



Community of Noroncal, Sturgeon County

Water & Wastewater Servicing Feasibility Study

Dylan Dickson, E.I.T., Sturgeon County

Thomas Ziegler, P.Eng., Associated Engineering

November 18, 2024

Introduction

Agenda:

- Background
- Methodology
- Water
- Wastewater
- Opinion of Probable Cost
- Local Improvement Process

Your presenters:

- Dylan Dickson, E.I.T.
Sturgeon County
- Thomas Ziegler, P.Eng.
Associated Engineering



Background – the Study

Residents of the Noroncal subdivision approached Sturgeon County to explore developing water and wastewater services in Noroncal.

April 11, 2024	June 25, 2024	To Date	
Petition received	Noroncal Subdivision Water and Sewer Servicing Feasibility Study presented to Council at RCM Petition motioned as Expression of Interest Motion carried unanimously	July 2024	Project Tender
Petition requested that Sturgeon County investigate the feasibility & cost per lot to provide water/sewer servicing in Noroncal		August 2024	Project Award Data Collection
		September 2024	Design Analysis
		October 2024	Design/Costing
		November 2024	Reporting & Presentation



Methodology of the Feasibility Study

- Study of background documents
- Technical analysis
 - Flow and consumption analysis
 - Hydraulic modelling
 - Constructability review
- Cost analysis & Opinion of Probable Cost
- Community Presentation and Engagement

Existing Utility Conditions – Water

- Surrounding neighborhoods are serviced with a rural-flow water service.
 - Satisfies conventional pressure ranges, although on the higher-pressure ranges.
 - Satisfies domestic water demand flow rate.
 - Does not satisfy fire fighting flow requirements. Region is supported by a special trucked fire fighting water plan.
- An existing stub exists at Crozier Ave and 1 Street.



Water Improvement Options

Options	Description	Viability
Option #1: Conventional Sized 150mm Water Main	- A water main sized to match the conventional minimum size of 150mm, as per Design Standards - This option would tie-in to existing stubs at Crozier Ave and 1 Street	- Hydraulic analysis shows a 150mm water main is technically viable. - Firefighting flow requirements to fire hydrant locations are not satisfied. - Select residences would need pressure reducing valves due to higher network pressures.
Option #2: Value-Engineered 75mm and 100mm Water Main	- A water main sized to provide the domestic water demand - This option would tie-in to existing stubs at Crozier Ave and 1 Street	- Hydraulic analysis supports - A 75mm water main is proposed for 1 Street. - A 100mm water main is proposed for Crozier Ave. - Optimizes the “age” of the water and matches the current firefighting level of service in the area. - The value engineered option reduces overall costs considerably. - Select residences would need pressure reducing valves due to higher network pressures.

- Option #2 is shown on the figure in the following slide.

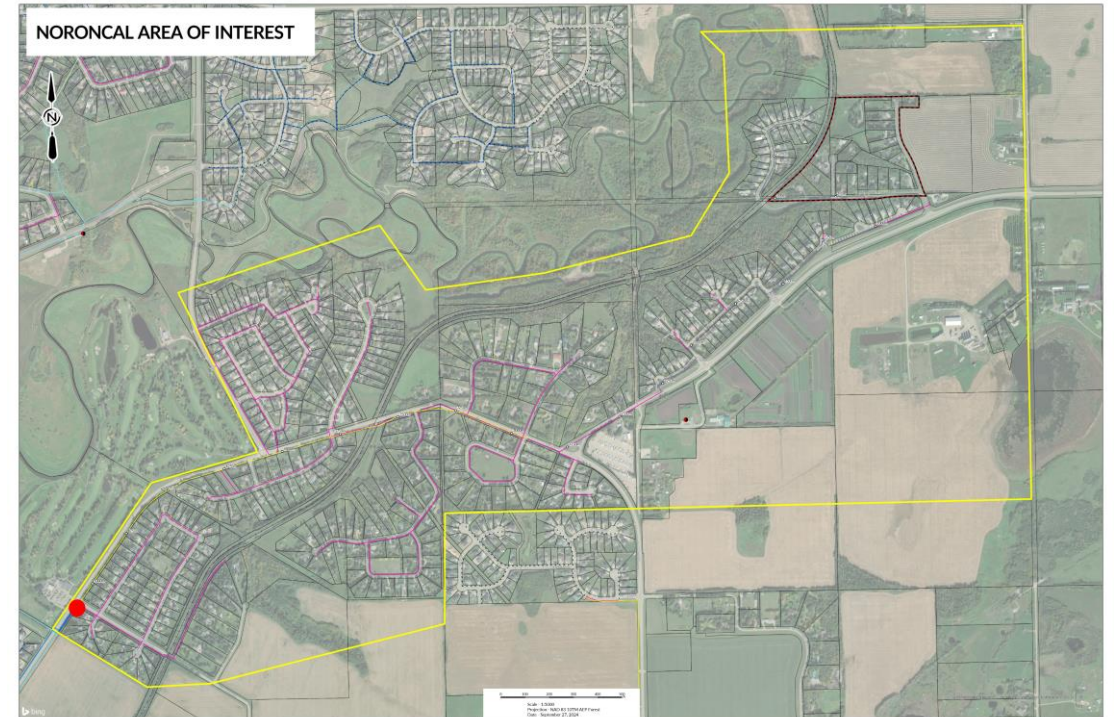




SAVE DATE: 2024-11-14 1:53 PM SAVED BY:
 DRAWING PATH: D:\GIS_KJ_L\sturgeon_2024-3041-00_Noronal_WWW_Servicing.aprx
 DATA SOURCE: Bing Maps.Aerial © 2024 Microsoft Corporation © 2024 Microsoft Distributor Attribution

Existing Utility Conditions – Wastewater

- Surrounding neighborhoods are serviced with a low-pressure effluent sewer system
 - Allin Ridge Estates
 - Allin Ridge Pointe
 - Crossing at Rivers Edge
- End of this system is the Sturgeon Valley Lift Station, roughly 4.3 km from Noroncal



Wastewater Improvement Options

Options	Description	Viability
Option #1: Conventional Lift Station with Grinder Pumps	• A forcemain in the municipal roadway with private septic tanks, equipped with grinder pump systems. • This option cannot tie-in to the low-pressure effluent-only forcemain in the adjacent neighborhood.	• This system is not compatible with the existing low-pressure effluent-only forcemain, due to low velocity conditions. • Due to the noted circumstances, this option is not viable without major reconstruction of existing infrastructure (see option below).
Option #2: Gravity System with Centralized Lift Station	• A conventional centralized forcemain and lift station. • This option cannot tie-in to the low-pressure effluent forcemain in the adjoining neighborhood.	• This system is not compatible with the existing low-pressure effluent-only forcemain, due to low velocity conditions. • To be technically viable, this option would require the construction of a long forcemain, previous studies identified a cost of \$12.2M for an adjacent neighborhood. This option is not economically viable.



Wastewater Improvement Options

Options	Description	Viability
<u>Option #3:</u> Conventional Gravity System	A gravity drained line that will tie-in to the Sturgeon Valley lift station.	- The wastewater line that will connect to the Sturgeon Valley lift station will be costly. - A recent study showed a price of \$24.3M for an adjacent neighborhood. This option is not economically viable.
<u>Option #4:</u> Low Pressure Effluent System	A sanitary tank effluent pump system that will tie-in to the low-pressure effluent-only forcemain in the adjoining neighborhood.	- The surrounding neighborhoods utilize the same wastewater system. - In previous phases, the forcemain was stubbed out with the anticipation of the development of future wastewater system to Noroncal. - The existing low-pressure effluent-only forcemain has capacity for the addition of the 22 residences. - This is a viable option.

- Option #4 is shown on the figure in the following slide.
- There may be a future tie-in option once the land southeast of Sturgeon Road is developed.





SAVE DATE: 2024-11-14 10:40AM SAVED BY:
 DRAWING PATH: D:\GIS_KJ_L\sturgeon_2024-3041-00_Noronal_WWW_Servicing.aprx
 DATA SOURCE: Bing Maps.Aerial © 2024 Microsoft Corporation © 2024 Mapbox © 2024 Microsoft Corporation © 2024 Microsoft Corporation © 2024 Microsoft Corporation



AE PROJECT NO. 2024-3041-00
 SCALE 1:3,000
 DATE 2024NOV14
 PROJECTION NAD 1983 10TM AEP FOREST
 DRAWN BY KJ
 CHECKED BY KR
 DESCRIPTION ISSUED FOR REPORT

FIGURE 5-1

STURGEON COUNTY
 NORONCAL WATER & WASTEWATER
 FEASIBILITY STUDY

WASTEWATER - DETAIL



Opinion of Probable Cost: Municipal Infrastructure

Opinion of Probable Cost - Summary of Municipal Infrastructure				
Description		Water and Wastewater		Water Only
General Requirements	\$	220,000.00	\$	120,000.00
Removals	\$	92,000.00	\$	64,800.00
Water Distribution System	\$	289,700.00	\$	289,700.00
Wastewater Collection System	\$	250,800.00	\$	-
Road and Surface Restoration	\$	84,000.00	\$	55,200.00
Services - Municipal	\$	287,320.00	\$	123,200.00
	\$	1,223,820.00	\$	652,900.00
Engineering and Testing (15%+)¹	\$	234,573.00	\$	148,935.00
Contingency (30%)	\$	367,146.00	\$	195,870.00
	\$	601,719.00	\$	344,805.00
Municipal Project Cost	\$	1,825,539.00	\$	997,705.00

¹⁾ The cost of the feasibility study is recovered and is above the 15% value for Engineering and Testing.



Opinion of Probable Cost: Private Services

Opinion of Probable Cost - Summary of Private Services			
Description	Water and Wastewater		Water Only
Services - Private ¹	\$	1,076,440.00	\$ 291,800.00
Engineering and Testing (15%) ²	\$	161,466.00	\$ 43,770.00
Contingency (30%)	\$	322,932.00	\$ 87,540.00
	\$	484,398.00	\$ 131,310.00
Private Services Project Cost	\$	1,560,838.00	\$ 423,110.00

1) Numerous unknowns exist on the specific requirements internal to each parcel.

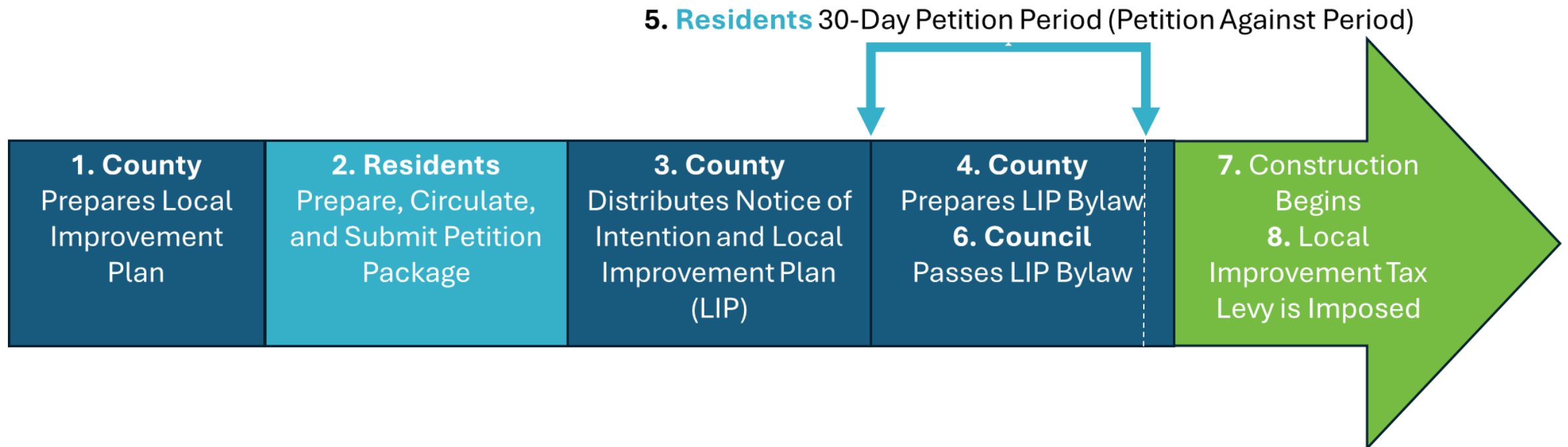
2) Engineering and Testing is not a stipulated requirement for the private portion of the work.

Total Overall Project Cost	\$	3,386,377.00	\$	1,420,815.00
-----------------------------------	-----------	---------------------	-----------	---------------------



Local Improvement Process

To build the water and sewer infrastructure, residents can initiate the Local Improvement Levy Process¹:



¹⁾ Residents will receive an information package that fully outlines the Local Improvement Levy process.

Example of Levy Financing: Water and Wastewater

Total Municipal Project Cost - Water and Wastewater			
Local Improvement Debt Servicing Cost			
Total Cost	\$		1,825,539.00
# of Parcels			21
Years	15	20	25
Interest Rate	4.76%	4.96%	5.08%
Total Cost of Borrowing	\$2,595,525	\$2,919,791	\$3,264,175
Annual Payment	\$173,035	\$145,990	\$130,567
Annual Cost per Parcel	\$8,240	\$6,952	\$6,217
Total Cost per Parcel	\$123,596	\$139,038	\$155,437



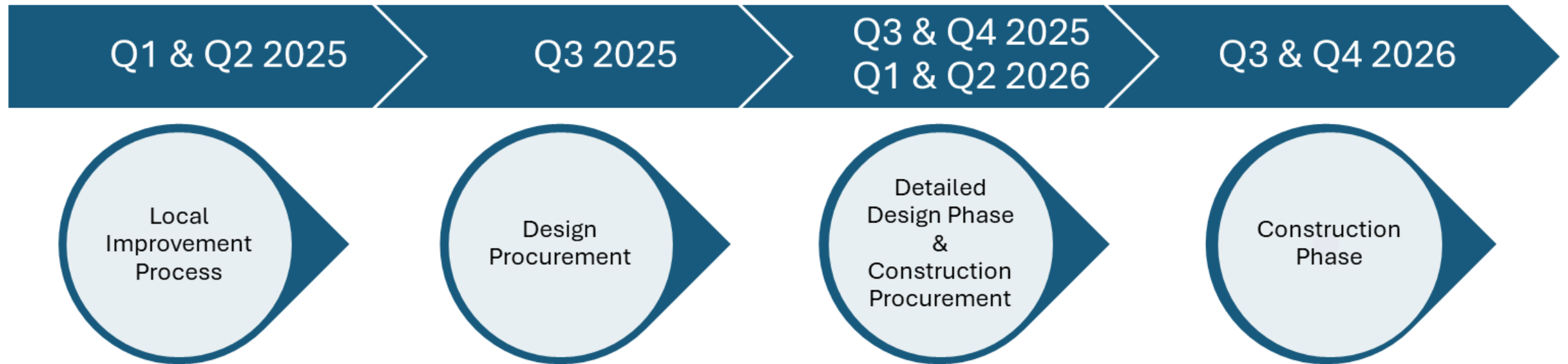
Example of Levy Financing: Water Only

Total Municipal Project Cost - Water Only			
Local Improvement Debt Servicing Cost			
Total Cost	\$ 997,705.00		
# of Parcels	21		
Years	15	20	25
Interest Rate	4.76%	4.96%	5.08%
Total Cost of Borrowing	\$1,418,523	\$1,595,743	\$1,783,957
Annual Payment	\$94,568	\$79,787	\$71,358
Annual Cost per Parcel	\$4,503	\$3,799	\$3,398
Total Cost per Parcel	\$67,549	\$75,988	\$84,950



Possible Project Schedule

The project schedule could look like this:





Sturgeon
C O U N T Y

Questions?

Questions welcomed by email, to Dylan Dickson, ddickson@sturgeoncounty.ca