

Preliminary Engineering Report
2016 Woodcrest Sanitary Sewer
Improvements

City of Elko New Market

City Project No.

BMI Project No. T15.102632

February 2016

Submitted by:

Bolton & Menk, Inc.
12224 Nicollet Avenue
Burnsville, MN 55337
P: 952-890-0509
F: 952-890-8065





Certification

Feasibility Report

for

Woodcrest Sewer

City of Elko New Market

Elko New Market, MN

T15.102632

February 11, 2016

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.

By: _____
Rich J. Revering, P.E.
License No. 20711

Date: _____



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1.0 BACKGROUND

1.1 PROJECT INITIATION

This project was initiated by the City Council in response to information on potential long-term sewer problems presented by City Engineering staff. No petition was submitted by project residents. This project or any portion of it would require a 4/5 council vote on a resolution "Ordering Improvement and Preparation of Plans," if the City wished to finance the project using Special Assessments. All other Council actions on the project would only require a majority vote.

1.2 PROJECT AREA

The project area is depicted on the following map. All parcels with driveways connecting to Woodcrest Lane, Woodcrest Circle, Woodcrest Drive, and Woodcrest Court would be eligible for City sewer as part of the project.

There are 42 existing homes in the described area. Some are on double lots. Examination of maps indicates up to 10 additional homes could be added. Some lots have been combined with adjacent lots and would need to be split off to achieve this.

The streets are gravel-surfaced with rural drainage (ditches). Water is provided from individual or shared wells. The parcels are heavily wooded as illustrated by the cover photo of this report. The mature trees should be considered an essential part of the unique character of this neighborhood. Indeed, the name of the plat appears to be derived therefrom.



2.0 EXISTING CONDITIONS

2.1 CONDITION AND DEFICIENCIES

The existing homes and unbuilt parcels in Woodcrest with driveways as described above are not served by City Sewer. Instead, each parcel has or would require a private system. These private systems are called Subsurface Sewage Treatment Systems (SSTS). The City defers to Scott County Environmental Services in the regulation of SSTS. County and City engineering staff share the following concerns about Woodcrest SSTS:

- Many Woodcrest SSTS date back to the 1970s. The newest system is 10 years old. The components of many of the systems are aging, the soils may have been altered by activities associated with residential land uses. SSTS lose infiltration effectiveness due to clogging with solids over time, and regulations have become stricter. We are aware of four systems that Scott County Environmental Services have determined require replacement, one as soon as 2016. We recently learned that the system needing replacement in 2016 has no private option available due to space limitations other than a holding tank.
- A new home is going in that requires some type of wastewater disposal system in 2016. The City was contacted about City sewer in response to this application and has met with the homeowner to discuss potential solutions. The City receives several calls per year from prospective buyers, realtors, and/or County officials asking about the potential for City sewer at Woodcrest. This call traffic is evidence of others' concern over the long-term viability of SSTS in this neighborhood.
- Lots are substantially smaller than typical township lots using SSTS for wastewater disposal. A new, standard SSTS can require 5,000 square feet of undisturbed space with suitable terrain and soils and adequate separation from seasonal groundwater. Non-standard SSTS can be permitted when these conditions are not met; however, costs and risks of failure or reduced service life are increased.
- Lots are heavily wooded, reducing available space and/or increasing costs for replacement systems.
- The City has seen no building permit activity for permits that would trigger an SSTS compliance inspection in recent years. The Building Official has said there have been inquiries, but once compliance inspection requirements are described, no permit applications have followed. Staff has also heard from some owners that there may be concerns about SSTS when it comes to property transfers. Some buyers or lenders have starting requesting inspections as part of transfers, even though Scott County does not require an inspection upon sale of property.

2.2 PROJECTED OUTCOMES OF NO ACTION

City staff believes that continued delay in the extension of City sewer to this subdivision will not be in the best long-term interest of Woodcrest Property owners or the City. We project the following if the City decides not to make City sewer available at Woodcrest:

- Sewage disposal problems due to failing systems and difficulties in replacing them

will increase rather than be avoided.

- Costs to remedy will escalate rather than be saved
- The City will continue to be asked for information and/or relief on a case by case basis over coming decades until City sewer is eventually provided.

A survey in 2012 indicated a meaningful level of support for City sewer if no costs were incurred until the homeowner chose to or was required to connect. With five properties needing to build or replace SSTS (one with no sustainable private option), the newest existing system being 10 years old, and a possible way identified to make sewer available with no up-front cost to property and no requirement to connect until desired or necessary, we think it is right and fitting that the City and residents take a thorough look at providing City sewer in Woodcrest in 2016.

3.0 PROPOSED IMPROVEMENTS

3.1 ALTERNATIVES CONSIDERED

3.1.1 No Change

3.1.2 Gravity Sanitary Sewer Extensions

Gravity-type sanitary sewer pipe is in place at the southerly and northerly boundaries of Woodcrest. It would be technically feasible to extend these systems into Woodcrest to serve existing homes; however the capital and quality-of-life costs make this option unattractive.

Gravity sewer consists of eight-inch diameter mainline pipes buried at a depth to prevent freezing, be deep enough to serve basement level fixtures in each home, and to allow a reasonable gradient from each home's piping below the basement floor downhill to the gravity system via a smaller sewer service. These mainline pipes will typically be in the 10 to 20-foot depth range.

The alignment and gradient of gravity pipes must be carefully controlled to be straight between manholes for maintenance and locate-ability purposes, and on a constant downhill gradient with no dips to maintain uniform flow capacity and prevent deposition of sediments from the wastewater. Gravity sewers are typically installed by excavating a trench, carefully setting each pipe segment, and carefully backfilling the trench. To make a safe trench at these depths, temporarily store the excavated soils, and allow men and equipment access, the disturbed area required can be 50 feet or more in width. Trenchless technology has not advanced enough to make gravity sewer installation a viable option except for short stretches under the most uninterrupted situations (such as under a highway or railroad).

We immediately rejected the idea of placing gravity piping in the rear yards. In many cases, there is inadequate working room between property lines and buildings. There is also insufficient utility easement – acquisition of easements from property owners would be required at each parcel. Piping costs would be higher than for locating in the front because the perimeter parcels would be the only side served. Most importantly, the number of trees requiring removal



would be prohibitive from a cost and change in neighborhood character perspective.

Gravity pipes could be placed under the road. This is unappealing because the road (and reliant traffic) would be disrupted during construction, increasing costs and inconvenience to homeowners. This location would pose a technical and cost challenge when extending services from the homes to the mains because many of the building sewers exit the rear or side of the homes. These services would be long, with several bends, and would in many cases again impact trees.

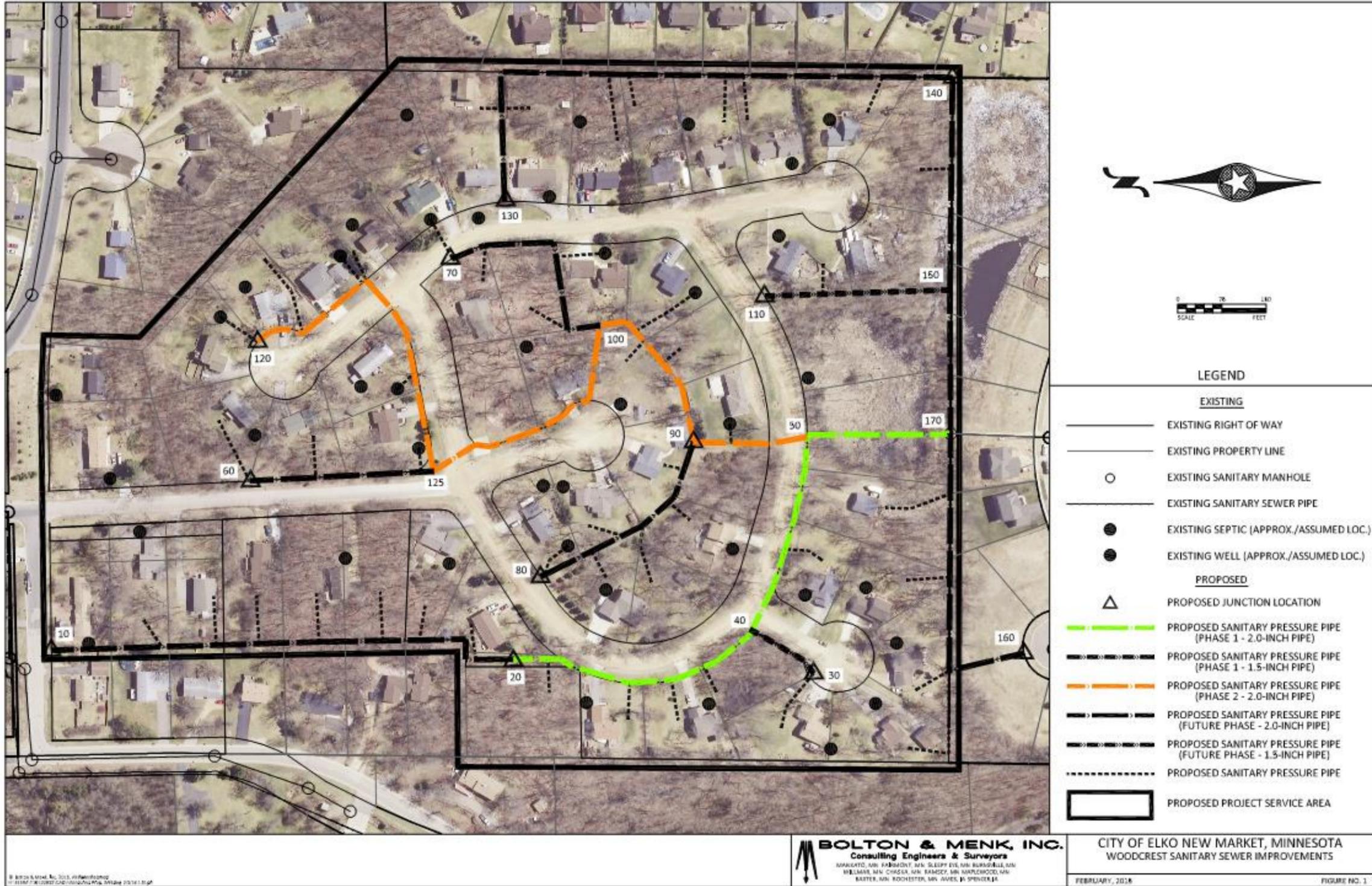
Because of the impacts on the neighborhood, a cost estimate was not prepared for comparison against other options. It should be noted; however, that on a per-foot basis, gravity sewer will typically cost a minimum of 3 to 5 times what a smaller diameter pressure sewer main would cost. On top of the piping cost, gravity sewer requires expensive manholes, easements, long gravity services, and tree removal/replacement – all on an upfront basis. The pressure sewer described in the next section addresses many of these challenges.

3.1.3 Pressure System Sanitary Sewer Extensions

Pressure sewer systems differ from gravity systems in that the sewage is forced through pipes under pressure rather than flowing freely by gravity. The pressure system pipes for Woodcrest would be 1 ½ or 2-inches in diameter (depending upon location). The alignment would follow available easements and/or rights of way and would generally follow the lay of the land, leading to shallower, more uniform depth than gravity sewers.

A pressure sewer system at Woodcrest would involve City installation of several branches of shared forcemain piping generally located to minimize cost, use available rights of way and easements, and maintain required setbacks from wells. The forcemains would carry collect grinder station discharges from each home and discharge to the existing gravity sewer at the southerly end of the Woodcrest neighborhood. One possible forcemain layout is depicted on the next page.

The forcemains would be installed using trenchless technology to minimize tree loss to the degree practical and avoid the need for wide construction easements and disturbance and restoration of the surface. Most trees should be able to remain; however, limited excavation will be necessary in areas with trees. Trees would be surveyed and alternatives considered with the property owner if certain desirable trees were found to be at risk.



The shared forcemain would provide a place for each home to connect to using a prepackaged grinder pump station, to be typically located at or just upstream of existing septic tanks, via a 1 ¼-inch diameter service forcemain. A graphic illustrating the typical grinder station is provided below. A control system senses when the grinder station structure is full and turns on the pump until the structure is empty. The cycle repeats as necessary. For most homes these will run only a few times a day. The energy consumption is similar to other home appliances. Most homeowners do not notice a significant increase in electrical use. Bolton & Menk, Inc. has had good results with Hydromatic brand grinder stations and pumps and would propose that manufacturer for Woodcrest.



3.2 INSTALLATION, CONNECTION AND USE LOGISTICS

Staff is recommending to the City Council a sewer program for Woodcrest residents consisting of the following terms:

- City would install shared forcemains laid out to serve some or all lots as determined by the City on a project by project basis. The shared forcemain system can be constructed in increments, within reason. The City would carry the installation cost and be reimbursed as parcels hook up over time.
- In the event forcemain is not installed for all Woodcrest homes initially, the City in the future would extend additional forcemain branches as necessary and at its discretion to areas of Woodcrest not yet served if homes in those areas choose to or need to connect to sewer. Scott County would notify the City of any properties with SSTS found to be failing or non-compliant so these additional extensions could be considered or a connection requirement enforced.
- No charges would be assessed or connection requirement imposed until a property owner chooses to connect or fails a compliance inspection and needs to hook up as determined by Scott County Environmental Services staff under Scott County Ordinance No. 4. Scott County would continue to regulate SSTS on properties not connected to City sewer or where sewer was not yet available.
- A grinder station at a property would only be installed when a home is ready to hook up to City sewer. Installation would be made by the City, with costs assessed to the property owner along with a share of the forcemain cost and City sewer-related fees.
- An assessment agreement for the homeowner's share of forcemain, grinder station and associated work costs, plus City fees, payable under terms set by the City Council would be made available for property owner's hooking up.
- City ordinance prohibits the replacement or major repair as defined by Scott County of SSTS if City sewer, including shared forcemains, is available to a parcel; however,

the City retains the right to determine whether sewer is available or will be made available.

- The City would be responsible for maintenance and repair of grinder stations, service forcemains, and shared forcemains. Service call outs and repair costs due to deliberate or accidental misuse of the system would be charged to the property owner(s) responsible for the misuse and assessed to property taxes if not paid. Allowed discharges to the system would be codified by the City.
- Shared grinder stations are discouraged by staff. Homeowners wishing to share a station and able to demonstrate written consent to a shared station and the associated costs, necessary easements, and responsibilities will need to submit a written request for the Council to consider. The City retains the right to deny shared grinder stations.

4.0 PRELIMINARY PROJECT COST ESTIMATE AND FINANCING

Capital costs include estimated construction costs based on recent bids on similar projects, a 10 percent contingency adjustment, and 25 percent overhead for survey, design, bidding, and construction services. The cost of this Feasibility Study is not necessarily included. This study was initiated by the City and the project has an uncertain outcome. Study costs are disproportionate to typical assessed projects because it required extraordinary research, coordination, and public involvement time. We anticipate the study would be funded from the annual engineering budget for wastewater services and not assessed to property owners.

4.1 CAPITAL COST ESTIMATES – SHARED FORCEMAINS

Table 1			
Shared Forcemains	Phase I (2016 Pilot)	Phase II	Remainder
Capital Cost	\$18,600	\$18,300	\$105,800

The total capital cost to the City to install the shared forcemains is estimated at \$142,600; however, the project could be installed in multiple phases as illustrated in the table. Phase I would serve at a minimum the two parcels needing to take action in 2016. Phase II would serve the other three parcels that have been notified by Scott County of non-compliant systems. This phase could go in after Phase I proves successful, but before action is required of these residents. These owners have several years to take action. The remainder could go in all at once or again, in segments as dictated by the need to address non-compliant systems or accommodate requests.

Staff proposes that the cost to each property be equalized based on the total cost. For this estimate, the cost to each lot would be \$2,745. This figure would need to be updated for each project to account for escalation of installation costs.

4.2 CAPITAL COST ESTIMATES – ON-SITE WORK

Each lot will be required to have a grinder station and service forcemain installed. The septic tank will also need to be abandoned. Our estimate averages out the cost of these

to provide a uniform cost per lot. We recommend the City seek to arrive at a uniform cost per lot for the basic site work needed, since the forcemain location will be beyond the residents' control and the benefit to each is uniform. We further recommend this cost be updated annually or as necessary based on the bid climate at the time of installation. This may mean that estimating is required to update the average, and that cash flows may not be substantially realized or may be over-realized for each project; however, we think this approach treats each property owner fairly and promotes consistency in program costs to each resident tied to when they hook up.

The average estimated cost of on-site work to each lot to be served (52 total) is \$11,865 in 2016 dollars.

4.3 ESTIMATE OF HOMEOWNER COSTS AND FEES TO HOOK UP

The following table shows estimated costs and fees for the “Do Nothing” option and the pressure sewer option described above. An estimate for gravity sewer option is not provided as explained previously – gravity was deemed infeasible for Woodcrest if the character of the neighborhood is to be maintained and the program is to be affordable.

Table 2			
SSTS		Pressure Sewer to City	
Trunk Fee	\$0	Trunk Fee	\$3,751
MCES SAC	\$0	MCES SAC	\$4,333
City Conn. Fee	\$0	City Conn. Fee	\$1,882
Forcemains	\$0	Forcemains	\$2,745
On-Site Work	\$19,000	On-Site Work	\$11,865
TOTAL	\$19,000	TOTAL	\$24,576

4.4 POTENTIAL FEE WAIVERS, DISCOUNTS OR INCENTIVES

Staff has over the years and recently received numerous inquiries about a SAC waiver policy and has heard from residents assertions that sewer was promised to Woodcrest at no cost. No documentation has been found regarding the latter assertion; however, a waiver policy was enacted by the City of Elko in 2005. A copy is included at the end of this section.

The City for a time offered a SAC Waiver to certain property owners, including many in Woodcrest, if City sewer was made available and the property was connected. This policy has expired, but was based on the premise that homes that existed when Elko was first sewered contributed to debt service of the City-wide project through property taxes, even though they did not receive service. It has been asserted that debt service for a time was paid via ad valorem tax receipts.

The Council could still choose to honor this policy as a way to reduce the upfront costs to Woodcrest residents with no need for an offsetting expenditure from the wastewater fund. Honoring the policy would mean less revenue to the fund as Woodcrest hooks up over time. The City’s fee structure has changed since the time of the waiver policy. The fee most closely resembling the former SAC charge would be the City Connection Fee;

however, this fee is computed on a basis that does not include all costs included in the former SAC Fee.

The City could alternatively offer relief in the form of a waiver of other fees, discount on fees, construction, or overhead costs, or offer incentives to promote hookups in a more timely fashion. Staff's only suggestion in this regard is to consider the long-term costs and risks of no action and the fact that the City became a partner in seeking solutions to Woodcrest sewer issues as part of the merger and by Elko's initial acceptance of this property and plat into the City.

MEMORANDUM

Date: July 18, 2005
To: Joint Sewer Board
From: Executive Director
RE: Sewer Access Charge Waiver Policy

At the June meeting of the JSB, the Board directed staff to prepare a policy specifying the conditions and criteria under which the JSB would waive sewer access charges (SAC) for certain properties. Based on the discussion of the JSB, staff has prepared the following policy for adoption by the Joint Sewer Board:

Sewer Access Charge Waiver Policy

Property owners may petition for a waiver of the Sewer Access Charge(s) (SAC) due to JSB upon connection to the municipal sanitary sewer system. The following criteria must be met in order to grant a waiver:

- 1. The property was located within the corporate boundary of the City of Elko or the City of New Market prior to January 1, 1987.*
- 2. The property must have been improved with a single family, multi-family or commercial building served by an ISTS prior to January 1, 1989.*
- 3. The SAC charge will be waived for each single family, multi-family or commercial building connecting to the system that was served by an ISTS prior to January 1, 1989 and existing at the time of the petition for waiver. All single family, multi-family or commercial building served by an ISTS prior to January 1, 1989 will be considered to be one (1) SAC unit.*
- 4. The petition for waiver shall be submitted prior to connection to the system.*
- 5. Unless otherwise amended or modified, this policy shall expire upon connection of the Cities of Elko and New Market to the Metropolitan Council system.*

Please contact the Executive Director with any questions regarding the matter in this agenda (952-467-2711).

4.5 EQUIVALENT UNIFORM ANNUAL COST (EUAC) COMPARISON

EUAC is a method used in the discipline of Engineering Economics to compare alternatives that have different useful lives. It is useful in this study to compare SSTS with an average useful life estimated at 35 years to a pressure system with components lasting 70 years or more. The EUAC also accounts for annual operating costs and replacement of components such as septic tank baffles or grinder pumps that may not last as long as one complete life cycle of the option. In this case for the pressure system it also includes sewer bills of \$50 per month (about 6,000 gallons of usage). The EUAC can be thought of as the amount of money per year, in today's dollars, that would be needed to operate the option perpetually, including installation, operation, repairs, maintenance, and replacements.

We estimate the EUAC (from a Resident's perspective) for SSTS to be \$1,215 and the EUAC for the pressure system to be \$905. Assuming both options are technically viable, the option with the lower EUAC should be selected if cost is the primary consideration. We view these options as being pretty close in EUAC since the numbers are based on assumptions of cost, longevity, and interest rates that nobody can know for sure or completely. We do, however, view the pressure sewer option as more viable, simply because it is not dependent upon local site conditions – it will work on every lot, even if groundwater is high or space is tight.

What this analysis shows is that despite the higher capital cost of pressure sewer (due to City fees), it should not be rejected on a cost basis. The longevity of its components and ability to service or replace only needed parts brings its long term annual average cost down to that of the SSTS option or less.

5.0 STAKEHOLDER INVOLVEMENT

Stakeholder involvement related to this study includes an informational meeting held for property owners in Woodcrest and adjacent parcels and a mailed survey sent out after the meeting. The questions and comments from the informational meeting, along with City Engineer responses, are attached for Council consideration.

A three-question survey was sent to residents after the meeting to allow residents unable to attend or unwilling to speak at the meeting to offer feedback to the City. The questions and a chart illustrating the responses are included in the appendix. The responses indicate limited support for extending City sewer, but strong interest in getting more information about the potential for City sewer.

6.0 PROJECT SCHEDULE

All or a portion (if done in phases) of this project could be completed in 2016, provided an improvement is ordered in the spring of 2016. For example, if an improvement is ordered after a public hearing in March, plans and specifications could be approved in early May and bids received in June. Completion would depend upon the size of the project, but based on these dates and normal weather for this climate hookups could be made during the 2016 season for those needing to.



7.0 CONCLUSIONS AND RECOMMENDATIONS

It is our opinion based on findings from examination of existing conditions, information provided by Scott County Environmental Services, and testimony and survey results from Woodcrest residents that this improvement is necessary, cost effective, and feasible, and that the City should plan for the strategic implementation of a pressure sewer system at Woodcrest; but that the system can be implemented in stages.

There is one home currently in need of replacing its SSTS that has no private option due to space availability. It is located adjacent to a new home whose owners are interested in City sewer rather than a new SSTS. This situation provides an opportunity for the City to implement a pilot project that would initially serve these two homes with a smaller investment and risk than taking on full-scale replacement immediately. As the City and residents gain experience and confidence with the pressure system, the initial phase could be expanded to serve other properties that may desire or need City service. The pilot project provides flexibility for stakeholders to work out what terms will best meet the long-term needs of this neighborhood.

We recommend the City accept this report by resolution and call for a public hearing, the “improvement hearing,” to be held as soon as reasonably convenient, and that at the improvement hearing, a project serving the two homes with immediate interest with the potential for future expansion be presented to project residents.

Appendix A: Preliminary Cost Estimates

Low Pressure

**Woodcrest Sanitary Sewer Improvements
City of Elko New Market, Minnesota
Bolton & Menk, Inc. Project T15.102632**

3/22/2007

Low Pressure Sewer Mains - Shared

Item No.	Work Item	Total Quantity	Units	Unit Price	Phase 1		Phase 2		Remainder		Total Cost
					Branch Quantity	Branch Cost	Branch Quantity	Branch Cost	Branch Quantity	Branch Cost	
1	1 1/2-inch Pressure Sewer – Trenchless	450.0	LF	\$10.50	0	\$0.00	0	\$0.00	450	\$4,725.00	\$ 4,725.00
2	2-inch Pressure Sewer – Trenchless	6,435.0	LF	\$11.50	985	\$11,327.50	965	\$11,097.50	4485	\$51,577.50	\$ 74,002.50
3	3-inch Pressure Sewer -- Trenchless	0.0	LF	\$13.00	0	\$0.00	0	\$0.00	0	\$0.00	\$ -
4	End of Line Flushing Connection	3.0	EA	\$1,200.00	1	\$1,200.00	1	\$1,200.00	1	\$1,200.00	\$ 3,600.00
5	Erosion & Sediment Control	1.0	LS	\$1,000.00	0.33	\$333.33	0.33	\$333.33	0.33	\$333.33	\$ 1,000.00
6	Pipe Locate Markers	18.0	EA	\$50.00	3	\$150.00	3	\$150.00	12	\$600.00	\$ 900.00
7	Air Release Structure Manhole	3.0	EA	\$6,000.00	0	\$0.00	0	\$0.00	3	\$18,000.00	\$ 18,000.00
8	Turf Restoration	1	LS	\$1,500.00	0.33	\$500.00	0.33	\$500.00	0.33	\$500.00	\$ 1,500.00
SCHEDULE "A" - SUBTOTAL						\$13,510.83		\$13,280.83		\$76,935.83	\$ 103,727.50
											\$ 10,372.75
											\$ 28,525.06
											\$ 142,625.31
											\$ 2,742.79

Low Pressure Sewer Services and Grinder Stations

Item No.	Item	Estimated Quantity	Units	Unit Price	AMOUNT
1	1 1/4-inch Pressure Sewer	2,550.0	LF	\$10.50	\$ 26,775.00
2	1 1/4-inch Curb Stops	52.0	Each	\$800.00	\$ 41,600.00
3	Abandon Septic Tank In Place	43.0	LF	\$500.00	\$ 21,500.00
4	4" PVC SVC Lateral SDR 26	520.0	LF	\$15.00	\$ 7,800.00
5	Simplex Grinder Station	52.0	EA	\$5,000.00	\$ 260,000.00
6	Grinder Pump Electrical Connection	52.0	EA	\$250.00	\$ 13,000.00
7	6' Pump Access Extension	52.0	EA	\$840.00	\$ 43,680.00
8	50' Grinder Pump Cable	52.0	EA	\$85.00	\$ 4,420.00
9	Furnish & Install Rex Meters with Socket	52.0	EA	\$300.00	\$ 15,600.00
10	Turf Restoration	1	LS	\$5,800.00	\$ 5,800.00
SCHEDULE "A" - SUBTOTAL					\$ 440,175.00
					\$ 44,017.50
					\$ 121,048.13
					\$ 605,240.63
					\$ 11,867.46

H:\ELNM\T15102632\2_Preliminary_Design\C_Reports\Feasibility Report\[Sewer Feasibility Estimate.xls]Low Pressure

Pressure EUAC

Low Pressure System				
	Cost	Notes	Life	Annual Equiv
Package Pump Stations	\$ 5,000.00	70 year life	70	(\$71.43)
Electrical Service	\$ 635.00	50 year life	50	(\$12.70)
City Fees	\$ 9,966.00	Permanent	100	(\$99.66)
Replace Pumps	\$ 3,000.00	Every 20 years	70	(\$42.86)
Replace Controls	\$ 1,500.00	Replace every 25 years	70	(\$21.43)
Forcemains	\$ 4,000.00	HDD or insert	70	(\$57.14)
Annual Sewer Bills	\$ 600.00		1	(\$600.00)
Total EUAC				(\$905.22)

3%

SSTS EUAC

Subsurface Sewage Treatment System				
	Cost	Notes	Life	Annual Equiv
Rehab Tank Baffles and Accessories	\$ 750.00	25 year life	25	(\$43.07)
Mound System	\$ 19,000.00	35 year life	35	(\$884.25)
Service Root Clear	\$ 750.00	15 year average	15	(\$62.82)
Tank Pumping	\$ 300.00	2 year routine	2	(\$156.78)
System Inspection	\$ 800.00	15 year average	15	(\$67.01)
Total EUAC				(\$1,213.94)

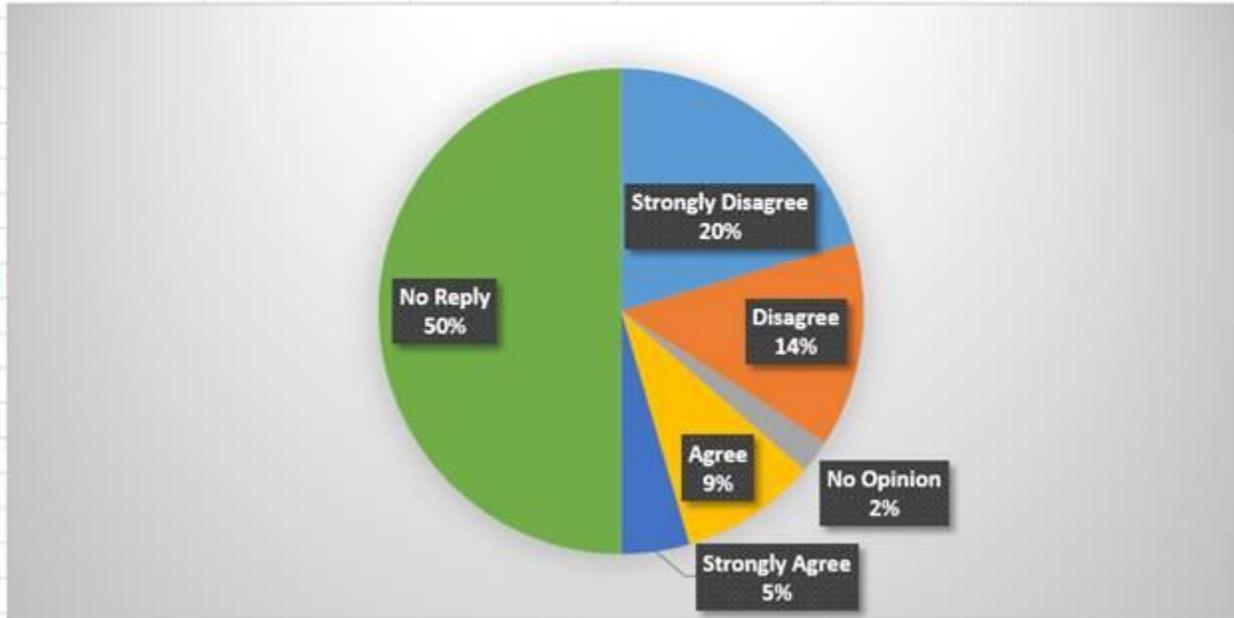
3%

Appendix B: Survey Results

Woodcrest Residents' Survey Results

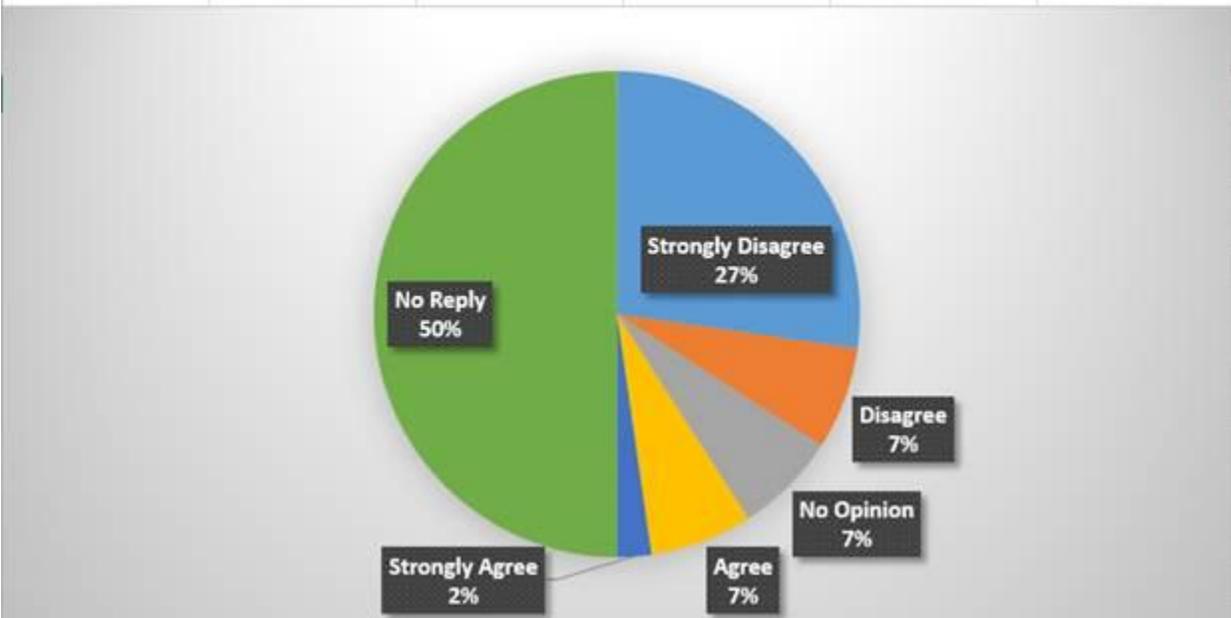
1. Woodcrest will need to be served by City sanitary sewer at some point in the future, even if it is not in the near future.

Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree	No Reply
9	6	1	4	2	22
20%	14%	2%	9%	5%	50%



2. I support the concept that has been presented by staff for the extension of City sanitary sewer to serve Woodcrest.

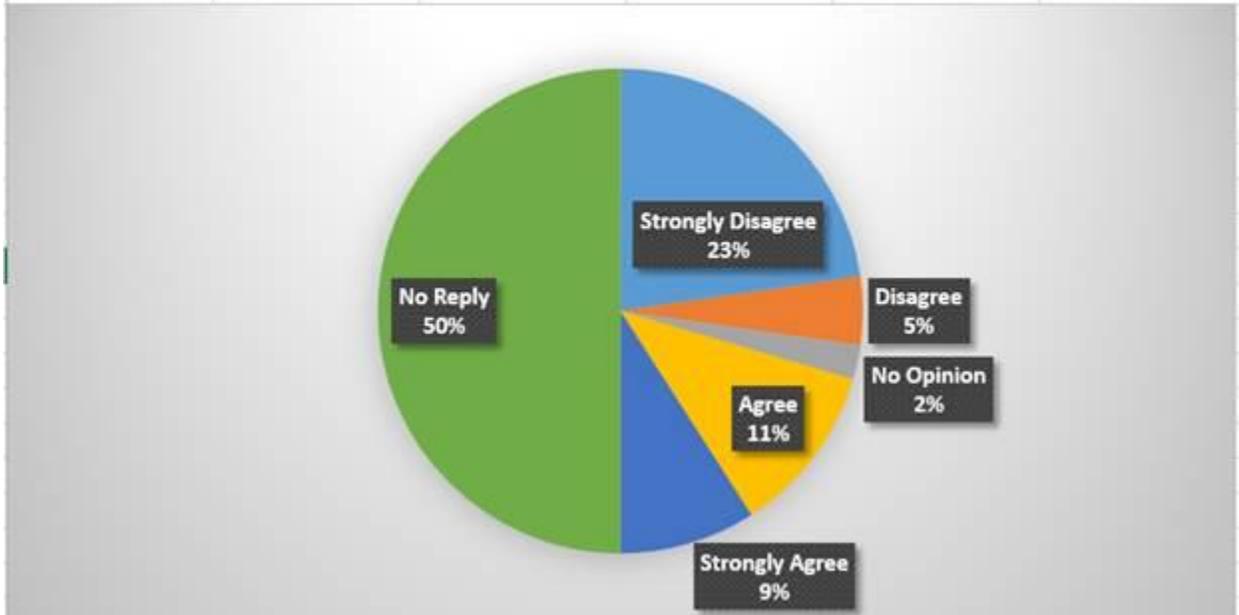
Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree	No Reply
12	3	3	3	1	22
27%	7%	7%	7%	2%	50%



Woodcrest Residents' Survey Results

3. I need more information before I can decide if I support City sewer in Woodcrest.

Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree	No Reply
10	2	1	5	4	22
23%	5%	2%	11%	9%	50%



Services Provided:

Civil and Municipal Engineering

Water and Wastewater Engineering

Traffic and Transportation Engineering

Aviation Planning and Engineering

Water Resources Engineering

Coatings Inspection Services

Landscape Architecture Services

Surveying and Mapping

Geographic Information System Services

Funding Assistance

www.bolton-menk.com
