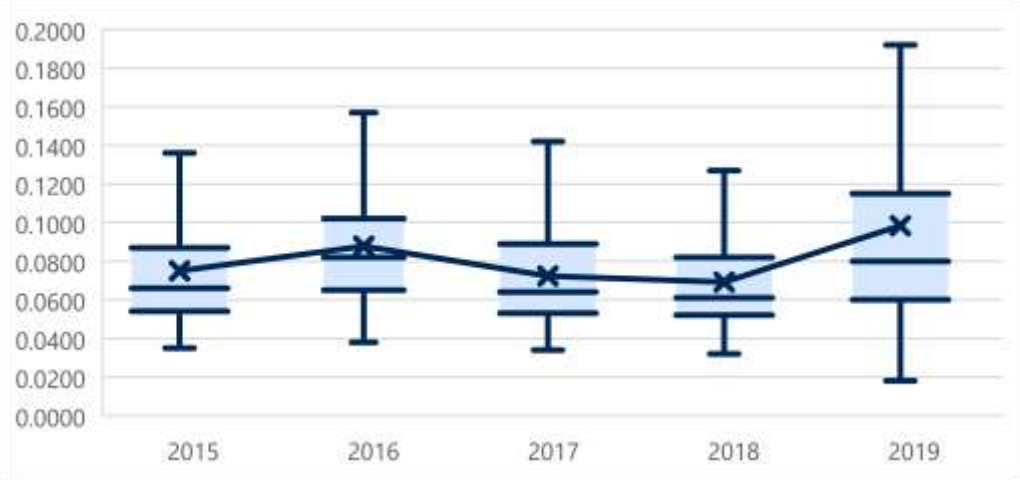
ADW	Average dry weather flow in normal groundwater conditions, no runoff
AWW	Average wet weather flow, wettest 180-day average for a controlled discharge pond system (lagoons); assumes high groundwater with inflows
BOD	Biological oxygen demand
CBOD	Carbonaceous biological oxygen demand
CI	Cast Iron
CIP	Capital Improvement Plan
DMR	Discharge Monitoring Report
EDU	Equivalent dwelling unit
GPD	Gallons per day
gpcd	Gallons per capita per day
ISTS	Individual subsurface sewage treatment systems
LF	Linear feet
MG	Million gallons
MGD	Million gallons per day
mg/L	Milligrams per liter
PER	Preliminary engineering report
PHWW	Peak hourly wet weather flow; assumes high groundwater with inflows due to a one-hour storm event
PIWW	Peak instantaneous wet weather flow; assumes high groundwater with inflow due to a twenty-five year one-hour storm event
RCP	Reinforced concrete pipe
SCADA	Supervised Control and Data Acquisition
TSS	Total suspended solids
VCP	Vitrified clay pipe

10. Appendix A – Determination of Design Flows

A. See Figure 10-1 for a depiction of the reported inflows to the pond system between 2015 and 2019. The trend line represents the mean flow for each year. The top and bottom bars mark the statistical maximum and minimum values. The figure does not plot outlier values.

The bars on the bottom and top of each box represent data points in the first quartile (33%) and the third quartile (67%). The middle bar in the box represents the median value (50%) for the year. A trend line connects the mean values. Note the mean value trends above the median value.

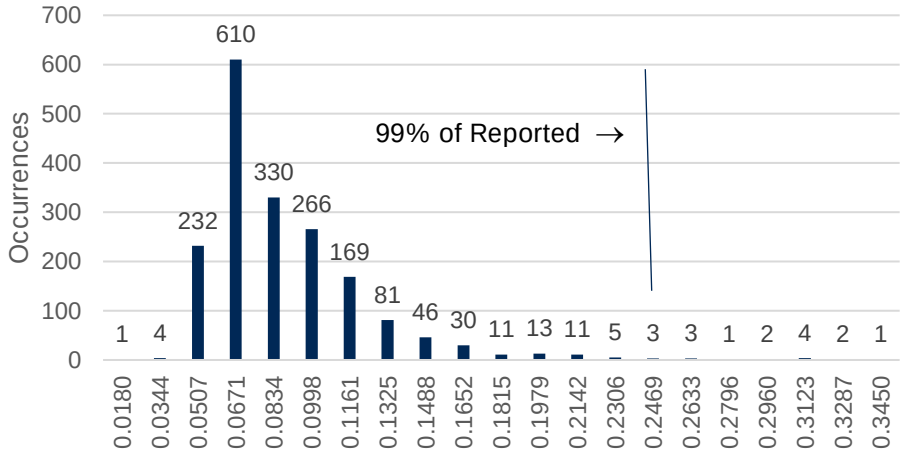
Figure 10-1; Box & Whisper Diagram of Influent Values[6]



[6] The five horizontal lines, top to bottom represent the 90th percentile observation, 67th, 50th, 33rd, and 10th, respectively. In this representation, the mean value for each year is linked with a trend line.

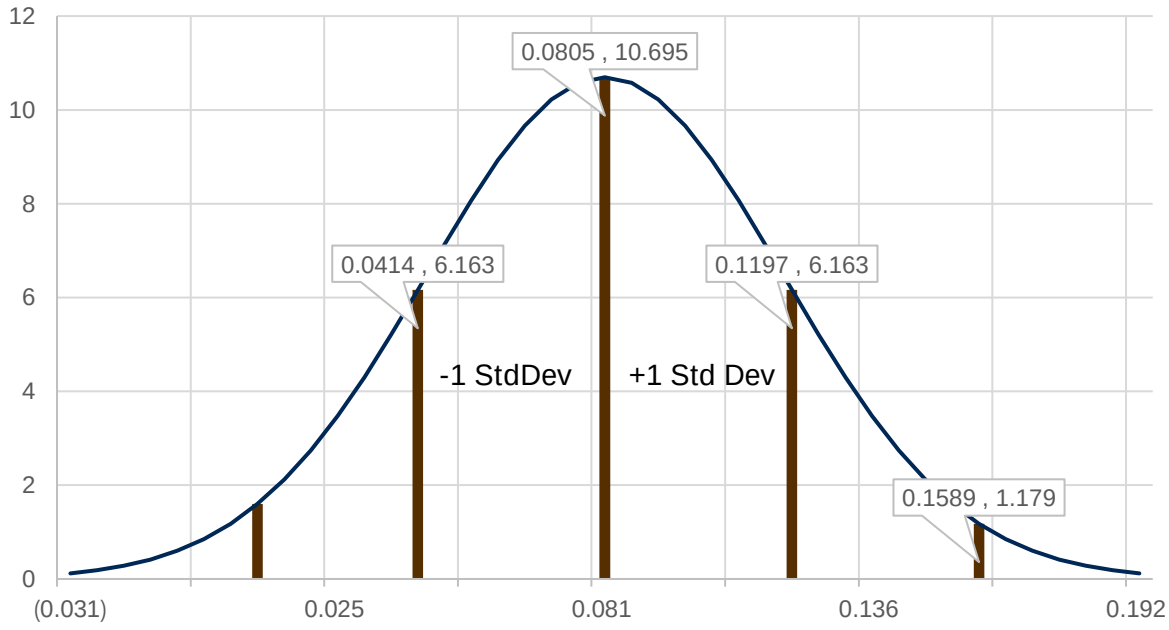
B. Figure 10-2 depicts the frequency of reported, daily influent flows for the years 2015 through 2019. 80% of the reported values are less than 0.0998 MGD (the maximum median value for 2019 shown in Figure 10-1) with the most common reported value near 0.0671 MGD (610 occurrences). Review of the reported values greater than 0.0249 MGD reveals these reports came mostly during the Spring Thaw cycle where the greatest infiltration takes place in the collection system.

Figure 10-2; Frequency of Reported Influent Values



C. Figure 10-3 depicts the normal distribution of reported values of daily influent for the years 2015 through 2019. The vertical bars represent the mean (in the middle) with the next set of bars being one and two standard deviations from the mean, in both directions.

Figure 10-3; Normal Distribution of Reported Influent Values



D. Table 10-1 collects the mean, minimum, and maximum average reported values for each month for the years 2015 through 2019. It is evident that the months of April and May reveal the highest amount of infiltration. Review of frost monitoring stations in northern Minnesota reveals that frost is completely gone from the upper six feet of the ground surface by the end of April.

Table 10-1; Peak Influent Months

Month	Mean	Min	Max
Jan	0.056	0.042	0.073
Feb	0.058	0.036	0.092
Mar	0.078	0.046	0.123
Apr	0.116	0.074	0.176
May	0.116	0.073	0.202
Jun	0.094	0.073	0.137
Jul	0.082	0.059	0.127
Aug	0.068	0.046	0.113
Sep	0.070	0.050	0.140
Oct	0.085	0.051	0.137
Nov	0.076	0.055	0.126
Dec	0.066	0.046	0.088

E. Table 10-2 summarizes the average mean, average minimum and average maximum reported values of influent for the years 2015 and 2019. Wet months are April through September and dry months are between October and March.

Table 10-2; Wet & Dry Month Influent Summary

Period	Mean	Min	Max
Wet	0.0910	0.0625	0.1491
Dry	0.0707	0.0462	0.1102

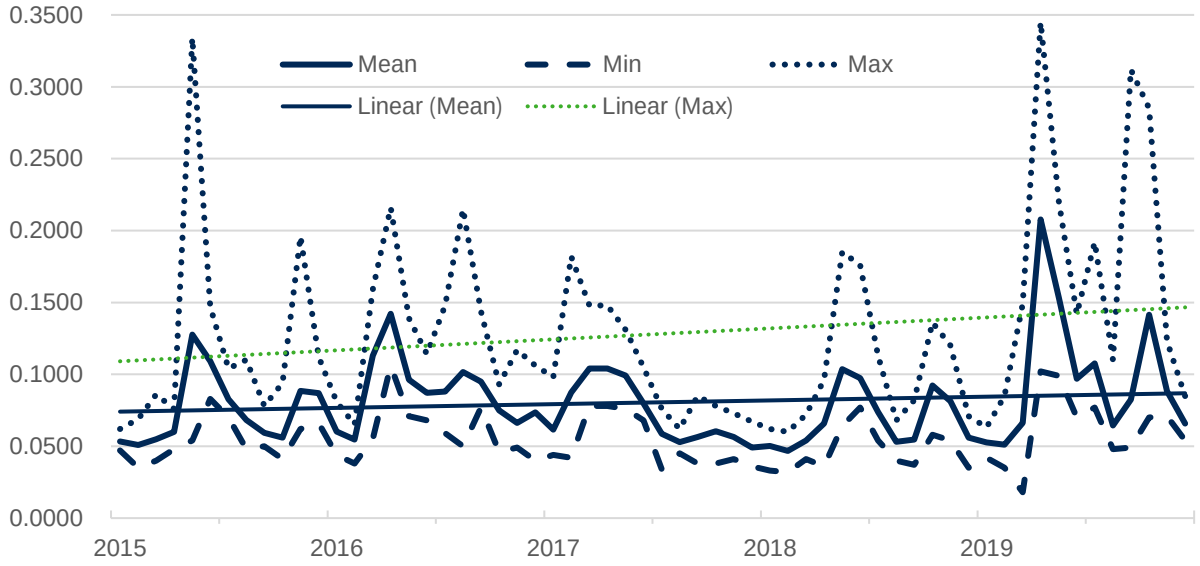
F. Table 10-3 identifies the design flows rates selected for this project.

Table 10-3; Project Design Flows

Average Annual Design Flow (gpd)	80,500
Average Dry Weather Design Flow, ADW (gpd)	70,700
Average Wet Weather Design Flow, AWW (gpd)	91,000
Peak Hourly Wet Weather Design Flow, PHWW (gpd)	158,900
Peak Instantaneous Wet Weather Design Flow, PIWW (gpd)	149,100

G. See Figure 10-4 to appreciate the maximum, minimum, and mean flows between 2015 and 2019.

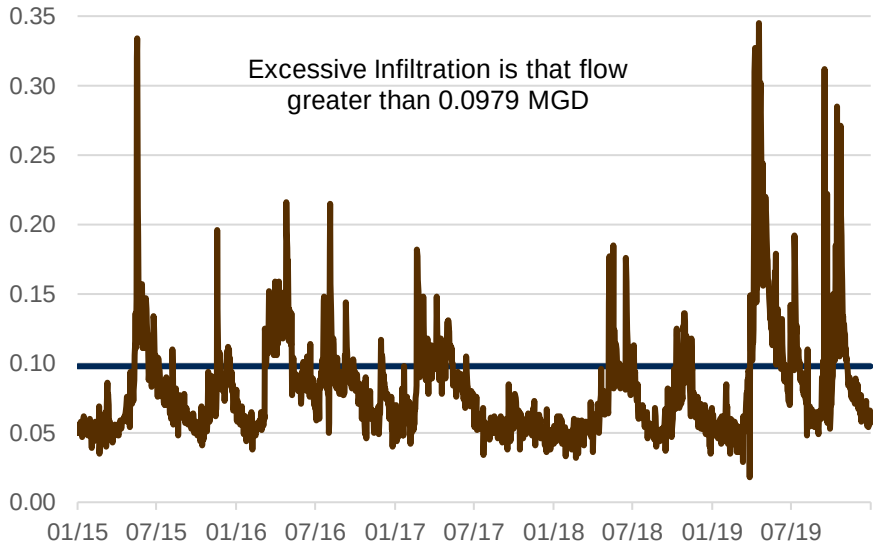
Figure 10-4; Monthly Flow Graphic



H. Excessive Infiltration

1. MPCA defines “excessive infiltration” as the quantity of flow that is more than 120 gpcd (domestic base flow and infiltration. Given that the population of Blackduck is approximately 816, excessive infiltration would be daily flows exceeding 0.979 MGD. See Figure 10-5 below for a graphic depiction of inflows with the horizontal line marking the 0.0979 point.

Figure 10-5; Excessive Infiltration



I. Excessive Inflows

1. MPCA defines excessive inflows as: "the quantity of flow during storm events that results in chronic operational problems related to hydraulic overloading of the treatment system or that results in a total flow of more than 275 gpcd (domestic and industrial base flow plus infiltration and inflow). For Blackduck, excessive inflows would be those inflows greater than 0.2244 MGD.
2. From Figure 10-5 one can observe excessive inflow too place in 2015 and 2019. Review of daily influent reports revealed there were 17 days, of 1,826 daily reports, of excessive inflow.
3. In 2015, excessive inflows occurred on two days (see the snippet). MnDOT records show the full "frost out" occurred around May 9. Note that in the days preceding there was a lengthy period of precipitation.

Date	Precip (in)	Influent (MGD)
5/6/2015 (Wed)		0.0710
5/7/2015 (Thu)	0.4800	0.0860
5/8/2015 (Fri)	0.5200	0.0790
5/9/2015 (Sat)		0.0730
5/10/2015 (Sun)		0.0810
5/11/2015 (Mon)	0.3600	0.0880
5/12/2015 (Tue)	1.0000	0.1060
5/13/2015 (Wed)		0.1160
5/14/2015 (Thu)	0.3600	0.1360
5/15/2015 (Fri)	0.3500	0.1110
5/16/2015 (Sat)		0.1460
5/17/2015 (Sun)	1.4200	0.3200
5/18/2015 (Mon)	0.7500	0.3340
5/19/2015 (Tue)		0.2120
5/20/2015 (Wed)		0.1920

4. In 2019, excessive inflows occurred in 15 daily reports. The most extensive period was that shown in the snippet to the right where 12 days showed excessive inflow. The other three days were in September and October but were also accompanied by periods of precipitation.

   The reader can also refer to Figure 2-4, on Page 13 of this report to appreciate the 2019 graph of daily inflows and the influence of precipitation on those inflows.

   Review of the MnDOT "frost out" history shows that the frost was "out" in early April 2019.

Date	Precip (in)	Influent (MGD)
4/5/2019 (Fri)		0.1150
4/6/2019 (Sat)	0.0200	0.1240
4/7/2019 (Sun)		0.2090
4/8/2019 (Mon)	0.4800	0.3100
4/9/2019 (Tue)	0.0500	0.3270
4/10/2019 (Wed)		0.2350
4/11/2019 (Thu)		0.1980
4/12/2019 (Fri)	0.9800	0.1440
4/13/2019 (Sat)	0.1800	0.1770
4/14/2019 (Sun)		0.1540
4/15/2019 (Mon)		0.1620
4/16/2019 (Tue)	0.0800	0.1980
4/17/2019 (Wed)		0.2470
4/18/2019 (Thu)	0.3700	0.3450
4/19/2019 (Fri)		0.3020
4/20/2019 (Sat)		0.2610
4/21/2019 (Sun)	0.4000	0.2920
4/22/2019 (Mon)		0.3020
4/23/2019 (Tue)		0.2550
4/24/2019 (Wed)		0.2350
4/25/2019 (Thu)		0.2120
4/26/2019 (Fri)		0.2040
4/27/2019 (Sat)		0.2440
4/28/2019 (Sun)		0.1560
4/29/2019 (Mon)	0.0200	0.1860

J. Summary

1. In 2019 City pumped an average of 0.0575 MGD of potable water. Based on a population of 816, this amounts to 70 gpcd.
2. The data presented above indicates the average daily influent is 0.0805 MGD or 99 gpcd.
3. Influent is 130% of the water supplied to the community.
4. The theoretical, acceptable infiltration is roughly 120% of accepted per capita water supply.
5. Therefore, the infiltration cost-effective to eliminate is estimated to be 10% of 99 gpcd or 10 gpcd or 0.0082 MGD.
6. Cost-effective infiltration elimination could reduce the average daily influent from 0.0805 MGD to 0.0723 MGD or 26,404,000 gallons per year.

11. Appendix B – Design Criteria

System	Criteria	Source
Water	Minimum size for watermain providing protection and serving hydrants shall be six-inch diameter.	10 State Stds.
Water	Minimize dead ends and dead-end mains shall be equipped with a means of flushing.	10 State Stds.
Water	Valves should be placed at not more than 500-foot intervals in commercial districts and not more than 800-foot intervals in other areas.	10 State Stds.
Water	hydrant spacings should be provided at each street intersection and no more than 350 to 600 feet in other areas.	10 State Stds.
Water	hydrant leads shall be a minimum if six inches in diameter.	10 State Stds.
Water	Watermains shall be placed at least 10 feet horizontally from existing or proposed gravity sanitary or storm sewer, septic tank, or subsoil treatment system.	10 State Stds.
Water	Watermains crossing sanitary or storm sewers shall be laid to provide a minimum vertical distance of 18 inches (outside to outside dimension) above or below the sewer line.	10 State Stds.
Water	Watermain shall be at least 10 feet from sewer manholes.	10 State Stds.
Water	Water services shall conform to local or state plumbing codes.	10 State Stds.
Water	Each water service connection should be individually metered.	10 State Stds.
Sewers	A public gravity sewer conveying raw wastewater shall not be less than 8 inches in diameter.	10 State Stds.
Sewer	Where sewers cannot be placed sufficiently deep to prevent freezing Insulation shall be provided to prevent freezing.	10 State Stds.
Sewer	Provide slopes that provide mean velocities of two feet per second.	10 State Stds.
Sewer	Sewers shall be laid with uniform sloe between manholes.	10 State Stds.
Sewer	Sewers 24 inches in diameter or less shall be laid in straight alignment between manholes.	10 State Stds.
Sewer	Manholes shall be installed at the end of each line; at all changes in grade, size or alignment; at all intersections; at distances not greater than 4300 feet for sewers 15 inches or less, and at 500 feet for sewers that are 18 inches to 30 inches.	10 State Stds.
Sewer	The minimum diameter of manholes shall be 48 inches.	10 State Stds.
Sewer	Sewers shall be laid at least 10 feet horizontally from any existing or proposed watermain.	10 State Stds.
Sewer	Sewers crossing watermains shall be laid a minimum vertical distance of 18 inches between the outside of the watermain and the outside of the sewer main.	10 State Stds.
Sewer	Service cleanouts at each service's intersection with public right of way line.	USDA-RD
Sewer	Average Dry Weather Design Flow, ADW (gpd) = 70,700	Project
Sewer	Average Annual Design Flow (gpd) = 80,500	Project
Sewer	Average Wet Weather Design Flow, AWW (gpd) = 91,000	Project
Sewer	Peak Instantaneous Wet Weather Design Flow, PIWW (gpd) = 149,100	Project
Sewer	Peak Hourly Wet Weather Design Flow, PHWW (gpd) = 158,900	Project

System	Criteria	Source
Sewer	5-Day Carbonaceous Biochemical Oxygen Demand = Monitor only	MPCA
Sewer	Total Suspended Solids = Monito only	MPCA
Sewer	Fecal Coliform Organisms = less than 200 Organisms per 100 ml	MPCA
Sewer	pH (Standard Unit) = Monitor only	MPCA
Sewer	Effluent Flow = less than 45.8 MGD	MPCA

12. Appendix C – USCS Classification of Wastewater Irrigation Field

Figure 12-1; USCS Soil Map

A. Underlying the irrigation field are four soil types. See the tabulation of characteristics below.

Table 12-1; Soil Characteristics of Irrigation Field

Map Unit Symbol	% of Area	Soil Texture	Suitability[7]	Infiltration Rate (in/hr)	Depth to Water Table (in)
32B	28%	Sandy clay loam	Somewhat limited	0.20	79
72	31%	Clay loam, Sandy clay loam	Very limited	0.06	6
125	14%	Sandy clay loam	Somewhat limited	0.20	18
546	15%	Peat (muck)	Very limited	0	0

[7] Suitability for irrigation

13. Appendix D – Environmental Checklist

Issue	Will the project…?	Y	N	Impact
Access Control	Change access to property such as close, change location, or make a one way?		✓	
Accessibility	Assist persons with disabilities in the design of facility, sidewalk, curb, or gutter?	✓		Construction often impacts walkways, and these are usually replaced & improved.
Air Quality	Degrade air quality?		✓	There will be temporary & minor dust in the air during construction.
Bicycle & Pedestrians	Impact bicycle or pedestrian movement?	✓		Temporary impacts during the construction period.
Bridge	Involve a bridge replacement over water?		✓	
Construction impacts	Cause construction impact like erosion, noise, air, vibration, or other construction impacts?	✓		Temporary impacts during the construction period.
Controversy	Have controversy or be likely to cause controversy?		✓	Work can proceed only with community support.
Endangered species	Impact any endangered or threatened species of special concern due to the project location or design?		✓	None are known.
Energy impacts	Have major energy implications?		✓	
Erosion	Involve major soil disturbance (depth & volume) or have erosion potential due to landform, wind patterns or water volume?	✓		Excavations are short-term and soil stockpiles will be subjected to strict erosion control measures.
Excess materials	Involve disposal of excess material outside planned construction limits?	✓		Unsuitable materials encountered in excavations. These are transported to appropriate construction pits and replaced with acceptable materials.
Farmlands	Require any right-of-way from farmlands?		✓	No expansion to farmlands.
Floodplain	Cross or lie adjacent to any floodplain area?		✓	Beltrami County has not been officially mapped for floodplain insurance purposes.
Groundwater, geology, earthborn vibration	Impact groundwater, geology, or cause earthborn vibrations?	✓		Dewatering may be required in certain excavations. Minor earth borne vibration during construction.
Hazardous wastes	Involve a bridge replacement over water, former disposal or storage site, or hazardous materials route?		✓	None are known.
Historical, archeological, cultural[8]	Impact any structures developed prior to 1950? Require excavation or regrading?		✓	All disturbances are in areas previously disturbed by permanent constructions.
Land use	Inconsistent with local & regional use plans?		✓	

[8] USACE may require an archaeological assessment due to it being along the lakeshore and they must abide by Section 106 requirements

Issue	Will the project…?	Y	N	Impact
Minerals	Impact commercial minerals or peat resources present?		✓	
Noise	Impact noise sensitive receptors?	✓		Construction noise during active excavations. Work restricted to weekdays with weekend limitations.
Right-of-way	Require any R/W or easements?	✓		Temporary easements may be necessary.
Relocation	Require any relocation of homes or businesses?		✓	
Stream, river modifications	Change the course, current, or cross section of any stream or river?		✓	
Social	Impact public safety (i.e. police, protection, etc.)		✓	
	Impact sensitive groups? (children, handicapped, minorities, poor, etc.)		✓	
	Impact accessibility to schools, churches, or recreation facilities?		✓	
	Impact community cohesion?		✓	
Soil	Involve major soil disturbance (depth or volume), resulting in the widening of the overhead canopy?		✓	
Transportation	Require road rerouting, closing, or redevelopment?	✓		Temporary road closures during construction activities.
	Be accessible by mass transportation?	✓		
Vegetation, wildlife	Impact vegetation, fish, or wildlife?		✓	Work restricted to an urban area within in areas already improved.
Visual quality	Impact visual qualities? (view to or from facility)		✓	
Water quality	Impact water quality of lakes, streams, wetlands, etc.?		✓	Construction activities will require high-level erosion control measures.
Wetlands	Impact wetlands present within construction limits?		✓	No work around wetlands. Work restricted to existing infrastructure.
	Destroy, improve, or create wetland habitat?		✓	No work near wetlands.
Wild & scenic rivers or canoe & boating rivers	Impact a state or federal wild & scenic river, federal candidate wild & scenic river or state canoe & boating route?		✓	City of Blackduck is part of the Red River Drainage Area—not the Mississippi Drainage Area.

14. Appendix E – Needs / Alternate Costs & Alternatives

	Needs, Alternates												Alternatives	
Description		A	B	C	D	E	F	G	H	I	J	K	Comprehensive Reconstruction	CIPP & Selected Improvements
	Unit	LF	LF	LF	LS	LS	LF	LS	LS	LS	LS	LS		
	Quantity	9,600	6,300	10,444	1	1	820	1	1	1	1	1		
	U Cost	$215	$225	$64	$437,500	$64,400	$150	$60,000	$79,850	$86,125	$81,000	$30,000		
Total Estimated Construction Cost	…	$2,064,000	$1,418,000	$668,000	$438,000	$64,000	$123,000	$60,000	$80,000	$86,000	$81,000	$30,000	$4,294,000	$1,357,000
10% Contingency	10.00%	$206,400	$141,800	$66,800	$43,800	$6,400	$12,300	$6,000	$8,000	$8,600	$8,100	$3,000	$429,400	$135,700
Preliminary Engineering	1.10%	$22,700	$15,600	$7,350	$4,820	$700	$1,350	$660	$880	$950	$890	$330	$47,230	$14,930
Basic Engineering	10.00%	$206,400	$141,800	$66,800	$43,800	$6,400	$12,300	$6,000	$8,000	$8,600	$8,100	$3,000	$429,400	$135,700
Resident Inspection	10.00%	$206,400	$141,800	$66,800	$43,800	$6,400	$12,300	$6,000	$8,000	$8,600	$8,100	$3,000	$429,400	$135,700
Additional Engineering	…	…	…	…	…	…	…	…	…	…	…	…	…	…
Construction Staking	0.25%	$5,160	$3,550	$1,670	$1,100	$160	$310	$150	$200	$220	$200	$80	$10,740	$3,390
Easement Description	0.25%	$5,160	$3,550	$1,670	$1,100	$160	$310	$150	$200	$220	$200	$80	$10,740	$3,390
Operating & Maintenance Manual	0.18%	$3,720	$2,550	$1,200	$790	$120	$220	$110	$140	$150	$150	$50	$7,730	$2,440
Soil Boring (For Design)	0.40%	$8,260	$5,670	$2,670	$1,750	$260	$490	$240	$320	$340	$320	$120	$17,180	$5,430
Construction Material Testing	0.40%	$8,260	$5,670	$2,670	$1,750	$260	$490	$240	$320	$340	$320	$120	$17,180	$5,430
Pilot Study														
Labor Stds. Compliance for Spplmntl. Funding	0.30%	$6,190	$4,250	$2,000	$1,310	$190	$370	$180	$240	$260	$240	$90	$12,880	$4,070
Electrical Service	0.72%	$14,860	$10,210	$4,810	$3,150	$460	$890	$430	$580	$620	$580	$220	$30,920	$9,770
Legal, Fiscal And Administration	2.00%	$41,280	$28,360	$13,360	$8,760	$1,280	$2,460	$1,200	$1,600	$1,720	$1,620	$600	$85,880	$27,140
Interim Financing Costs	5.00%	$103,200	$70,900	$33,400	$21,900	$3,200	$6,150	$3,000	$4,000	$4,300	$4,050	$1,500	$214,700	$67,850
Total Estimated Project Cost	…	$2,901,990	$1,993,710	$939,200	$615,830	$89,990	$172,940	$84,360	$112,480	$120,920	$113,870	$42,190	$6,037,380	$1,907,940

Alt	Description	Const Cost	Project Cost
A	Replace all VCP	$2,064,000	$2,901,990
B	Replace all 4" Watermain	$1,418,000	$1,993,710
C	Reline VCP by CIPP	$668,000	$939,200
D	Refurbish all Pump Stations	$438,000	$615,830
E	Refurbish Drake Motel Pump Station	$64,000	$89,990
F	Extend Sanitary Services to Mill Ave Neighborhood	$123,000	$172,940
G	Provide SCADA Control System	$60,000	$84,360
H	Replace Agricultural Irrigators(Single Full Circle)	$80,000	$112,480
I	Replace Agricultural Irrigators (Two Half Circle)	$86,000	$120,920
J	Refurbish Effluent Pumps & Controls for Irrigator	$81,000	$113,870
K	Provide Portable Generator	$30,000	$42,190

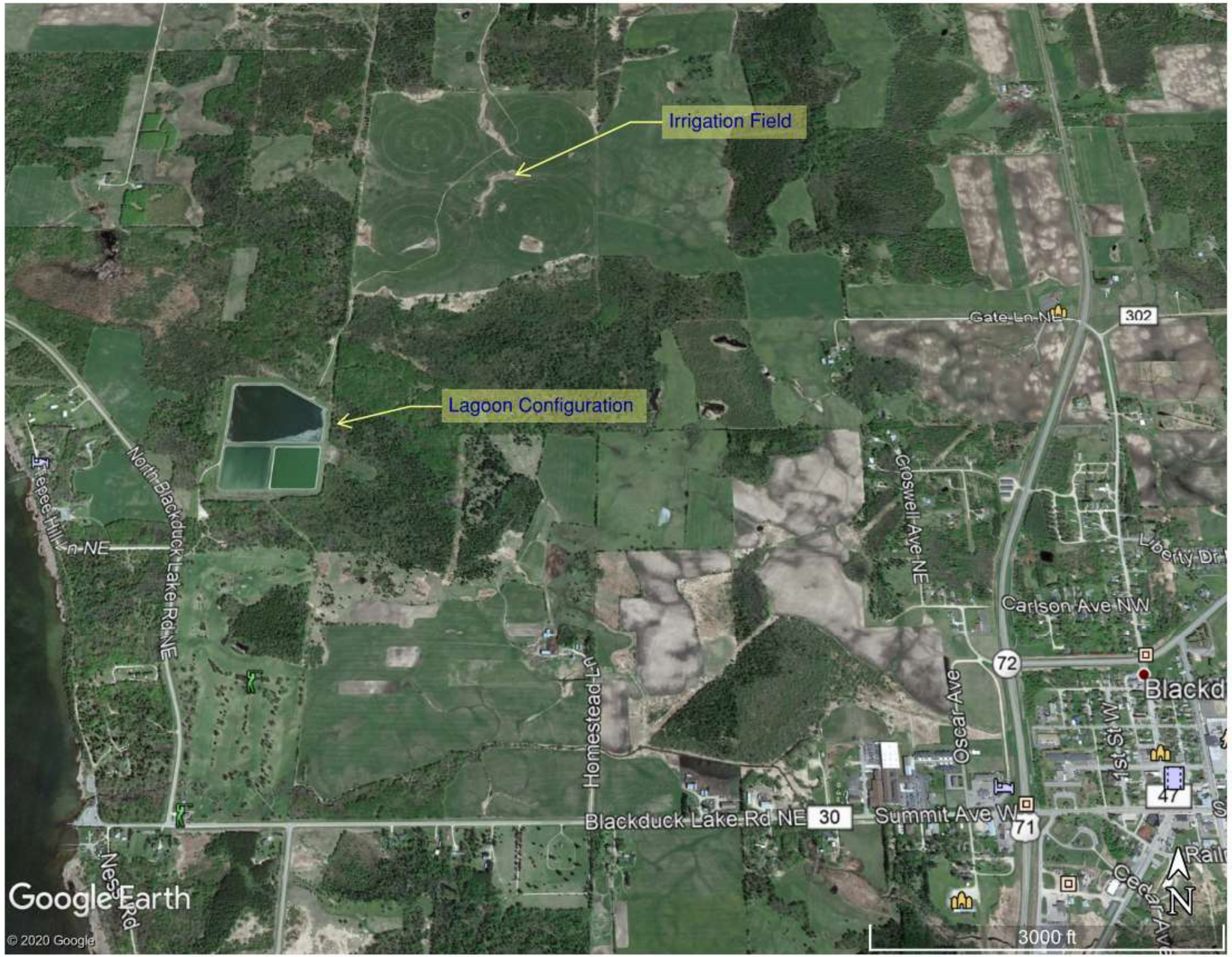
- "Comprehensive Reconstruction" includes Alternates: A, B, D, F, G, H, J & K
- "CIPP w Selected Improvements" includes Alternates: C, D, G, H, J & K

15. Appendix F - Comprehensive Reconstruction Estimate of Probable Cost

				Project Totals		RD Eligible		RD Eligible		RD Ineligible	
Spec. No.	Description	Unit	Unit Price ($)	Project Quantity	Project Extension ($)	Quantity	Extension ($)	Quantity	Extension ($)	Quantity	Extension ($)
01 3000	Mobilization	LS	214,000.00	1.00	214,000.00	0.40	85,600.00	0.40	85,600.00	0.20	42,800.00
01 5526	Traffic Control	LS	40,000.00	1.00	40,000.00	0.40	16,000.00	0.40	16,000.00	0.20	8,000.00
01 5713	Storm Drain Inlet Protection	Each	250.00	32.00	8,000.00					32.00	8,000.00
01 5713	Temporary Erosion Control	LS	15,000.00	1.00	15,000.00	0.40	6,000.00	0.40	6,000.00	0.20	3,000.00
02 4100	Remove Manhole (Sanitary)	Each	400.00	30.00	12,000.00	30.00	12,000.00				
02 4100	Remove Catch Basin	Each	300.00	5.00	1,500.00					5.00	1,500.00
02 4100	Remove Hydrant	Each	300.00	24.00	7,200.00			24.00	7,200.00		
02 4100	Remove Gate Valve & Box	Each	150.00	46.00	6,900.00			46.00	6,900.00		
02 4100	Remove Curb & Gutter	LF	4.00	2,145.00	8,580.00	745.83	2,983.34	634.17	2,536.66	765.00	3,060.00
02 4100	Remove Pipe Sewer (Storm)	LF	5.00	475.00	2,375.00	25.00	125.00			450.00	2,250.00
02 4100	Remove Bituminous Pavement	SY	3.50	36,571.67	128,000.83	17,400.00	60,900.00	19,171.67	67,100.83		
02 4100	Remove Concrete Driveway Pavement	SY	10.00	50.00	500.00					50.00	500.00
02 4100	Remove Concrete Walk	SF	0.55	2,675.00	1,471.25	1,652.00	908.60	1,023.00	562.65		
31 2200	Common Excavation (8' depth)	CY	3.00	102,813.33	325,320.00	46,400.00	417,600.00	56,413.33	507,720.00		
31 2200	Select Granular Embankment (CV) (12" Depth)	CY	15.00	12,851.67	192,775.00	5,800.00	87,000.00	7,051.67	105,775.00		
32 1123	Aggregate Base (CV) Class 5 (8" Depth)	CY	20.00	8,568.21	171,364.12	3,866.86	77,337.20	4,701.35	94,026.92		
32 1216	Bituminous Material for Tack Coat	Gal	1.00	4,241.05	4,241.05	1,914.00	1,914.00	2,327.05	2,327.05		
32 1216	Type SP 9.5 Wearing Course Mixture (3,B)	Ton	70.00	4,240.28	296,819.52	1,913.65	133,955.64	2,326.63	162,863.88		
32 1216	Type SP 9.5 Non Wear Course Mixture (3,B)	Ton	70.00	4,240.28	296,819.52	1,913.65	133,955.64	2,326.63	162,863.88		
32 1500	Aggregate Surfacing (CV) Class 5 (4" Depth)	CY	20.00	526.80	10,535.98	306.45	6,129.02	220.35	4,406.97		
32 1600	4" Concrete Walk	SF	5.00	6,900.00	34,500.00	3,729.17	18,645.86	3,170.83	15,854.14		
32 1600	Concrete Curb & Gutter Design B618	LF	16.00	1,380.00	22,080.00	745.83	11,933.35	634.17	10,146.65		
32 1600	8" Concrete Valley Gutter	SY	70.00	50.00	3,500.00					50.00	3,500.00
32 8600	Agricultural Irrigator, Full Circle	LS	79,850.00	1.00	79,850.00	1.00	79,850.00				
32 8600	Irrigator Piping, Wiring & Controls	LS	81,000.00	1.00	81,000.00	1.00	81,000.00				
32 9219	Turf Establishment	LS	75,000.00	1.00	75,000.00	0.40	30,000.00	0.40	30,000.00	0.20	15,000.00
33 1000	6" Watermain	LF	28.00	12,693.00	355,404.00			12,693.00	355,404.00		
33 1000	1" Water Service Pipe	LF	23.00	915.60	21,058.80			915.60	21,058.80		
33 1000	6" Gate Valve & Box	Each	1,500.00	46.00	69,000.00			46.00	69,000.00		
33 1000	1" Corporation Stop	Each	250.00	100.00	25,000.00			100.00	25,000.00		
33 1000	2" Corporation Stop	Each	275.00	1.00	275.00			1.00	275.00		
33 1000	1" Curb Stop & Box	Each	350.00	100.00	35,000.00			100.00	35,000.00		
33 1000	2" Curb Stop & Box	Each	375.00								
33 1000	Hydrant (9.5' Bury)	Each	4,500.00	24.00	108,000.00			24.00	108,000.00		
33 1000	Ductile Iron Fittings (AWWA C153)	Lbs	8.00	4,974.25	39,794.00			4,974.25	39,794.00		
33 1000	Connect to Existing Watermain	Each	1,000.00	13.00	13,000.00			13.00	13,000.00		
33 3100	8" Sanitary Sewer Main	LF	33.00	10,440.00	344,520.00	10,440.00	344,520.00				
33 3100	Sanitary Sewer Manhole (0'-8')	Each	3,800.00	30.00	114,000.00	30.00	114,000.00				
33 3100	Connect to Existing Sanitary Sewer Main	Each	250.00	10.00	2,500.00	10.00	2,500.00				
33 3100	4" Sanitary Sewer Service Pipe	LF	25.00	3,122.88	78,072.00	3,122.88	78,072.00				
33 3100	8"X4" Sanitary Sewer Service Wye	Each	200.00	96.00	19,200.00	96.00	19,200.00				
33 3100	4" Sanitary Sewer Cleanout Assembly	Each	400.00	96.00	38,400.00	96.00	38,400.00				
33 3213	Refurbish Main Lift Station	LS	67,250.00	1.00	67,250.00	1.00	67,250.00				
33 3213	Refurbish Frenzel Lift Station	LS	22,400.00	1.00	22,400.00	1.00	22,400.00				
33 3213	Refurbish Forestry Lift Station	LS	31,520.00	1.00	31,520.00	1.00	31,520.00				
33 3213	Refurbish Mallard Lift Station	LS	31,340.00	1.00	31,340.00	1.00	31,340.00				
33 3213	Refurbish West End Lift Station	LS	31,330.00	1.00	31,330.00	1.00	31,330.00				
33 3213	Prepackaged Lift Station (Mill Ave Addition)	LS	55,000.00	1.00	55,000.00	1.00	55,000.00				
33 3213	Furnish & Install SCADA System	LS	60,000.00	1.00	60,000.00	1.00	60,000.00				
33 3213	Refurbish Irrigator Pumps, Controls & Panels	LS	35,000.00	1.00	35,000.00	1.00	35,000.00				
33 4211	8" PVC Pipe Sewer (Storm)	LF	25.00	450.00	11,250.00					450.00	11,250.00
33 4211	Connect to Existing Storm Sewer	Each	600.00	2.00	1,200.00					2.00	1,200.00
33 4211	Const Drainage Structure Design SD	Each	4,000.00	5.00	20,000.00					5.00	20,000.00
48 1000	Portable Generator (15 KW Trailer Mounted Diesel)	LS	25,000.00	1.00	25,000.00	1.00	25,000.00				
	Total Construction Cost			...	4,293,846.00		2,219,370.00		1,954,416.00		120,060.00

16. Appendix G – Map of Proposed Improvements, and Affected Services

17. Appendix H – Map of Lagoons & Irrigation Field



A bill for an act

relating to local taxes; authorizing the city of Blackduck to impose a local sales and use tax.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MINNESOTA:

Section 1. **CITY OF BLACKDUCK; TAXES AUTHORIZED.**

Subdivision 1. **Sales and use tax authorization.** Notwithstanding Minnesota Statutes, section 477A.016, or any other law, ordinance, or city charter, and if approved by the voters at a general election as required under Minnesota Statutes, section 297A.99, subdivision 3, the city of Blackduck may impose, by ordinance, a sales and use tax of up to one-half of one percent for the purposes specified in subdivision 2. Except as otherwise provided in this section, the provisions of Minnesota Statutes, section 297A.99, govern the imposition, administration, collection, and enforcement of the tax authorized under this subdivision. The tax imposed under this subdivision is in addition to any local sales and use tax imposed under any other special law.

Subd. 2. **Use of sales and use tax revenues.** The revenues derived from the tax authorized under subdivision 1 must be used by the city of Blackduck to pay the costs of collecting and administering the tax, including associated bond costs on bonds issued under subdivision 3, and securing and paying debt service on the bonds, and to finance all or part of the following projects:

(1) $200,000 for electricity and utility improvements at the city campground;

(2) $250,000 for construction of a playground and ADA compliant restroom at the city wayside rest;

(3) $300,000 for trail extensions and improvements adjacent to Wayside Rest Park;

(4) $150,000 for irrigation improvements at the city golf course; and

(5) $100,000 for rehabilitation of the Blackduck Community Library.

Subd. 3. **Bonding authority.** (a) The city of Blackduck may issue bonds under Minnesota Statutes, chapter 475, to finance all or a portion of the costs of the project authorized in subdivision 2 and approved by the voters as required under Minnesota Statutes, section 2.2297A.99, subdivision 3, paragraph (a). The aggregate principal amount of bonds issued under this subdivision may not exceed:

(1) $200,000 for the project listed in subdivision 2, clause (1), plus an amount to be applied to the payment of the costs of issuing the bonds;

(2) $250,000 for the project listed in subdivision 2, clause (2), plus an amount to be applied to the payment of the costs of issuing the bonds;

(3) $300,000 for the project listed in subdivision 2, clause (3), plus an amount to be applied to the payment of the costs of issuing the bonds;

(4) $150,000for the project listed in subdivision 2, clause (4), plus an amount to be applied to the payment of the costs of issuing the bonds; and

(5) $100,000 for the project listed in subdivision 2, clause (5), plus an amount to be applied to the payment of the costs of issuing the bonds;

(b) The bonds may be paid from or secured by any funds available to the county, including the tax authorized under subdivision 1. The issuance of bonds under this subdivision is not subject to Minnesota Statutes, sections 275.60 and 275.61.

(c) The bonds are not included in computing any debt limitation applicable to the county. Any levy of taxes under Minnesota Statutes, section 475.61, to pay principal of and interest on the bonds is not subject to any levy limitation. A separate election to approve the bonds under Minnesota Statutes, section 475.58, is not required.

Subd. 4. **Termination of taxes.** The tax imposed under subdivision 1 expires at the earlier of: (1) 20 years after the tax is first imposed; or (2) when the county determines that the amount it has received from this tax is sufficient to pay for the project costs authorized under subdivision 2 for projects approved by voters as required under Minnesota Statutes, section 297A.99, subdivision 3, paragraph (a), plus an amount sufficient to pay the costs related to issuance of any bonds authorized under subdivision 3, including interest on the bonds. Except as otherwise provided in Minnesota Statutes, section 297A.99, subdivision

3, paragraph (f), any funds remaining after payment of the allowed costs due to timing of the termination of the tax under Minnesota Statutes, section 297A.99, subdivision 12, shall be placed in the county's general fund. The tax imposed under subdivision 1 may expire at an earlier time if the county determines by ordinance.

EFFECTIVE DATE. This section is effective the day after the governing body of the city of Blackduck and its chief clerical officer comply with Minnesota Statutes, section 645.021, subdivisions 2 and 3.

Old Duck & Black Duck

Revised Site Visit and Assessment Proposal

March 10. 2023

Prepared for: Christina Regas, City Administrator, City of Blackduck, MN 218/835-4803 christina.regas@blackduckmn.com

Prepared by: Mayda Jensen, Jensen Conservation Services, Inc. 13515 C Street, Omaha, NE 68144 402/689-5436 maydasjensen@gmail.com

Sculpture: *Old Duck* (downtown) *& Black Duck (on Highway)*

Site Visit and Assessment Proposal

Jensen Conservation Services, Inc. proposes to visit Blackduck, MN to review and assess the condition and art conservation needs for the older black duck sculpture located in the downtown area as well as the younger *Black Duck* sculpture located near the highway. We require access to the top of both sculptures be provided by the City of Blackduck. We will examine the sculptures and assess the conditions of damage and discuss with the client possible avenues of repair and restoration. We will prepare two written conservation treatment proposals to summarize our findings for each sculpture and a program of care and restoration that is amenable to the City. Our summary report will include a budget for the project(s).

Fee Schedule

Our fee schedule for the proposed site visit and summary report is

Mileage:	$736.00
Perdiem	$200.00
Professional Services	$1,350.00
TOTAL	**$2,286.00**

Blackduck Funding Options

Funding Resources:

1. **<u>Cenex Cooperative – Having good roads should enhance agriculture safety.</u>**
    a. **Timeline:** Applications are accepted during three application periods. Jan. 1 to Feb. 15; May 1 to June 15; Sept. 1 to Oct. 15 each year.
    b. **Use:** Priority is given to requests that align with ag safety and farmer well-being, agriculture education and rural community vitality.
    c. **Eligibility:** Grant requests must be submitted by a local cooperative. Grant requests received directly from a local organization are not accepted.
    d. **Funding Range:** Up to $10,000. Each member cooperative can receive up to $10,000 in matching funds annually. A minimum matching contribution of $1,000 and maximum of $10,000 will be considered.

2. **<u>USDA Community Facilities Loan/Grant – There are sometimes additional funding allocated with a presidential disaster declaration. See attached.</u>**
    a. **Timeline:** Applications for this program are accepted year-round. Funding is made on a first come first serve basis.
    b. **Use:** Road equipment is an eligible expense; however, it is less competitive than equipment for emergency response (Firetruck, ambulance, etc.)
    c. **Eligibility:** The City of Blackduck is eligible applicant.
    d. **Funding Range:** Grant or loan funds may be available.

3. **<u>Minnesota Department of Labor and Industry – May be eligible if the city can show that the new equipment (road grader) is safer than your employees than the old equipment.</u>**
    a. **Website:** MNOSHA WSC: Safety Grant Program application | Minnesota Department of Labor and Industry
    b. **Timeline:** Feb 15, April 15, June 15, Oct 15, and Dec 15
    c. **Use:** Occupational Safety and Health Administration (MNOSHA) state-plan program, which is approved by federal OSHA, to protect workers at private and public worksites.
    d. **Eligibility:** Requires a hazard assessment which must address the hazards associated with the process or processes addressed by the grant project and provide **specific** recommendations associated with each item requested as part of the application. This can be done by an inhouse safety/health committee that produce the report and meeting minutes of discussion.
    e. **Funding Range:** Up to $10,000

President Joseph R. Biden, Jr. Approves Major Disaster Declaration for Minnesota

Release Date: July 15, 2022

WASHINGTON -- FEMA announced that federal disaster assistance has been made available to the state of Minnesota to supplement state, tribal and local recovery efforts in the areas affected by the severe storms, straight-line winds and flooding April 22 – June 15, 2022.

Public assistance federal funding is available to the state, tribal and eligible local governments and certain private nonprofit organizations on a cost-sharing basis for emergency protective measures, including direct federal assistance under public assistance, in Beltrami, Clearwater, Cook, Kittson, Koochiching, Lake, Lake of the Woods, Mahnomen, Marshall, Norman, Pennington, Polk, Red Lake, Roseau and St. Louis counties; and the Bois Forte Band of Chippewa, Leech Lake Band of Ojibwe, Red Lake Nation and the White Earth Nation.

Federal funding is also available on a cost-sharing basis for hazard mitigation measures statewide.

Brian F. Schiller has been named the Federal Coordinating Officer for federal recovery operations in the affected area. Additional designations may be made at a later date if requested by the state and warranted by the results of further assessments.

CITY OF BLACKDUCK

MAR 16 2023

February 15, 2023

Dear Area Business Owners, Suppliers and Organizations:

After-Prom has been a tradition at Blackduck High School for over 25 years, since its inception in 1995 when the first After-Prom was established. It was successful because of caring business owners, parents, and our community. We are please to be able to provide students a safe, fun, and supervised event. There is much evidence that supports a reduction in safety issues in communities where programs such as After-Proms are utilized. Last year we had approximately 100 students who participated.

This year, prom will be held Saturday May 6th, 2023 at Blackduck High School, with the After-Prom to follow from 11pm-2:30am. Immediately following the Grand March the students will receive a wonderful meal, have Digital Jake host the dance and then the After Prom begins. Some of the activities this year will include: Laser Tag, Volleyball, a Hypnotist, Photo Booth, Card Games, Corn Hole, Relay Games, and many other activities. There will also be a variety of prizes to be won which include things like: TV's, microwaves, mini fridges, camping gear, Buddy heaters, Bluetooth speakers, gift cards and much more!

Our goal this year is to raise $6000 to provide food, entertainment, games and prizes. Please consider supporting the safety of our kids by donating to our After-Prom program.

Any donations may be mailed to:
Sandy Lien
PO Box 550
Blackduck, MN 56630

Please make checks payable to **Blackduck High School After-Prom**.

If you choose to donate any prizes, you can call for pickup from either Sandy Lien 218-766-3733 or Sara Anderson 218-556-5412.

We appreciate any and all donations! If possible, we would like to have donations by April 15th.

Thank you for your consideration!

Sincerely,

The After-Prom Committee, Blackduck High School

From: Jennifer Parker
To: Dwight Kalvig; Dwight Warden; Christina Regas; maxwellg75@gmail.com
Subject: Information for Churches, City, Chamber
Date: Thursday, March 16, 2023 11:07:15 AM

[EXTERNAL]

I am hoping that area churches, Chamber, and BDC, among others, may be interested in donating to this fantastic accomplishment!

Attached you will find the information for donating to a fund to help Maximus and his family with expenses for the National Spelling Bee.
The organization covers airfare and hotel for Maximus and one parent, this fund will help so that his stepdad and brother can also go. Many of you will remember and have taught his stepdad: Luke Binkley.
We are hoping to cover airfare for two plus meals, admission tickets to various places, and transportation while they are in D.C.

A group of us were thinking that we could maybe raise enough this way and not have to organize some kind of public fundraiser as well - to that end, any of you who can share this with your churches or organizations you are a part of would be greatly appreciated!

For Max: Would you also consider making a Mayoral Proclamation - perhaps a Maximus Katsoulis Day? Or whatever makes more sense?
Max is only the second student from Blackduck to go to the STATE Spelling Bee, and the first from Blackduck OR Beltrami County to go to the National Spelling Bee.

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Jennifer Parker
Blackduck High School
English Department
Speech, One-Act Play, and Theater

parkerj@blackduck.k12.mn.us
(218)835-5210

QUOTATION

Crunden Electric Inc.
29513 Corlan Rd. NE
Blackduck, MN 56630
USA

Voice: 218-835-4127
Fax:

Quote Number: 993
Quote Date: Mar 3, 2023
Page: 1

Quoted To:
CITY OF BLACKDUCK PO. BOX 380 8 SUMMIT AVE. NE Blackduck, MN 56630 USA

Customer ID	Good Thru	Payment Terms	Sales Rep
COB	4/2/23	Net 30 Days	

Quantity	Item	Description	Unit Price	Amount
1.00		MATERIAL PKG	8,066.90	8,066.90
1.00		BELTRAMI ELECTRIC FEES	850.00	850.00
1.00	SI	STATE INSPECTION FEES	341.00	341.00
40.00	L	LABOR	85.00	3,400.00
		2 NEW 200AMP SERVICES AND RECONNECT EXISTING CIRCUITS . (BELTRAMI ELECT NEW BOILER FEE NOT INCLUDED IN QUOTE.)		
			Subtotal	12,657.90
			Sales Tax	
			TOTAL	**12,657.90**

City of Black duck

From:	"Dudgeon, Dan T." <DDudgeon@beltramielectric.com>
To:	"crunden@paulbunyan.net" <crunden@paulbunyan.net>
Date:	Fri, Jan 20, 2023, 14:11
Subject:	Charger ICE-60-60kW DC All-in-One_Spec-Sheet v2.pdf
Attachments:	Charger ICE-60-60kW DC All-in-One_Spec-Sheet v2.pdf

Bill here is the charger for the school according to the sheet it looks like it may be just one charger unless they plan on buying a second, you will have to check with them. For Black Duck city hall. If they were to upgrade to a steffes unit then we would wave the wire charges and the service improvement would be dropped from $850 to $550.00 this is at today's prices which are subject to change in the spring once they look at how last year ended up. The price for the 5130 steffes unit is $8752.70 + tax Rebates for that unit total $2160.00 so a total of $6592.70 + tax This does not include installation, so they would need plumber and electrician. If you would pass this along to them at city hall Thank You Dan Dudgeon Beltrami Electric

Business

Residential Heating Incentives Application

Beltrami Electric Cooperative Inc.
Your Touchstone Energy® Cooperative

Minnkota Power COOPERATIVE
A Touchstone Energy® Cooperative

Name:			Phone:		Account #:	
Mailing Address:			Installation Address:			
City:	State:	Zip:	City:		State:	Zip:
Email:					Location #:	

Thermostats	Manufacturer	Model Number	Qty	Incentive	Power Savers
Programmable Thermostat				50% of Purchase Price (Up to $25)	
Energy Star® Smart Thermostat (must be Wi-Fi connected)				50% of Purchase Price (Up to $50)	

Dual Fuel Electric Heating (Electric Heat That Require Alt Fuel Backup)	Mfr	Model #	Serial Number	Qty (kW)	Value of Electricity ($25/kW)

Storage Electric Heating (Steffes Storage or Slab Storage)	Mfr	Model #	Serial Number	Qty (kW)	BEC Storage ($30/kW)	Value of Electricity ($45/kW)
STORAGE BOILER	STEFFES	5130		28.8	$864	$1296
					$2160 Total	

Supplemental heating for ASHP (Steffes furnances or modulating plenum heaters)	Mfr	Model #	Serial Number	Qty	Power Savers ($500/unit)
Must modulate to allow ASHP to operate down to 5°F, and must be on load control					

Air-Source Heat Pumps/ Mini Split Heat Pumps	Mfr	Model #	Serial #	AHRI #	Qty (Tons)	Power Savers (<17 SEER - $300/Ton) (>=17 SEER - $500/Ton)	Value of Electricity ($190/Ton)
Air source heat pump & Evaporator coil							

Closed Loop Geothermal Heat Pumps	Mfr	Model #	Serial #	AHRI #	Qty (Tons)	Power Savers ($400/ton - $5,000 max) (1/2 Rebate for Replace)	Value of Electricity ($250/Ton)
(16.1 EER/3.1 COP) (electric backup must be on load control)							

Open Loop Geothermal Heat Pumps	Mfr	Model #	Serial #	AHRI #	Qty (Tons)	Power Savers ($200/ton - $2,500 max) (1/2 Rebate for Replace)	Value of Electricity ($250/Ton)
(20.1 EER/3.5 COP) (electric backup must be on load control)							

Hydronic Equipment
STEFFES COMFORT PLUS FURNACES

Model	KW Input	BEC Part Number	KW Output 12HR Charge	BTU Output 12HR Charge	Shipping Weight	Member Location Price
5120	14.0 19.2 24.8	10340	8.97 12.31 13.35	30,621 41,994 45,566	2302	$6,884.90
5130	28.8 37.2	10341	18.46 19.23	62,991 65,615	3154	$8,752.70
5140	38.4 45.6	10342	24.62 25.64	83,988 87,487	4026	$9,788.90
½ HP Var. Speed AH w/Water Coil		10353			165	$1,943.70
¾ HP Var. Speed AH w/Water Coil		10354			165	$2,487.10
Primary Loop Kit		10345			37	$794.20
Air Handler Sensor Kit		10348				$33.72
Static Heat Recovery Unit		10344			11	$257.40
18" Elevation Stand		10347				$381.15

Beltrami Electric Cooperative Price List, Effective December 1, 2022 through May 31, 2023. This price does **not** include sales tax or cost of installation.

The purchaser must pick up the unit at BEC's warehouse and make their own arrangements to deliver the unit to the job site. Beltrami Electric does **not** offer delivery or installation. We recommend hiring a heating contractor and/or an electrician to install the unit.

Discount Note: The listed prices may have discounts applied if installed at locations served by Beltrami Electric Cooperative, Inc. The discount is earned upon completion of the installation. If installation is not completed or if unit is used at other than BEC location the discount is not earned and the sale will be charged at the full unit price.

CHARGE NOTE: The storage heaters are currently charged fourteen hours per day. The kW output is higher when charged for more hours. The ripple control guide lists12 hours of charge for the ETS units, therefore sizing should be based on outputs listed for 12-hour charge.

Approx $1400/yr savings (off-Peak)

CITY OF BLACKDUCK

Revenue/Expenditure
Audit Detail Full

Audit 2022 January to 2022 Period 15

Fund 101 GENERAL FUND
Expenditure

E 101-41940-206 Electricity **Budget** $8,000.00 **Total** $6,322.20 **Balance** $1,677.80

	Vendor SearchName	Invoice	------Check------	Batch Name	Debit	Credit
2022-01 January	**Comments**		**Refer**	**PO**	Begin	**$0.00**
2022-01 Pay	BELTRAMI ELECTRI	122321	010480	1/10/2022 DECBILLS120721	$902.34	$0.00
	December 2021 bill		29	0		
2022-01 Pay	BELTRAMI ELECTRI	04311061	010480	1/10/2022 DECBILLS120721	$0.00	$0.00
	correction letter		44	0		
2022-01 Pay	BELTRAMI ELECTRI	010122	010563	2/9/2022 JANBILLS2022	$1,079.54	$0.00
	JAN BILLING		13	0		
2022-01 JE				REV2021je209	$0.00	$902.34
	reversing journal entry for AP batch		223	0		
2022-01 JE				REV2021je209-2c	$0.00	$902.34
	reversing entry for journal entry 209		224	0		
2022-01 JE				REV2021je209	$902.34	$0.00
	reversing journal entry for AP batch		223	0		
	Total 2022-01 January				$2,884.22	$1,804.68
					Ending	$1,079.54
	Vendor SearchName	**Invoice**	**------Check------**	**Batch Name**	**Debit**	**Credit**
2022-03 March	**Comments**		**Refer**	**PO**	Begin	**$1,079.54**
2022-03 Pay	BELTRAMI ELECTRI	010641		3/8/2022 FEBBILLS2022	$1,181.52	$0.00
			31	0		
	Total 2022-03 March				$1,181.52	$0.00
					Ending	$2,261.06
	Vendor SearchName	**Invoice**	**------Check------**	**Batch Name**	**Debit**	**Credit**
2022-04 April	**Comments**		**Refer**	**PO**	Begin	**$2,261.06**
2022-04 Pay	BELTRAMI ELECTRI	033122	010717	4/5/2022 MARBILLS2022	$840.83	$0.00
			1044	0		
	Total 2022-04 April				$840.83	$0.00
					Ending	$3,101.89
	Vendor SearchName	**Invoice**	**------Check------**	**Batch Name**	**Debit**	**Credit**
2022-05 May	**Comments**		**Refer**	**PO**	Begin	**$3,101.89**
2022-05 Pay	BELTRAMI ELECTRI	042828	010822	5/10/2022 APRILBILLS0406	$897.94	$0.00
			104	0		
	Total 2022-05 May				$897.94	$0.00
					Ending	$3,999.83
	Vendor SearchName	**Invoice**	**------Check------**	**Batch Name**	**Debit**	**Credit**
2022-06 June	**Comments**		**Refer**	**PO**	Begin	**$3,999.83**
2022-06 Pay	BELTRAMI ELECTRI	060322	010908	6/7/2022 MAYBILLS	$429.16	$0.00
			12	0		
	Total 2022-06 June				$429.16	$0.00
					Ending	$4,428.99
	Vendor SearchName	**Invoice**	**------Check------**	**Batch Name**	**Debit**	**Credit**
2022-07 July	**Comments**		**Refer**	**PO**	Begin	**$4,428.99**
2022-07 Pay	BELTRAMI ELECTRI	0262722	011005	7/12/2022 JUNEBILLS	$244.62	$0.00
			88	0		

CITY OF BLACKDUCK

Revenue/Expenditure
Audit Detail Full

Audit 2022 January to 2022 Period 15

Fund 101 GENERAL FUND
Expenditure

E 101-41940-206 Electricity **Budget** $8,000.00 **Total** $6,322.20 **Balance** $1,677.80

					Total 2022-07 July			$244.62	$0.00
								Ending	$4,673.61
	Vendor SearchName	**Invoice**	**------Check------**		**Batch Name**			**Debit**	**Credit**
2022-08 August	**Comments**		**Refer**	**PO**				Begin	**$4,673.61**
2022-08 Pay	BELTRAMI ELECTRI	080122	011106		8/9/2022	JULYBILLS		$263.31	$0.00
			15	0					
					Total 2022-08 August			$263.31	$0.00
								Ending	$4,936.92
	Vendor SearchName	**Invoice**	**------Check------**		**Batch Name**			**Debit**	**Credit**
2022-09 September	**Comments**		**Refer**	**PO**				Begin	**$4,936.92**
2022-09 Pay	BELTRAMI ELECTRI	083022	011195		9/7/2022	AUGBILLS		$258.55	$0.00
			33	0					
					Total 2022-09 September			$258.55	$0.00
								Ending	$5,195.47
	Vendor SearchName	**Invoice**	**------Check------**		**Batch Name**			**Debit**	**Credit**
2022-10 October	**Comments**		**Refer**	**PO**				Begin	**$5,195.47**
2022-10 Pay	BELTRAMI ELECTRI	09232022	011286		10/11/2022	SEPTBILLS2022		$220.21	$0.00
			15	0					
2022-10 Pay	BELTRAMI ELECTRI		011381		11/8/2022	OCTBILLS2022		$306.12	$0.00
			93	0					
2022-10 Pay	BELTRAMI ELECTRI		011381		11/8/2022	OCTBILLS2022		$0.00	$306.12
			93	0					
					Total 2022-10 October			$526.33	$306.12
								Ending	$5,415.68
	Vendor SearchName	**Invoice**	**------Check------**		**Batch Name**			**Debit**	**Credit**
2022-11 November	**Comments**		**Refer**	**PO**				Begin	**$5,415.68**
2022-11 Pay	BELTRAMI ELECTRI		011381		11/8/2022	OCTBILLS2022		$306.12	$0.00
			93	0					
					Total 2022-11 November			$306.12	$0.00
								Ending	$5,721.80
	Vendor SearchName	**Invoice**	**------Check------**		**Batch Name**			**Debit**	**Credit**
2022-12 December	**Comments**		**Refer**	**PO**				Begin	**$5,721.80**
2022-12 Pay	BELTRAMI ELECTRI	1201222	011457		12/6/2022	NOVBILLS2022		$600.40	$0.00
			0	0					
					Total 2022-12 December			$600.40	$0.00
								Ending	$6,322.20
Control Act 101-25300 Unrese			**Total**	E 101-41940-206	Electricity			$8,433.00	$2,110.80
		In Balance		**Total Year**		**$6,322.20**		**Ending**	**$6,322.20**
Total Expenditure								$8,433.00	$2,110.80
			Fund	101				$8,433.00	$2,110.80