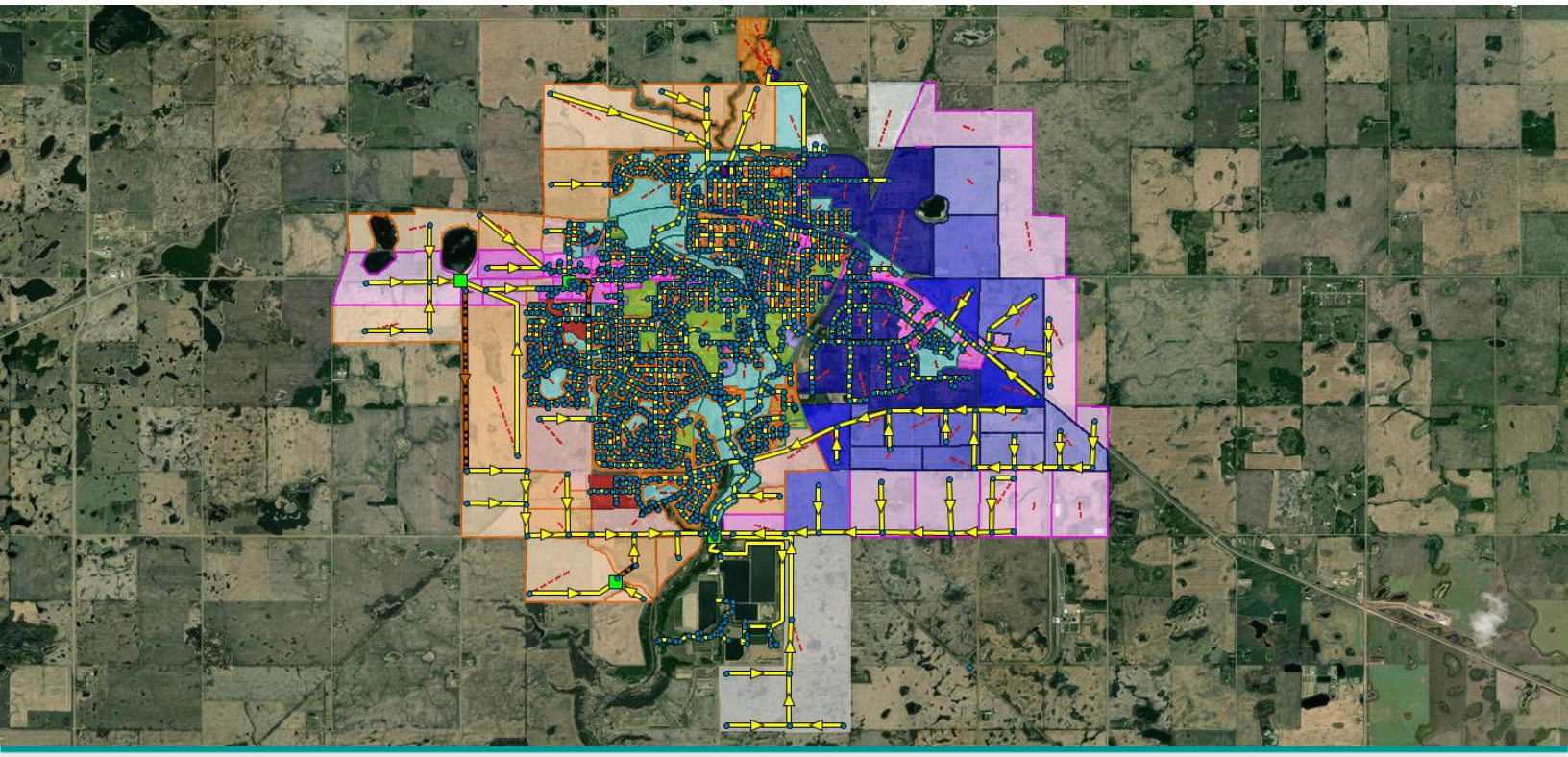
McElhanney

BEST MANAGED COMPANIES CANADA



City of Camrose
Sanitary Master Plan

May 1, 2026

Submitted to: City of Camrose
Prepared by McElhanney

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Our file: 2131-00681-01

Your Challenge.
Our Passion.

Our File: 2131-00681-01

May 1, 2026, 2026

City of Camrose
5204 – 50 Avenue, Camrose, AB
Camrose, Alberta T4V 0S8

Attention: Jeremy Enarson, Manager – Engineering Services, Infrastructure

City of Camrose Sanitary Master Plan

McElhanney Ltd. is pleased to submit the City of Camrose Sanitary Master Plan.

A detailed investigation and assessment was undertaken by McElhanney to:

1. Import the previous model into PCSWMM format;
2. Calibrate the sanitary collection system model to match recorded flow conditions;
3. Identify capacity-related deficiencies in the existing sanitary collection system;
4. Evaluate and recommend alternatives to improve the sanitary collection system, to suit existing and expected future development conditions; and
5. Prepare a cost estimate and capital plan to budget and prioritize projects to improve the sanitary collection system.

We trust this report provides the necessary information as needed by the City for capital planning related to the sanitary sewer collection system.

Sincerely,

Jeff Amundson, P.Eng.
jamundson@mcelhanney.com
780-809-3257

Revision Record

Revision	Description	Date	Issued By
DRAFT	Sanitary Master Plan	March 4, 2025	J. Amundson
DRAFT	Sanitary Master Plan	September 8, 2025	J. Amundson
DRAFT	Sanitary Master Plan	January 16, 2026	J. Amundson
FINAL	Sanitary Master Plan	February 20, 2026	J. Amundson
FINAL	Sanitary Master Plan	May 1, 2026	J. Amundson

Report Signature

This report is prepared for the sole use of the City of Camrose. No representation of any kind is made by McElhanney Ltd. or its employees to any party not affiliated with the City of Camrose. The information provided in this report represents McElhanney's best professional judgement in light of the knowledge available to McElhanney during the time of preparation.

Please direct any questions or clarification regarding the contents of this report to the following team members who prepared this report.

Prepared by:

241674 2026-05-01

Jeff Amundson, PEng
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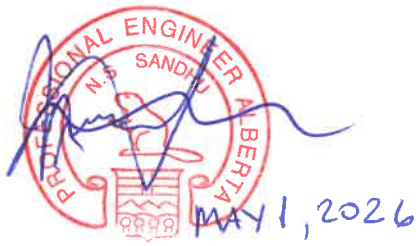
587-937-8281

Reviewed by:



Nav Sandhu, P.Eng.
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PERMIT TO PRACTICE
McELHANNEY LTD.

RM SIGNATURE: _____

RM APEGA ID #: 67846

DATE: 2026-05-01

PERMIT NUMBER: P006383
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

Executive Summary

The City of Camrose (the City) sanitary sewer system is comprised of a gravity collection pipe network discharging to the City lagoon wastewater treatment system located to the south. The system is generally composed of 200mm – 450mm sanitary lines / mains discharging to a larger receiving main, referred to as the Stoney Creek sanitary trunk, following the Mirror Lake / Stoney Creek alignment. There are three lift stations; the 58 Street Lift Station servicing approximately 14 properties, the Cornerstone Lift Station servicing existing commercial / residential development to the northwest, and the South Lift Station (SLS) receiving wastewater for the entire City and discharging to the City lagoon wastewater treatment system.

This Sanitary Master Plan has been prepared as an update to the previous *Sanitary Sewer Master Plan* due to its age. The previous model was done in MOUSE computational software. Since then, industry standard has moved away from MOUSE to more user-friendly and accessible software, with PCSWMM being the most common; McElhanney recommended the City adopt PCSWMM for this reason, to which the City agreed. For this analysis, McElhanney imported the previous model, supplementing it with the most recent City GIS information.

As an initial step in the analysis, McElhanney initiated a flow monitoring program. The summer flow monitoring period was very dry, with only three storms initially seeming suitable for calibration. For reasons elaborated on in the report, only one storm ended up being useful, resulting in a very difficult calibration. This introduced a possible source of error, also discussed within the report.

A series of upgrades were proposed as part of the previous *Sanitary Sewer Master Plan* (2007). The City has since proceeded with design of upgrades to the South Lift Station, which include emergency overflow into an existing 7,000 m^3 cell (Cell A) and an additional 7,000 m^3 overflow cell (Cell B). These upgrades were intended to increase the system capacity to accommodate a 25-yr storm. The previous report also recommends upgrades to the Cornerstone Lift Station.

The model results showed the City system capacity largely being adequate to accommodate a 25-yr storm, and for the 100-yr storm a few segments were for identified for future monitoring. This is not consistent with some of the findings in the previous *Sanitary Sewer Master Plan* report. In particular, the Stony Creek sanitary trunk no longer shows surcharging under a 100-yr storm. Additionally, the SLS is able to meet a 25-yr level of service with the current 7,000 m^3 overflow cell (Cell A). This is likely a combination of two factors: (1) that the previous Sanitary Master Plan calibration was performed over a very wet period with significant rainfall, whereas the current model calibration was performed over a very dry period, and (2) the City of Edmonton IDF curves used in the previous Sanitary Master Plan produced significantly higher rainfall than the Environment Canada Camrose rainfall gauge used in the current

model. These two factors result in lower flows for the current model, reducing scope of required upgrades.

The system was also evaluated for velocity, to determine whether self-cleansing velocities were achieved. Segments were identified across the City where the system did not meet design criteria. These areas have been shown against the current City problem areas; areas not captured in the flagged City problem areas should be investigated, and where issues are noted added to the City flushing program.

Future development of the City has been broken into 10-yr, 25-yr, 50-yr, and Ultimate horizons. Residential growth is planned to the southwest, west, and north. Mixed-use commercial is planned to the west along Highway 13, and several other locations interspersed among future development areas. Industrial and industrial commercial are planned to the east. Several other areas are still under policy review.

A plan has been created service these future development zones, per ***Figure 13: Future Sanitary System – Proposed Upgrades (Alternative 2 – Recommended)*** within the report. Proposed system upgrades have generally been conceptualized to accomplish the following:

- Expand the system to service Stage 1 (10-yr), Stage 2 (25-yr), Stage 3 (50-yr), and Ultimate future growth horizons,
- Take advantage of existing grades to the extent possible to optimize bury depths,
- Take advantage of likely development sequencing,
- For 5-year horizons, focus on connecting to existing infrastructure, to limit requirement for large capital investments to support new development, and
- Configure pipe network to limit new lift station construction, while avoiding unfeasibly deep bury depths.

A corresponding cost estimate has been prepared to guide high-level planning, with the intention that these costs be refined as development is progressed.

As a final recommendation, given the disagreement between the model results, and the fact that the City has proceeded with required upgrades from the previous analysis, additional flow monitoring is strongly recommended before making major changes to implementation planning and scheduling. This is specifically relevant to upgrades to the Stoney Creek trunk sewer if residential development to the north is considered. This is also relevant to planned upgrades to the South Lift Station.

This would be a simplified program, and would require installation of several flow monitors along the sanitary pipe trunk, and a corresponding rain gauge. From there, it would be a straightforward matter to verify the model, and update recommendations if need be.

Contents

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1. Introduction

McElhanney Ltd. (McElhanney) was retained by the City to complete an assessment of the City sanitary system and complete a capital plan for upgrades. This follows a previous *Sanitary Sewer Master Plan* completed November 2007 by Associated Engineering. This project was initiated to update the previous model and report.

The City of Camrose (the City) sanitary sewer system is comprised of a gravity collection pipe network discharging to the City lagoon wastewater treatment system located to the south. The existing gravity sewer network ranges from 150mm – 1500mm; the system is generally composed of 200mm – 450mm sanitary lines / mains discharging to a larger receiving main following Mirror Lake / Stoney Creek ranging from 600mm – 1500mm (referred to as the Stoney Creek sanitary trunk). There are three lift stations (LSs), the 58 Street Lift Station servicing approximately 14 properties, the Cornerstone Lift Station servicing existing commercial / residential development to the northwest, and the South Lift Station (SLS) receiving wastewater for the entire City and discharging to the City lagoon wastewater treatment system. The City is bisected by Mirror Lake / Stoney Creek.

Figure 1: Existing Sanitary System – Size and ***Figure 2: Existing Sanitary System – Material*** show the existing City sanitary system sizing and material, respectively.

1.1. SCOPE OF WORK

The following scope of work was completed for the project.

EXISTING DATA REVIEW

- Review background information, including GIS data, as-built information and past reports.
- Complete ‘gap’ analysis to identify areas of missing information.

MODEL CONVERSION & MODEL UPDATE

- Import previous hydraulic model into PCSWMM format.
- Update model to include new development and previously completed upgrades.

FLOW MONITORING PROGRAM & MODEL CALIBRATION

- Develop and implement a flow monitoring program to facilitate modeled flow calibration.
- Develop and agree on applicable design criteria and level of service for system loading and pipe functionality.
- Development of a calibrated hydraulic model, to assess the capacity of the existing sanitary collection system.
- Analyse the existing system based on the following scenarios:

- Average Dry Weather Flow (ADWF) based on existing population.
- Average Dry Weather Velocity based on existing population.
- Peak Wet Weather Flow (PWWF) based on existing population.
- Peak Wet Weather Flow (PWWF) based on Stage 1 (10-yr), Stage 2 (25-yr), Stage 3 (50-yr), and Ultimate growth horizons.

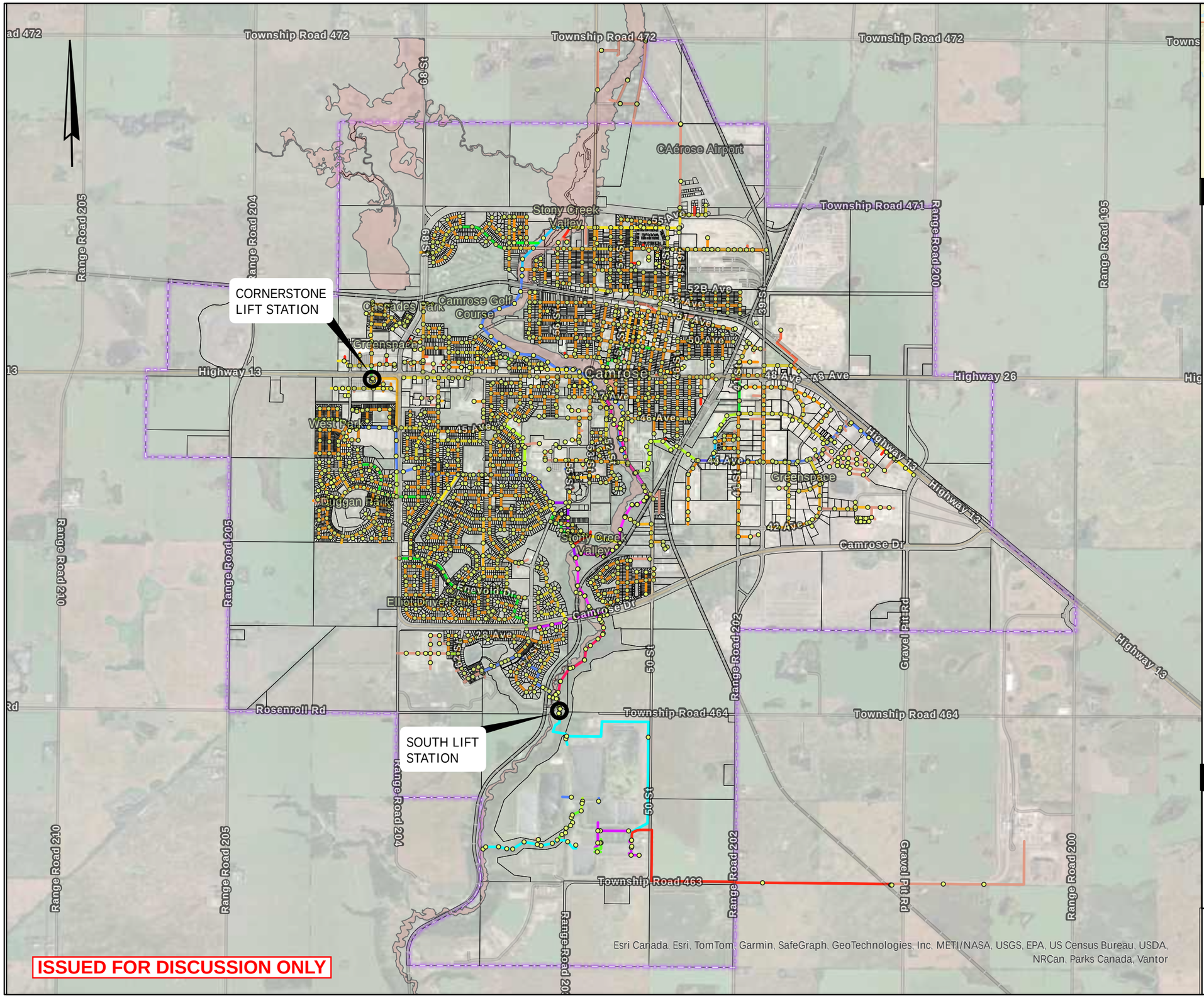
CAPITAL PLAN

- Develop a series of proposed capital upgrades if needed, which would, once constructed, meet the agreed upon design criteria and level of service outlined.
- Prepare preliminary, Class 'D', cost estimates for the construction of the proposed capital upgrades.

1.2. AVAILABLE DATA

Background information relevant to the sanitary collection system assessment was reviewed to develop an understanding of the system and to determine a set of required design criteria. This included past reports, record drawings, GIS information, aerial imagery, and LiDAR data. Relevant information that was reviewed and used in the analysis is listed below.

- *Sanitary Sewer Master Plan* (2007), by Associated Engineering
- City Sanitary Model, per *Sanitary Sewer Master Plan*
- Cornerstone Lift Station daily pumping records, pump curve, and operations manual
- South Lift Station daily pumping records, pump curve, and pump operation control scheme
- Flow monitoring and rain gauge recorded data, detailed in ***Section 1.3***
- City GIS database
- Land use & zoning maps, by Associated Engineering
- *City of Camrose Growth Study* (2023), by Green Space Alliance
- Flood study extents
- *Railway Junction Intermunicipal Area Structure Plan* (April 2021), by ISL Engineering and Land Services
- *East Gateway Area Structure Plan* (July 2016), by ISL Engineering and Land Services
- *Wastewater Treatment Plant Design Basis Memorandum* (March 2020), by Associated Engineering



LEGEND

- Camrose City Limit
- 100yr Flood Extent
- Sanitary Manhole

Existing Conduits Pipe Diameters (mm)

75	500
100	525
150	600
200	675
250	750
300	900
350	1000
375	1200
400	1500
450	

0 0.5 1 Kilometers

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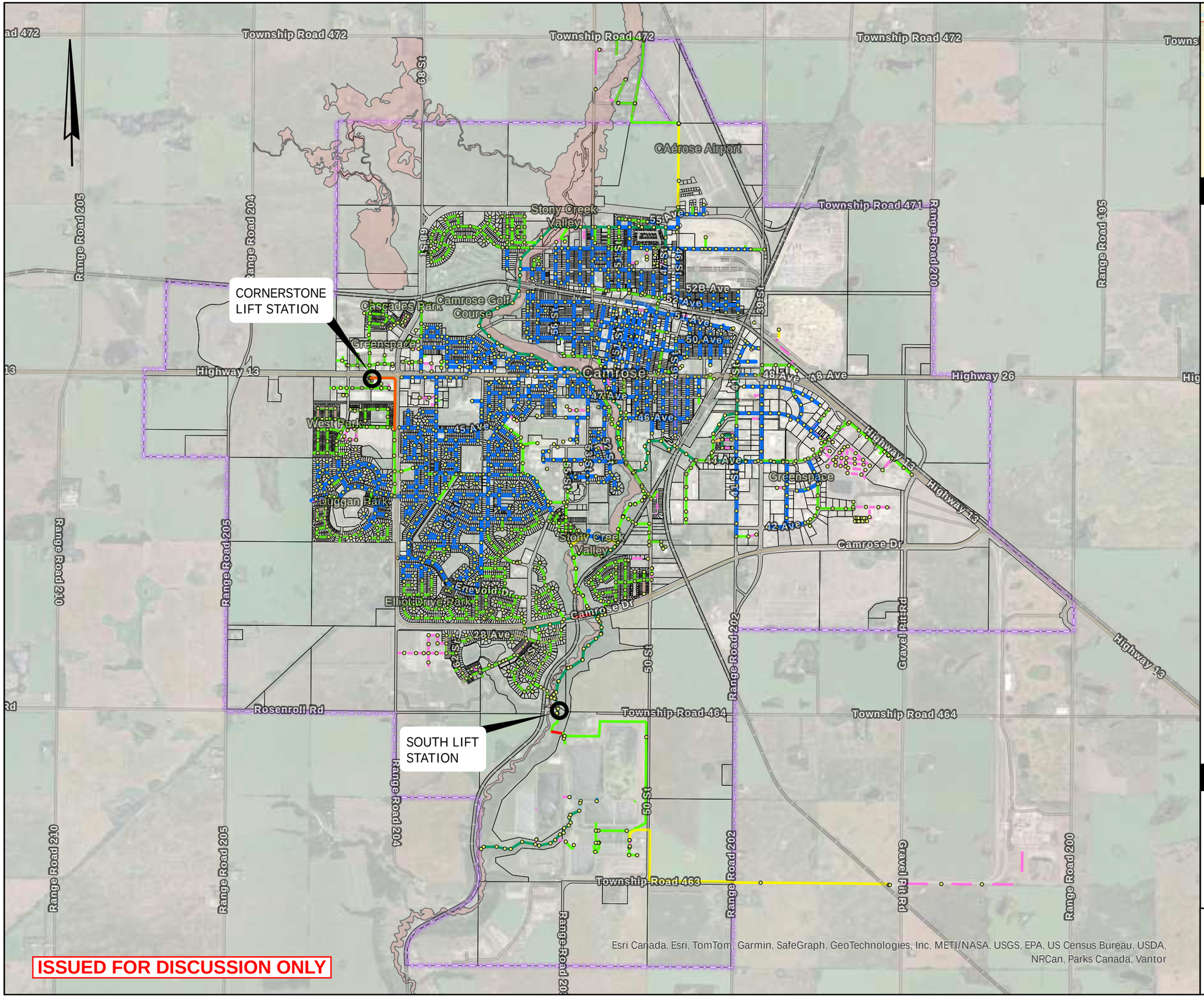
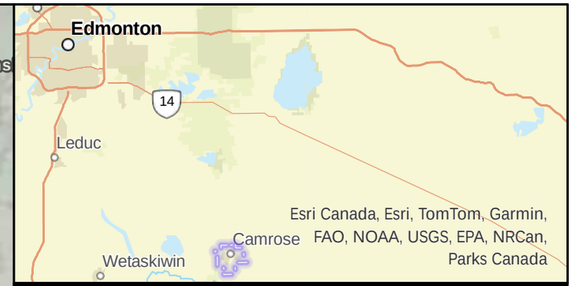
TITLE

Figure 1
Existing Sanitary System - Size

NAD 1983 3TM 111

Date: 4/30/2026





LEGEND

- Camrose City Limit
- 100yr Flood Extent
- Sanitary Manhole
- Existing Forcemain

Sanitary System

Material

- CLAY
- PVC
- CONCRETE
- STEEL
- CLPEC STEEL
- DUCTILE IRON
- HDPE
- AC
- ACCMP
- LOG
- UNKNOWN

0 0.5 1 Kilometers

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TITLE

Figure 2
Existing Sanitary System - Material

NAD 1983 3TM 111

Date: 4/30/2026

1.3. FLOW MONITORING PROGRAM

The first stage in the calibration is to undertake a flow monitoring program. Five (5) Isco Type 2150 Area-Velocity flow meters were installed at selected locations across the City. These meters measure the depth of flow using a differential pressure transducer. Both the velocity and depth sensor are enclosed in the same sensor head. As depth increases, it puts more strain on the sensor which in turn sends out a larger signal to the data logger. The sensors are accurate to the following:

- ±0.1 ft/s from -5 to 5 ft/s (±0.03 m/s from -1.5 to +1.5 m/s)
- ±2% of reading from 5 to 20 ft/s (1.5 to 6.1 m/s)

The objective of selecting sites for flow monitoring is to identify manholes suitable for model calibration and validation. The flow meters were installed at key locations shown in ***Figure 6: Existing Population – PWWF Capacity Assessment*** The monitoring stations were selected to capture key areas of the City, with the intention that City characteristics are reasonably captured to inform the model.

Table 1: Flow Monitoring Program

STATION	RECEIVING AREA DESCRIPTION	CATCHMENT AREA	PIPE SIZE
1	North Commercial / Residential	178 ha	375mm
2	East Industrial	400 ha	450mm
3	West Central Residential	394 ha	750mm
4	West Lower Residential	87 ha	900mm
5	All City Inflow	1711 ha	1500mm

The monitoring period took place April 12, 2024 to August 12, 2024.

Rainfall data was also gathered over the same time period. A temporary rain gauge was installed to produce a rainfall response curve, detailed in **.** The rain gauge was an ISCO 674 Tipping Bucket Rain Gauge; the rain gauge recorded measurements over 5-minute intervals, in 0.254mm (0.01 inch) increments.

1.4. GROWTH FORECAST

The City has been working with Associated Engineering on the Water Master Plan concurrent to this study. As part of the Water Master Plan the City has confirmed growth horizons. These same growth horizons have been used for this study for consistency in approach. This has been included in ***Figure 3: Projected Growth – Phasing.*** This figure shows the following:

Table 2: Population Growth

GROWTH HORIZON	RESIDENTIAL	COMMERCIAL	INDUSTRIAL	POLICY REVIEW	POPULATION
Stage 0 (2025)					[1]19,457*
Stage 1 (10-year)	7.1 ha	6 ha			21,281
Stage 2 (25-year)	179 ha	30 ha	98 ha		24,342
Stage 3 (50-year)	509 ha	56 ha	325 ha		30,453
Ultimate	410 ha	618 ha	178 ha	263 ha	-

*Based on 2021 census data, adjusted to 2025 with 0.9% growth rate

For City population forecasting the City has published *Growth Study 2023-2048* (published 2024), produced for the City of Camrose by Green Space Alliance. Based on this report, McElhanney was directed to use a 0.9% population growth per the overall average growth rate for a medium growth scenario. Background information on details and assumptions supporting projected growth rates can be found within the referenced report.

To simplify discussion, and supporting figures and tables, different growth areas have also been further grouped into six zones. These zones have been grouped according to a logic-based combination of both planned land use and prevailing drainage patters.

- **N Residential:** Comprised of planned residential development, on the north boundary of existing residential development and west of Camrose Airport.
- **NW Residential / Commercial:** Includes a mix of residential and commercial mixed use, with commercial growth concentrated along Highway 13. This zone also includes three quarter sections more directly west of the City, as these areas are conceptualized to drain towards the proposed NW Lift Station (LS).
- **SW Residential:** Largely planned for residential development, with a small commercial mixed-use area. This zone is west of Stoney Creek and existing residential subdivisions, and south of Camrose Drive.
- **NE Industrial / Commercial:** Includes commercial / industrial and industrial use. This zone is adjacent to existing industrial development, north of Highway 26 and east of the airport.

[1] Statistics Canada. 2023. *Census Profile*. 2021 Census of Population. Statistics Canada Catalogue no. 98-316-X2021001. Ottawa. Released November 15, 2023. https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/details/page.cfm?Lang=E&SearchText=Camrose&DGUIDlist=2021A00054810011&GENDERlist=1,2,3&STATISTIClist=1&HEADERlist=0 (accessed April 15, 2025).

- **E Industrial / Commercial:** Includes commercial / industrial, commercial mixed, and industrial use. This zone is opposite to existing industrial development northeast of Highway 13 / CP rail line , and south of Highway 26.

- **SE Industrial / Commercial:** Mix of industrial use south of Camrose Drive, commercial / industrial use north of Township Road 461, and residential and commercial mixed use immediately east of Stoney Creek.

- **Policy Review:** This area is adjacent to the City of Camrose wastewater treatment lagoon system and the Camrose Regional Landfill. The strategy for developing this zone is under consideration by the City, and planned land use is undecided.

Areas within these zones have been further broken down into smaller subzones, broken down according to a logic-based combination of planned land use, development horizon, and sewershed area. The naming convention uses the following rules:

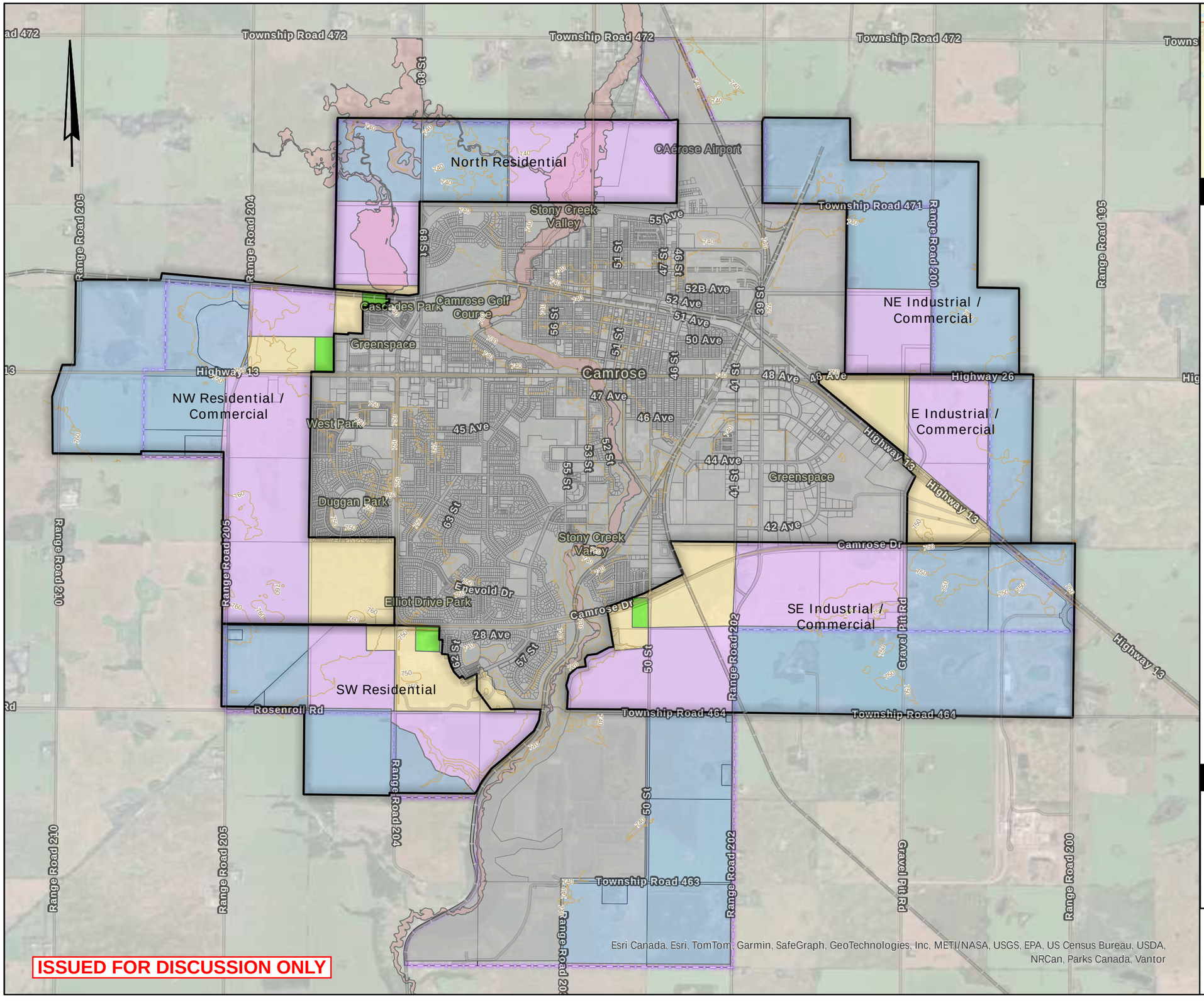
- Zone
    - **N Residential:** N
    - **NW Residential / Commercial:** NW
    - **SW Residential:** SW
    - **NE Industrial / Commercial:** NE
    - **E Industrial / Commercial:** E
    - **SE Industrial / Commercial:** SE

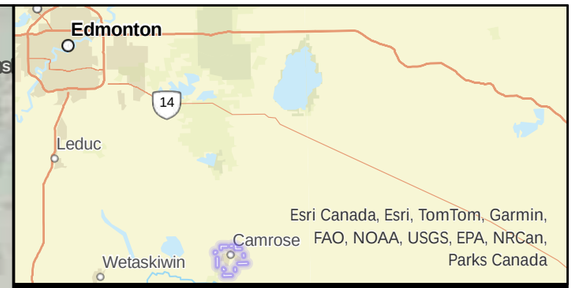
- Land Use
    - **Residential:** RES
    - **Commercial:** COMM
    - **Industrial:** IND

- Development Horizon
    - **Stage 1:** 1
    - **Stage 2:** 2
    - **Stage 3:** 3
    - **Ultimate:** U

- Zone Number
    - Two-digit ascending (e.g. 01, 02)

An example subzone following this convention, located in the SW Residential zone, Stage 1 development horizon, first in sequence, would appear as follows: SW_RES_101





LEGEND

- Camrose City Limit
- 100yr Flood Extent
- Land Use Zones
- Topographic Contours

Growth Horizons

- Existing Built-up Area
- Stage 1 (10 yrs)
- Stage 2 (25 yrs)
- Stage 3 (50 yrs)
- Ultimate Build-out

0 0.5 1 Kilometers

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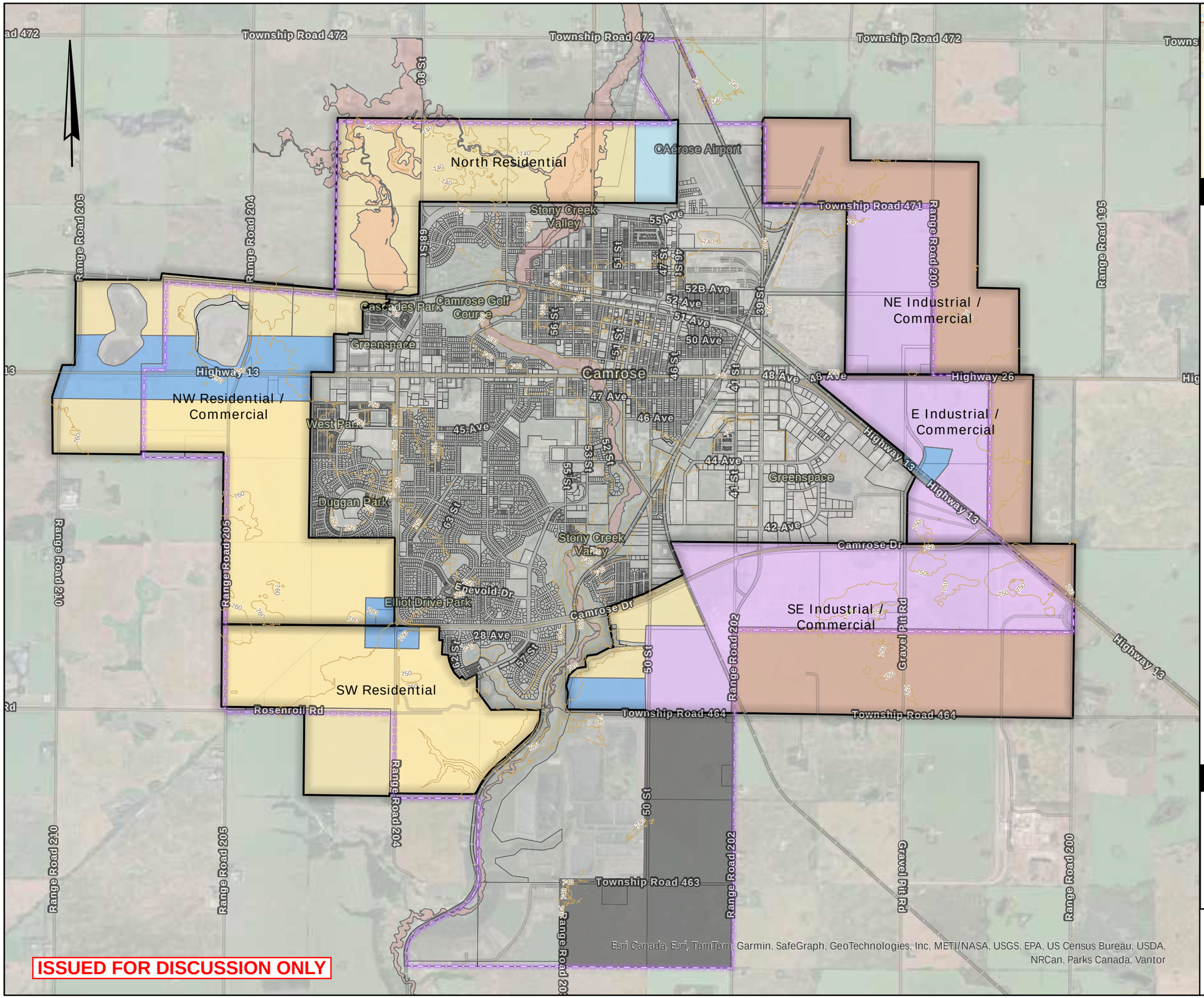
Figure 3
Projected Growth - Phasing

NAD 1983 3TM 111

Date: 4/30/2026

Esri Canada, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, US Census Bureau, USDA, NRCan, Parks Canada, Vantor

ISSUED FOR DISCUSSION ONLY



LEGEND

- Camrose City Limit
- Topographic Contour
- 100yr Flood Extent
- Land Use Zones

Land Use at Ultimate Stage

Area

- Airport
- Existing Built-up Area
- Commercial - Industrial
- Commercial - Mixed Use
- Future Residential
- Industrial
- Policy Review

0 0.5 1 Kilometers

McElhanney

CITY OF Camrose

TITLE

Figure 4
Projected Growth - Development Type

NAD 1983 3TM 111

Date: 4/30/2026

2. Analysis Methodology

2.1. DESIGN CRITERIA

Hydraulic modeling was undertaken to ascertain the performance of the existing and proposed sanitary collection system. The hydraulic model was developed in PCSWMM version 7.7. Sanitary inflow, or loading, was calculated using a custom Python script that inputs average sanitary generation of each subcatchment area into the contributing manhole. The scripts performed these calculations by multiplying the assumed population in each contributing area with the per capita sanitary generation rate (120L/c/d) for residential areas, and by multiplying the floor area with the commercial/industrial/institutional sanitary generation rates for the respective type of land use. Model results were evaluated based on the capacity analysis criteria outlined in ***Table 3: Design Criteria***.

The following guidelines and standards were used to establish design criteria, in order of precedence.

- *City of Camrose Minimum Design Standards for Development* (April 2004), published by City of Camrose.
- *Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems: Part 3 Wastewater Systems Standards for Performance and Design of a Total of 5 Parts* (March 2013), published by Alberta Government.
- *Volume 3 Drainage. Vol 3-03: Design Guidelines* (February 2022), published by EPCOR.
- *Code of Practice for the Hydraulic Modeling of Urban Drainage Systems Version 01*, published by Chartered Institution of Water and Environmental Management (CIWEM).

Table 3: Design Criteria

DESIGN PARAMETER	VALUE	REFERENCE
Capacity (Pipes > 200 mm diameter)	80% d/D	Volume 3 Drainage. Vol 3-03: Design Guidelines, Section 1.8.2.iii (February 2022). EPCOR.
Minimum Velocity	0.6 m/s	Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems: Part 3 Wastewater Systems Standards for Performance and Design of a Total of 5 Parts, Section 3.3.1.1 (March 2013). Alberta Government.
Maximum Velocity	6.0 m/s	Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems: Part 3 Wastewater Systems Standards for Performance and Design of a Total of 5 Parts, Section 3.3.1.1 (March 2013). Alberta Government.

DESIGN PARAMETER	VALUE	REFERENCE
Minimum Pipe Diameter	200 mm	Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems: Part 3 Wastewater Systems Standards for Performance and Design of a Total of 5 Parts, Section 3.3.1.1 (March 2013). Alberta Government.
Minimum Slope	200mm: 0.40% 250mm: 0.28% 300mm: 0.22% 375mm: 0.15% 450mm: 0.12% 525mm: 0.10% 600mm: 0.08%	Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems: Part 3 Wastewater Systems Standards for Performance and Design of a Total of 5 Parts, Table 3.4 Minimum Design Slopes for Sanitary Sewers (March 2013). Alberta Government.
Minimum Cover Depth	3.0 m	Minimum Design Standards for Development, Section 4.3.0.1. (April 2004). City of Camrose.
Maximum Manhole Spacing	120 m	Minimum Design Standards for Development, Section 4.4.0.2. (April 2004). City of Camrose.
Design Storm	25-yr 1-hr AES Distribution	Previous Sanitary Master Plans; not found in typical design standards
Extreme Storm for Risk Analysis	100-yr 4-hr Chicago	Previous Sanitary Master Plans; not found in typical design standards
Sanitary Peaking Factor	2X	Minimum Design Standards for Development, Section 4.1.0. (April 2004). City of Camrose.
Per Capita Loading	320 L/c/d	Minimum Design Standards for Development, Section 4.1.0. (April 2004). City of Camrose.

2.2. DESIGN STORMS

The system was initially analysed using the 25-year return period 1-hour design storm inflow and infiltration rates based on the RTK method. Note that a 25-year return period was selected based on previous experience with Sanitary Sewer Master Plan reporting; this design criteria is not specified in applicable engineering standards. A 100-year return period was also run as part of the risk analysis. The analysis used synthetic design storms with the aforementioned applied probability, or return period, derived from Camrose IDF data applicable to the Camrose climate station. As no design storm is recommended for use in the Camrose or Alberta Government engineering documents, a design storm was selected that is representative of rainfall distributions in the region. The Atmospheric Environmental Service (AES) distribution for the Prairies region was initially used to generate the synthetic design storm for the short duration rainfall event (1 hour). However, discrepancies were noted in the results between

the previous master plan and this master plan. The previous master plan used a 4-hr Chicago distribution design; this synthetic storm was also run in this analysis to more accurately compare results.

Table 4: Design Storm Rainfall Totals

RETURN PERIOD	CURRENT (2023) (mm)
25 Year, 1 Hour, AES Distribution	28.0
25 Year, 4 Hour, Chicago Distribution	41.5
100 Year, 4 Hour, Chicago Distribution	48.0

2.3. MODEL DEVELOPMENT

PCSWMM version 7.7 was used for the hydraulic model development. The previous model was performed using MOUSE modeling software. This software is becoming less used as an industry-standard, with many agencies such as the City of Calgary no longer recommending it's use. McElhanney, with the approval of the City, has imported the model to PCSWMM. McElhanney gathered and reviewed background information to determine gaps in knowledge regarding the existing sanitary collection system. The conveyance network geometry (i.e. inverts, size, material, etc.) for the sanitary system was updated based on the GIS data, record drawing and the topographic survey.

The existing and proposed networks were analysed based on the following scenarios.

- Peak Dry Weather Flow (PDWF) based on Stage 1 (10-yr), Stage 2 (25-yr), Stage 3 (50-yr), and Ultimate growth horizon.
- Peak Wet Weather Flow (PWWF) based on Stage 1 (10-yr), Stage 2 (25-yr), Stage 3 (50-yr), and Ultimate growth horizon and 25-year design storm.

Detailed information on model calibration has been included in ***Appendix D – Model Calibration***. In general, the model was developed by establishing sanitary loading according to the following three components:

- Base Sanitary Flow (BSF)
    - Consists of residential / commercial / industrial daily inflow
    - Evaluated through development of dry weather flow rates / flow patterns captured by flow monitoring program
- Base Groundwater Inflow and Infiltration (GWI)

  - Consists of constant groundwater inflow, infiltrating through cracks, joints, poor manhole connections, and other connections
  - Evaluated through review of constant infiltration captured by flow monitoring program

- Rainfall Dependent Inflow and Infiltration (RDII)
  - Consists of stormwater flows from direct connections of downspouts, sump pumps, foundation drains, etc., and infiltration of subsurface water through cracked pipes, leaky joints, poor manhole connections, etc.
  - Calculated by adjusting the following three parameters, to calibrate stormwater response:
    - R: the fraction of rainfall volume that enters the sewer system
    - T: the time from the onset of rainfall to the peak of the UH in hours
    - K: the ratio of time to recession of the UH to the time to peak

2.3.1. Base Sanitary Loading

2.3.1.1. Dry Weather Flow

April 22-29, 2024 was used to calculate dry weather flow patterns given the low rainfall, and inflow and infiltration during this period, with the exception of Flow Monitor 3. Flow Monitor 3 data was irregular for the initial reporting period, and stabilized April 27. The reason for this is unclear, as the date the pattern corrected does not align with the monthly maintenance inspections. July 8-15 was used instead given the preceding dry weather and data consistency.

No rainfall was noted over these period or the five days preceding. Flow data was observed for consistency and confirmation that flow patterns were representative of long-term data, with no unusual spikes or troughs, although flow patterns trend down slightly over the dry weather period.

2.3.1.2. Residential

Residential flow rates were determined through examination of flow monitoring data of dry weather events at Flow Monitors 1-5. Calibrating the model, the per capita loading rate was calculated 120 L/c/d under dry weather flow conditions. This is considerably less than design standards, but is closer to other Master Plans done for other communities within Alberta; as an example, 140 L/c/d and 160 L/c/d were both observed in the previous year for Edson and Ponoka. This is higher than the *City of Camrose Minimum Design Standards for Development (April 2004)*, at 320 L/c/d; however, given that these flowrates have been calibrated from flow monitoring data, 120 L/c/d has been used for existing model development.

Residential population for each subcatchment was determined by performing a count of individual residences per catchment and assigning a population density. High density apartment block unit density was determined by observation at street level where professional judgement was used to assume a layout.

Population density per private residence was assigned through application of Statistics Canada census data, per ***Table 5***. Population density for single family and high-density housing was determined by using published design estimates, and distributing proportionally to equate to the Camrose population.

Table 5: Population Density Analysis

NAME	VALUE
Camrose Population*	18,772
Single Family Homes	6,299
Single Family Population Density	2.9 cap/unit
High Density Housing Units	1,066
High Density Housing Population Density	2.2 cap/unit

*Census Profile, 2021 Census of Population. Statistics Canada.

2.3.1.3. Industrial / Commercial / Institutional

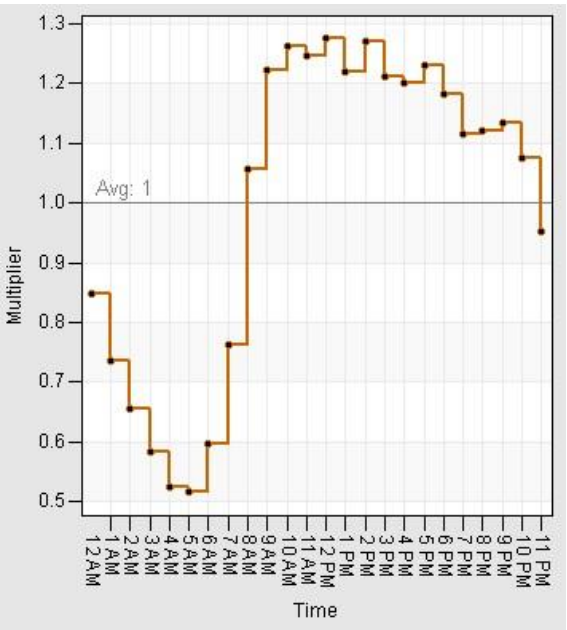
ICI flow rates were determined by subtracting residential flow from the total and applying remaining flow to ICI areas. Residential loading was determined by applying the residential per capita flow rate and population density from ***Section 2.3.1.2*** above to the counted private residences. ICI loading was determined as a function of building footprint and type (e.g. schools, office buildings, etc.), and adjusted by a flat multiplier to calibrate to South Lift Station record data.

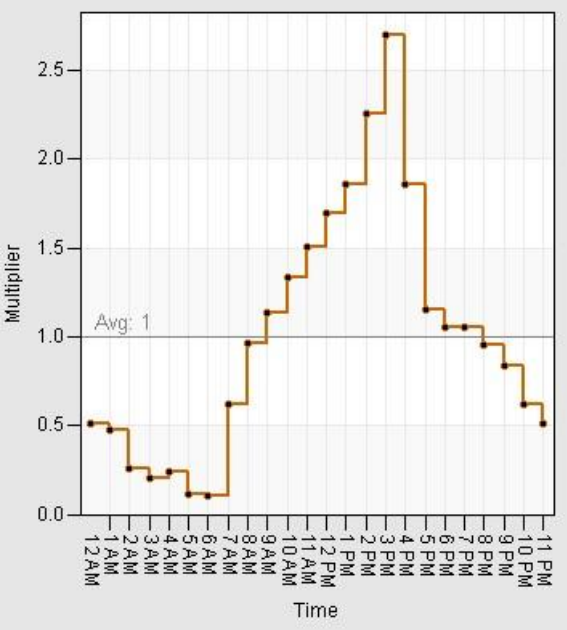
2.3.2. Flow Patterns and Peaking Factor

The model allows the use of user-defined daily flow patterns to be applied to on or several land use types or catchments being analyzed. Peaking factors refer to the ratio between the maximum flow rate and average flow rate (or base sanitary flow rate) during dry weather conditions.

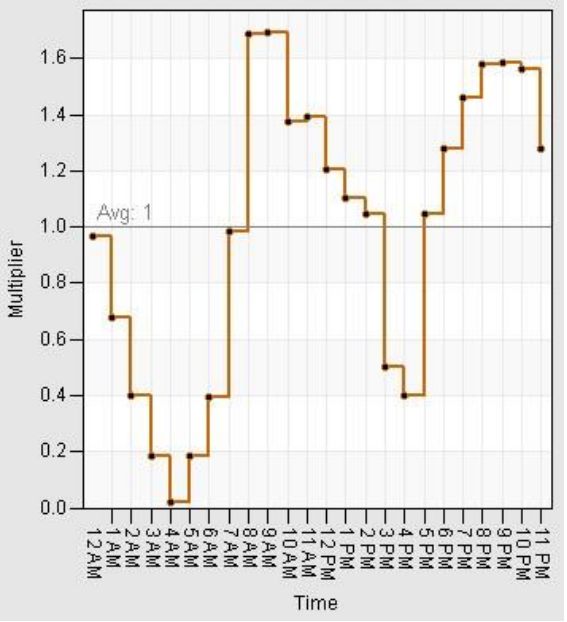
Diurnal patterns were created and reviewed for each monitoring station and assigned to subcatchments. Flow data was reviewed for consistency in recorded data over the event period used to create diurnal patterns. The April 22-29 was ultimately used to create the diurnal patterns, as there was no rainfall over these intervals. For the analysis, the base diurnal curve established from the flow monitoring data was used to better match observed flow patterns, rather than the 2X peaking factor identified in the Camrose Development Standards; the 2X peaking factor is intended for general design where patterns produced from ongoing monitoring are not available.

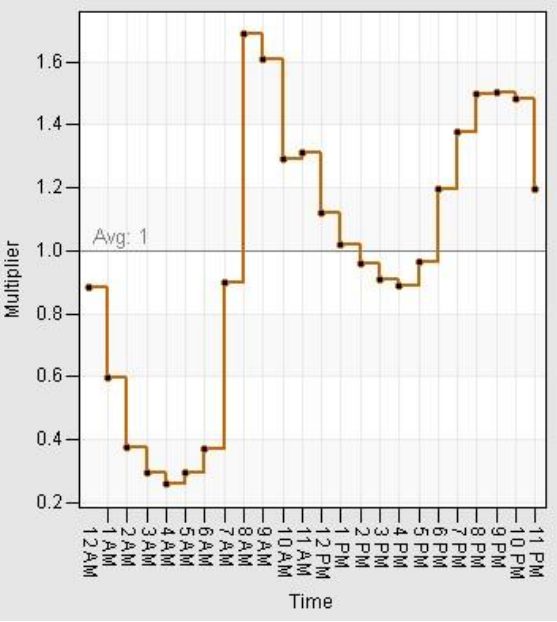
Figure 5: Diurnal Curves outlines the diurnal patterns established based on the flow monitoring, for all five monitoring sites.



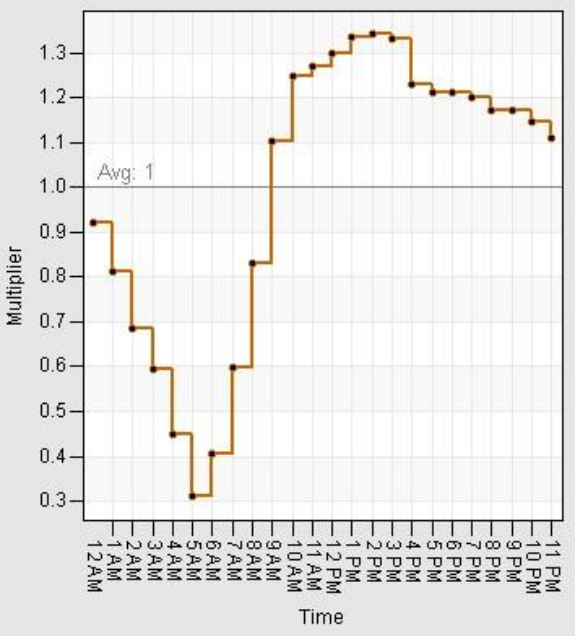


Site 1: N Residential, area bounded by 48 Ave / 52A Street / 53 Avenue / 54 Ave Industrial Area / Railway
Site 2: E Industrial, area bounded by Camrose Drive / Highway 13 / Railway





Site 3: W Residential + Cornerstone Development, area bounded by Enevold Drive / City boundary / Cornerstone development / Camrose recreation centre / Stoney Creek & Mirror Lake
Site 4: SW Residential, area bounded by Camrose Drive / Parkview Drive / 68 Street / Erickson Drive / 36 Avenue / 57 Street / Enevold Drive



Site 5: Entire City, excluding SW residential subdivision bounded by Camrose Drive and railway

Figure 5: Diurnal Curves

Developing catchments using a combination of current orthophoto, land use and property lines, LiDAR, and sanitary pipe layout, combined with the PCSWMM watershed delineation tool. Catchments were evaluated at a level of approximately ½ block, depending on individual characteristics.

2.3.3. Model Verification

2.3.3.1. Rainfall

Rainfall data retrieved from the temporary tipping bucket rain gauge installed at the Camrose Fire Hall building was analysed to determine a suitable time period of dry weather, and reviewed against the Camrose Environment Canada Rain Gauge 3011240 located at the Camrose Airport immediately north of the City. A second temporary rain gauge was installed at the South Lift Station at a later date, as described below.

Three significant storms were observed during the reporting period; May 6-8, June 27, and August 4-5.

- May 6 17:00 – May 8 1:00: 32.7 mm (total). Rainfall was spread over this period with no significant peaks.
- June 27 4:00 – June 27 19:00: 18.3mm (total). Rainfall was concentrated over a 3-hour period between 12:00 and 15:00 with a depth of 15.6mm.
- August 4 12:00 – Aug 5 10:00: 43.8mm (total). Rainfall was concentrated over a 3-hour period between August 4 23:00 and August 5 2:00 with a depth of 33.7mm.

The project rain gauge at the Camrose Fire Hall was reviewed after the May 6-8 storm event, and rainfall was noted significantly lower rainfall than the Environment Canada rain gauge. A new rainfall gauge was installed to replace the previous gauge at the South Lift Station. Audit of the second rain gauge data at the South Lift Station showed significantly lower rainfall than the Environment Canada rain gauge as well. Additionally, rainfall was not reported during periods of known rainfall. For these reasons, data from the installed project rain gauge was dismissed in favor of the Environment Canada rain gauge due to these inconsistencies. The drawback to the Environment Canada rain gauge is the data is reported hourly as opposed to the more precise 5 minute increments in the project rain gauge. To create a rain gauge with 5-minute increments from this hourly data, a Gaussian (or normal) distribution was applied to periods of concentrated rainfall. This was verified against patterns in flow monitor data, to confirm regular patterns.

2.3.3.2. Calibration

As previously summarized, Rainfall Dependent Inflow and Infiltration (RDII) is calculated by adjusting the following three parameters, to calibrate system response to a storm event:

R: the fraction of rainfall volume that enters the sewer system

T: the time from the onset of rainfall to the peak of the UH in hours

K: the ratio of time to recession of the UH to the time to peak

A detailed summary of the calibration of these values to accurately simulate a response to a known storm can be found in ***Appendix C – Model Calibration***. This section also discusses accuracy of results and sources of error.

3. Existing System Assessment

3.1. EXISTING PIPE CAPACITY

The colour classification used in depicts the maximum depth of flow in the pipe (d) as a percentage of the diameter of the pipe (D). Design criteria related to pipe flow has been discussed in ***Section 2***; for this analysis pipe full greater than 85% is considered deficient. ***Figure 6: Existing Population – PWWF Capacity Assessment*** shows pipes not meeting this design criteria, based on the model results.

Camrose has notably few problem areas. Steps were taken since the previous Sanitary Sewer Master Plan (2007) to perform recommended upgrades. The following is a summary of status of previously recommended upgrades:

Table 6: Status of Previously Suggested Upgrades

Proposed Upgrade	Purpose	Scope of Work	Planned Year of Completion	Status
Design and construct the Creekside Trunk	Provide capacity for future development west of 68 Street	250mm of 375mm sanitary sewer	2007	Complete
Ring Road Sanitary Trunk	Prevent flooding at 53 Street and provide capacity for future development	1239m 1050mm sanitary trunk	2010	Incomplete
Intercept the Enevold trunk to Camrose Drive	Provide capacity for Enevold ¼ section	800m of 450mm sanitary trunk	2008	Incomplete
Intercept lateral lines at two locations in the Mohler industrial area into the 600mm diameter trunk	Reduce surcharging of lateral sewers	2 manholes plus 30m of 600mm sanitary sewer	2008	Complete
Point repair to the Bethany Trunk and waterproofing manholes Raise and repair manholes to reduce I/I	Prevent further deterioration and risk of failure	10m of 450mm sanitary trunk Waterproof 5 manholes	2008	Incomplete
Replace Stoney Creek trunk from 55 Ave to 43 Ave	Reduce surcharge and risk of overflow, provide capacity for future development	3100m of 1200mm plus 5500m of 1350mm sanitary trunk	2026	Incomplete

Proposed Upgrade	Purpose	Scope of Work	Planned Year of Completion	Status
Construct overflow trunk along Mount Pleasant Drive from 42 Ave to 43 Ave	Provide additional protection against flooding in the Mount Pleasant Area	200m of 600mm storm sewer	2009	Incomplete
Upgrade South Lift Station & force main	Prevent overflows from the lift station and provide capacity for future development	Replace pumps & forcemain	2006	In progress: -Minor upgrade to pumps complete -Addition of emergency storage compete -Refer to WWTP DBM for outstanding items
Pump station and force main in the Mohler area	Divert capacities from the Bethany trunk and mainline trunk Provide capacity for future development	Pump station Plus 1100m force main and gravity main	2011	Incomplete
Replace 900mm trunk under Camrose Drive	Provide capacity for future development	138m of 1350mm and 38m of 1500mm Sanitary Trunk (or twin existing)	2026	Incomplete
Twin or replace Stoney Creek Trunk from 43 Ave to Camrose Drive		1800m of 1350mm Sanitary Trunk (or twin existing)	2040	Incomplete / Not planned
Upgrade Cornerstone pump station to 93L/s		Replace or upgrade pumps to 93L/s capacity	2010	Complete
Provide in-line storage in Cornerstone basin		800m of 1800mm in-line storage tank c/w RTC	2015	Incomplete
Upgrade Cornerstone pump station and force main to 145 L/s		700m of 400mm HDPE force main	2020	In progress: -Pump has been upgraded, parallel pump operation calculated at 102 L/s/ per Section 3.4 -Forcemain has not been upgraded

DEFICIENCY #1
SURCHARGING <1.05m
REPORTED UNDER 1:100 YR
STORM CONDITIONS

DEFICIENCY #2
SURCHARGING <1.0m
REPORTED UNDER 1:100 YR
STORM CONDITIONS

DEFICIENCY #3
SURCHARGING <1.0m
REPORTED UNDER 1:100 YR
STORM CONDITIONS

FLOW MONITOR 1
FLOW MONITOR 2
FLOW MONITOR 3
FLOW MONITOR 4
FLOW MONITOR 5

Township Road 472
Township Road 471
Township Road 464
Township Road 463
Range Road 205
Range Road 204
Range Road 210
Range Road 202
Range Road 200
Range Road 195
Highway 13
Highway 26
Gravel Pit Rd
Camrose Golf Course
Cascades Park
Greenspace
West Park
Duggan Park
Elliot Drive Park
Stony Creek Valley
Camrose Dr
Rosenroll Rd
55 Ave
57 Ave
50 Ave
48 Ave
47 Ave
46 Ave
44 Ave
42 Ave
55 St
50 St
41 St

Esri Canada, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, US Census Bureau, USDA, NRCan, Parks Canada, Vantor

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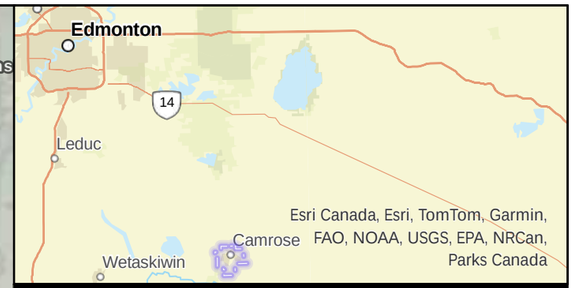


LEGEND

- Camrose City Limit
- 100yr Flood Extent
- Existing Sanitary Network
- Areas of Concern
- Camrose Creek Trunk
- Flow Monitor

0 0.5 1 Kilometers

McElhanney

CITY OF Camrose

TITLE

Figure 6
Existing Population - 25-yr PWWF Capacity Assessment

NAD 1983 3TM 111

Date: 4/30/2026

Three areas are noted exceeding design criteria for the 100-yr storm, shown in ***Figure 6: Existing Population – PWWF Capacity Assessment***.

- **Deficiency 1**: 200mm-300mm sanitary pipe; following:
    - 46th Street north of 53rd Avenue
    - 54th Avenue from 46th Street to 47th Street,
    - 47th Street north of 54th Avenue to alleyway,
    - Alleyway alignment between 54th Avenue and 55th Avenue, west of 47th Street to 50th Street

  Model results show surcharging to 1.04m under a 100-yr storm; no surcharging was observed for a 25-yr event. Given that surcharging is only observed under extreme storm conditions, and is not surcharging to a height where basement flooding is expected, risk is considered minor, and does not warrant further concern at this stage.

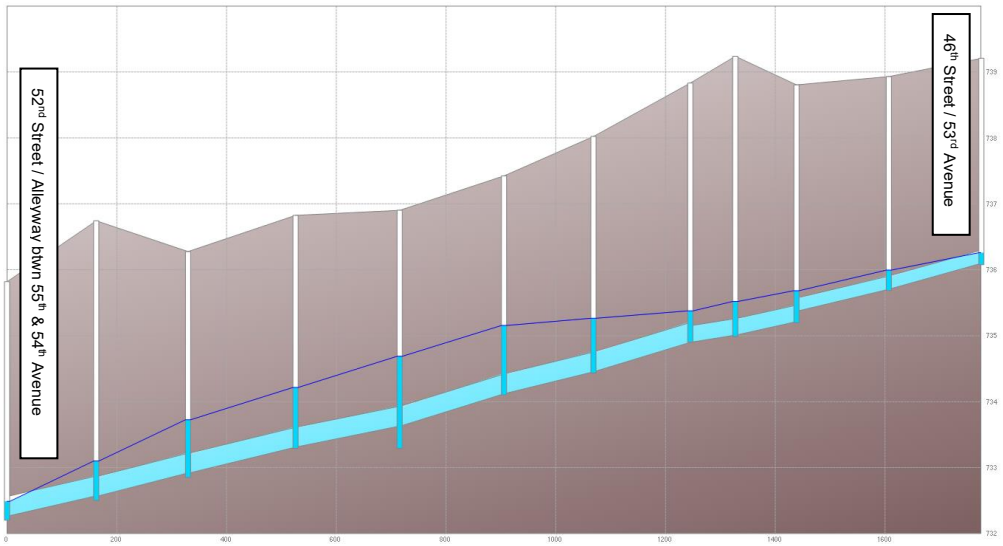


Figure 7: Deficiency 1: 200mm-300mm Sanitary Pipe; Following 46th Street, to Alleyway Alignment Between 54th Avenue and 55th Avenue West of 47th Street, terminating at 50th Street – 100-yr 4-hr Chicago Design Storm

- **Deficiency 2**: 250mm / 300mm sanitary pipe; affecting several alignments, including 52nd Avenue, 47th Street, and 51st Avenue

  Model results show surcharging under 100-yr storm conditions to a depth of 0.93m; given the depth of pipe, risk is considered negligible, and does not warrant further concern at this stage. The pipe segment along 48th Street, from 51st Avenue to 50th Avenue, can be upsized from 250mm to 300mm if there is a renewal project pursued in this area.

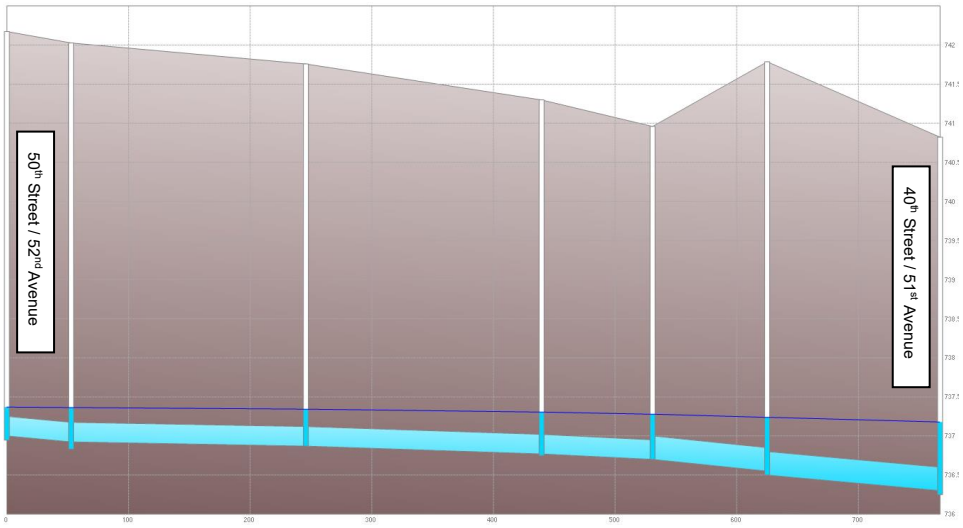


Figure 8: Deficiency 2: 250mm-300mm Sanitary Pipe; Following 52nd Street and 48th Street – 100-yr 4-hr Chicago Design Storm

- **Deficiency 3**: 200mm sanitary pipe; following 39th Street alignment, from 44th Avenue to 47th Avenue

  For the 25-yr storm, no surcharging was evident. Model results show surcharging under 100-yr storm conditions, to a depth of 0.7m; given the depth of pipe, risk is considered negligible, and does not warrant further concern at this stage.

  Additionally, upstream and downstream pipe segment is 250mm / 300mm, larger than the 200mm present in the deficiency area. There could be an error in the data entry, or this could be a byproduct of renewal schedule. This should be confirmed.

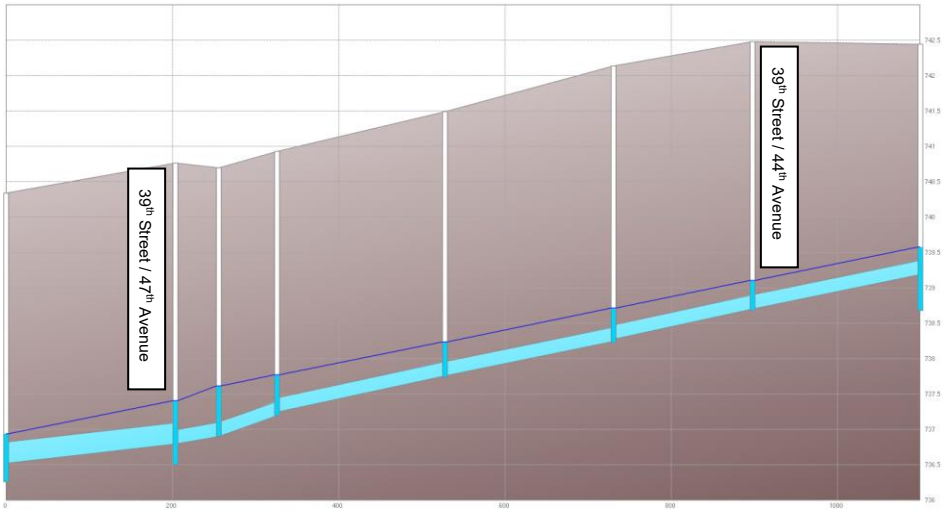


Figure 9: Deficiency 3: 200mm sanitary pipe; following 39th Street alignment, from north of 44th Avenue to 47th Avenue – 100-yr 4-hr Chicago Design Storm

100-yr storm results were evaluated against the previous Sanitary Master Plan as part of the system risk assessment for extreme rainfall scenarios. Notably, for the previous Sanitary Master Plan, the Stoney Creek Sanitary Trunk showed significant surcharging for a 100-yr 4-hr Chicago storm distribution, whereas the current model shows the pipe having adequate capacity; this is captured below, in ***Figure 11: Current Model – Stoney Creek Trunk: Existing Conditions, 100-yr 4-hr Chicago Storm Distribution***. As the City has not experienced ongoing flooding, risk from discrepancy in model results is reduced; however, this is an important consideration for planning future upgrades making use of the Stoney Creek sanitary trunk. The implication of this is reviewed in more detail in ***Section 6***.

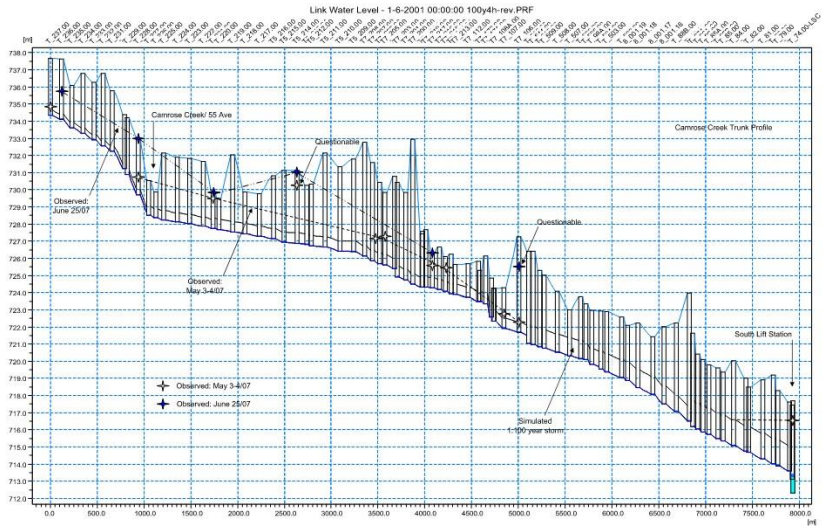


Figure 10: Previous Sanitary Master Plan – Stoney Creek Trunk: Existing Conditions, 100-yr 4-hr Chicago Storm Distribution

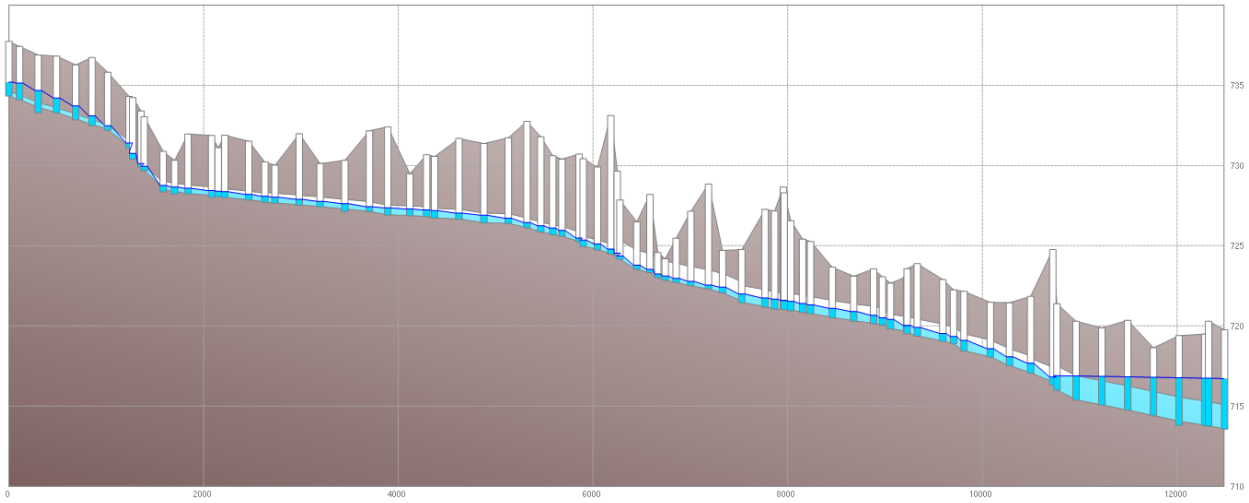


Figure 11: Current Model – Stoney Creek Trunk: Existing Conditions, 100-yr 4-hr Chicago Storm Distribution

3.2. EXISTING PIPE VELOCITY

Shallow slopes and the inability to meet minimum cleansing velocities may result in an increase in Fat, Oil and Grease (FOG) buildup and increased sedimentation in the network. This FOG buildup can impede pipe flow, reducing capacity and further exacerbating any capacity related issues noted. A monitoring and maintenance plan is generally recommended to verify pipe condition and clear restrictions.

Modeled velocities in sections of the pipe network across the City are less than the minimum self cleansing velocity of 0.6 m/s. The inability of mains to reach a cleansing velocity during the PDWF analysis can be attributed to the shallow slopes found throughout the pipe network. Table 12 below provides a summary for the City's sanitary sewers with respect to size and minimum required slopes, indicating the amount of sewers not achieving minimum pipe slope criteria for the total system, and by pipe diameter.

Table 7: Pipe Characteristics Relating to Velocity

Location	Result
TOTAL SYSTEM (excluding forcemains)	
Length	140,710m
Pipe Velocity < 0.6m/s	118,946m (84.5% of total)
Pipe Velocity < 0.6 m/s (for pipes more than 20% full)	13,210m (11.1% of total)
Pipe Diameter Below Minimum Slope Requirements	67,611m (48.0% of total)
BY PIPE DIAMETER	
Pipe Diameter <= 200mm	
Length	85,631m (60.9% of total)
Pipe Slope < 0.4%	44,086m (31.3% of total) (51.5% of 200mm)
Pipe Diameter = 250mm	
Length	18,361m (13.0% of total)
Pipe Slope Below Minimum Slope Requirement of 0.28%	11,455m (8.1% of total) (62.4% of 250mm)

Location	Result
Pipe Diameter = 300mm	
Length	13,097m (9.3% of total)
Pipe Slope Below Minimum Slope Requirement of 0.22%	7,890m (5.6% of total) (60.2% of 300mm)
Pipe Diameter = 375mm	
Length	5,803m (4.1% of total)
Pipe Slope Below Minimum Slope Requirement of 0.15%	1151m (0.8% of total) (19.8% of 375mm)
Pipe Diameter = 450mm	
Length	2,737m (1.9% of total)
Pipe Slope Below Minimum Slope Requirement of 0.12%	198m (0.1% of total) (7.2% of 450mm)
Pipe Diameter = 525mm	
Length	944m (0.7% of total)
Pipe Slope Below Minimum Slope Requirement of 0.10%	0m (0.0% of total) (0.0% of 525mm)
Pipe Diameter >= 600mm	
Length	14,138m (10.0%)
Pipe Slope Below Minimum Slope Requirement of 0.08%	2,830m (2.0% of total) (48.0% of >= 600mm)

Approximately 48.0% of the pipes within the City have a slope less than design minimum, and 31.3% of the pipe within the City is 200mm pipe with a slope less than 0.4% (minimum slope for a 200mm pipe). This is typical for communities within Alberta, as flat grades often create difficult constraints, requiring installations flatter than desirable. The inability to meet minimum cleansing velocities may result in an increase in Fat, Oil and Grease (FOG) buildup in the network, which can impede pipe flow reducing capacity, further exacerbating any capacity related issues noted. As this issue is common in Alberta due to flat grades, usual action to mitigate potential problems is a regular flushing and maintenance schedule established in consultation with City operations staff. This should also include periodic review of CCTV video to confirm pipe condition. Recommendations are discussed in ***Section 6: Next Steps***.

PDWF was used to model the minimum pipe velocity, simulating an extended dry period when I&I is significantly reduced. The purpose of this analysis is to identify pipes that do not meet the minimum pipe cleansing velocity of 0.6 m/s as per the Alberta Government requirements[2]. Selection criteria for this analysis was modified to exclude pipes with flow under 20% d/D (flow depth / diameter, to describe pipe capacity utilized) under PDWF, as pipes with small inflows will not meet self-cleansing velocity even at reasonable pipe slope due to relative friction.

Several areas have been identified under this selection criteria, per ***Figure 12: Existing Sanitary System – PDWF Velocity Analysis***; pipes with flow under 20% d/D were excluded. These areas are described as follows:

- Sections of Marler Drive from 68 Street to 59 Street;
- Montclare Avenue;
- Sections of the north trunk following 54 Avenue, 47 Street, and 54 Street;
- Sections of the receiving sanitary main following Stoney Creek / Mirror Lake;
- Sections of pipe within the commercial Cornerstone development area; and
- Other smaller sections of pipe throughout the gravity network.

The City has identified observed problem areas within their GIS database; these have been overlayed on ***Figure 12: Existing Sanitary System – PDWF Velocity Analysis***. Highlighted areas not captured in the City database should be inspected for performance issues, and added to the City flushing program if needed.

[2] Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems: Part 3 Wastewater Systems Standards for Performance and Design of a Total of 5 Parts, Section 3.3.1.1 (March 2013). Alberta Government. https://open.alberta.ca/dataset/f57fec02-7de8-4985-b948-dcf5e2664aee/resource/6df3ae50-cacb-4e4c-b5b3-98d829ab661a/download/part3-wastewatersystemsstandards-2013.pdf

3.3. SOUTH LIFT STATION UPGRADES

The City has experienced historical sanitary flooding at the South Lift Station, identified in the previous Sanitary Master Plan. The previous model was also validated by a June 2007 storm; notably, this was reported as a 5-yr storm, where 40-45mm rain fell over a 6-hr duration, resulting in overload of the SLS and minor overflow to the storage cell. Following this, a series of upgrades were recommended.

The City has since proceeded with the design of these upgrades, per the *City of Camrose Wastewater Treatment Plant Design Basis Memorandum* (March 2020), by Associated Engineering. Pertinent to this analysis, the memo has identified a pump rate of 330 L/s, with emergency overflow into an existing 7,000 m^3 cell (Cell A) and an additional proposed 7,000 m^3 overflow cell (Cell B). The report recommended increasing the pump rate to 370 L/s with relatively minor upgrades. These upgrades are intended to increase the system capacity to accommodate a 25-yr storm level of service.

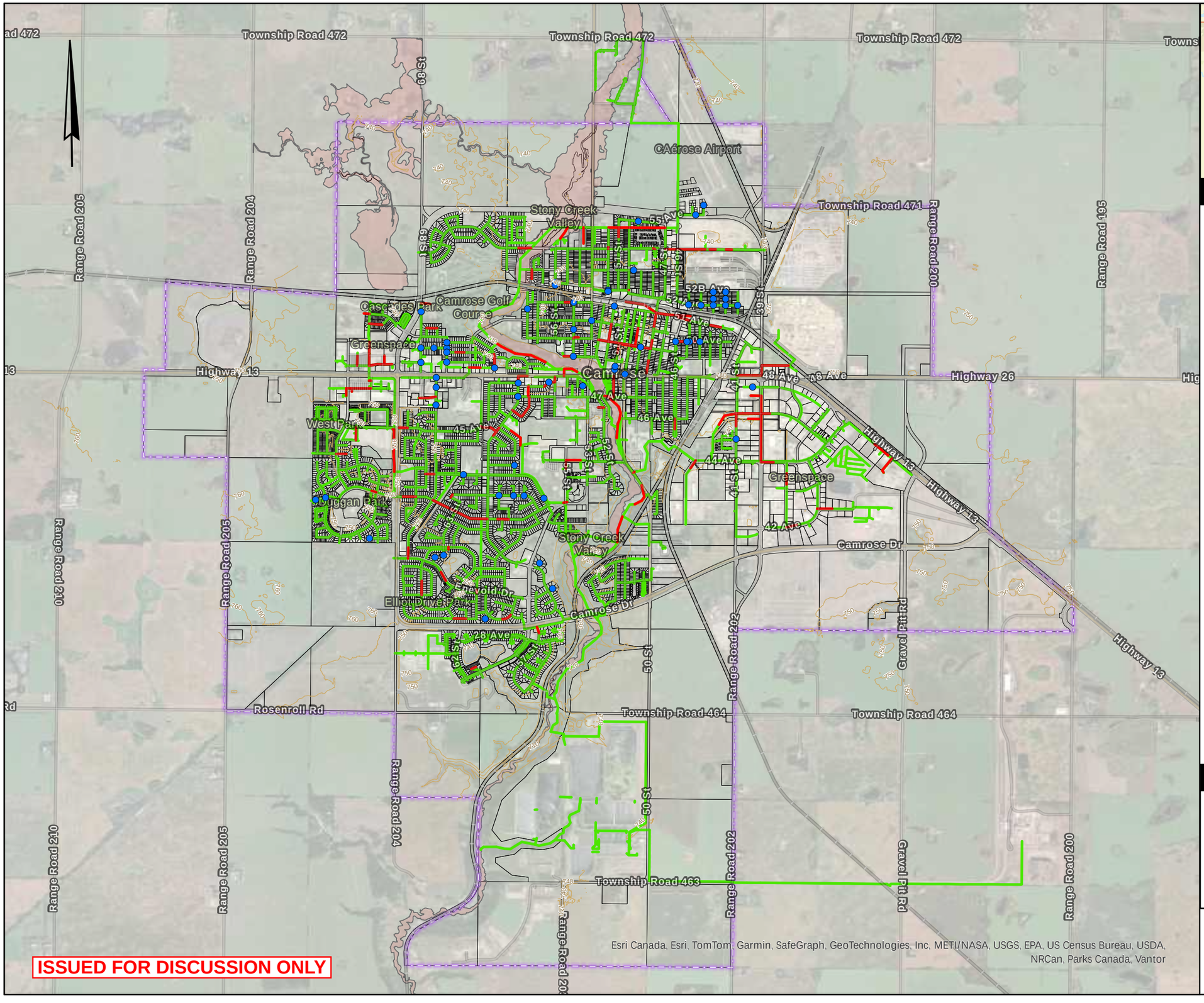
A confirmation check was performed, where the current model was run with a 5-yr 6-hr Chicago distribution design storm, to compare results to the previous Sanitary Master Plan results where flooding occurred; no flooding was observed in the current model. However, reviewing the current IDF curve, the 5-yr 6-hr Chicago distribution produced 32mm depth rainfall, far less than the 40-45mm identified in the previous Sanitary Master Plan report; this suggests the previous model rainfall for an equivalent return period was far higher. Reviewing the previous Sanitary Master Plan report, the previous IDF curves were based on City of Edmonton, not the Environment Canada Camrose rain gauge. The current model was then re-run with rainfall scaled up 1.25x; the model indicated overflow in this scenario, similar to the previous model. This indicates the previous analysis was performed assuming higher rainfall, which should be considered when comparing results.

The model was run according to current design criteria, a 25-yr design storm, to determine continuity from the previous Sanitary Master Plan; model results indicate overflow into Cell A, but not Cell B. As Cell A is already in use, this indicates the current system can already accommodate a 25-yr level of service. However, given the discrepancy between the current and existing model, recommendations for next steps are identified in ***Section 6***.

3.4. CORNERSTONE LIFT STATION UPGRADES

Cornerstone Lift Station upgrades were identified in the previous Sanitary Master Plan; the previous Sanitary Master Plan indicated the Cornerstone Lift Station Capacity at 62 L/s, and recommended pump upgrades. The City has since upgraded the Cornerstone Lift Station pumps, but not the forcemain; updated pump curves for the Cornerstone Lift Station are included in ***Appendix B***, along with the pump control scheme, where pumps are shown to operate in lead-lag configuration. Lift station capacity for single pump operation was calculated at 77 L/s, and for parallel pump operation was calculated at 102 L/s.

The model was run with updated pump curve information; results showed satisfactory system performance meeting design criteria; wet well depth for the 100-yr 4-hr storm was computed at 1.47 m.



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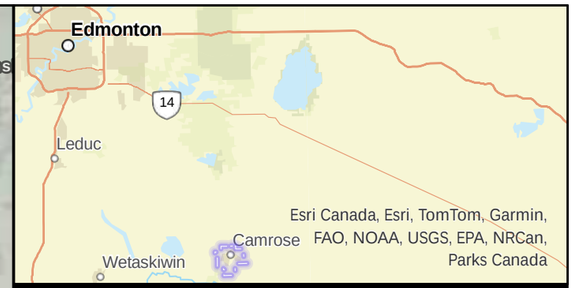


LEGEND

- Camrose City Limit
- 100yr Flood Extent
- Existing Conduits
- Conduits - < 0.6 m/s
- City Flood Problem Records

0 0.5 1 Kilometers

McElhanney

CITY OF Camrose

TITLE

Figure 12
Existing Sanitary System - PDWF Velocity Analysis

NAD 1983 3TM 111

Date: 4/30/2026

4. Proposed System Assessment

4.1. OBJECTIVE

As previously discussed, for the existing system, the Camrose sanitary system is showing no significant issues under PWWF conditions for a 25-year design storm.

Proposed system upgrades have been assessed based on proposed 10-yr, 25-yr, 50-yr, and Ultimate growth horizons. Proposed system upgrades have generally been conceptualized to accomplish the following:

- Expand the system to service Stage 1 (10-yr), Stage 2 (25-yr), and Stage 3 (50-yr) and Ultimate future growth horizons according to ***Section 1.4***,
- Take advantage of existing grades to the extent possible to optimize bury depths,
- Take advantage of likely development sequencing,
- For 10-year horizons and future growth horizons where possible, focus on connecting to existing infrastructure, to limit requirement for large capital investments to support new development, and
- Configure pipe network to limit new lift station construction, while avoiding unfeasibly deep bury depths.

4.2. SYSTEM ANALYSIS EVALUATION CRITERIA

Refer to ***Figure 13: Future Sanitary System – Proposed Upgrades (Alternative 2 – Recommended)*** and ***Figure 14: Future Sanitary System – Proposed Upgrades (Alternative 1 – Not Recommended)*** for the proposed expansion plan, including planned future infrastructure upgrades to support new development.

Impact on the existing system was evaluated under the following condition:

- PWWF (25-yr), full buildout, 15% infill, pipe capacity < 85%
- Analysis was also run on the system for a PWWF based on the 100-yr design storm event, to evaluate risk under extreme storm conditions.

The following provides justification for capacity assessment evaluation criteria:

- **Per Capita Loading Rate**: City of Camrose Development Standards (April 2004) stipulates a per capita loading rate of 320 L/c/d, and has been used in this analysis.

- **Peaking Factor**: City of Camrose Development Standards (April 2004) stipulates a sanitary peaking factor of 2X, and has been used in this analysis.

- **Level of Service**: Per ***Section 2.1***, 25-year is typically evaluated for impact to existing system, with 100-yr analysis being performed for risk assessment.

- **Future Development Area Population Density**: The system was evaluated assuming same concentration in new development as existing development. While the growth rate for the City is projected at 0.9%, it is anticipated that not all quarter sections will be built out at the same rate. Relative developability has been assessed per *Table 30: Relative Developability Values of Quarter- Sections* from the *Camrose Growth Study (2023)*. In general, the intention is that full buildout be considered for all areas to properly plan downstream infrastructure supporting new development.

- **Future Development Area Inflow & Infiltration**: Future development areas were assessed using 0.28 L/s/ha inflow and infiltration allowance, per ***Section 2.1***. This was further refined according to anticipated coverage, as inflow and infiltration is anticipated at buildings and pipe network; open areas for large industrial / commercial lots are not anticipated to contribute to sanitary inflow and infiltration.

    - Industrial: 15% Road Coverage, 20% Building Coverage
    - Commercial: 15% Road Coverage, 35% Building Coverage
    - Residential: 15% Road Coverage, 65% Building Coverage

- **Infill**: Amount of infill was assumed based on *Municipal Development Plan*, by City of Camrose (2024). This document identifies 15% infill, which has been incorporated into this analysis.

- **Pipe Capacity**: Pipe capacity limit is 85%, per ***Section 2 Design Criteria***.

4.3. UPGRADES TO EXISTING SYSTEM

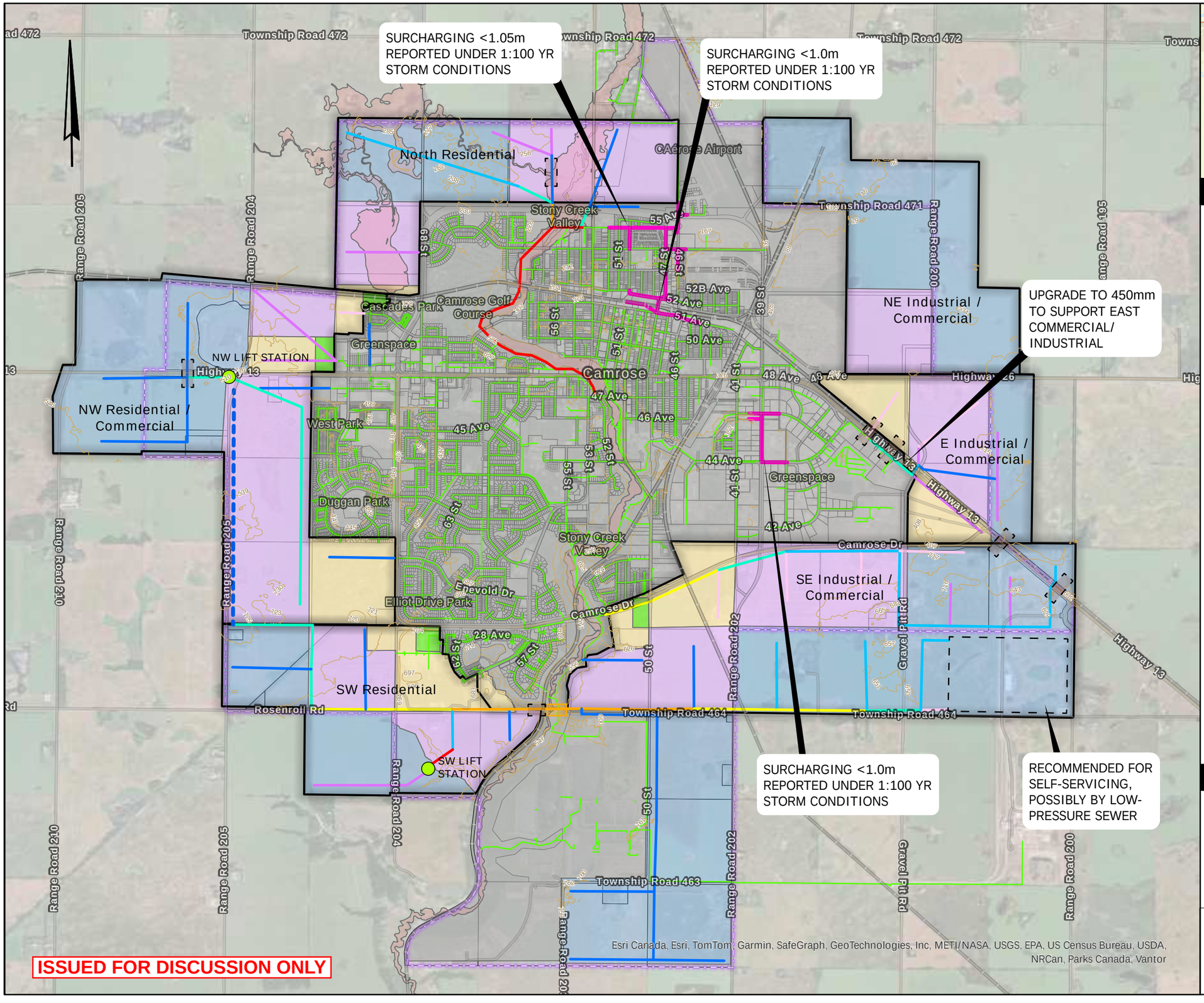
Future development has been evaluated at the following development horizons:

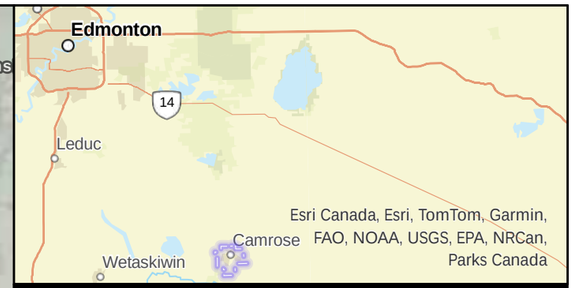
- Stage 1 – 10 Year
- Stage 2 – 25 Year
- Stage 3 – 50 Year
- Stage 4 – Ultimate

Stage 1 and some Stage 2 development zones have largely been conceptualized to connect to the existing network, rather than make use of new large trunk receiving mains or lift stations. Stage 1 development horizons do not trigger upgrades to any existing infrastructure per current connections.

Some of Stage 2, and all Stage 3 and Ultimate development zones, generally require new infrastructure to support sanitary servicing. There are several exceptions: (1) the proposed residential area to the north, which is proposed to connect to the Stoney Creek sanitary trunk. The additional loading attributable to this development will trigger an upgrade to 3,010m of the existing sanitary trunk to 750mm diameter. And

(2) several development zones proposed to connect to the existing system described in ***Section 4.4***. These do not trigger required upgrades according to evaluation criteria per the preceding section.





LEGEND

- Camrose City Limit
- 100yr Flood Extent
- Existing Sanitary Network
- Future Lift Station
- Future Forcemain
- Areas of Concern
- Land Use Zones

Growth Horizons

- Existing Built-up Area
- Stage 1 (10 yrs)
- Stage 2 (25 yrs)
- Stage 3 (50 yrs)
- Ultimate Build-out
- Trenchless Crossing
- Pipe Bridge

Future Conduits

Pipe Diameter (mm)

- 200
- 250
- 300
- 375
- 450
- 525
- 600
- 750

0 0.5 1 Kilometers

McElhanney

CITY OF Camrose

TITLE

Figure 13
Future Sanitary System
Proposed Upgrades
(Alternative 2 - Recommended)

ISSUED FOR DISCUSSION ONLY

NAD 1983 3TM 111

Date: 5/1/2026

SURCHARGING <1.0m
REPORTED UNDER 1:100 YR
STORM CONDITIONS

SURCHARGING <1.0m
REPORTED UNDER 1:100 YR
STORM CONDITIONS

SURCHARGING <1.0m
REPORTED UNDER 1:100 YR
STORM CONDITIONS

NORTH RESIDENTIAL

NORTH-WEST
RESIDENTIAL /
COMMERCIAL

NORTH-EAST
COMMERCIAL /
INDUSTRICAL

EAST
COMMERCIAL /
INDUSTRICAL

SOUTH-EAST
COMMERCIAL /
INDUSTRICAL

SOUTH-WEST
RESIDENTIAL

NW LIFT STATION

NE LIFT STATION

SW LIFT STATION

SE LIFT STATION

CAérose Airport

Camrose

Stony Creek Valley

Cascade Park

Camrose Golf Course

Greenspace

West Park

Duggan Park

Elliot Drive Park

Township Road 472

Township Road 471

Township Road 464

Township Road 463

Range Road 210

Range Road 205

Range Road 204

Range Road 202

Range Road 200

Range Road 195

Highway 13

Highway 26

Camrose Dr

Gravel Pit Rd

Rosenroll Rd

Enevold Dr

55 Ave

52B Ave

52 Ave

51 Ave

50 Ave

48 Ave

47 Ave

46 Ave

45 Ave

44 Ave

42 Ave

28 Ave

69 St

63 St

62 St

57 St

56 St

55 St

53 St

52 St

51 St

50 St

47 St

46 St

41 St

39 St

ISSUED FOR DISCUSSION ONLY

Edmonton
14
Leduc
Camrose
Wetaskiwin

LEGEND

- Camrose City Limit
- 100yr Flood Extent
- Existing Sanitary Network
- Future Lift Station
- Future Forcemain
- Areas of Concern
- Land Use Zones

Growth Horizons

- Existing Built-up Area
- Stage 1 (10 yrs)
- Stage 2 (25 yrs)
- Stage 3 (50 yrs)
- Ultimate Build-out
- Trenchless Crossing
- Pipe Bridge

Future Conduits

Pipe Diameter (mm)

- 200
- 250
- 300
- 375
- 450
- 525
- 600
- 750

0 0.5 1 Kilometers

McElhanney

CITY OF Camrose

TITLE

Figure 14
Future Sanitary System
Proposed Upgrades
(Alternative 1 - Not Recommended)

NAD 1983 3TM 111

Date: 7/14/2025

4.4. FUTURE DEVELOPMENT

For description of expansion zones (*NW Residential / Commercial*, *North Residential*, *NE Industrial / Commercial*, *E Industrial / Commercial*, *SE Industrial / Commercial, Policy Review*, and *SW Residential*) refer to ***Section 1.4***. For visual reference of the expansion zones, refer to ***Figure 3: Projected Growth – Phasing*** and ***Figure 13: Future Sanitary System – Proposed Upgrades (Alternative 2 – Recommended)***.

The servicing strategy for each zone has been assessed according to the objectives stated in ***Section 4.1*** and evaluation criteria described in ***Section 4.2***. Two alternatives were developed, based on feedback from the City; Alternative 2 is recommended, to reduce capital expenditures, and facilitate simpler construction phasing with less development constraints. For Alternative 1, refer to ***Figure 14: Future Sanitary System – Proposed Upgrades (Alternative 1 – Not Recommended)***.

Lift stations have been sized according to maximum calculated inflow, according to criteria established in ***Section 4.2***. Preliminary headloss calculations have been performed for conceptual forcemain sizing, based on calculated flowrate, length, and LiDAR elevation data. This is meant for guidance in high-level planning, with the intention the design be refined once future development plans are further progressed.

4.4.1.North Residential

Refer to ***Figure 22: Future Sanitary System Proposed Upgrades North Residential***.

Drainage pattens generally trend towards Stoney Creek. The servicing strategy for this area is intended to follow prevailing drainage patterns; sanitary trunk mains servicing this zone have been conceptualized ultimately draining to the existing Stoney Creek sanitary main. Subzone N_RES_301 to the west follows this same approach, but connects to an existing subdivision, which in turn discharges to the Stoney Creek sanitary main.

Model results indicate that while the existing Stoney Creek sanitary main does not presently have capacity issues, additional loading on the Stoney Creek sanitary trunk will eventually trigger required upsizing from 300mm-600mm to 750mm. The existing trunk can accommodate 75% buildout at Stage 3, and will require upgrading once development progresses past this point; additional information on impact of staging to the downstream trunk is summarized below.

Stage 3 0% Developed, Ultimate 0% Developed

- No issues present in Stoney Creek in extreme storm event, negligible risk

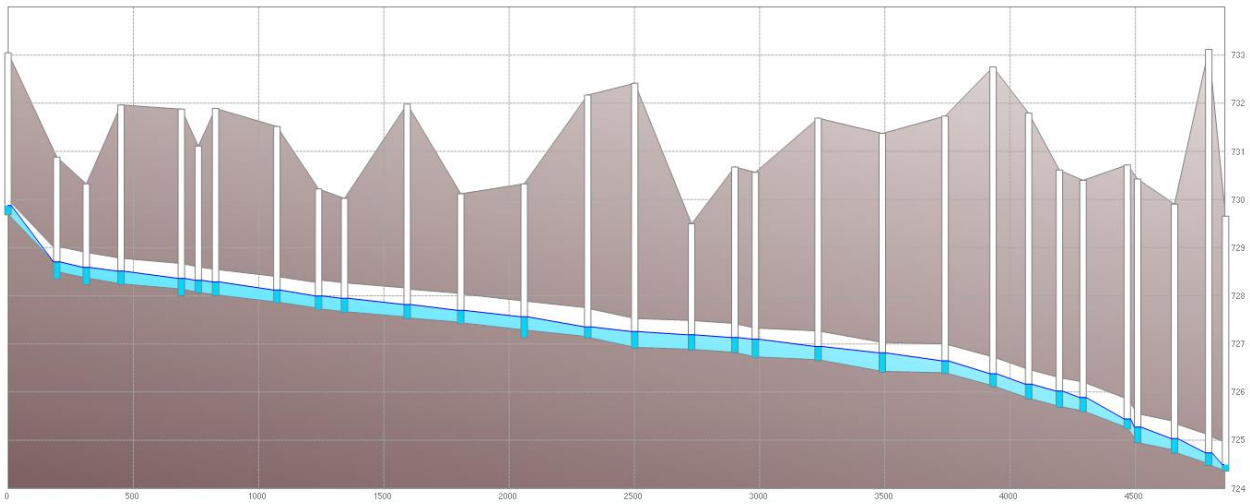


Figure 15: Stoney Creek Trunk HGL, Stage 2 0% Developed / Stage 3 0% Developed, from Stage 2 connection to 48 Ave – 25-yr 1-hr AES Design Storm

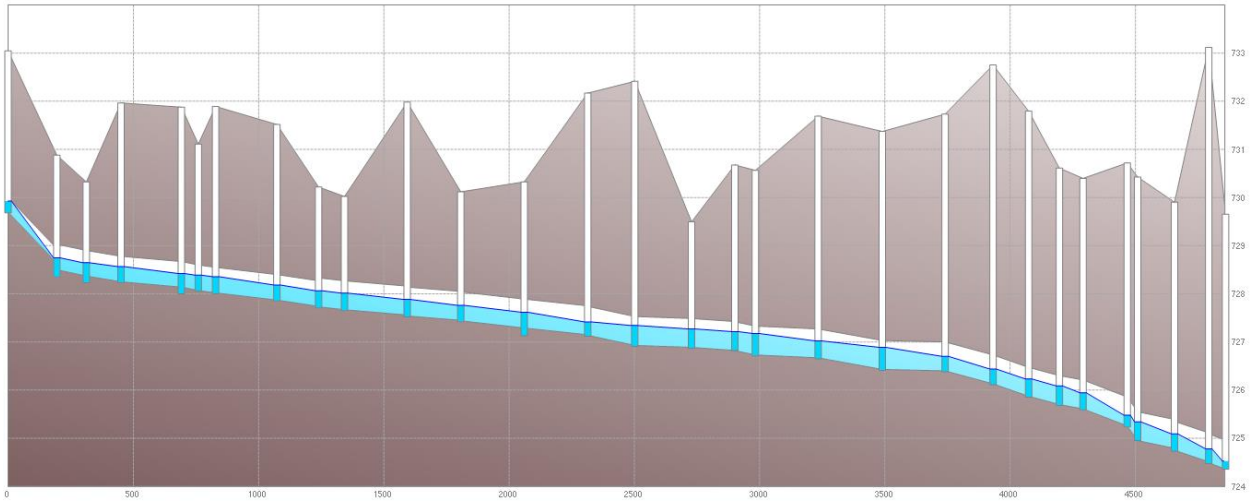


Figure 16: Stoney Creek Trunk HGL, Stage 2 0% Developed / Stage 3 0% Developed, from Stage 2 connection to 48 Ave – 100-yr 4-hr Chicago Design Storm

Stage 3 75% Developed, Ultimate 0% Developed

- Meets design criteria; accommodates 25-yr level of service
- Very minor surcharging in extreme storm event; negligible risk

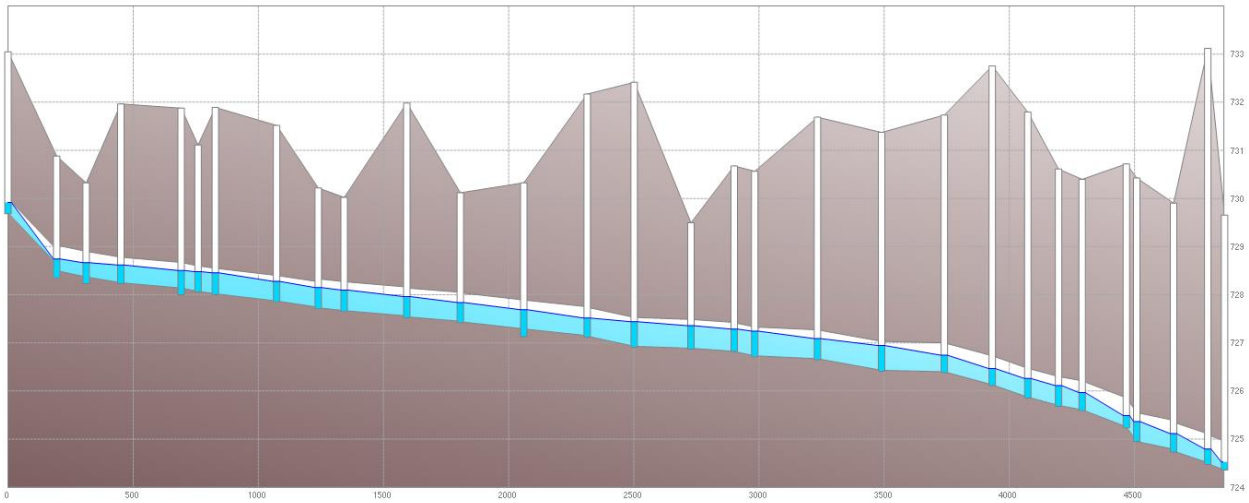


Figure 17: Stoney Creek Trunk HGL, Stage 2 75% Developed / Stage 3 0% Developed, from Stage 2 connection to 48 Ave – 25-yr 1-hr AES Design Storm

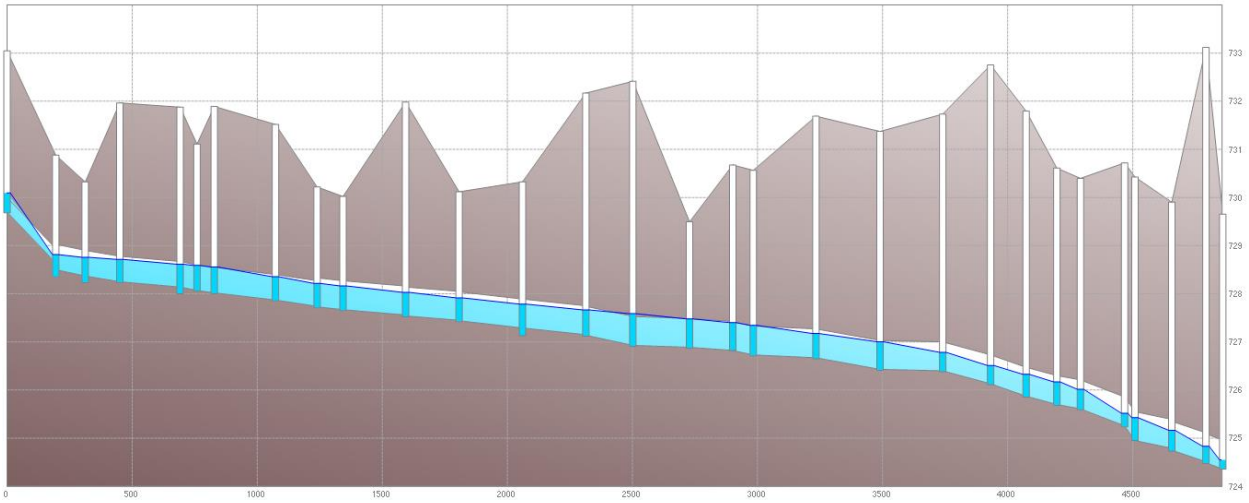


Figure 18: Stoney Creek Trunk HGL, Stage 2 75% Developed / Stage 3 0% Developed, from Stage 2 connection to 48 Ave – 100-yr 4-hr Chicago Design Storm

Stage 3 100% Developed, Ultimate 0% Developed

- Meets design criteria; accommodates 25-yr level of service
- Risk of surcharging in extreme storm event

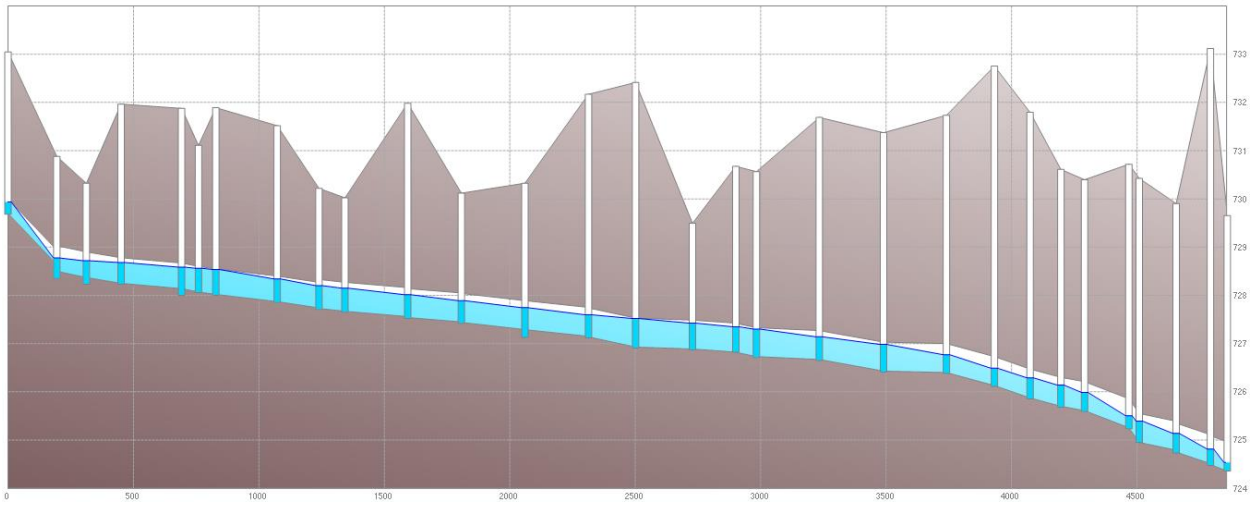


Figure 19: Stoney Creek Trunk HGL, Stage 2 100% Developed / Stage 3 0% Developed, from Stage 2 connection to 48 Ave – 25-yr 1-hr AES Design Storm

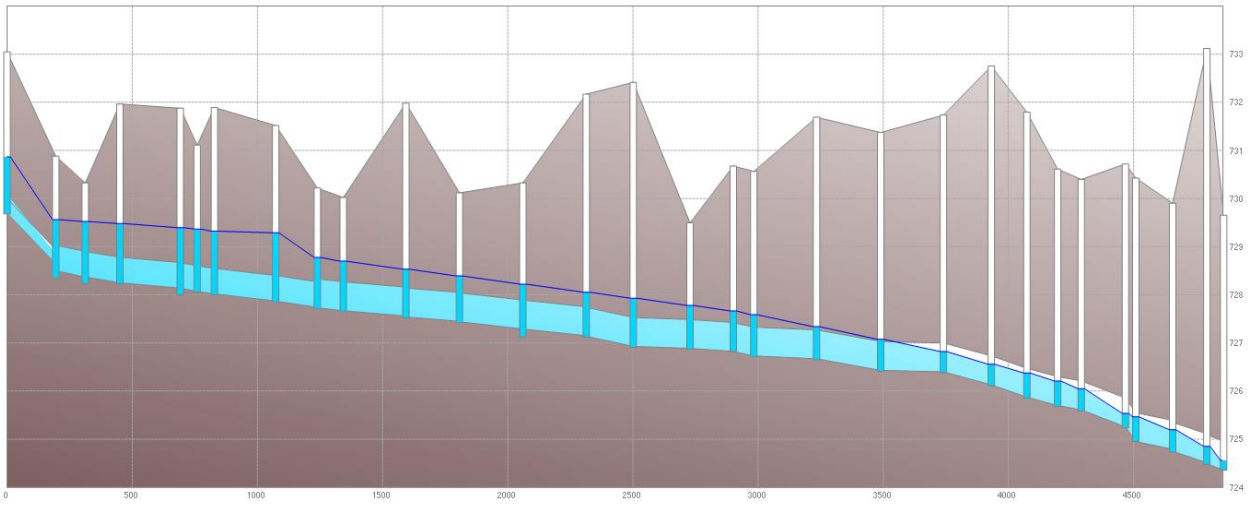


Figure 20: Stoney Creek Trunk HGL, Stage 2 100% Developed / Stage 3 0% Developed, from Stage 2 connection to 48 Ave – 100-yr 4-hr Chicago Design Storm

4.4.2.NW Residential / Commercial

Refer to ***Figure 21: Future Sanitary System Proposed Upgrades NW Residential / Commercial***.

Drainage patterns for this area dictate the servicing strategy.

- There is a drainage split at the future Camrose Drive extension, with areas north of Camrose Drive draining north / northeast. Zones NW Residential / Commercial and SW Residential have been separated at this split.
- The area to the north undulates, although the prevailing direction of drainage is northeast.
- Stage 2 commercial and residential areas, and NW_RES_301, drain towards existing Cascades development area.
- Stage 3 and Ultimate development generally drain towards the existing wetlands.

Stage 1 development, and some Stage 2 and Stage 3 development, is proposed to connect to existing sanitary mains.

- Model results indicate existing infrastructure can support this additional loading in part without adversely affecting system capacity. This also fits with the objective of having Stage 1 infrastructure connect to existing infrastructure to facilitate short-term development without requiring large capital expenditures.
- The exception to this is NW_RES_203; an upgrade to the sewermain exiting the residential development 71st Street / 49A Avenue from 200mm to 300mm is required to support this development.
- The Cornerstone Lift Station was reviewed with this development added, as discharge from these additional development areas is conveyed to this lift station; results showed the existing Cornerstone Lift Station can support Stage 1 and Stage 2 development. Stage 3 development, specifically subzones NW_RES_301 and NW_COMM_301, will require a 53 L/s capacity upgrade to the Cornerstone Lift Station.

Remaining Stage 2 and Stage 3 development, and Ultimate development, will require new infrastructure. Areas north of Camrose Drive are proposed to drain by gravity main to a new lift station (NW LS). A new forcemain will be installed to connect to proposed gravity infrastructure south of Camrose Drive.

4.4.3.SW Residential

Refer to ***Figure 26: Future Sanitary System Proposed Upgrades SW Residential***.

Areas south of the future Camrose Drive extension drain east towards Stoney Creek sanitary trunk. There is also a tributary running through this development area to the south; areas east of this tributary drain into this tributary.

Stage 1 and Stage 2 development is proposed to connect to existing sanitary mains, as model results show existing infrastructure can support this additional loading. However, this is with the assumption the proposed tie-in point is at the 600mm gravity main. Tie-in upstream of the existing 600mm sanitary main will trigger required upsizing.

Concerning Stage 3 and Ultimate buildout, these southwest residential / commercial areas are proposed to connect to a west-east sanitary trunk. The southernmost development areas west of the tributary will require a LS (LS-SW) for servicing, to connect to this sanitary trunk. This sanitary trunk is proposed to connect to the existing South Lift Station, crossing Stoney Creek by pipe bridge similar to the residential development south of Camrose Drive.

An alternative connection point for the Stage SW Residential / Commercial area was considered for Stage 3 and Ultimate buildout, at the existing deep (>8m depth) 600mm diameter main on Valleyview Drive. However, this triggered downstream surcharging; an extended upgrade project would be required to make use of this connection. It is more economical and more straightforward to create a new connection as proposed.

4.4.4.NE Industrial / Commercial

Refer to ***Figure 23: Future Sanitary System Proposed Upgrades NE Commercial / Industrial***.

Two alternatives have been presented for servicing the NE Industrial / Commercial, E Industrial / Commercial, and SE Industrial / Commercial areas, per ***Figure 13: Future Sanitary System – Proposed Upgrades (Alternative 2 – Recommended)*** and ***Figure 14: Future Sanitary System – Proposed Upgrades (Alternative 1 – Not Recommended)***.

Alternative 1 – Fully Serviced

Existing drainage patterns for these zones trend north and northeast.

Servicing these areas will require installation of gravity sanitary main running the north, with the addition of a new lift station (LS-NE). Two options were considered for lift station connection point:

- Connection to the Stoney Creek sanitary trunk
- Connection to new infrastructure supporting new development to the southeast

Connecting to new infrastructure supporting new development to the southeast was preferred by the City, as connecting to the Stoney Creek sanitary trunk would require further upgrades, at significant time, expense, and disruption to the City.

The difficulty with connecting to the south is extensive capital expenditures are required before this is possible. Per the description in ***Section 4.4.6 SE Industrial / Commercial*****,** below, the following capital projects will be required to support the NE Industrial / Commercial area:

- Gravity main running south to LS-SE
- LS-SE & forcemain connection to the west-running gravity main
- Gravity main running west, from the forcemain connection to the South Lift Station

Finally, there is a Stage 3 industrial area identified; given the capital projects required to support this future development area, if Stage 2 development is preferred it is recommended to make use of either low-pressure sewer or sanitary holding tanks until future infrastructure is in place.

Alternative 2 – Self-Serviced

Given the distance from the wastewater treatment plant, and the constraints in using existing infrastructure, this area is difficult and expensive to service compared to other identified development areas. Fully servicing this area necessitates construction of a liftstation and significant length of forcemain. On this basis, the NE Industrial / Commercial area may be better suited to be self-serviced to avoid these large capital expenditures.

Self-servicing may lower developer interest and land value although this may also depend on the needs of a specific development. This will need to be evaluated against City objectives and in consultation with property owners / developers once the City decides to proceed with developing these areas. However, the benefit of this alternative is phasing becomes straightforward, and significant sanitary infrastructure investment is not required prior to development.

4.4.5.E Industrial / Commercial

Refer to ***Figure 24: Future Sanitary System Proposed Upgrades E Commercial / Industrial***.

Alternative 1 – E Commercial / Industrial: Industrial Tie-In to Existing, Commercial Tie-In to Future Gravity Main (Not Recommended)

For the Stage 2 and 3 east commercial and industrial zones, drainage patterns run southwest. Drainage for the Ultimate commercial area to the east trends south. These areas are constrained by the Highway 13 / CR Rail line.

Industrial zones within this area are proposed to connect to the existing gravity sanitary system, as the additional loading does not trigger surcharging in downstream pipe.

The commercial zone to the east is proposed to connect to a gravity main running south. This is dependant on whether the E Industrial / Commercial area is self-serviced. If this area is self-serviced, this option is not available. This option is generally not preferable; an additional constraint is introduced, in that the future gravity main and all downstream infrastructure needs to be installed prior to development.

Alternative 2 – E Commercial / Industrial Tie-In (Recommended)

For this alternative, the E Commercial / Industrial areas are proposed to connect to the existing sanitary sewer network, tying in to the existing main on Highway 13. This will require upgrade to 465m of existing sanitary main from 300mm to 450mm, as well as a Highway 13 and CR Rail crossing.

4.4.6. SE Industrial / Commercial

Refer to ***Figure 25: Future Sanitary System Proposed Upgrades SE Industrial / Commercial***.

Drainage patterns make this area difficult to describe accurately in general terms. Drainage patterns trend west towards Stoney Creek, but with noted undulation. Drainage is also split north and south.

Alternative 1 – New LS-SE (Not Recommended)

If Alternative 1 per the previous sections are selected to service the ultimate E & NE Commercial / Industrial areas, new infrastructure will be required, including;

- A gravity main running south to a new LS (LS-SE)
- A new LS (LS-SE)
- A new forcemain from LS-SE connecting to the proposed gravity main, running west. As discussed, LS-SE and the accompanying forcemain are required to facilitate the NE & E Industrial / Commercial areas per Alternative 1.
- Downstream west-running sanitary trunk mains are proposed. They have been split to accommodate the irregular grading patterns of the SE Industrial / Commercial zone.

Alternative 2 – Gravity Sewer and Limited Self Service (Recommended)

A second alternative has been conceptualized to allay the need for a new lift station. If the City proceeds with Alternative 2 per the previous sections, a lift station will not be required to accommodate new gravity main servicing the NE and E Commercial / Industrial areas.

The only limitation to this alternative is the parcel of land west of the Cargill canola crushing facility, draining towards the SE. Servicing this area by gravity will require excessively deep sewer pipe, ±10m depending on final grading design. Having this parcel be self-serviced, possibly by low-pressure sewer, greatly simplifies and lowers cost of required infrastructure by mitigating the need for an expensive lift station and forcemain. Requiring this area to be self-serviced may lower developer interest and land value, which will need to be evaluated against City objectives, and in consultation with the property owners / developers, once the City decides to proceed with developing this area.

4.4.7. Policy Review Area

There is an area to the south immediately east of the lagoon system and the Camrose Regional Landfill. This area has been included for information only, and has not been included in the cost estimate, as the City is still deliberating on land use. A conceptual trunk sewer layout optimized for existing grading has been shown in relevant figures.

5. Cost Estimate and Capital Planning

An opinion of probable costs was prepared for required infrastructure to support future development buildout. An approximate unit cost based on pipe diameter was applied per linear metre for each proposed pipe length and has been itemized in ***Table 8: Future Upgrade Cost Estimate*** on the following page. The higher cost of placing the upgrades on developed land is to account for additional considerations like utility locates, installing around other buried utilities, re-graveling/paving, temporary measures, traffic management, and emergency services. This is a Class 'D' cost estimate and is subject to change based on specific site conditions and detailed design. A 10% allowance for engineering and 35% contingency have also been included.

Note that the cost estimate is based on conceptual layout. Construction is likely to proceed differently depending on development needs once planning has progressed. The cost estimate is based on information currently available. The cost estimate targets the major conveyance network of large trunks / lift stations / forcemains; subdivision-level gravity networks are assumed to be covered under developer costs, and have not been accounted for in this cost estimate.

Each item has also been tabulated according to contributing area, with the intention this be used for offsite levy calculations. These tables have been included in ***Appendix E – Cost Estimate Breakdown By Area***.

City of Camrose Sanitary Sewer Assessment
Table 8: Future Upgrade Cost Estimate
Section 1.0 - East Commercial Industrial

Item	Description	Phase	Unit	Estimated Rate	Estimate Quantity	Estimated Material Cost	Engineering (10%)	Contingencies (35%)	Estimated Conceptual Cost
Section 1.1 - SubZone E IND 201									
1.1.1	New Sanitary Sewer Main C_E_001A (200mm PVC) - Supply & Install	2	lm	$300	418	$ 126,000	$ 12,600	$ 44,100	$ 182,700
1.1.2	New Sanitary Sewer Main Rail_C_E_001 (200mm PVC) - Supply & Install		lm	$2,000	28	$ 56,000	$ 5,600	$ 19,600	$ 81,200
1.1.3	New Sanitary Sewer Main C_E_001B (200mm PVC) - Supply & Install		lm	$300	68	$ 21,000	$ 2,100	$ 7,350	$ 30,450
1.1.4	New Manhole (1200mm) - Supply & Install		each	$12,000	6	$ 76,000	$ 7,600	$ 26,600	$ 110,200
Subtotal						**$ 279,000.00**	**$ 27,900.00**	**$ 97,650.00**	**$ 404,550.00**
Section 1.2 - SubZone E IND 202									
1.2.1	New Sanitary Sewer Main C_E_002 (250mm PVC) - Supply & Install	2	lm	$375	866	$ 325,000	$ 32,500	$ 113,750	$ 471,250
1.2.2	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 100,000	$ 10,000	$ 35,000	$ 145,000
Subtotal						**$ 425,000.00**	**$ 42,500.00**	**$ 148,750.00**	**$ 616,250.00**
Section 1.3 - SubZone E COMM 301									
1.3.1	New Sanitary Sewer Main Rail_C_E_003 (450mm PVC) - Supply & Install	3	lm	$2,000	46	$ 92,000	$ 9,200	$ 32,200	$ 133,400
1.3.2	New Sanitary Sewer Main C_E_003 (450mm PVC) - Supply & Install		lm	$675	66	$ 45,000	$ 4,500	$ 15,750	$ 65,250
1.3.3	New Manhole (1200mm) - Supply & Install		each	$12,000	3	$ 36,000	$ 3,600	$ 12,600	$ 52,200
Subtotal						**$ 173,000.00**	**$ 17,300.00**	**$ 60,550.00**	**$ 250,850.00**
Section 1.4 - SubZone E IND 301									
1.4.1	New Sanitary Sewer Main C_E_004 (250mm PVC) - Supply & Install	3	lm	$375	177	$ 67,000	$ 6,700	$ 23,450	$ 97,150
1.4.2	New Sanitary Sewer Main C_E_005 (200mm PVC) - Supply & Install		lm	$300	707	$ 212,000	$ 21,200	$ 74,200	$ 307,400
1.4.3	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 101,000	$ 10,100	$ 35,350	$ 146,450
Subtotal						**$ 380,000.00**	**$ 38,000.00**	**$ 133,000.00**	**$ 551,000.00**
Section 1.5 - SubZone E COMM U01									
1.5.1	New Sanitary Sewer Main C_E_006 (375mm PVC) - Supply & Install	ULT	lm	$575	715	$ 412,000	$ 41,200	$ 144,200	$ 597,400
1.5.2	New Sanitary Sewer Main C_E_007 (300mm PVC) - Supply & Install		lm	$450	63	$ 29,000	$ 2,900	$ 10,150	$ 42,050
1.5.3	New Sanitary Sewer Main C_E_008 (250mm PVC) - Supply & Install		lm	$375	445	$ 167,000	$ 16,700	$ 58,450	$ 242,150
1.5.4	New Sanitary Sewer Main C_E_009 (250mm PVC) - Supply & Install		lm	$375	394	$ 148,000	$ 14,800	$ 51,800	$ 214,600
1.5.5	New Manhole (1200mm) - Supply & Install		each	$12,000	15	$ 174,000	$ 17,400	$ 60,900	$ 252,300
Subtotal						**$ 930,000.00**	**$ 93,000.00**	**$ 325,500.00**	**$ 1,348,500.00**
Section 1.6 - SubZone E COMM U02									
1.6.1	New Sanitary Sewer Main C_SE_038 (375mm PVC) - Supply & Install	ULT	lm	$575	378	$ 218,000	$ 21,800	$ 76,300	$ 316,100
1.6.2	New Sanitary Sewer Main C_SE_039A (375mm PVC) - Supply & Install		lm	$575	162	$ 94,000	$ 9,400	$ 32,900	$ 136,300
1.6.3	New Sanitary Sewer Main Rail_C_SE_039 (375mm PVC) - Supply & Install		lm	$2,000	30	$ 60,000	$ 6,000	$ 21,000	$ 87,000
1.6.4	New Sanitary Sewer Main C_SE_039B (375mm PVC) - Supply & Install		lm	$575	46	$ 27,000	$ 2,700	$ 9,450	$ 39,150
1.6.5	New Manhole (1200mm) - Supply & Install		each	$12,000	7	$ 87,000	$ 8,700	$ 30,450	$ 126,150
Subtotal						**$ 486,000.00**	**$ 48,600.00**	**$ 170,100.00**	**$ 704,700.00**
Section 1.0 - Grand Total						**$ 2,673,000**	**$ 267,300**	**$ 935,550**	**$ 3,875,850**

Notes & Assumptions:

1 Unit prices are based on past experience, comparable tenders, and some engineering judgement.

2 Manhole quantity assumed based on 120m spacing

City of Camrose Sanitary Sewer Assessment
Table 8: Future Upgrade Cost Estimate
Section 2.0 - South East Commercial Industrial

Item	Description	Phase	Unit	Estimated Rate	Estimate Quantity	Estimated Material Cost	Engineering (10%)	Contingencies (35%)	Estimated Conceptual Cost
Section 2.1 - SubZone SE RES 101									
2.1.1	New Sanitary Sewer Main C_SE_001A (525mm PVC) - Supply & Install	1	lm	$788	369	$ 291,000	$ 29,100	$ 101,850	$ 421,950
2.1.2	New Manhole (1200mm) - Supply & Install		each	$12,000	4	$ 50,000	$ 5,000	$ 17,500	$ 72,500
Subtotal						**$ 341,000.00**	**$ 34,100.00**	**$ 119,350.00**	**$ 494,450.00**
Section 2.2 - SubZone SE RES 201									
2.2.1	New Sanitary Sewer Main C_SE_001B (525mm PVC) - Supply & Install	2	lm	$788	476	$ 375,000	$ 37,500	$ 131,250	$ 543,750
2.2.2	New Manhole (1200mm) - Supply & Install		each	$12,000	5	$ 60,000	$ 6,000	$ 21,000	$ 87,000
Subtotal						**$ 435,000.00**	**$ 43,500.00**	**$ 152,250.00**	**$ 630,750.00**
Section 2.3 - SubZone SE IND 201									
2.3.1	New Sanitary Sewer Main C_SE_002 (525mm PVC) - Supply & Install	2	lm	$788	331	$ 262,000	$ 26,200	$ 91,700	$ 379,900
2.3.2	New Sanitary Sewer Main C_SE_003 (200mm PVC) - Supply & Install		lm	$300	460	$ 138,000	$ 13,800	$ 48,300	$ 200,100
2.3.3	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 92,000	$ 9,200	$ 32,200	$ 133,400
Subtotal						**$ 492,000.00**	**$ 49,200.00**	**$ 172,200.00**	**$ 713,400.00**
Section 2.4 - SubZone SE RES 301									
2.4.1	New Sanitary Sewer Main C_SE_007 (300mm PVC) - Supply & Install	3	lm	$450	571	$ 258,000	$ 25,800	$ 90,300	$ 374,100
2.4.2	New Manhole (1200mm) - Supply & Install		each	$12,000	6	$ 70,000	$ 7,000	$ 24,500	$ 101,500
Subtotal						**$ 328,000.00**	**$ 32,800.00**	**$ 114,800.00**	**$ 475,600.00**
Section 2.5 - SubZone SE COMM 301									
2.5.1	New Sanitary Sewer Main C_SE_005 (600mm PVC) - Supply & Install	3	lm	$900	225	$ 203,000	$ 20,300	$ 71,050	$ 294,350
2.5.2	New Sanitary Sewer Main C_SE_006 (600mm PVC) - Supply & Install		lm	$900	648	$ 584,000	$ 58,400	$ 204,400	$ 846,800
2.5.3	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 100,000	$ 10,000	$ 35,000	$ 145,000
Subtotal						**$ 887,000.00**	**$ 88,700.00**	**$ 310,450.00**	**$ 1,286,150.00**
Section 2.6 - SubZone SE IND 301									
2.6.1	New Sanitary Sewer Main C_SE_008 (600mm PVC) - Supply & Install	3	lm	$900	429	$ 387,000	$ 38,700	$ 135,450	$ 561,150
2.6.2	New Sanitary Sewer Main C_SE_009 (375mm PVC) - Supply & Install		lm	$575	599	$ 345,000	$ 34,500	$ 120,750	$ 500,250
2.6.3	New Sanitary Sewer Main C_SE_010 (600mm PVC) - Supply & Install		lm	$900	392	$ 353,000	$ 35,300	$ 123,550	$ 511,850
2.6.4	New Manhole (1200mm) - Supply & Install		each	$12,000	13	$ 155,000	$ 15,500	$ 54,250	$ 224,750
Subtotal						**$ 1,240,000.00**	**$ 124,000.00**	**$ 434,000.00**	**$ 1,798,000.00**
Section 2.7 - SubZone SE IND 302									
2.7.1	New Sanitary Sewer Main C_SE_004 (450mm PVC) - Supply & Install	3	lm	$675	175	$ 118,000	$ 11,800	$ 41,300	$ 171,100
2.7.2	New Sanitary Sewer Main C_SE_011 (450mm PVC) - Supply & Install		lm	$675	440	$ 297,000	$ 29,700	$ 103,950	$ 430,650
2.7.3	New Manhole (1200mm) - Supply & Install		each	$12,000	6	$ 75,000	$ 7,500	$ 26,250	$ 108,750
Subtotal						**$ 490,000.00**	**$ 49,000.00**	**$ 171,500.00**	**$ 710,500.00**
Section 2.8 - SubZone SE IND 303									
2.8.1	New Sanitary Sewer Main C_SE_012 (450mm PVC) - Supply & Install	3	lm	$675	52	$ 36,000	$ 3,600	$ 12,600	$ 52,200
2.8.2	New Sanitary Sewer Main C_SE_014 (450mm PVC) - Supply & Install		lm	$675	634	$ 429,000	$ 42,900	$ 150,150	$ 622,050
2.8.3	New Manhole (1200mm) - Supply & Install		each	$12,000	7	$ 82,000	$ 8,200	$ 28,700	$ 118,900
Subtotal						**$ 547,000.00**	**$ 54,700.00**	**$ 191,450.00**	**$ 793,150.00**
Section 2.9 - SubZone SE IND 304									
2.9.1	New Sanitary Sewer Main C_SE_015 (450mm PVC) - Supply & Install	3	lm	$675	89	$ 60,000	$ 6,000	$ 21,000	$ 87,000
2.9.2	New Sanitary Sewer Main C_SE_016 (200mm PVC) - Supply & Install		lm	$300	380	$ 115,000	$ 11,500	$ 40,250	$ 166,750
2.9.3	New Sanitary Sewer Main C_SE_017 (375mm PVC) - Supply & Install		lm	$575	367	$ 212,000	$ 21,200	$ 74,200	$ 307,400

City of Camrose Sanitary Sewer Assessment
Table 8: Future Upgrade Cost Estimate
Section 2.0 - South East Commercial Industrial

Item	Description	Phase	Unit	Estimated Rate	Estimate Quantity	Estimated Material Cost	Engineering (10%)	Contingencies (35%)	Estimated Conceptual Cost
2.9.4	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 96,000	$ 9,600	$ 33,600	$ 139,200
Subtotal						**$ 483,000.00**	**$ 48,300.00**	**$ 169,050.00**	**$ 700,350.00**
Section 2.10 - SubZone SE IND 305									
2.10.1	New Sanitary Sewer Main C_SE_013 (200mm PVC) - Supply & Install	3	lm	$300	471	$ 142,000	$ 14,200	$ 49,700	$ 205,900
2.10.2	New Manhole (1200mm) - Supply & Install		each	$12,000	5	$ 60,000	$ 6,000	$ 21,000	$ 87,000
Subtotal						**$ 202,000.00**	**$ 20,200.00**	**$ 70,700.00**	**$ 292,900.00**
Section 2.11 - SubZone SE IND 306									
2.11.1	New Sanitary Sewer Main C_SE_018 (375mm PVC) - Supply & Install	3	lm	$575	438	$ 252,000	$ 25,200	$ 88,200	$ 365,400
2.11.2	New Sanitary Sewer Main C_SE_019 (375mm PVC) - Supply & Install		lm	$575	274	$ 158,000	$ 15,800	$ 55,300	$ 229,100
2.11.3	New Manhole (1200mm) - Supply & Install		each	$12,000	7	$ 84,000	$ 8,400	$ 29,400	$ 121,800
Subtotal						**$ 494,000.00**	**$ 49,400.00**	**$ 172,900.00**	**$ 716,300.00**
Section 2.12 - SubZone SE COMM U01									
2.12.1	New Sanitary Sewer Main C_SE_021 (600mm PVC) - Supply & Install	ULT	lm	$900	403	$ 364,000	$ 36,400	$ 127,400	$ 527,800
2.12.2	New Sanitary Sewer Main C_SE_022 (450mm PVC) - Supply & Install		lm	$675	640	$ 433,000	$ 43,300	$ 151,550	$ 627,850
2.12.3	New Sanitary Sewer Main C_SE_023 (600mm PVC) - Supply & Install		lm	$900	411	$ 371,000	$ 37,100	$ 129,850	$ 537,950
2.12.4	New Manhole (1200mm) - Supply & Install		each	$12,000	13	$ 159,000	$ 15,900	$ 55,650	$ 230,550
Subtotal						**$ 1,327,000.00**	**$ 132,700.00**	**$ 464,450.00**	**$ 1,924,150.00**
Section 2.13 - SubZone SE COMM U02									
2.13.1	New Sanitary Sewer Main C_SE_024 (600mm PVC) - Supply & Install	ULT	lm	$900	453	$ 408,000	$ 40,800	$ 142,800	$ 591,600
2.13.2	New Sanitary Sewer Main C_SE_025 (450mm PVC) - Supply & Install		lm	$675	667	$ 451,000	$ 45,100	$ 157,850	$ 653,950
2.13.3	New Sanitary Sewer Main C_SE_026 (450mm PVC) - Supply & Install		lm	$675	356	$ 240,000	$ 24,000	$ 84,000	$ 348,000
2.13.4	New Manhole (1200mm) - Supply & Install		each	$12,000	13	$ 160,000	$ 16,000	$ 56,000	$ 232,000
Subtotal						**$ 1,259,000.00**	**$ 125,900.00**	**$ 440,650.00**	**$ 1,825,550.00**
Section 2.14 - SubZone SE COMM U03									
2.14.1	New Sanitary Sewer Main C_SE_027 (450mm PVC) - Supply & Install	ULT	lm	$675	160	$ 109,000	$ 10,900	$ 38,150	$ 158,050
2.14.2	New Sanitary Sewer Main C_SE_028 (200mm PVC) - Supply & Install		lm	$300	268	$ 81,000	$ 8,100	$ 28,350	$ 117,450
2.14.3	New Sanitary Sewer Main C_SE_029 (450mm PVC) - Supply & Install		lm	$675	160	$ 109,000	$ 10,900	$ 38,150	$ 158,050
2.14.4	New Sanitary Sewer Main C_SE_030 (450mm PVC) - Supply & Install		lm	$675	268	$ 181,000	$ 18,100	$ 63,350	$ 262,450
2.14.5	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 99,000	$ 9,900	$ 34,650	$ 143,550
Subtotal						**$ 579,000.00**	**$ 57,900.00**	**$ 202,650.00**	**$ 839,550.00**
Section 2.15 - SubZone SE IND U01									
2.15.1	New Sanitary Sewer Main C_SE_031 (250mm PVC) - Supply & Install	ULT	lm	$300	616	$ 185,000	$ 18,500	$ 64,750	$ 268,250
2.15.2	New Manhole (1200mm) - Supply & Install		each	$12,000	6	$ 75,000	$ 7,500	$ 26,250	$ 108,750
Subtotal						**$ 260,000**	**$ 26,000**	**$ 91,000**	**$ 377,000**
Section 2.16 - SubZone SE IND U02									
2.16.1	New Sanitary Sewer Main C_SE_032 (375mm PVC) - Supply & Install	ULT	lm	$575	431	$ 248,000	$ 24,800	$ 86,800	$ 359,600
2.16.2	New Sanitary Sewer Main C_SE_033 (250mm PVC) - Supply & Install		lm	$375	402	$ 151,000	$ 15,100	$ 52,850	$ 218,950
2.16.3	New Sanitary Sewer Main C_SE_034 (375mm PVC) - Supply & Install		lm	$575	387	$ 223,000	$ 22,300	$ 78,050	$ 323,350
2.16.4	New Manhole (1200mm) - Supply & Install		each	$12,000	11	$ 135,000	$ 13,500	$ 47,250	$ 195,750
Subtotal						**$ 757,000.00**	**$ 75,700.00**	**$ 264,950.00**	**$ 1,097,650.00**
Section 2.17 - SubZone SE IND U03									
2.17.1	New Sanitary Sewer Main C_SE_035 (375mm PVC) - Supply & Install	ULT	lm	$575	193	$ 111,000	$ 11,100	$ 38,850	$ 160,950

City of Camrose Sanitary Sewer Assessment
Table 8: Future Upgrade Cost Estimate
Section 2.0 - South East Commercial Industrial

Item	Description	Phase	Unit	Estimated Rate	Estimate Quantity	Estimated Material Cost	Engineering (10%)	Contingencies (35%)	Estimated Conceptual Cost
2.17.2	New Sanitary Sewer Main C_SE_036 (250mm PVC) - Supply & Install		lm	$375	472	$ 177,000	$ 17,700	$ 61,950	$ 256,650
2.17.3	New Sanitary Sewer Main C_SE_037 (375mm PVC) - Supply & Install		lm	$575	373	$ 215,000	$ 21,500	$ 75,250	$ 311,750
2.17.4	New Sanitary Sewer Main C_SE_038 (375mm PVC) - Supply & Install		lm	$575	392	$ 226,000	$ 22,600	$ 79,100	$ 327,700
2.17.5	New Manhole (1200mm) - Supply & Install		each	$12,000	13	$ 156,000	$ 15,600	$ 54,600	$ 226,200
Subtotal						**$ 885,000.00**	**$ 88,500.00**	**$ 309,750.00**	**$ 1,283,250.00**
Section 2.0 - Grand Total						**$ 11,006,000**	**$ 1,100,600**	**$ 3,852,100**	**$ 15,958,700**

Notes & Assumptions:

1 Unit prices are based on past experience, comparable tenders, and some engineering judgement.

2 Manhole quantity assumed based on 120m spacing

City of Camrose Sanitary Sewer Assessment
Table 8: Future Upgrade Cost Estimate
Section 3.0 - South West Residential

Item	Description	Phase	Unit	Estimated Rate	Estimate Quantity	Estimated Material Cost	Engineering (10%)	Contingencies (35%)	Estimated Conceptual Cost
Section 3.1 - SubZone SW RES 301									
3.1.1	New Sanitary Sewer Main C_SW_003 (450mm PVC) - Supply & Install	3	lm	$675	387	$ 262,000	$ 26,200	$ 91,700	$ 379,900
3.1.2	New Manhole (1200mm) - Supply & Install		each	$12,000	4	$ 52,000	$ 5,200	$ 18,200	$ 75,400
Subtotal						**$ 314,000.00**	**$ 31,400.00**	**$ 109,900.00**	**$ 455,300.00**
Section 3.2 - SubZone SW RES 302									
3.2.1	New Sanitary Sewer Main C_SW_004_A (600mm PVC) - Supply & Install	3	lm	$900	313	$ 282,000	$ 28,200	$ 98,700	$ 408,900
3.2.2	New Sanitary Sewer Main Rail_C_SW_004 (600mm PVC) - Supply & Install		lm	$2,000	18	$ 37,000	$ 3,700	$ 12,950	$ 53,650
3.2.3	New Sanitary Sewer Main C_SW_004_B (600mm PVC) - Supply & Install		lm	$900	70	$ 63,000	$ 6,300	$ 22,050	$ 91,350
3.2.4	New Sanitary Sewer Main Creek_C_SW_004 (600mm PVC) - Supply & Install		lm	$2,000	15	$ 30,000	$ 3,000	$ 10,500	$ 43,500
3.2.5	New Sanitary Sewer Main C_SW_004_C (600mm PVC) - Supply & Install		lm	$900	52	$ 48,000	$ 4,800	$ 16,800	$ 69,600
3.2.6	New Sanitary Sewer Main C_SW_005 (300mm PVC) - Supply & Install		lm	$450	296	$ 134,000	$ 13,400	$ 46,900	$ 194,300
3.2.7	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 101,000	$ 10,100	$ 35,350	$ 146,450
Subtotal						**$ 695,000.00**	**$ 69,500.00**	**$ 243,250.00**	**$ 1,007,750.00**
Section 3.3 - SubZone SW RES 303									
3.3.1	New Sanitary Sewer Main C_SW_006 (600mm PVC) - Supply & Install	3	lm	$900	285	$ 257,000	$ 25,700	$ 89,950	$ 372,650
3.3.2	New Sanitary Sewer Main C_SW_007 (600mm PVC) - Supply & Install		lm	$800	521	$ 417,000	$ 41,700	$ 145,950	$ 604,650
3.3.3	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 94,000	$ 9,400	$ 32,900	$ 136,300
Subtotal						**$ 768,000.00**	**$ 76,800.00**	**$ 268,800.00**	**$ 1,113,600.00**
Section 3.4 - SubZone SW RES 304									
3.4.1	New Sanitary Sewer Main C_SW_008 (300mm PVC) - Supply & Install	3	lm	$450	767	$ 346,000	$ 34,600	$ 121,100	$ 501,700
3.4.2	New Manhole (1200mm) - Supply & Install		each	$12,000	7	$ 89,000	$ 8,900	$ 31,150	$ 129,050
Subtotal						**$ 435,000.00**	**$ 43,500.00**	**$ 152,250.00**	**$ 630,750.00**
Section 3.5 - SubZone SW RES U01									
3.5.1	New Sanitary Sewer Main C_SW_009 (300mm PVC) - Supply & Install	ULT	lm	$450	1,135	$ 511,000	$ 51,100	$ 178,850	$ 740,950
3.5.2	New Force Main FM_SW_001 (300mm HDPE) - Supply & Install		lm	$2,000	283	$ 567,000	$ 56,700	$ 198,450	$ 822,150
3.5.3	New Liftstation LS_SW_001 (Pump + Pumphouse) - Supply & Install		each	$2,500,000	1	$ 2,500,000	$ 250,000	$ 875,000	$ 3,625,000
3.5.4	New Manhole (1200mm) - Supply & Install		each	$12,000	12	$ 138,000	$ 13,800	$ 48,300	$ 200,100
Subtotal						**$ 3,716,000.00**	**$ 371,600.00**	**$ 1,300,600.00**	**$ 5,388,200.00**
Section 3.6 - SubZone SW RES U02									
3.6.1	New Sanitary Sewer Main C_SW_010 (300mm PVC) - Supply & Install	ULT	lm	$300	395	$ 119,000	$ 11,900	$ 41,650	$ 172,550
3.6.2	New Manhole (1200mm) - Supply & Install		each	$12,000	4	$ 52,000	$ 5,200	$ 18,200	$ 75,400
Subtotal						**$ 171,000.00**	**$ 17,100.00**	**$ 59,850.00**	**$ 247,950.00**
Section 3.7 - SubZone SW RES U03									
3.7.1	New Sanitary Sewer Main C_SW_011 (600mm PVC) - Supply & Install	ULT	lm	$900	384	$ 346,000	$ 34,600	$ 121,100	$ 501,700
3.7.2	New Sanitary Sewer Main C_SW_012 (600mm PVC) - Supply & Install		lm	$900	423	$ 381,000	$ 38,100	$ 133,350	$ 552,450
3.7.3	New Sanitary Sewer Main C_SW_013 (300mm PVC) - Supply & Install		lm	$450	757	$ 341,000	$ 34,100	$ 119,350	$ 494,450
3.7.4	New Sanitary Sewer Main C_SW_014 (450mm PVC) - Supply & Install		lm	$675	762	$ 515,000	$ 51,500	$ 180,250	$ 746,750
3.7.5	New Manhole (1200mm) - Supply & Install		each	$12,000	14	$ 170,000	$ 17,000	$ 59,500	$ 246,500
Subtotal						**$ 1,753,000.00**	**$ 175,300.00**	**$ 613,550.00**	**$ 2,541,850.00**
Section 3.0 - Grand Total						**$ 7,852,000**	**$ 785,200**	**$ 2,748,200**	**$ 11,385,400**

Notes & Assumptions:

1 Unit prices are based on past experience, comparable tenders, and some engineering judgement.

2 Manhole quantity assumed based on 120m spacing

City of Camrose Sanitary Sewer Assessment
Table 8: Future Upgrade Cost Estimate
Section 4.0 - North West Residential Commercial

Item	Description	Phase	Unit	Estimated Rate	Estimate Quantity	Estimated Material Cost	Engineering (10%)	Contingencies (35%)	Estimated Conceptual Cost
Section 4.1 - SubZone NW RES 101									
4.1.1	New Sanitary Sewer Main C_NW_016 (300mm PVC) - Remove & Replace	1	lm	$1,200	671	$ 806,000	$ 80,600	$ 282,100	$ 1,168,700
4.1.2	New Manhole (1200mm) - Remove & Replace		each	$12,000	5	$ 60,000	$ 6,000	$ 21,000	$ 87,000
Section 4.2 - SubZone NW COMM 101									
4.2.1	New Sanitary Sewer Main C_NW_002A (250mm PVC) - Supply & Install	1	lm	$375	176	$ 66,000	$ 6,600	$ 23,100	$ 95,700
4.2.2	New Manhole (1200mm) - Supply & Install		each	$12,000	3	$ 30,000	$ 3,000	$ 10,500	$ 43,500
Subtotal						**$ 96,000.00**	**$ 9,600.00**	**$ 33,600.00**	**$ 139,200.00**
Section 4.3 - SubZone NW RES 201									
4.3.1	New Sanitary Sewer Main C_NW_001 (300mm PVC) - Supply & Install	2	lm	$450	621	$ 280,000	$ 28,000	$ 98,000	$ 406,000
4.3.2	New Manhole (1200mm) - Supply & Install		each	$12,000	6	$ 75,000	$ 7,500	$ 26,250	$ 108,750
Subtotal						**$ 355,000.00**	**$ 35,500.00**	**$ 124,250.00**	**$ 514,750.00**
Section 4.4 - SubZone NW RES 202									
4.4.1	New Sanitary Sewer Main C_NW_003 (300mm PVC) - Supply & Install	2	lm	$450	150	$ 68,000	$ 6,800	$ 23,800	$ 98,600
4.4.2	New Manhole (1200mm) - Supply & Install		each	$12,000	2	$ 28,000	$ 2,800	$ 9,800	$ 40,600
Subtotal						**$ 96,000.00**	**$ 9,600.00**	**$ 33,600.00**	**$ 139,200.00**
Section 4.5 - SubZone NW RES 203									
4.5.1	New Sanitary Sewer Main C_NW_004 (200mm PVC) - Supply & Install	2	lm	$300	241	$ 73,000	$ 7,300	$ 25,550	$ 105,850
4.5.2	New Manhole (1200mm) - Supply & Install		each	$12,000	3	$ 38,000	$ 3,800	$ 13,300	$ 55,100
Subtotal						**$ 111,000.00**	**$ 11,100.00**	**$ 38,850.00**	**$ 160,950.00**
Section 4.6 - SubZone NW COMM 201									
4.6.1	New Sanitary Sewer Main C_NW_002B (250mm PVC) - Supply & Install	2	lm	$375	528	$ 199,000	$ 19,900	$ 69,650	$ 288,550
4.6.2	New Manhole (1200mm) - Supply & Install		each	$12,000	6	$ 66,000	$ 6,600	$ 23,100	$ 95,700
Subtotal						**$ 265,000.00**	**$ 26,500.00**	**$ 92,750.00**	**$ 384,250.00**
Section 4.7 - SubZone NW RES 301									
4.7.1	New Sanitary Sewer Main C_NW_006 (250mm PVC) - Supply & Install	3	lm	$375	1,039	$ 390,000	$ 39,000	$ 136,500	$ 565,500
4.7.2	New Manhole (1200mm) - Supply & Install		each	$12,000	10	$ 117,000	$ 11,700	$ 40,950	$ 169,650
Subtotal						**$ 507,000.00**	**$ 50,700.00**	**$ 177,450.00**	**$ 735,150.00**
Section 4.8 - SubZone NW COMM 301									
4.8.1	New Sanitary Sewer Main C_NW_005 (300mm PVC) - Supply & Install	3	lm	$450	452	$ 204,000	$ 20,400	$ 71,400	$ 295,800
4.8.2	New Manhole (1200mm) - Supply & Install		each	$12,000	5	$ 58,000	$ 5,800	$ 20,300	$ 84,100
Subtotal						**$ 262,000.00**	**$ 26,200.00**	**$ 91,700.00**	**$ 379,900.00**
Section 4.9 - SubZone NW RES 302									
4.9.1	New Sanitary Sewer Main C_NW_008 (450mm PVC) - Supply & Install	3	lm	$675	2,373	$ 1,602,000	$ 160,200	$ 560,700	$ 2,322,900
4.9.2	New Forcemain FM_NW_001 (300mm HDPE) - Supply & Install		lm	$375	2,251	$ 845,000	$ 84,500	$ 295,750	$ 1,225,250
4.9.3	New Liftstation LS_NW_001 (Pump + Pumphouse) - Supply & Install		each	$1,000,000	1	$ 1,000,000	$ 100,000	$ 350,000	$ 1,450,000
4.9.4	New Manhole (1200mm) - Supply & Install		each	$12,000	21	$ 250,000	$ 25,000	$ 87,500	$ 362,500
Subtotal						**$ 3,697,000.00**	**$ 369,700.00**	**$ 1,293,950.00**	**$ 5,360,650.00**
Section 4.10 - SubZone NW COMM 302									
4.10.1	New Sanitary Sewer Main C_NW_007 (450mm PVC) - Supply & Install	3	lm	$675	276	$ 187,000	$ 18,700	$ 65,450	$ 271,150
4.10.2	New Manhole (1200mm) - Supply & Install		each	$12,000	3	$ 41,000	$ 4,100	$ 14,350	$ 59,450
Subtotal						**$ 228,000.00**	**$ 22,800.00**	**$ 79,800.00**	**$ 330,600.00**
Section 4.11 - SubZone NW RES U01									
4.11.1	New Sanitary Sewer Main C_NW_012 (300mm PVC) - Supply & Install	ULT	lm	$450	375	$ 169,000	$ 16,900	$ 59,150	$ 245,050
4.11.2	New Sanitary Sewer Main C_NW_013 (300mm PVC) - Supply & Install		lm	$450	338	$ 153,000	$ 15,300	$ 53,550	$ 221,850
4.11.3	New Manhole (1200mm) - Supply & Install		each	$12,000	7	$ 84,000	$ 8,400	$ 29,400	$ 121,800
Subtotal						**$ 406,000.00**	**$ 40,600.00**	**$ 142,100.00**	**$ 588,700.00**
Section 4.12 - SubZone NW COMM U01									
4.12.1	New Sanitary Sewer Main C_NW_009 (600mm PVC) - Supply & Install	ULT	lm	$900	402	$ 362,000	$ 36,200	$ 126,700	$ 524,900
4.12.2	New Sanitary Sewer Main C_NW_010 (375mm PVC) - Supply & Install		lm	$575	802	$ 461,000	$ 46,100	$ 161,350	$ 668,450
4.12.3	New Manhole (1200mm) - Supply & Install		each	$12,000	11	$ 134,000	$ 13,400	$ 46,900	$ 194,300
Subtotal						**$ 957,000.00**	**$ 95,700.00**	**$ 334,950.00**	**$ 1,387,650.00**
Section 4.13 - SubZone NW RES U02									
4.13.1	New Sanitary Sewer Main C_NW_011 (300mm PVC) - Supply & Install	ULT	lm	$450	290	$ 131,000	$ 13,100	$ 45,850	$ 189,950
4.13.2	New Sanitary Sewer Main C_NW_014 (300mm PVC) - Supply & Install		lm	$450	330	$ 149,000	$ 14,900	$ 52,150	$ 216,050
4.13.3	New Sanitary Sewer Main C_NW_015 (300mm PVC) - Supply & Install		lm	$450	824	$ 372,000	$ 37,200	$ 130,200	$ 539,400
4.13.4	New Manhole (1200mm) - Supply & Install		each	$12,000	13	$ 158,000	$ 15,800	$ 55,300	$ 229,100
Subtotal						**$ 810,000.00**	**$ 81,000.00**	**$ 283,500.00**	**$ 1,174,500.00**
Section 4.0 - Grand Total						**$ 7,790,000**	**$ 779,000**	**$ 2,726,500**	**$ 11,295,500**

Notes & Assumptions:

1 Unit prices are based on past experience, comparable tenders, and some engineering judgement.

2 Manhole quantity assumed based on 120m spacing

City of Camrose Sanitary Sewer Assessment
Table 8: Future Upgrade Cost Estimate
Section 5.0 - North Residential

Item	Description	Phase	Unit	Estimated Rate	Estimate Quantity	Estimated Material Cost	Engineering (10%)	Contingencies (35%)	Estimated Conceptual Cost
Section 5.1 - SubZone N RES 301									
5.1.1	New Sanitary Sewer Main C_N_001 (250mm PVC) - Supply & Install	3	lm	$375	689	$ 259,000	$ 25,900	$ 90,650	$ 375,550
5.1.2	New Manhole (1200mm) - Supply & Install		each	$12,000	7	$ 82,000	$ 8,200	$ 28,700	$ 118,900
Subtotal						**$ 341,000.00**	**$ 34,100.00**	**$ 119,350.00**	**$ 494,450.00**
Section 5.2 - SubZone N RES 302									
5.2.1	New Sanitary Sewer Main C_N_005 (450mm PVC) - Supply & Install	3	lm	$800	364	$ 292,000	$ 29,200	$ 102,200	$ 423,400
5.2.2	New Sanitary Sewer Main C_N_002 (600mm PVC) - Supply & Install		lm	$800	234	$ 188,000	$ 18,800	$ 65,800	$ 272,600
5.2.3	New Manhole (1200mm) - Supply & Install		each	$12,000	3	$ 38,000	$ 3,800	$ 13,300	$ 55,100
5.2.3	New Manhole (1500mm) - Supply & Install		each	$20,000	1	$ 20,000	$ 2,000	$ 7,000	$ 29,000
Subtotal						**$ 538,000.00**	**$ 53,800.00**	**$ 188,300.00**	**$ 780,100.00**
Section 5.3 - SubZone N RES 303									
5.3.1	New Sanitary Sewer Main C_N_000 (450mm PVC) - Supply & Install	3	lm	$675	218	$ 148,000	$ 14,800	$ 51,800	$ 214,600
5.3.1	New Sanitary Sewer Main C_N_006 (375mm PVC) - Supply & Install		lm	$575	782	$ 450,000	$ 45,000	$ 157,500	$ 652,500
5.3.2	New Sanitary Sewer Main C_N_007 (300mm PVC) - Supply & Install		lm	$450	30	$ 14,000	$ 1,400	$ 4,900	$ 20,300
5.3.3	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 94,000	$ 9,400	$ 32,900	$ 136,300
Subtotal						**$ 706,000.00**	**$ 70,600.00**	**$ 247,100.00**	**$ 1,023,700.00**
Section 5.4 - SubZone N RES 304									
5.4.1	New Sanitary Sewer Main C_N_003A (300mm PVC) - Supply & Install	3	lm	$450	167	$ 76,000	$ 7,600	$ 26,600	$ 110,200
5.4.2	New Sanitary Sewer Main Creek_C_N_003 (300mm PVC) - Supply & Install		lm	$2,000	54	$ 108,000	$ 10,800	$ 37,800	$ 156,600
5.4.3	New Sanitary Sewer Main C_N_003B (300mm PVC) - Supply & Install		lm	$450	234	$ 106,000	$ 10,600	$ 37,100	$ 153,700
5.4.4	New Sanitary Sewer Main C_N_004 (250mm PVC) - Supply & Install		lm	$375	253	$ 96,000	$ 9,600	$ 33,600	$ 139,200
5.4.5	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 96,000	$ 9,600	$ 33,600	$ 139,200
Subtotal						**$ 482,000.00**	**$ 48,200.00**	**$ 168,700.00**	**$ 698,900.00**
Section 5.5 - SubZone N RES U01									
5.5.1	New Sanitary Sewer Main C_N_009 (250mm PVC) - Supply & Install	ULT	lm	$375	86	$ 33,000	$ 3,300	$ 11,550	$ 47,850
5.5.2	New Manhole (1200mm) - Supply & Install		each	$12,000	2	$ 22,000	$ 2,200	$ 7,700	$ 31,900
Subtotal						**$ 55,000.00**	**$ 5,500.00**	**$ 19,250.00**	**$ 79,750.00**
Section 5.6 - SubZone N RES U02									
5.6.1	New Sanitary Sewer Main C_N_008 (375mm PVC) - Supply & Install	ULT	lm	$575	86	$ 50,000	$ 5,000	$ 17,500	$ 72,500
5.6.2	New Manhole (1200mm) - Supply & Install		each	$12,000	2	$ 22,000	$ 2,200	$ 7,700	$ 31,900
Subtotal						**$ 72,000.00**	**$ 7,200.00**	**$ 25,200.00**	**$ 104,400.00**
Section 5.0 - Grand Total						**$ 2,194,000**	**$ 219,400**	**$ 767,900**	**$ 3,181,300**

Notes & Assumptions:

1 Unit prices are based on past experience, comparable tenders, and some engineering judgement.

2 Manhole quantity assumed based on 120m spacing

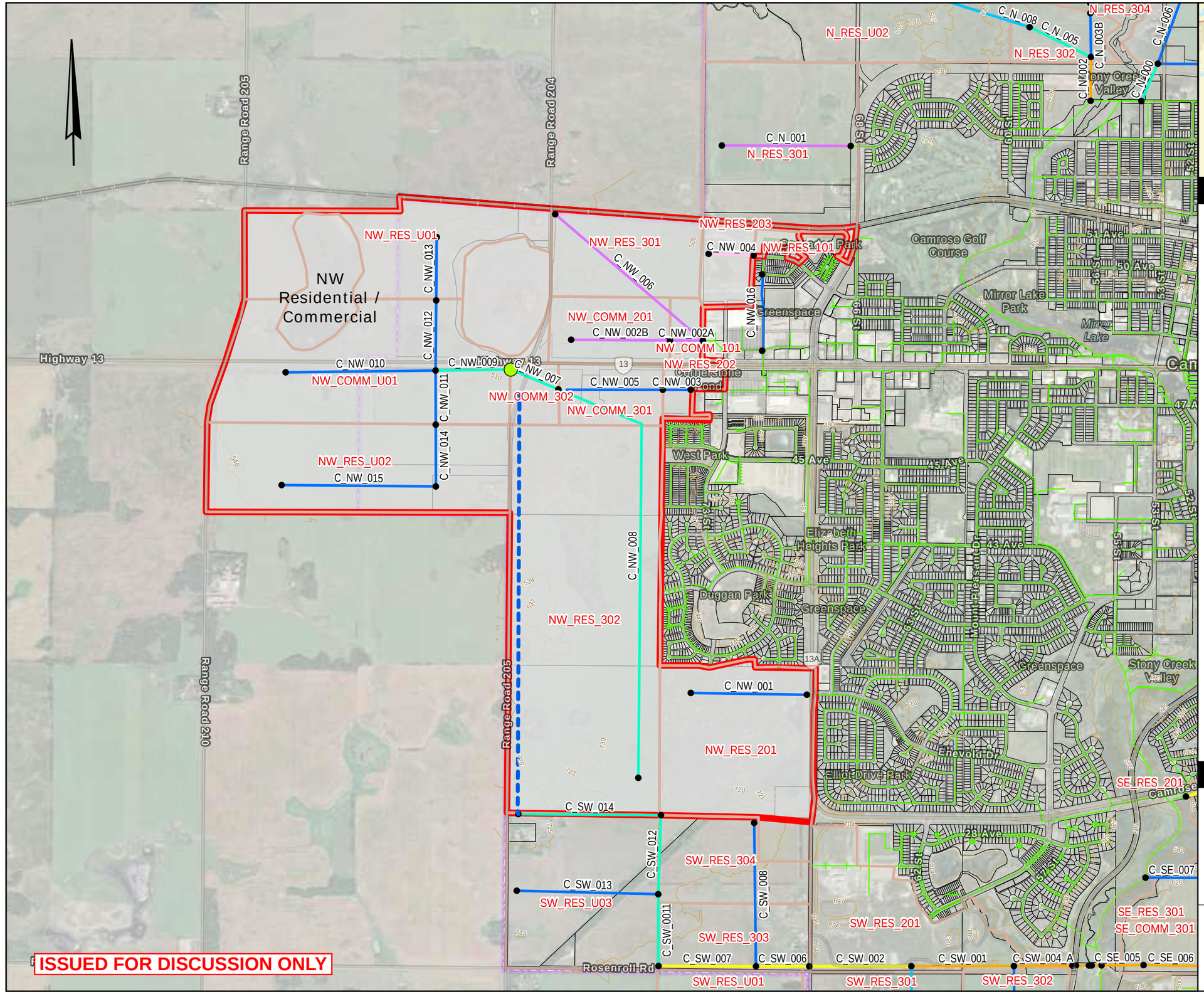
City of Camrose Sanitary Sewer Assessment
Table 8: Future Upgrade Cost Estimate
Section 6.0 - Sanitary Trunk Upgrade

Item	Description	Phase	Unit	Estimated Rate	Estimate Quantity	Estimated Material Cost	Engineering (10%)	Contingencies (35%)	Estimated Conceptual Cost
Section 6.1 - Upstream of Camrose Visitor Information Centre									
6.1.1	New Sanitary Sewer Main (750mm PVC) - Remove & Replace	3	lm	$3,000	1,622	$ 4,866,000	$ 486,600	$ 1,703,100	$ 7,055,700
6.1.2	New Manhole (1800mm) - Remove & Replace		each	$35,000	15	$ 525,000	$ 52,500	$ 183,750	$ 761,250
Subtotal						**$ 5,391,000.00**	**$ 539,100.00**	**$ 1,886,850.00**	**$ 7,816,950.00**
Section 6.2 - Downstream of Camrose Visitor Information Centre									
6.2.1	New Sanitary Sewer Main (750mm PVC) - Remove & Replace	3	lm	$3,000	586	$ 1,759,000	$ 175,900	$ 615,650	$ 2,550,550
6.2.2	New Manhole (1800mm) - Remove & Replace		each	$35,000	8	$ 280,000	$ 28,000	$ 98,000	$ 406,000
Subtotal						**$ 2,039,000.00**	**$ 203,900.00**	**$ 713,650.00**	**$ 2,956,550.00**
Section 6.0 - Grand Total						**$ 7,430,000**	**$ 743,000**	**$ 2,600,500**	**$ 10,773,500**

Notes & Assumptions:

1 Unit prices are based on past experience, comparable tenders, and some engineering judgement.

2 Manhole quantity assumed based on 120m spacing



ISSUED FOR DISCUSSION ONLY

LEGEND

- Subzones

Future Infrastructure

- Future Forcemain
- Future Lift Station

Future Conduits

Pipe Diameter (mm)

- 200
- 250
- 300
- 375
- 450
- 525
- 600
- 750

0 0.5 Kilometers

McElhanney

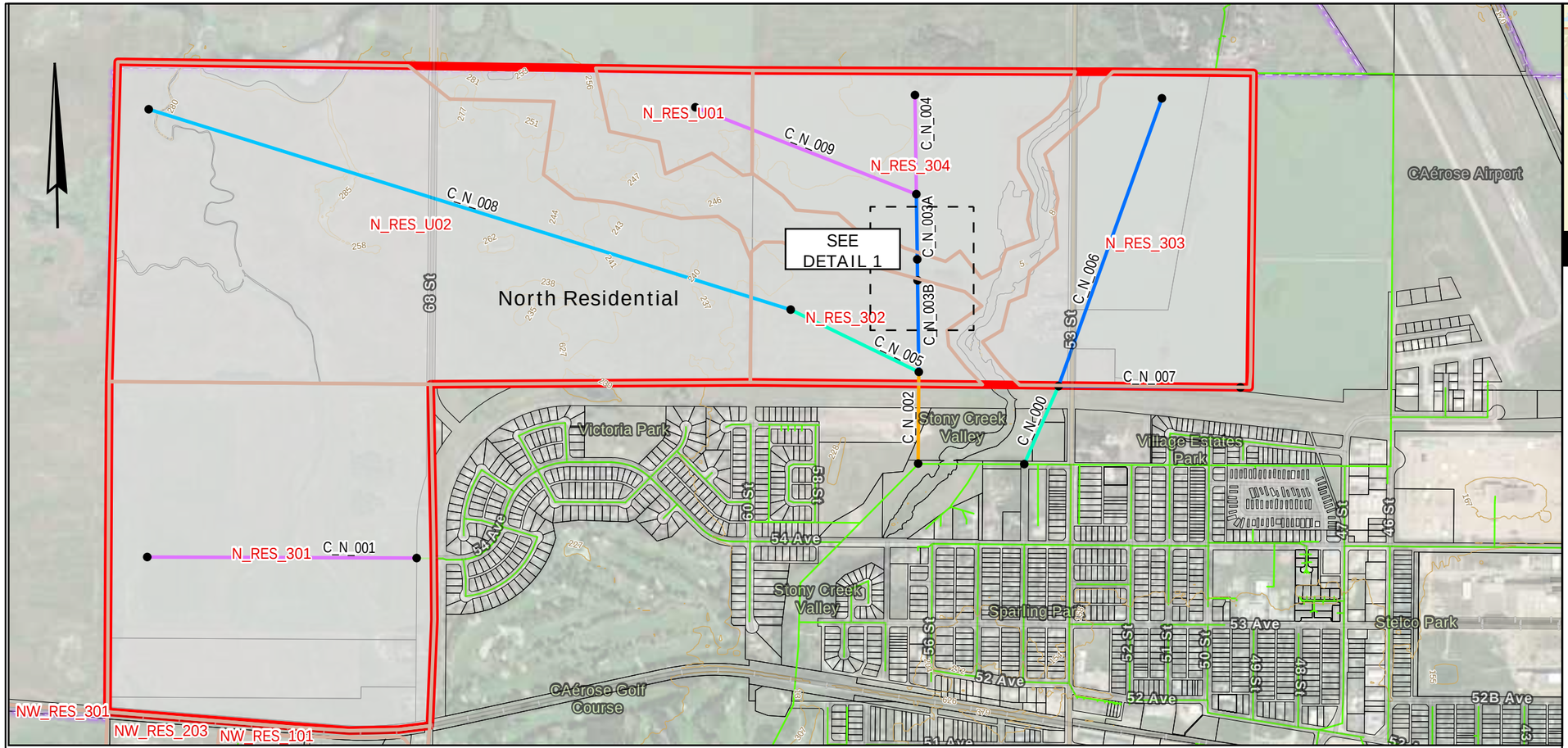
CITY OF Camrose

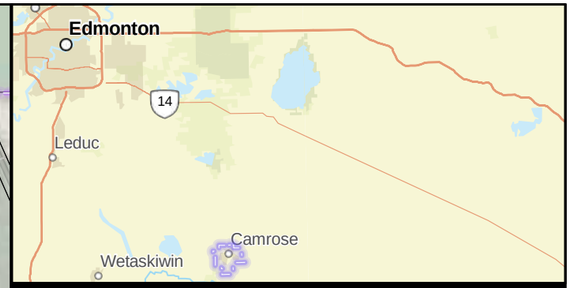
TITLE

Figure 21
Future Sanitary System
Proposed Upgrades
NW Residential / Commercial

NAD 1983 3TM 111

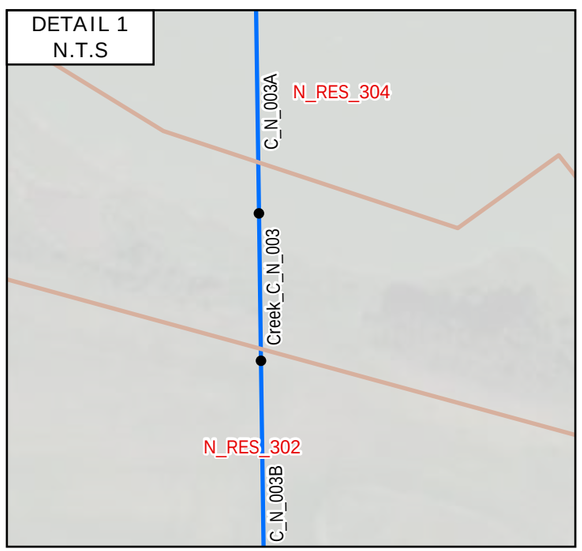
Date: 4/30/2026





LEGEND

- Subzones
- Future Conduits
- Pipe Diameter (mm)
  - 200
  - 250
  - 300
  - 375
  - 450
  - 525
  - 600
  - 750



0 0.5 Kilometers

McElhanney

CITY OF Camrose

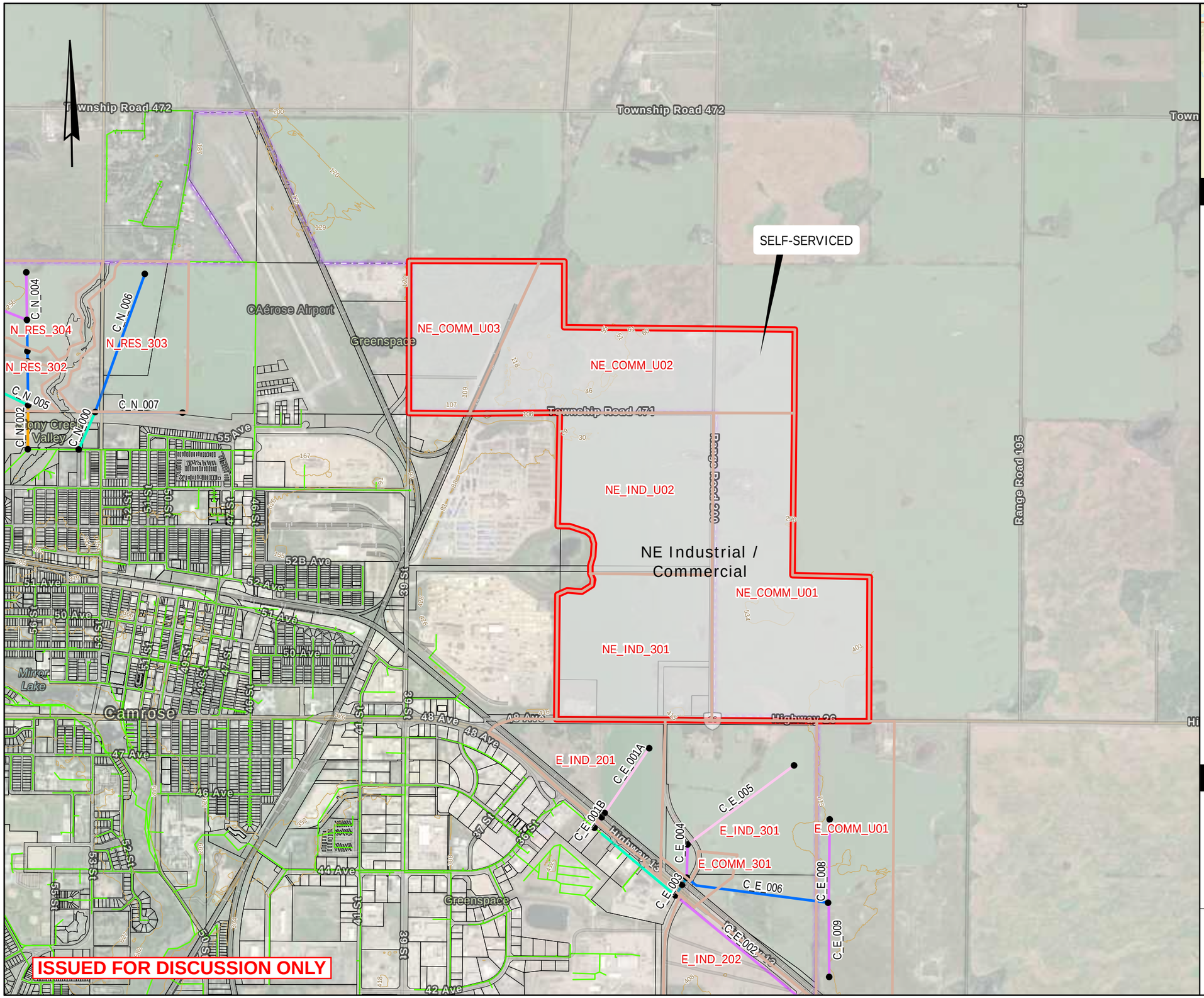
TITLE

Figure 22
Future Sanitary System
Proposed Upgrades
North Residential

NAD 1983 3TM 111

Date: 4/30/2026

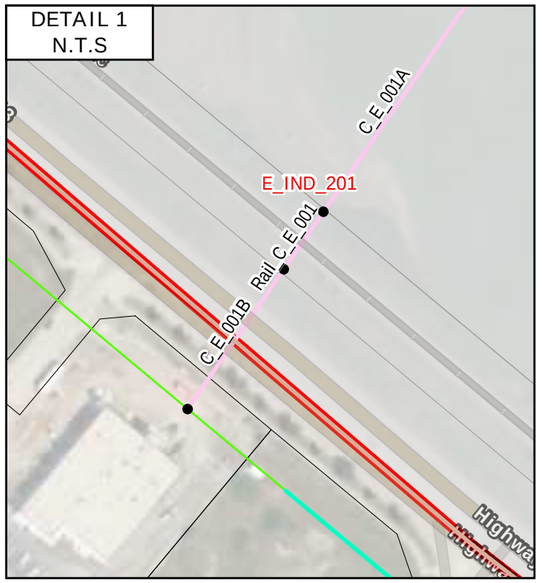
ISSUED FOR DISCUSSION ONLY



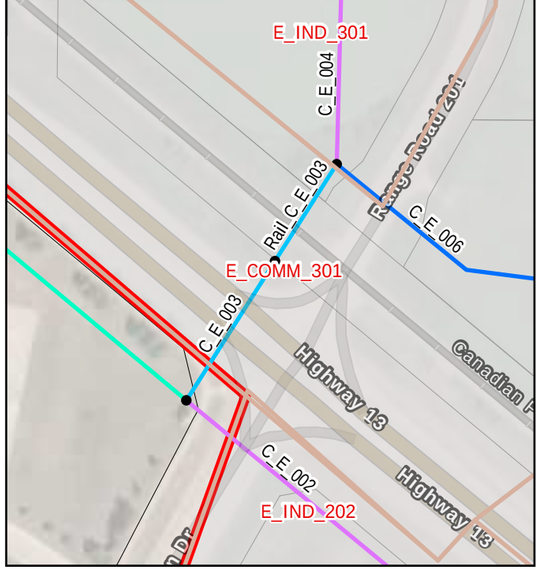
NAD 1983 3TM 111

Date: 4/30/2026

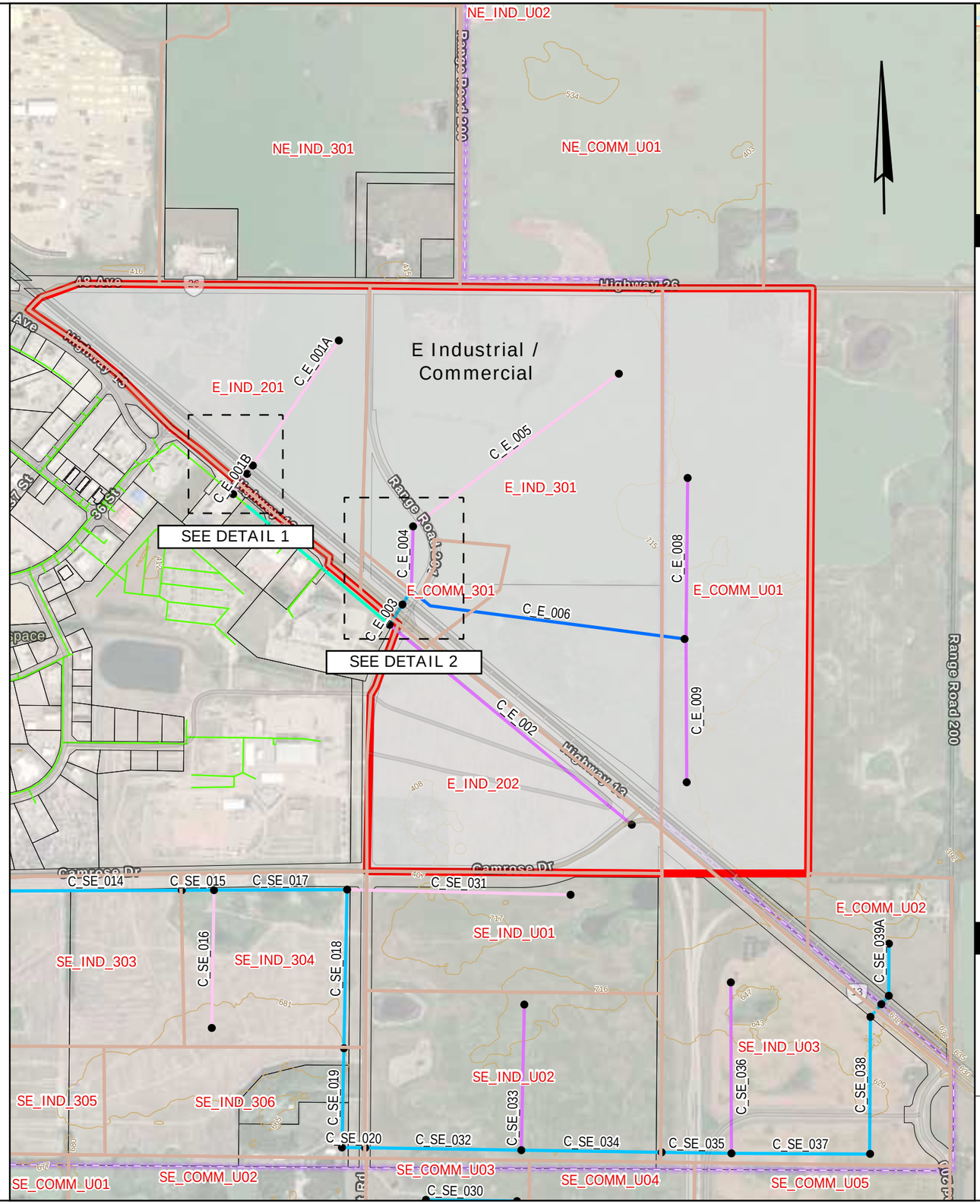
DETAIL 1
N.T.S

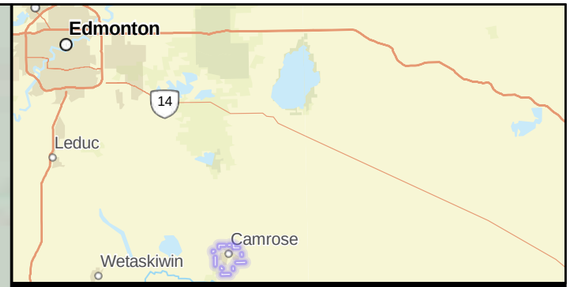


DETAIL 2
N.T.S



ISSUED FOR DISCUSSION ONLY





LEGEND

- Subzones
- Future Conduits
- Pipe Diameter (mm)
  - 200
  - 250
  - 300
  - 375
  - 450
  - 525
  - 600
  - 750

0 0.5 Kilometers

McElhanney

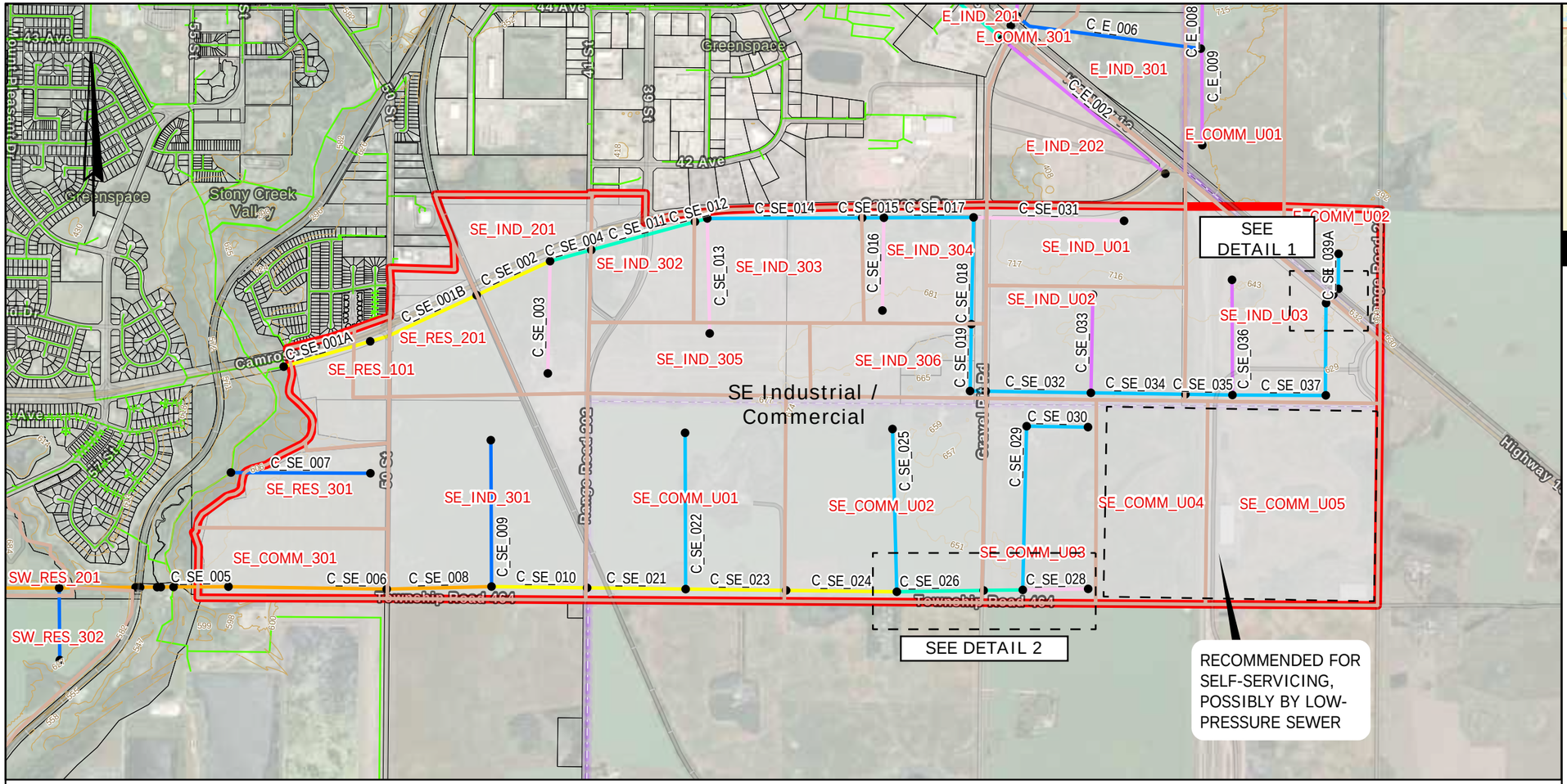
CITY OF Camrose

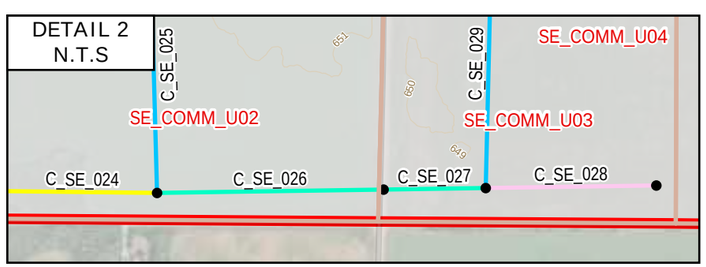
TITLE

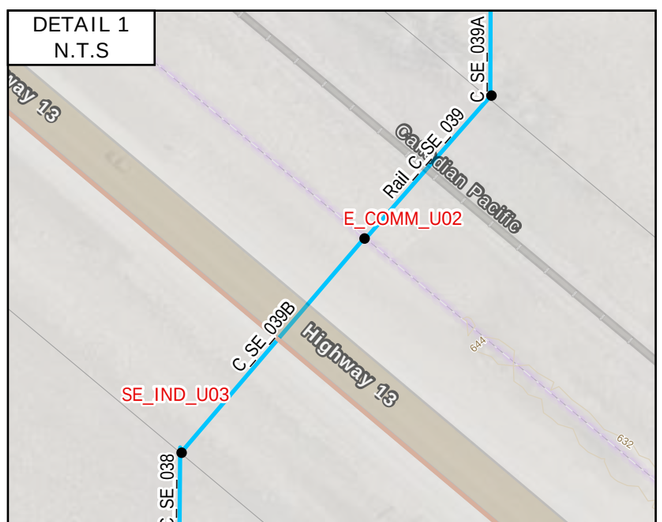
Figure 24
Future Sanitary System
Proposed Upgrades
E Industrial / Commercial

NAD 1983 3TM 111

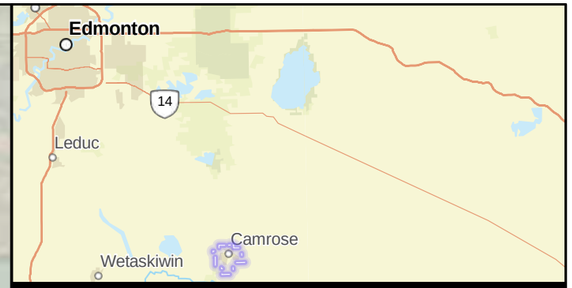
Date: 4/30/2026







ISSUED FOR DISCUSSION ONLY



LEGEND

- Subzones
- Future Conduits
- Pipe Diameter (mm)
  - 200
  - 250
  - 300
  - 375
  - 450
  - 525
  - 600
  - 750

0 0.5 Kilometers

McElhanney

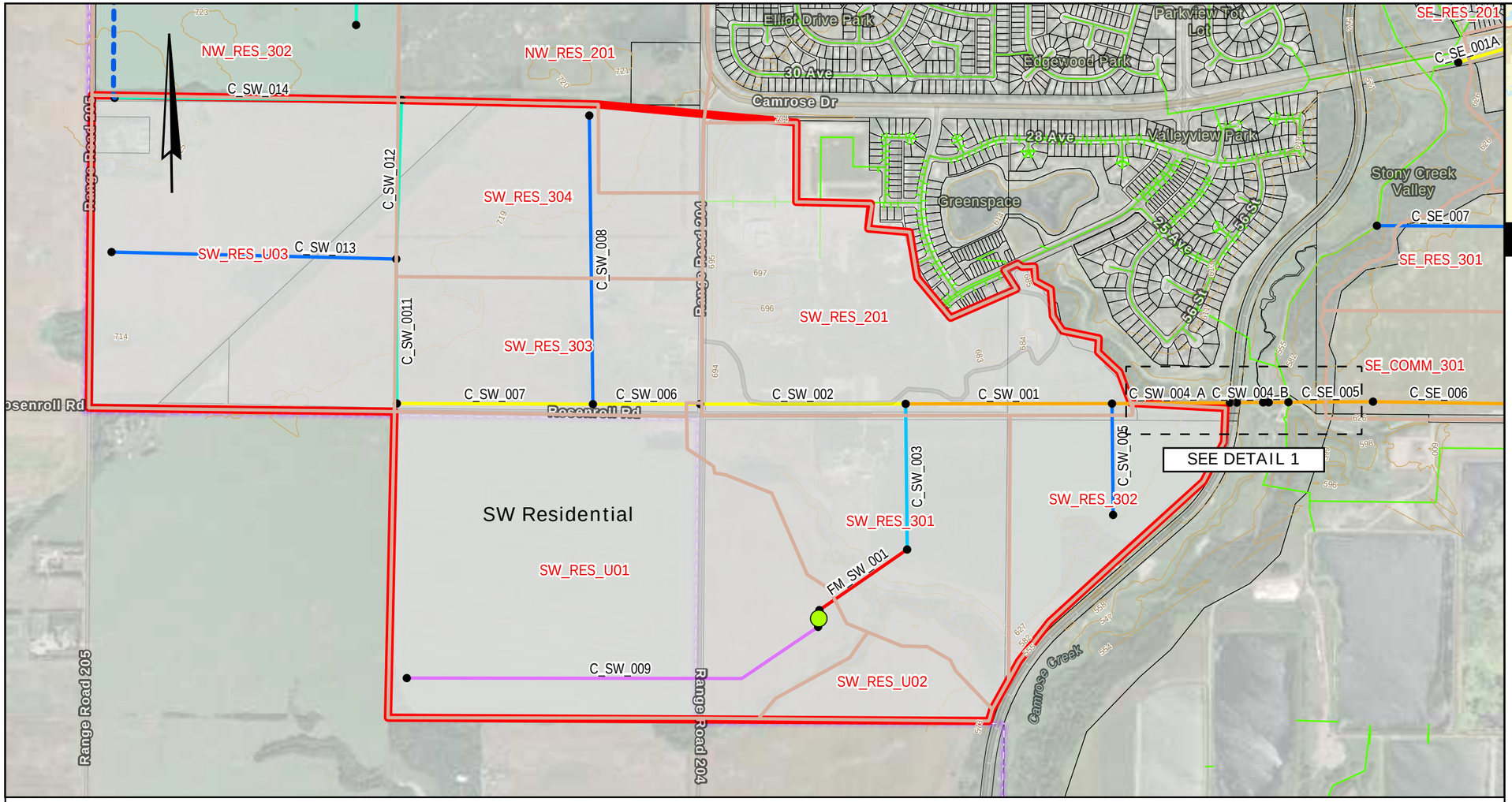
CITY OF Camrose

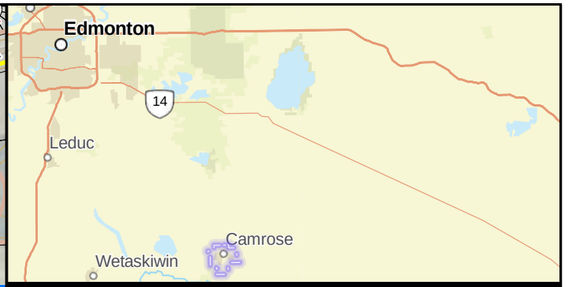
TITLE

Figure 25
Future Sanitary System
Proposed Upgrades
SE Industrial / Commercial

NAD 1983 3TM 111

Date: 4/30/2026





LEGEND

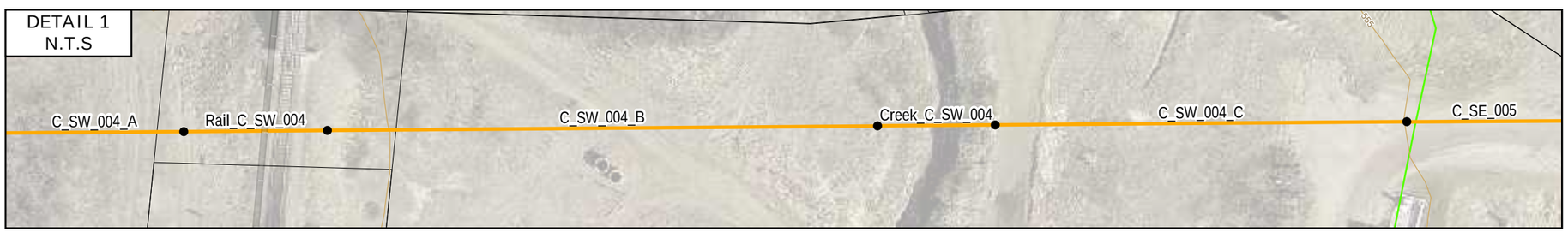
- Subzones
- Future Lift Station

Future Conduits

Pipe Diameter (mm)

- 200
- 250
- 300
- 375
- 450
- 525
- 600
- 750

DETAIL 1
N.T.S



ISSUED FOR DISCUSSION ONLY

0 0.5 Kilometers

McElhanney

CITY OF Camrose

TITLE

Figure 26
Future Sanitary System
Proposed Upgrades
SW Residential

NAD 1983 3TM 111

Date: 4/30/2026

6. Next Steps

It is recommended these projects be included in an update to this Sanitary Master Plan, or as follow-up projects.

6.1. DEVELOP A SEWER FLUSHING PROGRAM

A number of pipe segments did not meet the minimum pipe cleansing velocity of 0.6 m/s under average flow. As discussed in ***Section 3.2*** selection criteria for this analysis was modified to exclude pipe under 20% d/D (flow depth / diameter, to describe pipe capacity utilized) under PDWF, as pipe with small inflows will not meet self-cleansing velocity even at reasonable pipe slope. Relevant areas have been identified in ***Figure 12: Existing Sanitary System – PDWF Velocity Analysis***.

Shallow slopes and the inability to meet minimum cleansing velocities may result in an increase in Fat, Oil and Grease (FOG) buildup in the network. The FOG buildup can impede pipe flow reducing capacity, further exacerbating any capacity related issues noted. This problem can be mitigated with a regular flushing and maintenance schedule.

The City currently operates a flushing program; problem areas where blockages have been observed are flagged in the GIS database. Highlighted areas not captured in the City database should be inspected for performance issues, and added to the City flushing program if needed.

6.2. PROPOSED UPGRADE PHASING – CAPACITY

Refer to ***Figure 13: Future Sanitary System – Proposed Upgrades (Alternative 2 – Recommended)*** for the upgrade plan. As noted in the report, through the model calibration and review of existing conditions, the City sanitary sewer system is showing few areas with pipe capacity problems. Upgrades to the existing system have largely been conceptualized based on future development connection points and corresponding effect on pipe capacity. Costing has been provided to support decision-making for new development.

6.3. ADDITIONAL FLOW MONITORING

As noted in ***Section 2.3.3*** and ***Appendix D***, there were noted issues with the model calibration, with the very dry spring / summer having a pronounced impact. The model was ultimately calibrated to the August storm, but was not able to be further validated due to issues with spatial rainfall / rainfall distribution for the other two significant storm events.

Risk is reduced by the fact that the City has not been observing ongoing sanitary flooding, supporting the model results. However, there is notable disagreement between the model results and the previous Sanitary Master Plan; this is likely a combination of two factors: (1) that the previous Sanitary Master Plan calibration was performed over a very wet period with significant rainfall, whereas the current model calibration was performed over a very dry period, and (2) the City of Edmonton IDF curves used in the

previous Sanitary Master Plan produced significantly higher rainfall than the Environment Canada Camrose rainfall gauge used in the current model. These two factors result in lower flows for the current model, reducing scope of required upgrades. Given the disagreement between the model results, and the fact that the City has proceeded with required upgrades from the previous analysis, additional flow monitoring is strongly recommended before making major changes to implementation planning and scheduling. This is specifically relevant to upgrades to the Stoney Creek trunk sewer, if residential development to the north is considered. This is also relevant to planned upgrades to the South Lift Station.

This would be a simplified program, and would require installation of several flow monitors along the sanitary pipe trunk, and a corresponding rain gauge. From there, it would be a straightforward matter to verify the model, and update recommendations if need be.

6.4. UPDATES TO STANDARDS

A small update to the *City of Camrose Minimum Design Standards for Development (April 2004)* is recommended, to align with design criteria used in this report. This is not intended as a comprehensive standard review, rather general update as it relates to the Sanitary Master Plan. Only one notable update is recommended.

City of Camrose Minimum Design Standards for Development (April 2004) stipulates a per capita loading rate of 320 L/c/d. This rate has been carried for this analysis. However, this is higher than typical design values, which have been reduced in accordance with the increasing use of water-saving measures such as low-flow toilets. The City could consider adopting a lower design per capita loading rate; 220 L/c/d is a common design value, and for reference is prescribed by EPCOR Drainage[3].

[3] EPCOR Drainage. 2024. *Design Guidelines: Sanitary Flow Generation for NDR, Water Consumption and Fire Flow for HNA*. https://www.epcor.com/content/dam/epcor/documents/supporting-documents/2024-11_design-guidelines.pdf

Appendices

Appendix A Limitations

Use of this Report. This report was prepared by McElhanney Ltd. ("**McElhanney**") for the particular site, design objective, development and purpose (the "**Project**") described in this report and for the exclusive use of the client identified in this report (the "**Client**"). The data, interpretations and recommendations pertain to the Project and are not applicable to any other project or site location and this report may not be reproduced, used or relied upon, in whole or in part, by a party other than the Client, without the prior written consent of McElhanney. The Client may provide copies of this report to its affiliates, contractors, subcontractors and regulatory authorities for use in relation to and in connection with the Project provided that any reliance, unauthorized use, and/or decisions made based on the information contained within this report are at the sole risk of such parties. McElhanney will not be responsible for the use of this report on projects other than the Project, where this report or the contents hereof have been modified without McElhanney's consent, to the extent that the content is in the nature of an opinion, and if the report is preliminary or draft. This is a technical report and is not a legal representation or interpretation of laws, rules, regulations, or policies of governmental agencies.

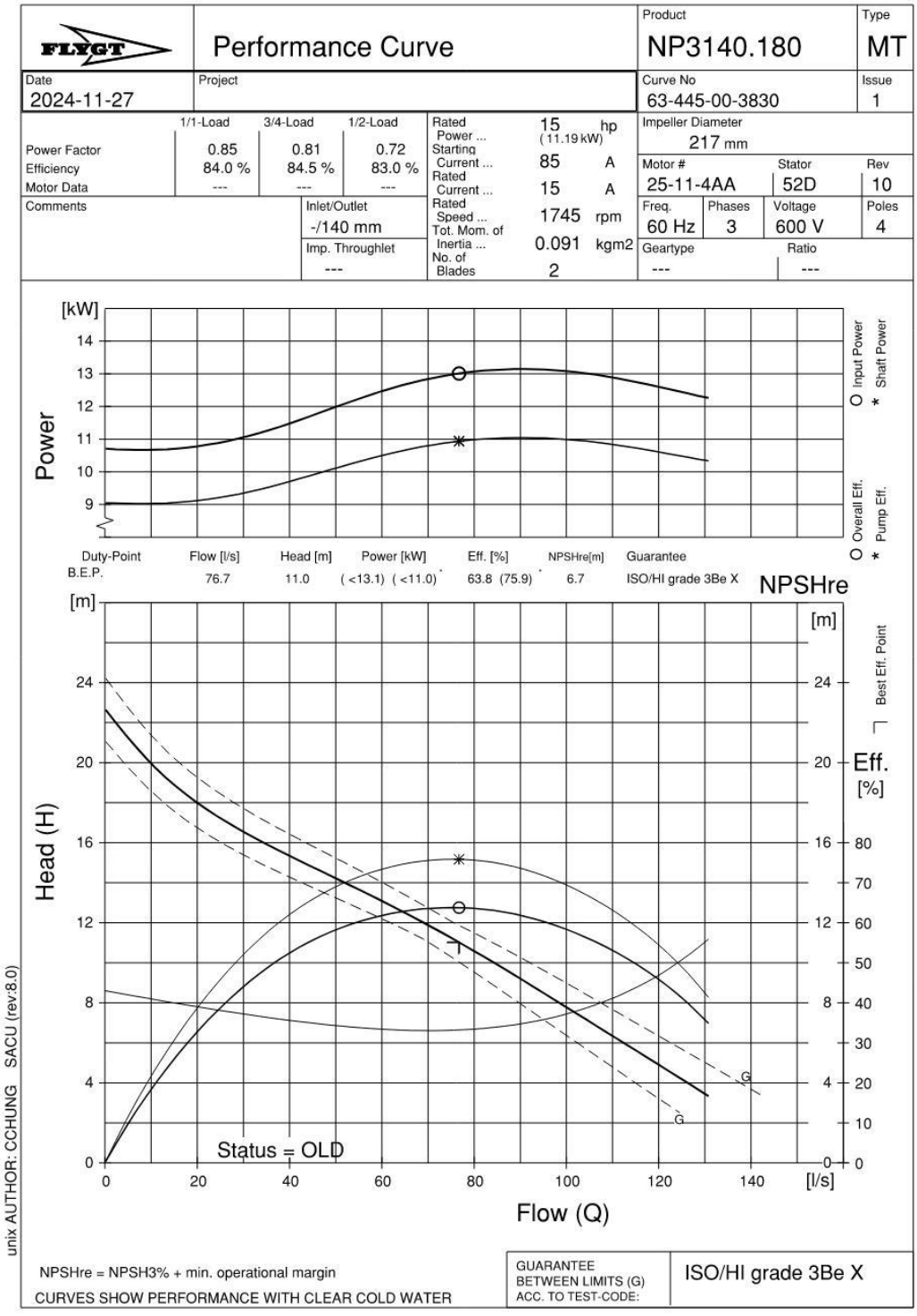
Standard of Care and Disclaimer of Warranties. This report was prepared with the degree of care, skill, and diligence as would reasonably be expected from a qualified member of the same profession, providing a similar report for similar projects, and under similar circumstances, and in accordance with generally accepted engineering and scientific judgments, principles and practices. McElhanney expressly disclaims any and all warranties in connection with this report.

Information from Client and Third Parties. McElhanney has relied in good faith on information provided by the Client and third parties noted in this report and has assumed such information to be accurate, complete, reliable, non-fringing, and fit for the intended purpose without independent verification. McElhanney accepts no responsibility for any deficiency, misstatements or inaccuracy contained in this report as a result of omissions or errors in information provided by third parties or for omissions, misstatements or fraudulent acts of persons interviewed.

Effect of Changes. All evaluations and conclusions stated in this report are based on facts, observations, site-specific details, legislation and regulations as they existed at the time of the site assessment/report preparation. Some conditions are subject to change over time and the Client recognizes that the passage of time, natural occurrences, and direct or indirect human intervention at or near the site may substantially alter such evaluations and conclusions. McElhanney should be requested to re-evaluate the conclusions of this report and to provide amendments as required prior to any reliance upon the information presented herein upon any of the following events: a) any changes (or possible changes) as to the site, purpose, or development plans upon which this report was based, b) any changes to applicable laws subsequent to the issuance of the report, c) new information is discovered in the future during site excavations, construction, building demolition or other activities, or d) additional subsurface assessments or testing conducted by others.

Independent Judgments. McElhanney will not be responsible for the independent conclusions, interpretations, interpolations and/or decisions of the Client, or others, who may come into possession of this report, or any part thereof. This restriction of liability includes decisions made to purchase, finance or sell land or with respect to public offerings for the sale of securities.

Appendix B Cornerstone Lift Station Pump Curve


FLYGT
Performance Curve
Product
NP3140.180
Type
MT
Date
2024-11-27
Project
Curve No
63-445-00-3830
Issue
1
1/1-Load
3/4-Load
1/2-Load
Power Factor
0.85
0.81
0.72
Efficiency
84.0 %
84.5 %
83.0 %
Motor Data

Comments
Inlet/Outlet
-/140 mm
Imp. Throughlet

Rated Power ... 15 hp (11.19 kW)
Starting Current ... 85 A
Rated Current ... 15 A
Rated Speed ... 1745 rpm
Tot. Mom. of Inertia ... 0.091 kgm2
No. of Blades 2
Impeller Diameter
217 mm
Motor #
25-11-4AA
Stator
52D
Rev
10
Freq.
60 Hz
Phases
3
Voltage
600 V
Poles
4
Geartype

Ratio

[kW]
Power
Input Power
Shaft Power
Overall Eff.
Pump Eff.
Duty-Point
B.E.P.
Flow [l/s]
76.7
Head [m]
11.0
Power [kW]
(<13.1) (<11.0)
Eff. [%]
63.8 (75.9)
NPSHre[m]
6.7
Guarantee
ISO/HI grade 3Be X
NPSHre
[m]
Head (H)
Best Eff. Point
Eff.
[%]
Status = OLD
[l/s]
Flow (Q)
NPSHre = NPSH3% + min. operational margin
CURVES SHOW PERFORMANCE WITH CLEAR COLD WATER
GUARANTEE BETWEEN LIMITS (G) ACC. TO TEST-CODE:
ISO/HI grade 3Be X
unix AUTHOR: CCHUNG SACU (rev:8.0)

May 24, 2007

The Cornerstone Lift Station pumps sanitary sewage from the surrounding area into the main lines that flow to the South Lift Station.

The pumping station is a Flygt prepackaged system. There are two pumps in an underground vault that stop or start depending on the volume inside the vault.

There is a generator that is run by a diesel Cummins motor. This generator will stop and start automatically if there is a power interruption. A transfer switch diverts the power needs to the generator when needed.

There are five Flygt bulbs inside the vault that control the station. They are currently set at:

1. 736.9 m which is low level alarm
2. 737.0 m which is pump stop
3. 738.2 m which is lead pump start
4. 738.0 m which is lag pump start
5. 738.6 m which is high level alarm

This is a brief operating sequence. For a more detailed description refer to the manual.

When entering the vault City of Camrose confined space entry policy is to be strictly enforced.

Appendix C South Lift Station Pump Curve

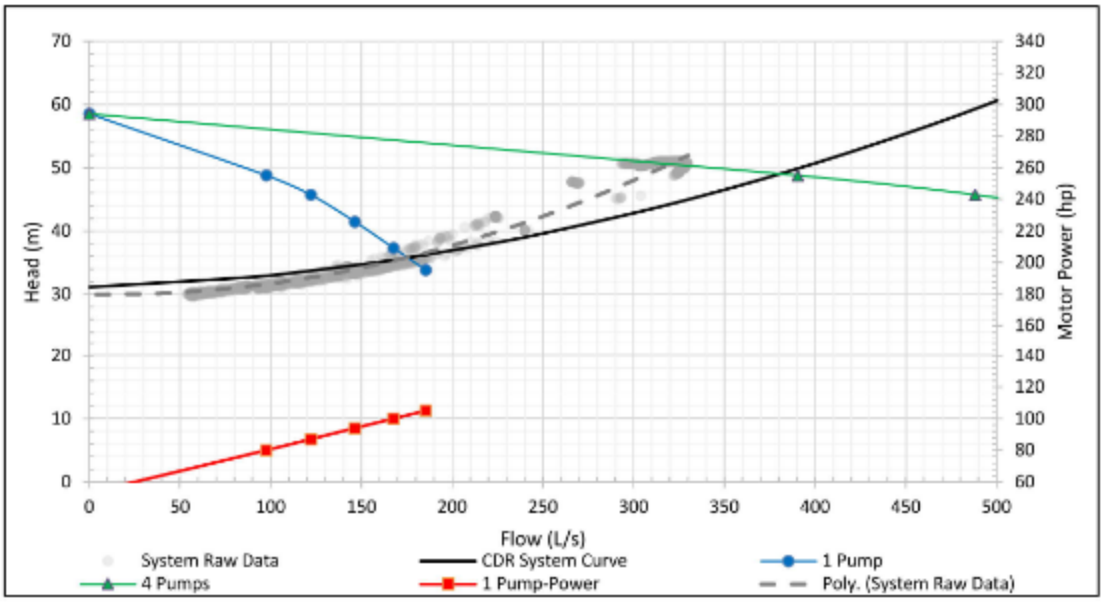


Figure 1a - SLS Existing and Assumed Conditions

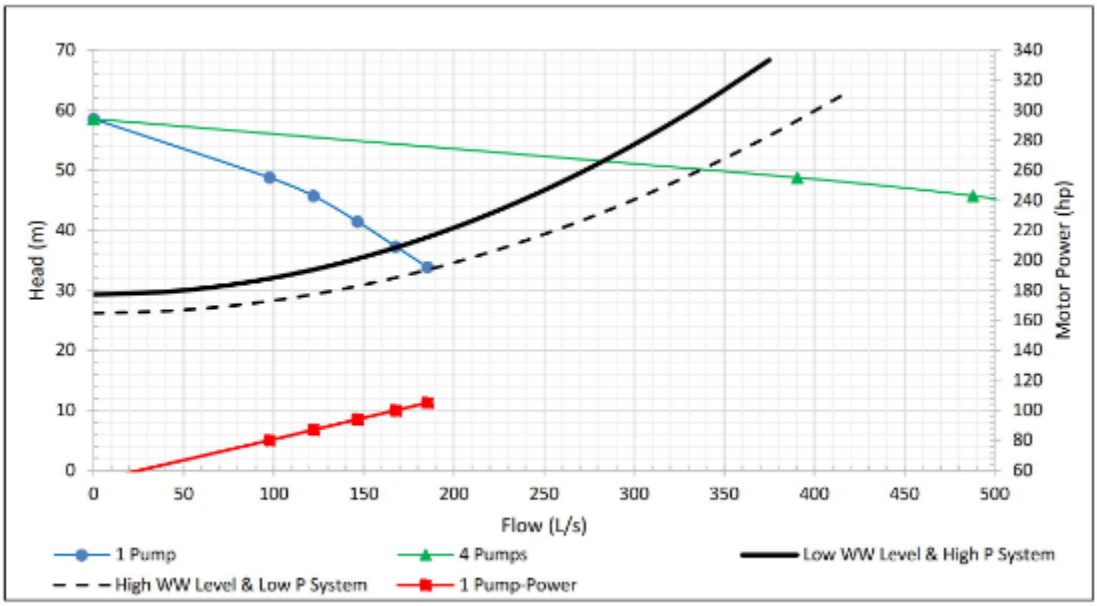


Figure 1b - Calculated System Curve and Existing Pumps

Figure 27: Pump Curve Information, Retrieved from Technical Memo: SLS Capacity Upgrades and Wet Well Maintenance (January 9, 2020), by Associated Engineering

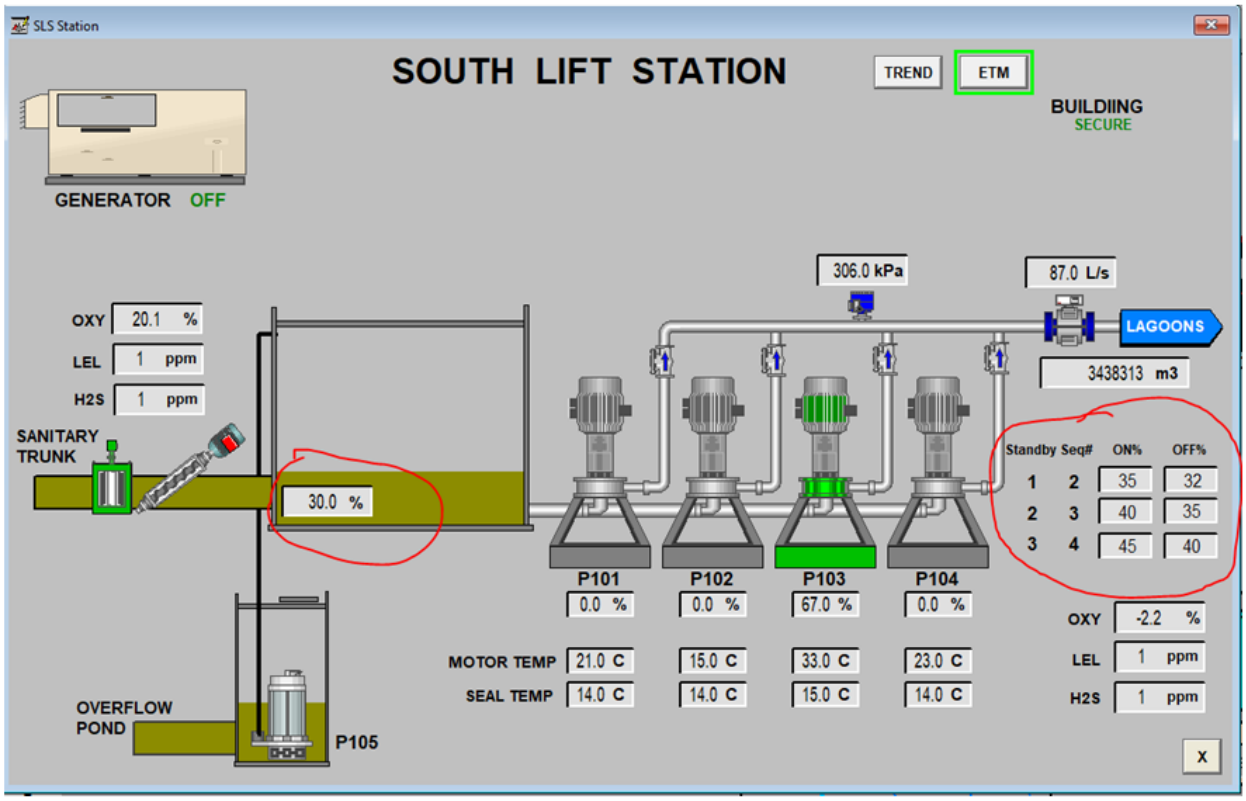


Figure 28: SLS Pump Control Scheme

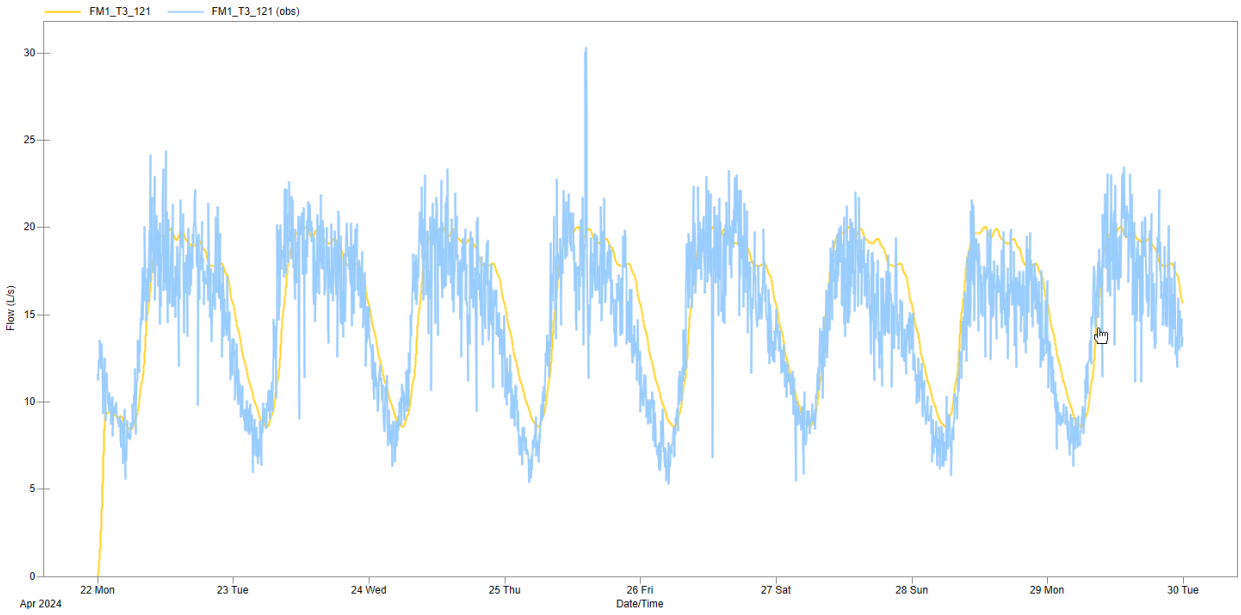
Appendix D Model Calibration

DRY WEATHER FLOW VERIFICATION

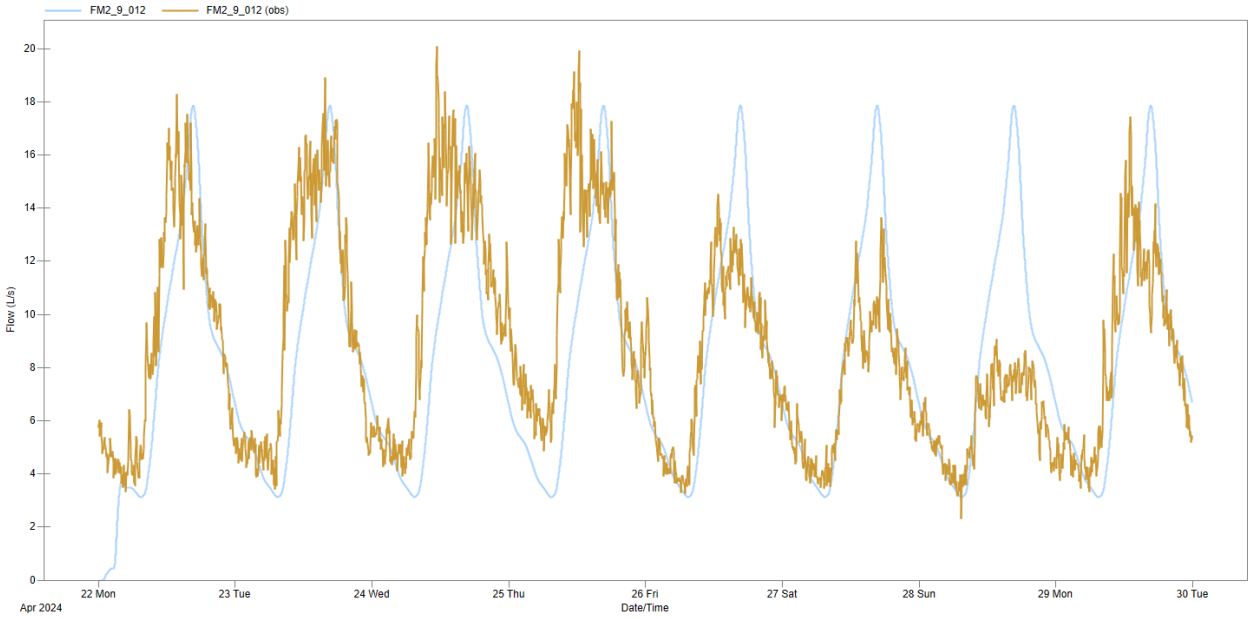
Model verification was performed to confirm the diurnal curves established and used within the computer simulation accurately depict the observed flow patterns and peak flow rates during Dry Weather Flow (DWF) conditions. The dates April 22-29 were selected for DWF analysis and the following additional observations were made and applied to the analysis. However, as previously discussed, the Monitoring Station 3 data was irregular for the initial reporting period and stabilized on April 27. July 8-15 was used instead given the preceding dry weather and data consistency.

Figure 29: PDWF Model Verification shows the modeled and monitored PDWF values and the percent differences during the analysed dry period.

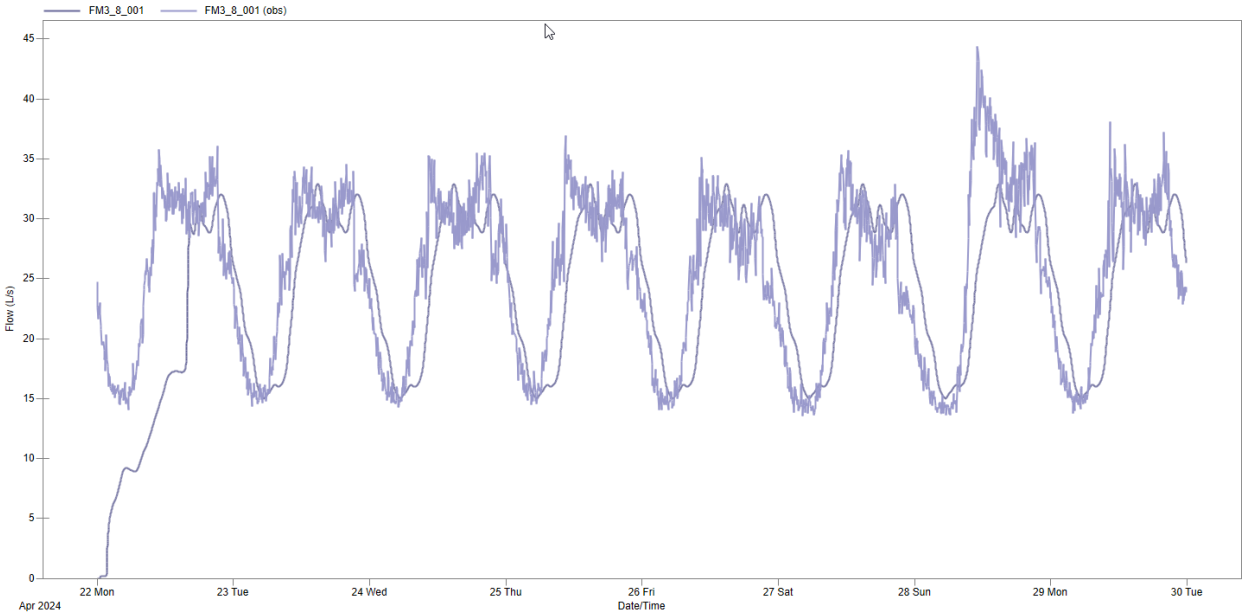
Station 1



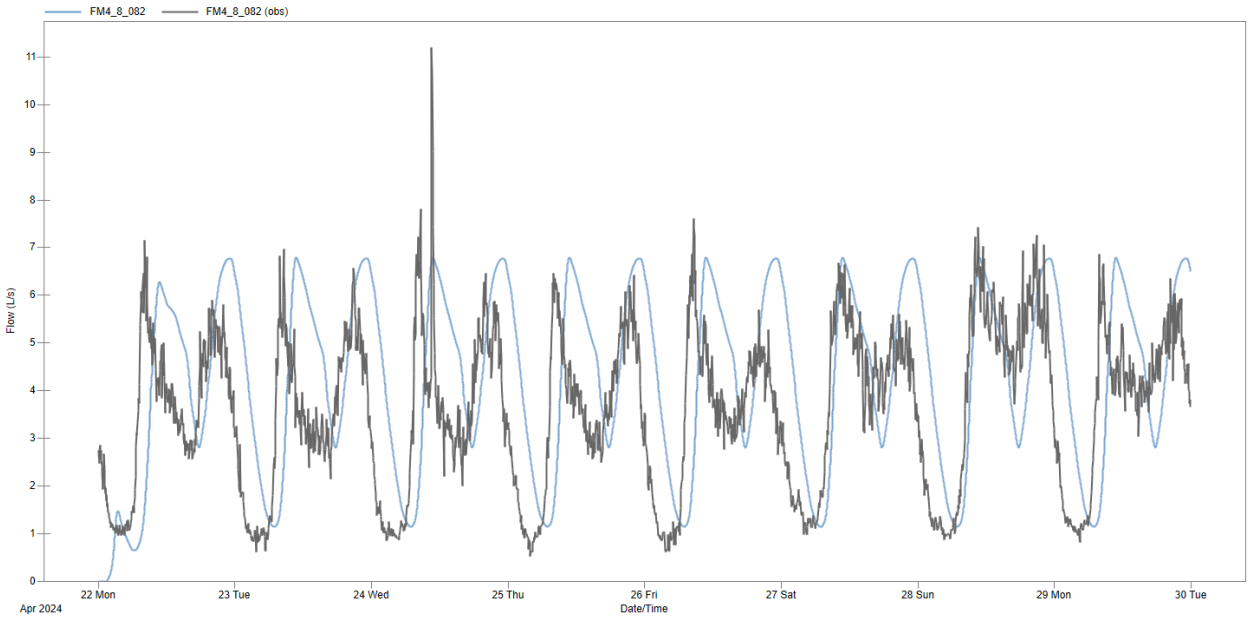
Station 2



Station 3



Station 4



Station 5

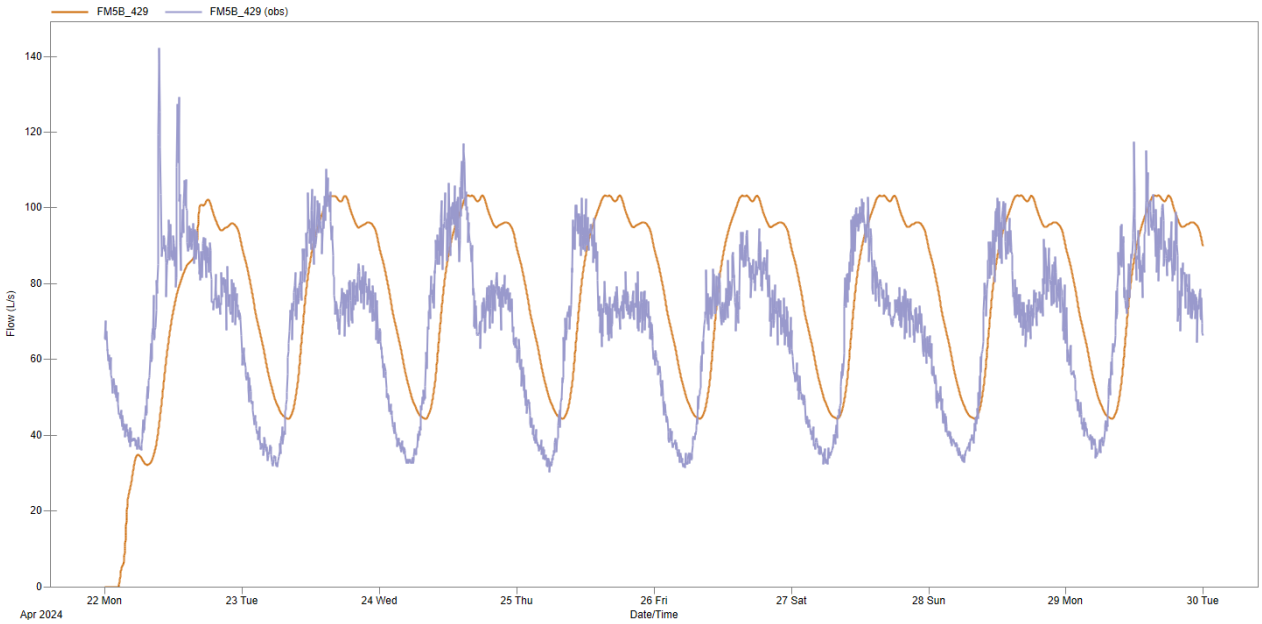


Figure 29: PDWF Model Verification

BASELINE GROUNDWATER INFILTRATION (GWI)

The baseline groundwater infiltration (GWI) rate was reviewed at the different monitoring stations. For simplicity, GWI was incorporated into the gross area loading rates determined in the previous sections. GWI was estimated based on minimum inflow during the dry weather flow period. Calibration results indicate 0.005 L/s/ha best fit flow monitor patterns.

RAINFALL DEPENDENT INFLOW AND INFILTRATION (RDII)

In addition to baseline GWI used, Rainfall Dependent Inflow and Infiltration (RDII) was estimated and applied using the RTK method. RTK factors were calibrated based on the flow monitoring completed and using local rainfall data. The RTK method is based on establishing three-unit hydrographs which estimate the flow response due to rainfall for a specified time period. The RTK factors are used to establish the unit hydrograph and represent the following.

R = Fraction of rainfall falling on the sewer-shed that enters the sanitary collection system

T = Time to peak

K = Ratio of the time of the recession to the time of peak

As discussed in ***Section 2.3.4.1***, there were problems with the project rain gauge, and Environment Canada rain gauge data was used instead. ***Table 9*** outlines the calibrated RTK factors based on the flow monitoring and rainfall data collected from April – August 2024.

Table 9: RDII RTK Factors

RESPONSE	R	T	K
Monitoring Station 1			
Short Term	0.0019	7.5	0.125
Medium Term	0.0004	18.3675	0.4
Long Term	0.001	70	1.5
Monitoring Station 2			
Short Term	0.00369	7.5	0.125
Medium Term	0.00045	23.25	0.4
Long Term	0.001	70	1.5
Monitoring Station 3			
Short Term	0.00063672	7.5	0.125

RESPONSE	R	T	K
Medium Term	0.0004	23.25	0.4
Long Term	0.001	70	1.5
Monitoring Station 4			
Short Term	0.001615	7.5	0.125
Medium Term	0.00129	23.25	0.4
Long Term	0.001	70	1.5
Monitoring Station 5			
Short Term	0.0019	7.5	0.125
Medium Term	0.0004	23.25	0.4
Long Term	0.001	70	1.5

Per ***Section 2.3.4.1***, three (3) weather events with heavy rainfall were evaluated to determine RDII patterns. This was a summer with below average rainfall; these three events were the only events potentially suitable for calibration.

- May 6 17:00 – May 8 1:00: 32.7 mm. Rainfall was spread over this period with no significant peaks.

  This event seemed suitable on initial review, given the depth of rainfall. However, calibrating to this event generated an unexpectedly high stormwater response, and flooding across the City of Camrose in a 100-yr storm. Further analysis was performed to review calibrated RTK values and corresponding stormwater peaking value against Sanitary Sewer Master Plans from similar communities in Alberta.

  Other similar communities showed lower stormwater response, including communities with known inflow and infiltration problems, suggesting problems with calibrating to this date. Reviewing conditions around the storm, there was a noted dry period preceding the storm, and the storm itself was low intensity taking place over an extended period of 32 hours. Due to the issues with calibration, this event was not used for system analysis.

- June 27 4:00 – June 27 19:00: 18.3mm. Rainfall was concentrated over a 3-hour period June 27 12:00 – June 27 15:00: 15.6mm.

  Calibrating to this event produced irregular RTK values. More thorough review was performed to determine the cause. Closer review of flow monitoring data indicated the south flow monitors (Flow Monitors #3 and #5) did not show an increase in flow over the storm period. This suggested the rainfall occurred over the north part of the City only. This is supported by the fact that the Environment Canada rain gauge is located to the north at the Camrose Airport.

  Due to the irregular spatial distribution of the rain event, this event was also not suitable for calibration.

- August 4 12:00 – Aug 5 10:00: 43.8mm. Rainfall was concentrated over a 3-hour period August 4 23:00 – August 5 2:00: 33.7mm.

  This rain event had significant rainfall over a shorter term. Unfortunately, Flow Monitor 5 failed shortly before this storm event, so this flow monitor was unable to be used for the calibration.

  Calibrating to this event gave results within expected range. Additionally, this storm was much more similar in distribution to the AES design storm distribution used to analyze the 25-year and 100-yr storm response, which is used to verify system conveyance in a high intensity storm where a large spike in flow can be expected. Given the conditions described per the previous points, the City was calibrated to this event with no further validation.

Tables 9-12 and ***Figures 3-10*** highlight the modeled and monitored PWWF and the percent difference.

Table 10: May 6-8 Modeled and Monitored PWWF

FLOW MONITOR	DAY	MODELED (L/s)	MONITORED (L/s)	DIFFERENCE (%)
1	May 6-8	33.91	46.1	26.44
2	May 6-8	28.4	38.13	25.52
3	May 6-8	54.12	75.12	27.95
4	May 6-8	12.67	33.42	62.09
5	May 6-8	230.1	266.9	13.78

Table 11: June 27 Modeled and Monitored PWWF

FLOW MONITOR	DAY	MODELED (L/s)	MONITORED (L/s)	DIFFERENCE (%)
1	June 27	43.44	49.92	12.98
2	June 27	32.36	No Data	N/A
3	June 27	65.9	31.43	109.67
4	June 27	15.2	11.47	31.82
5	June 27	323.5	163.7	97.61

Table 12: Aug 4-5 Modeled and Monitored PWWF

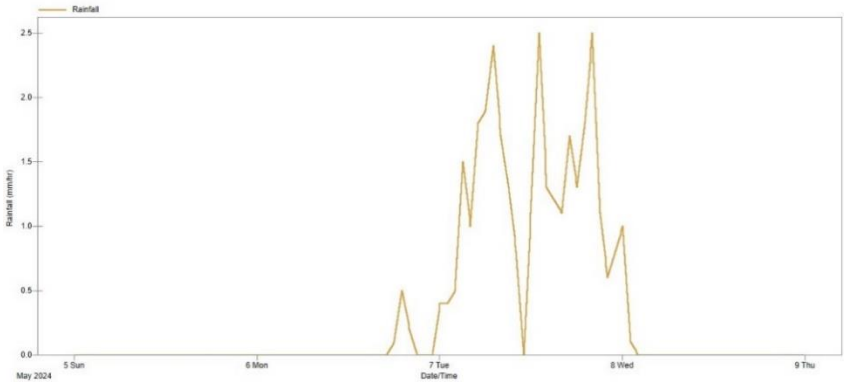
FLOW MONITOR	DAY	MODELED (L/s)	MONITORED (L/s)	DIFFERENCE (%)
1	August 4-5	65.5	65.96	0.69
2	August 4-5	53.78	54.5	1.32
3	August 4-5	86.29	87.38	1.24
4	August 4-5	22.45	22.59	0.62
5	August 4-5	560.2	No Data	N/A

Table 13: Absolute Average Percent Difference

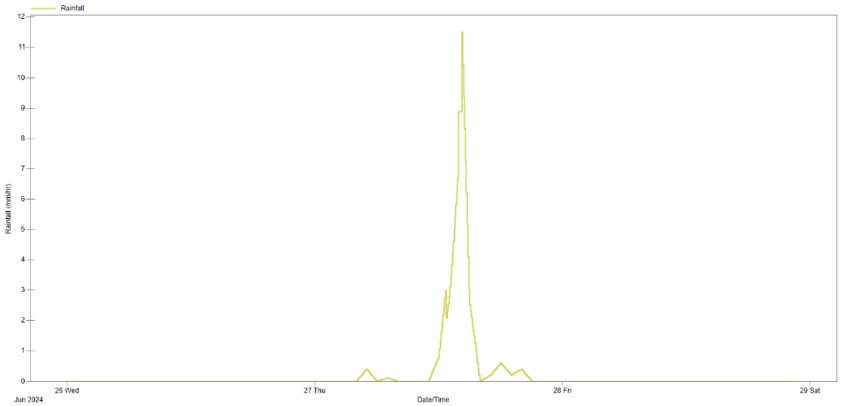
FLOW MONITOR	MAY 6-8 (%)	JUNE 27 (%)	AUGUST 4-5 (%)	ABSOLUTE AVERAGE PERCENT DIFFERENCE (%)
1	26.44	12.98	0.69	13.37
2	25.52	N/A	1.32	13.42
3	27.95	52.30	1.25	46.29
4	62.09	32.82	0.62	31.51
5	13.79	97.62	N/A	55.70

Rainfall

May 6-8, 2024



June 27, 2024



August 4-5, 2024

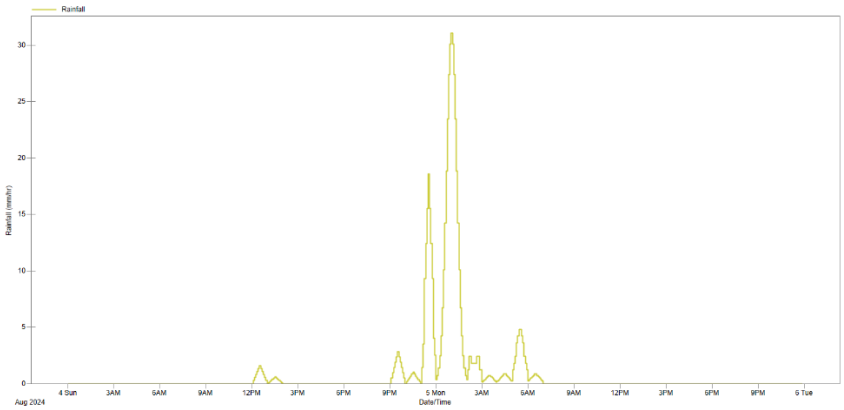
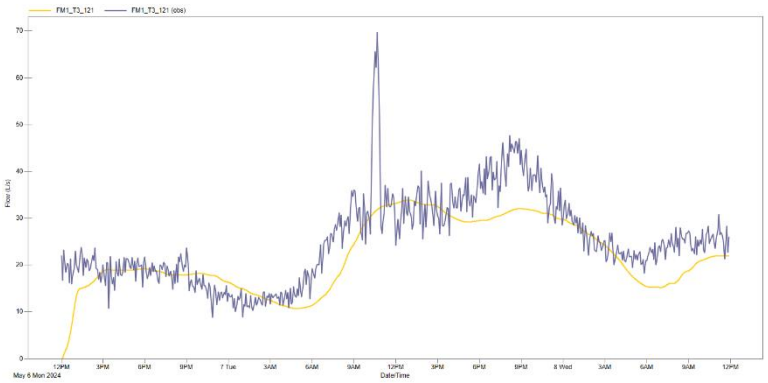


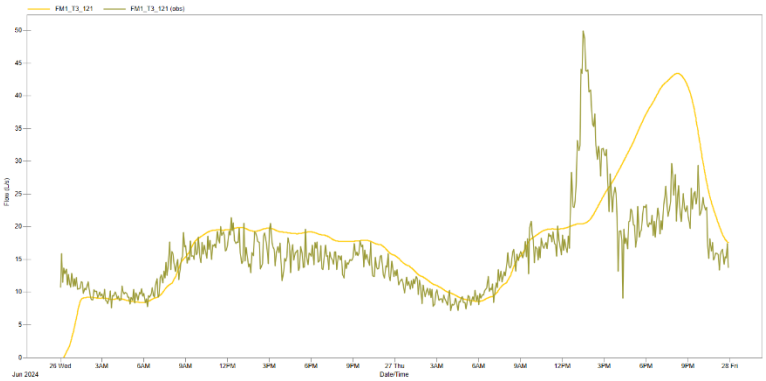
Figure 30: WWF Calibration & Validation Rainfall

Flow Monitor 1

May 6-8, 2024



June 27, 2024



August 4-5, 2024

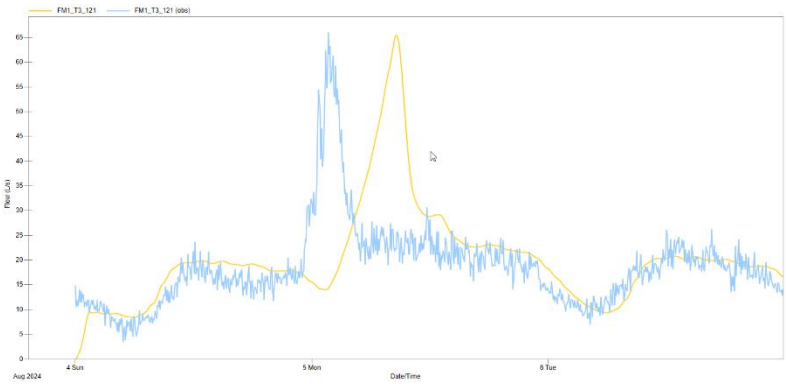
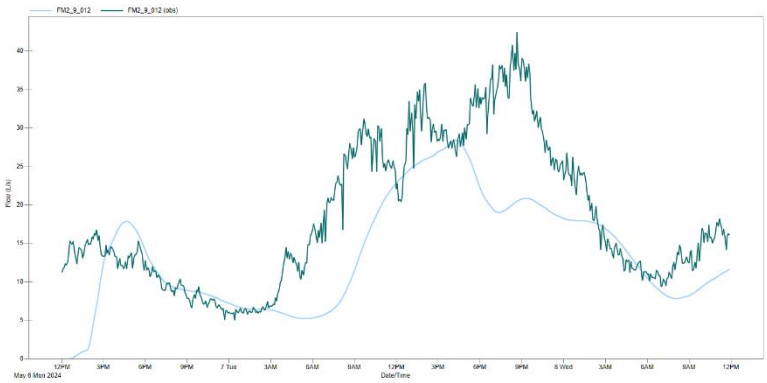


Figure 31: Flow Monitor 1 PWWF Validation

Flow Monitor 2

May 6-8, 2024



June 27, 2024 (No Data)

August 4-5, 2024

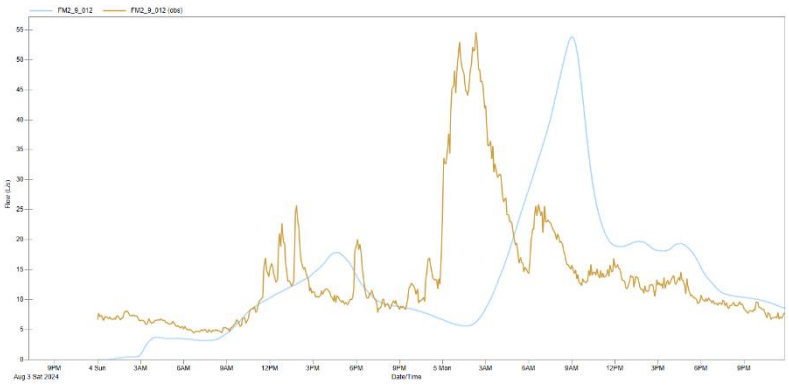
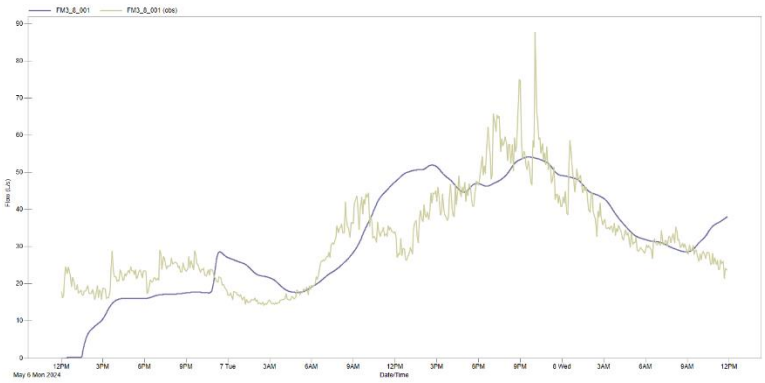


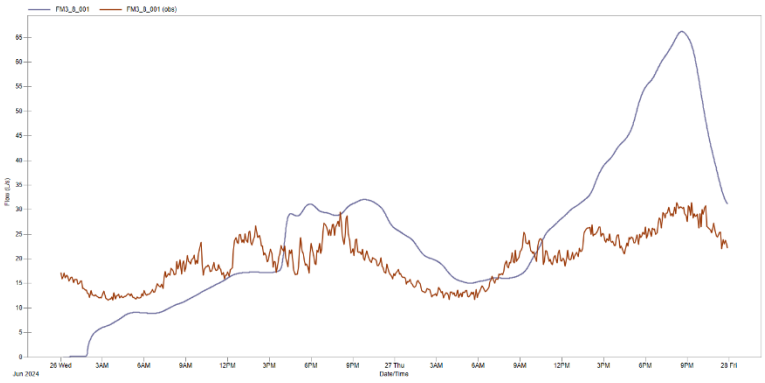
Figure 32: Flow Monitor 2 PWWF Validation

Flow Monitor 3

May 6-8, 2024



June 27, 2024



August 4-5, 2024

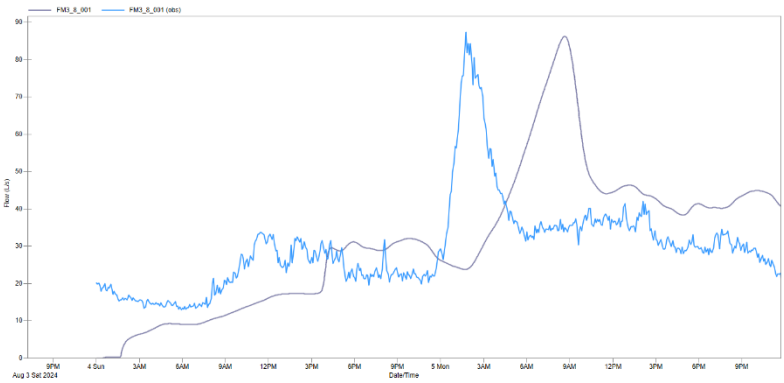
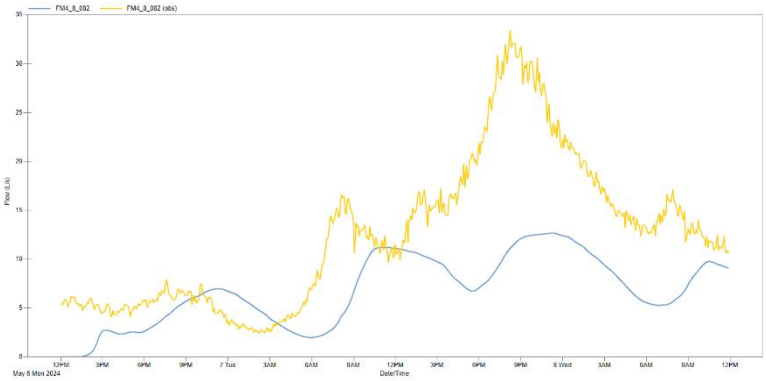


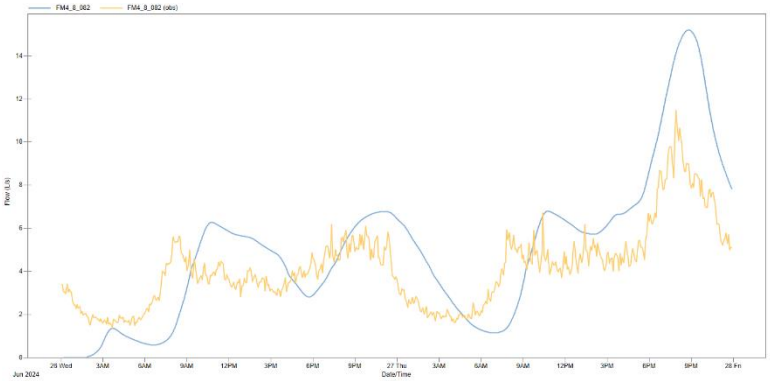
Figure 33: Flow Monitor 3 PWWF Validation

Flow Monitor 4

May 6-8, 2024



June 27, 2024



August 4-5, 2024

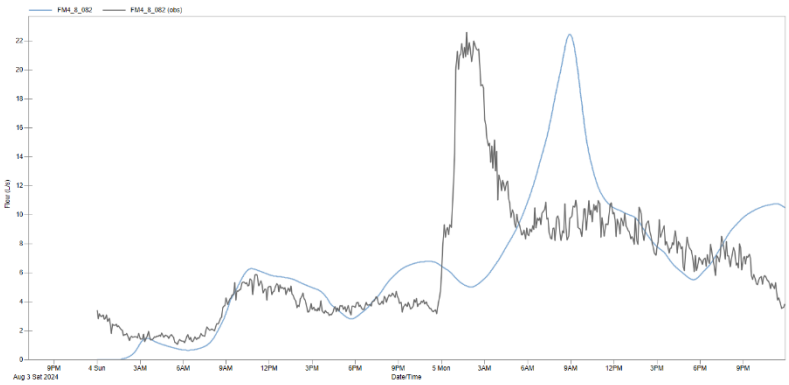
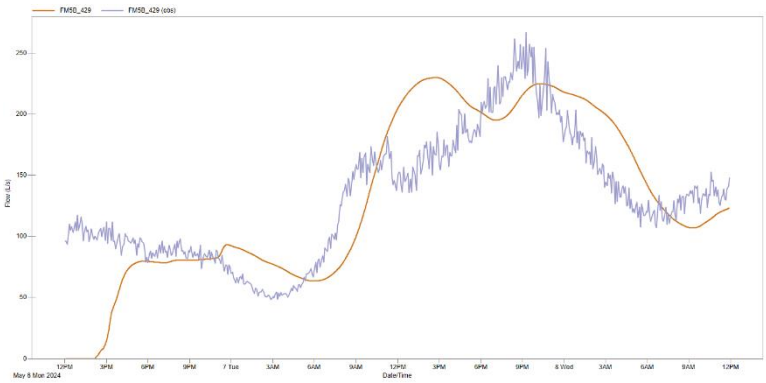


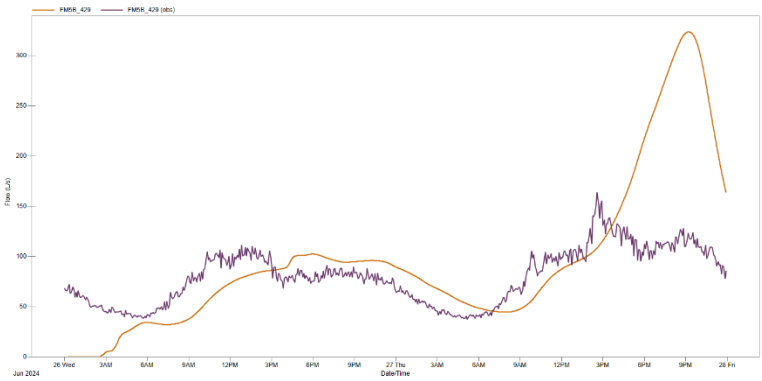
Figure 34: Flow Monitor 4 PWWF Validation

Flow Monitor 5

May 6-8, 2024



June 27, 2024



August 4-5, 2024 (No Data)

Figure 35: Flow Monitor 5 PWWF Validation

Appendix E Cost Estimate Breakdown By Area

City of Camrose Sanitary Sewer Assessment
Future Upgrade Cost Estimate
Section 1.0 - East Commercial Industrial

Item	Description	Phase	Unit	Estimated Rate	Estimate Quantity	Estimated Material Cost	Engineering (10%)	Contingencies (35%)	Estimated Conceptual Cost	Total Contributing Area (Ha)	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution
												E IND 201		E IND 202		E COMM 301		E IND 301		E COMM U01		E COMM U02
Section 1.1 - SubZone E IND 201																						
1.1.1	New Sanitary Sewer Main C_E_001A (200mm PVC) - Supply & Install	2	lm	$300	418	$ 126,000	$ 12,600	$ 44,100	$ 182,700	41.2	41.2	100%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
1.1.2	New Sanitary Sewer Main Rail_C_E_001 (200mm PVC) - Supply & Install		lm	$2,000	28	$ 56,000	$ 5,600	$ 19,600	$ 81,200	41.2	41.2	100%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
1.1.3	New Sanitary Sewer Main C_E_001B (200mm PVC) - Supply & Install		lm	$300	68	$ 21,000	$ 2,100	$ 7,350	$ 30,450	41.2	41.2	100%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
1.1.4	New Manhole (1200mm) - Supply & Install		each	$12,000	6	$ 76,000	$ 7,600	$ 26,600	$ 110,200	41.2	41.2	100%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
	Subtotal					**$ 279,000.00**	**$ 27,900.00**	**$ 97,650.00**	**$ 404,550.00**			**$ 404,550.00**										
Section 1.2 - SubZone E IND 202																						
1.2.1	New Sanitary Sewer Main C_E_002 (250mm PVC) - Supply & Install	2	lm	$375	866	$ 325,000	$ 32,500	$ 113,750	$ 471,250	34.7	0.0	0%	34.7	100%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
1.2.2	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 100,000	$ 10,000	$ 35,000	$ 145,000	34.7	0.0	0%	34.7	100%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
	Subtotal					**$ 425,000.00**	**$ 42,500.00**	**$ 148,750.00**	**$ 616,250.00**					**$ 616,250.00**								
Section 1.3 - SubZone E COMM 301																						
1.3.1	New Sanitary Sewer Main Rail_C_E_003 (450mm PVC) - Supply & Install	3	lm	$2,000	46	$ 92,000	$ 9,200	$ 32,200	$ 133,400	163.7	0.0	0%	0.0	0%	6.4	4%	89.3	55%	68.0	42%	0.0	0%
1.3.2	New Sanitary Sewer Main C_E_003 (450mm PVC) - Supply & Install		lm	$675	66	$ 45,000	$ 4,500	$ 15,750	$ 65,250	163.7	0.0	0%	0.0	0%	6.4	4%	89.3	55%	68.0	42%	0.0	0%
1.3.3	New Manhole (1200mm) - Supply & Install		each	$12,000	3	$ 36,000	$ 3,600	$ 12,600	$ 52,200	163.7	0.0	0%	0.0	0%	6.4	4%	89.3	55%	68.0	42%	0.0	0%
	Subtotal					**$ 173,000.00**	**$ 17,300.00**	**$ 60,550.00**	**$ 250,850.00**							**$ 9,810.00**		**$ 136,830.00**		**$ 104,210.00**		
Section 1.4 - SubZone E IND 301																						
1.4.1	New Sanitary Sewer Main C_E_004 (250mm PVC) - Supply & Install	3	lm	$375	177	$ 67,000	$ 6,700	$ 23,450	$ 97,150	89.3	0.0	0%	0.0	0%	0.0	0%	89.3	100%	0.0	0%	0.0	0%
1.4.2	New Sanitary Sewer Main C_E_005 (200mm PVC) - Supply & Install		lm	$300	707	$ 212,000	$ 21,200	$ 74,200	$ 307,400	89.3	0.0	0%	0.0	0%	0.0	0%	89.3	100%	0.0	0%	0.0	0%
1.4.3	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 101,000	$ 10,100	$ 35,350	$ 146,450	89.3	0.0	0%	0.0	0%	0.0	0%	89.3	100%	0.0	0%	0.0	0%
	Subtotal					**$ 380,000.00**	**$ 38,000.00**	**$ 133,000.00**	**$ 551,000.00**									**$ 551,000.00**				
Section 1.5 - SubZone E COMM U01																						
1.5.1	New Sanitary Sewer Main C_E_006 (375mm PVC) - Supply & Install	ULT	lm	$575	715	$ 412,000	$ 41,200	$ 144,200	$ 597,400	68.0	0.0	0%	0.0	0%	0.0	0%	0.0	0%	68.0	100%	0.0	0%
1.5.2	New Sanitary Sewer Main C_E_007 (300mm PVC) - Supply & Install		lm	$450	63	$ 29,000	$ 2,900	$ 10,150	$ 42,050	68.0	0.0	0%	0.0	0%	0.0	0%	0.0	0%	68.0	100%	0.0	0%
1.5.3	New Sanitary Sewer Main C_E_008 (250mm PVC) - Supply & Install		lm	$375	445	$ 167,000	$ 16,700	$ 58,450	$ 242,150	68.0	0.0	0%	0.0	0%	0.0	0%	0.0	0%	68.0	100%	0.0	0%
1.5.4	New Sanitary Sewer Main C_E_009 (250mm PVC) - Supply & Install		lm	$375	394	$ 148,000	$ 14,800	$ 51,800	$ 214,600	68.0	0.0	0%	0.0	0%	0.0	0%	0.0	0%	68.0	100%	0.0	0%
1.5.5	New Manhole (1200mm) - Supply & Install		each	$12,000	15	$ 174,000	$ 17,400	$ 60,900	$ 252,300	68.0	0.0	0%	0.0	0%	0.0	0%	0.0	0%	68.0	100%	0.0	0%
	Subtotal					**$ 930,000.00**	**$ 93,000.00**	**$ 325,500.00**	**$ 1,348,500.00**											**$ 1,348,500.00**		
Section 1.6 - SubZone E COMM U02																						
1.6.1	New Sanitary Sewer Main C_SE_038 (375mm PVC) - Supply & Install	ULT	lm	$575	378	$ 218,000	$ 21,800	$ 76,300	$ 316,100	15.0	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	15.0	100%
1.6.2	New Sanitary Sewer Main C_SE_039A (375mm PVC) - Supply & Install		lm	$575	162	$ 94,000	$ 9,400	$ 32,900	$ 136,300	15.0	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	15.0	100%
1.6.3	New Sanitary Sewer Main Rail_C_SE_039 (375mm PVC) - Supply & Install		lm	$2,000	30	$ 60,000	$ 6,000	$ 21,000	$ 87,000	15.0	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	15.0	100%
1.6.4	New Sanitary Sewer Main C_SE_039B (375mm PVC) - Supply & Install		lm	$575	46	$ 27,000	$ 2,700	$ 9,450	$ 39,150	15.0	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	15.0	100%
1.6.5	New Manhole (1200mm) - Supply & Install		each	$12,000	7	$ 87,000	$ 8,700	$ 30,450	$ 126,150	15.0	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	15.0	100%
	Subtotal					**$ 486,000.00**	**$ 48,600.00**	**$ 170,100.00**	**$ 704,700.00**													**$ 704,700.00**
	Section 1.0 - Grand Total					**$ 2,673,000**	**$ 267,300**	**$ 935,550**	**$ 3,875,850**													

Notes & Assumptions:

1 Unit prices are based on past experience, comparable tenders, and some engineering judgement.
2 Manhole quantity assumed based on 120m spacing

City of Camrose Sanitary Sewer Assessment
Future Upgrade Cost Estimate
Section 2.0 - South East Commercial Industrial

Item	Description	Phase	Unit	Estimated Rate	Estimate Quantity	Estimated Material Cost	Engineering (10%)	Contingencies (35%)	Estimated Conceptual Cost	Total Contributing Area (Ha)	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)
												SE RES 101		SE RES 201		SE IND 201		SE RES 301		SE COMM 301		SE IND 301	
Section 2.1 - SubZone SE RES 101																							
2.1.1	New Sanitary Sewer Main C_SE_001A (525mm PVC) - Supply & Install	1	lm	$788	369	$ 291,000	$ 29,100	$ 101,850	$ 421,950	329.7	4.5	1%	35.2	11%	37.7	11%	0.0	0%	0.0	0%	0.0	0%	20.5
2.1.2	New Manhole (1200mm) - Supply & Install		each	$12,000	4	$ 50,000	$ 5,000	$ 17,500	$ 72,500	329.7	4.5	1%	35.2	11%	37.7	11%	0.0	0%	0.0	0%	0.0	0%	20.5
	Subtotal					**$ 341,000.00**	**$ 34,100.00**	**$ 119,350.00**	**$ 494,450.00**			**$ 6,730.00**		**$ 52,830.00**		**$ 56,540.00**							
Section 2.2 - SubZone SE RES 201																							
2.2.1	New Sanitary Sewer Main C_SE_001B (525mm PVC) - Supply & Install	2	lm	$788	476	$ 375,000	$ 37,500	$ 131,250	$ 543,750	325.2	0.0	0%	35.2	11%	37.7	12%	0.0	0%	0.0	0%	0.0	0%	20.5
2.2.2	New Manhole (1200mm) - Supply & Install		each	$12,000	5	$ 60,000	$ 6,000	$ 21,000	$ 87,000	325.2	0.0	0%	35.2	11%	37.7	12%	0.0	0%	0.0	0%	0.0	0%	20.5
	Subtotal					**$ 435,000.00**	**$ 43,500.00**	**$ 152,250.00**	**$ 630,750.00**					**$ 68,320.00**		**$ 73,120.00**							
Section 2.3 - SubZone SE IND 201																							
2.3.1	New Sanitary Sewer Main C_SE_002 (525mm PVC) - Supply & Install	2	lm	$788	331	$ 262,000	$ 26,200	$ 91,700	$ 379,900	290.0	0.0	0%	0.0	0%	37.7	13%	0.0	0%	0.0	0%	0.0	0%	20.5
2.3.2	New Sanitary Sewer Main C_SE_003 (200mm PVC) - Supply & Install		lm	$300	460	$ 138,000	$ 13,800	$ 48,300	$ 200,100	37.7	0.0	0%	0.0	0%	37.7	100%	0.0	0%	0.0	0%	0.0	0%	0.0
2.3.3	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 92,000	$ 9,200	$ 32,200	$ 133,400	290.0	0.0	0%	0.0	0%	37.7	13%	0.0	0%	0.0	0%	0.0	0%	20.5
	Subtotal					**$ 492,000.00**	**$ 49,200.00**	**$ 172,200.00**	**$ 713,400.00**							**$ 266,830.00**							
Section 2.4 - SubZone SE RES 301																							
2.4.1	New Sanitary Sewer Main C_SE_007 (300mm PVC) - Supply & Install	3	lm	$450	571	$ 258,000	$ 25,800	$ 90,300	$ 374,100	20.6	0.0	0%	0.0	0%	0.0	0%	20.6	100%	0.0	0%	0.0	0%	0.0
2.4.2	New Manhole (1200mm) - Supply & Install		each	$12,000	6	$ 70,000	$ 7,000	$ 24,500	$ 101,500	20.6	0.0	0%	0.0	0%	0.0	0%	20.6	100%	0.0	0%	0.0	0%	0.0
	Subtotal					**$ 328,000.00**	**$ 32,800.00**	**$ 114,800.00**	**$ 475,600.00**									**$ 475,600.00**					
Section 2.5 - SubZone SE COMM 301																							
2.5.1	New Sanitary Sewer Main C_SE_005 (600mm PVC) - Supply & Install	3	lm	$900	225	$ 203,000	$ 20,300	$ 71,050	$ 294,350	265.5	0.0	0%	0.0	0%	0.0	0%	0.0	0%	22.3	8%	67.9	26%	0.0
2.5.2	New Sanitary Sewer Main C_SE_006 (600mm PVC) - Supply & Install		lm	$900	648	$ 584,000	$ 58,400	$ 204,400	$ 846,800	265.5	0.0	0%	0.0	0%	0.0	0%	0.0	0%	22.3	8%	67.9	26%	0.0
2.5.3	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 100,000	$ 10,000	$ 35,000	$ 145,000	265.5	0.0	0%	0.0	0%	0.0	0%	0.0	0%	22.3	8%	67.9	26%	0.0
	Subtotal					**$ 887,000.00**	**$ 88,700.00**	**$ 310,450.00**	**$ 1,286,150.00**											**$ 108,130.00**		**$ 329,190.00**	
Section 2.6 - SubZone SE IND 301																							
2.6.1	New Sanitary Sewer Main C_SE_008 (600mm PVC) - Supply & Install	3	lm	$900	429	$ 387,000	$ 38,700	$ 135,450	$ 561,150	243.1	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	67.9	28%	0.0
2.6.2	New Sanitary Sewer Main C_SE_009 (375mm PVC) - Supply & Install		lm	$575	599	$ 345,000	$ 34,500	$ 120,750	$ 500,250	67.9	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	67.9	100%	0.0
2.6.3	New Sanitary Sewer Main C_SE_010 (600mm PVC) - Supply & Install		lm	$900	392	$ 353,000	$ 35,300	$ 123,550	$ 511,850	175.2	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
2.6.4	New Manhole (1200mm) - Supply & Install		each	$12,000	13	$ 155,000	$ 15,500	$ 54,250	$ 224,750	243.1	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	67.9	28%	0.0
	Subtotal					**$ 1,240,000.00**	**$ 124,000.00**	**$ 434,000.00**	**$ 1,798,000.00**													**$ 719,860.00**	
Section 2.7 - SubZone SE IND 302																							
2.7.1	New Sanitary Sewer Main C_SE_004 (450mm PVC) - Supply & Install	3	lm	$675	175	$ 118,000	$ 11,800	$ 41,300	$ 171,100	252.3	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	20.5
2.7.2	New Sanitary Sewer Main C_SE_011 (450mm PVC) - Supply & Install		lm	$675	440	$ 297,000	$ 29,700	$ 103,950	$ 430,650	252.3	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	20.5
2.7.3	New Manhole (1200mm) - Supply & Install		each	$12,000	6	$ 75,000	$ 7,500	$ 26,250	$ 108,750	252.3	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	20.5
	Subtotal					**$ 490,000.00**	**$ 49,000.00**	**$ 171,500.00**	**$ 710,500.00**														
Section 2.8 - SubZone SE IND 303																							
2.8.1	New Sanitary Sewer Main C_SE_012 (450mm PVC) - Supply & Install	3	lm	$675	52	$ 36,000	$ 3,600	$ 12,600	$ 52,200	231.8	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	20.5
2.8.2	New Sanitary Sewer Main C_SE_014 (450mm PVC) - Supply & Install		lm	$675	634	$ 429,000	$ 42,900	$ 150,150	$ 622,050	205.0	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
2.8.3	New Manhole (1200mm) - Supply & Install		each	$12,000	7	$ 82,000	$ 8,200	$ 28,700	$ 118,900	231.8	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	20.5
	Subtotal					**$ 547,000.00**	**$ 54,700.00**	**$ 191,450.00**	**$ 793,150.00**														
Section 2.9 - SubZone SE IND 304																							
2.9.1	New Sanitary Sewer Main C_SE_015 (450mm PVC) - Supply & Install	3	lm	$675	89	$ 60,000	$ 6,000	$ 21,000	$ 87,000	172.6	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
2.9.2	New Sanitary Sewer Main C_SE_016 (200mm PVC) - Supply & Install		lm	$300	380	$ 115,000	$ 11,500	$ 40,250	$ 166,750	24.4	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
2.9.3	New Sanitary Sewer Main C_SE_017 (375mm PVC) - Supply & Install		lm	$575	367	$ 212,000	$ 21,200	$ 74,200	$ 307,400	148.3	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
2.9.4	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 96,000	$ 9,600	$ 33,600	$ 139,200	172.6	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
	Subtotal					**$ 483,000.00**	**$ 48,300.00**	**$ 169,050.00**	**$ 700,350.00**														
Section 2.10 - SubZone SE IND 305																							
2.10.1	New Sanitary Sewer Main C_SE_013 (200mm PVC) - Supply & Install	3	lm	$300	471	$ 142,000	$ 14,200	$ 49,700	$ 205,900	26.8	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
2.10.2	New Manhole (1200mm) - Supply & Install		each	$12,000	5	$ 60,000	$ 6,000	$ 21,000	$ 87,000	26.8	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
	Subtotal					**$ 202,000.00**	**$ 20,200.00**	**$ 70,700.00**	**$ 292,900.00**														
Section 2.11 - SubZone SE IND 306																							
2.11.1	New Sanitary Sewer Main C_SE_018 (375mm PVC) - Supply & Install	3	lm	$575	438	$ 252,000	$ 25,200	$ 88,200	$ 365,400	121.3	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
2.11.2	New Sanitary Sewer Main C_SE_019 (375mm PVC) - Supply & Install		lm	$575	274	$ 158,000	$ 15,800	$ 55,300	$ 229,100	121.3	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
2.11.3	New Manhole (1200mm) - Supply & Install		each	$12,000	7	$ 84,000	$ 8,400	$ 29,400	$ 121,800	121.3	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
	Subtotal					**$ 494,000.00**	**$ 49,400.00**	**$ 172,900.00**	**$ 716,300.00**														
Section 2.12 - SubZone SE COMM U01																							
2.12.1	New Sanitary Sewer Main C_SE_021 (600mm PVC) - Supply & Install	ULT	lm	$900	403	$ 364,000	$ 36,400	$ 127,400	$ 527,800	175.2	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
2.12.2	New Sanitary Sewer Main C_SE_022 (450mm PVC) - Supply & Install		lm	$675	640	$ 433,000	$ 43,300	$ 151,550	$ 627,850	68.6	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
2.12.3	New Sanitary Sewer Main C_SE_023 (600mm PVC) - Supply & Install		lm	$900	411	$ 371,000	$ 37,100	$ 129,850	$ 537,950	106.6	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
2.12.4	New Manhole (1200mm) - Supply & Install		each	$12,000	13	$ 159,000	$ 15,900	$ 55,650	$ 230,550	175.2	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
	Subtotal					**$ 1,327,000.00**	**$ 132,700.00**	**$ 464,450.00**	**$ 1,924,150.00**														
Section 2.13 - SubZone SE COMM U02																							
2.13.1	New Sanitary Sewer Main C_SE_024 (600mm PVC) - Supply & Install	ULT	lm	$900	453	$ 408,000	$ 40,800	$ 142,800	$ 591,600	106.6	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
2.13.2	New Sanitary Sewer Main C_SE_025 (450mm PVC) - Supply & Install		lm	$675	667	$ 451,000	$ 45,100	$ 157,850	$ 653,950	68.3	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
2.13.3	New Sanitary Sewer Main C_SE_026 (450mm PVC) - Supply & Install		lm	$675	356	$ 240,000	$ 24,000	$ 84,000	$ 348,000	38.3	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
2.13.4	New Manhole (1200mm) - Supply & Install		each	$12,000	13	$ 160,000	$ 16,000	$ 56,000	$ 232,000	106.6	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
	Subtotal					**$ 1,259,000.00**	**$ 125,900.00**	**$ 440,650.00**	**$ 1,825,550.00**														
Section 2.14 - SubZone SE COMM U03																							
2.14.1	New Sanitary Sewer Main C_SE_027 (450mm PVC) - Supply & Install	ULT	lm	$675	160	$ 109,000	$ 10,900	$ 38,150	$ 158,050	38.3	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
2.14.2	New Sanitary Sewer Main C_SE_028 (200mm PVC) - Supply & Install		lm	$300	268	$ 81,000	$ 8,100	$ 28,350	$ 117,450	38.3	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
2.14.3	New Sanitary Sewer Main C_SE_029 (450mm PVC) - Supply & Install		lm	$675	160	$ 109,000	$ 10,900	$ 38,150	$ 158,050	38.3	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
2.14.4	New Sanitary Sewer Main C_SE_030 (450mm PVC) - Supply & Install		lm	$675	268	$ 181,000	$ 18,100	$ 63,350	$ 262,450	38.3	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
2.14.5	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 99,000	$ 9,900	$ 34,650	$ 143,550	38.3	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
	Subtotal					**$ 579,000.00**	**$ 57,900.00**	**$ 202,650.00**	**$ 839,550.00**														
Section 2.15 - SubZone SE IND U01																							
2.15.1	New Sanitary Sewer Main C_SE_031 (250mm PVC) - Supply & Install	ULT	lm	$300	616	$ 185,000	$ 18,500	$ 64,750	$ 268,250	27.0	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0

City of Camrose Sanitary Sewer Assessment
Future Upgrade Cost Estimate
Section 2.0 - South East Commercial Industrial

Item	Description	Phase	Unit	Estimated Rate	Estimate Quantity	Estimated Material Cost	Engineering (10%)	Contingencies (35%)	Estimated Conceptual Cost	Total Contributing Area (Ha)	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)
												SE RES 101		SE RES 201		SE IND 201		SE RES 301		SE COMM 301		SE IND 301	
2.15.2	New Manhole (1200mm) - Supply & Install	ULT	each	$12,000	6	$ 75,000	$ 7,500	$ 26,250	$ 108,750	27.0	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
Subtotal						**$ 260,000**	**$ 26,000**	**$ 91,000**	**$ 377,000**														
Section 2.16 - SubZone SE IND U02																							
2.16.1	New Sanitary Sewer Main C_SE_032 (375mm PVC) - Supply & Install	ULT	lm	$575	431	$ 248,000	$ 24,800	$ 86,800	$ 359,600	99.6	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
2.16.2	New Sanitary Sewer Main C_SE_033 (250mm PVC) - Supply & Install		lm	$375	402	$ 151,000	$ 15,100	$ 52,850	$ 218,950	37.9	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
2.16.3	New Sanitary Sewer Main C_SE_034 (375mm PVC) - Supply & Install		lm	$575	387	$ 223,000	$ 22,300	$ 78,050	$ 323,350	61.7	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
2.16.4	New Manhole (1200mm) - Supply & Install		each	$12,000	11	$ 135,000	$ 13,500	$ 47,250	$ 195,750	99.6	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
Subtotal						**$ 757,000.00**	**$ 75,700.00**	**$ 264,950.00**	**$ 1,097,650.00**														
Section 2.17 - SubZone SE IND U03																							
2.17.1	New Sanitary Sewer Main C_SE_035 (375mm PVC) - Supply & Install	ULT	lm	$575	193	$ 111,000	$ 11,100	$ 38,850	$ 160,950	61.7	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
2.17.2	New Sanitary Sewer Main C_SE_036 (250mm PVC) - Supply & Install		lm	$375	472	$ 177,000	$ 17,700	$ 61,950	$ 256,650	46.7	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
2.17.3	New Sanitary Sewer Main C_SE_037 (375mm PVC) - Supply & Install		lm	$575	373	$ 215,000	$ 21,500	$ 75,250	$ 311,750	61.7	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
2.17.4	New Sanitary Sewer Main C_SE_038 (375mm PVC) - Supply & Install		lm	$575	392	$ 226,000	$ 22,600	$ 79,100	$ 327,700	15.0	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
2.17.5	New Manhole (1200mm) - Supply & Install		each	$12,000	13	$ 156,000	$ 15,600	$ 54,600	$ 226,200	61.7	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0
Subtotal						**$ 885,000.00**	**$ 88,500.00**	**$ 309,750.00**	**$ 1,283,250.00**														
Section 2.0 - Grand Total						**$ 11,006,000**	**$ 1,100,600**	**$ 3,852,100**	**$ 15,958,700**														

Notes & Assumptions:

1 Unit prices are based on past experience, comparable tenders, and some engineering judgement.
2 Manhole quantity assumed based on 120m spacing

City of Camrose Sanitary Sewer Assessment
Future Upgrade Cost Estimate
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Item	Description	Phase	Unit	Estimated Rate	Estimate Quantity	Estimated Material Cost	Engineering (10%)	Contingencies (35%)	Estimated Conceptual Cost	Total Contributing Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution
											SE IND 302		SE IND 303		SE IND 304		SE IND 305		SE IND 306		SE COMM U01		SE COMM U02
Section 2.1 - SubZone SE RES 101																							
2.1.1	New Sanitary Sewer Main C_SE_001A (525mm PVC) - Supply & Install	1	lm	$788	369	$ 291,000	$ 29,100	$ 101,850	$ 421,950	329.7	6%	32.3	10%	24.4	7%	26.8	8%	21.7	7%	0.0	0%	0.0	0%
2.1.2	New Manhole (1200mm) - Supply & Install		each	$12,000	4	$ 50,000	$ 5,000	$ 17,500	$ 72,500	329.7	6%	32.3	10%	24.4	7%	26.8	8%	21.7	7%	0.0	0%	0.0	0%
	Subtotal					**$ 341,000.00**	**$ 34,100.00**	**$ 119,350.00**	**$ 494,450.00**		**$ 30,750.00**		**$ 48,490.00**		**$ 36,550.00**		**$ 40,190.00**		**$ 32,610.00**				
Section 2.2 - SubZone SE RES 201																							
2.2.1	New Sanitary Sewer Main C_SE_001B (525mm PVC) - Supply & Install	2	lm	$788	476	$ 375,000	$ 37,500	$ 131,250	$ 543,750	325.2	6%	32.3	10%	24.4	7%	26.8	8%	21.7	7%	0.0	0%	0.0	0%
2.2.2	New Manhole (1200mm) - Supply & Install		each	$12,000	5	$ 60,000	$ 6,000	$ 21,000	$ 87,000	325.2	6%	32.3	10%	24.4	7%	26.8	8%	21.7	7%	0.0	0%	0.0	0%
	Subtotal					**$ 435,000.00**	**$ 43,500.00**	**$ 152,250.00**	**$ 630,750.00**		**$ 39,770.00**		**$ 62,720.00**		**$ 47,260.00**		**$ 51,970.00**		**$ 42,180.00**				
Section 2.3 - SubZone SE IND 201																							
2.3.1	New Sanitary Sewer Main C_SE_002 (525mm PVC) - Supply & Install	2	lm	$788	331	$ 262,000	$ 26,200	$ 91,700	$ 379,900	290.0	7%	32.3	11%	24.4	8%	26.8	9%	21.7	7%	0.0	0%	0.0	0%
2.3.2	New Sanitary Sewer Main C_SE_003 (200mm PVC) - Supply & Install		lm	$300	460	$ 138,000	$ 13,800	$ 48,300	$ 200,100	37.7	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.3.3	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 92,000	$ 9,200	$ 32,200	$ 133,400	290.0	7%	32.3	11%	24.4	8%	26.8	9%	21.7	7%	0.0	0%	0.0	0%
	Subtotal					**$ 492,000.00**	**$ 49,200.00**	**$ 172,200.00**	**$ 713,400.00**		**$ 36,290.00**		**$ 57,240.00**		**$ 43,140.00**		**$ 47,430.00**		**$ 38,490.00**				
Section 2.4 - SubZone SE RES 301																							
2.4.1	New Sanitary Sewer Main C_SE_007 (300mm PVC) - Supply & Install	3	lm	$450	571	$ 258,000	$ 25,800	$ 90,300	$ 374,100	20.6	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.4.2	New Manhole (1200mm) - Supply & Install		each	$12,000	6	$ 70,000	$ 7,000	$ 24,500	$ 101,500	20.6	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
	Subtotal					**$ 328,000.00**	**$ 32,800.00**	**$ 114,800.00**	**$ 475,600.00**														
Section 2.5 - SubZone SE COMM 301																							
2.5.1	New Sanitary Sewer Main C_SE_005 (600mm PVC) - Supply & Install	3	lm	$900	225	$ 203,000	$ 20,300	$ 71,050	$ 294,350	265.5	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	68.6	26%	68.3	26%
2.5.2	New Sanitary Sewer Main C_SE_006 (600mm PVC) - Supply & Install		lm	$900	648	$ 584,000	$ 58,400	$ 204,400	$ 846,800	265.5	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	68.6	26%	68.3	26%
2.5.3	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 100,000	$ 10,000	$ 35,000	$ 145,000	265.5	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	68.6	26%	68.3	26%
	Subtotal					**$ 887,000.00**	**$ 88,700.00**	**$ 310,450.00**	**$ 1,286,150.00**												**$ 332,200.00**		**$ 331,100.00**
Section 2.6 - SubZone SE IND 301																							
2.6.1	New Sanitary Sewer Main C_SE_008 (600mm PVC) - Supply & Install	3	lm	$900	429	$ 387,000	$ 38,700	$ 135,450	$ 561,150	243.1	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	68.6	28%	68.3	28%
2.6.2	New Sanitary Sewer Main C_SE_009 (375mm PVC) - Supply & Install		lm	$575	599	$ 345,000	$ 34,500	$ 120,750	$ 500,250	67.9	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.6.3	New Sanitary Sewer Main C_SE_010 (600mm PVC) - Supply & Install		lm	$900	392	$ 353,000	$ 35,300	$ 123,550	$ 511,850	175.2	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	68.6	39%	68.3	39%
2.6.4	New Manhole (1200mm) - Supply & Install		each	$12,000	13	$ 155,000	$ 15,500	$ 54,250	$ 224,750	243.1	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	68.6	28%	68.3	28%
	Subtotal					**$ 1,240,000.00**	**$ 124,000.00**	**$ 434,000.00**	**$ 1,798,000.00**												**$ 421,940.00**		**$ 420,550.00**
Section 2.7 - SubZone SE IND 302																							
2.7.1	New Sanitary Sewer Main C_SE_004 (450mm PVC) - Supply & Install	3	lm	$675	175	$ 118,000	$ 11,800	$ 41,300	$ 171,100	252.3	8%	32.3	13%	24.4	10%	26.8	11%	21.7	9%	0.0	0%	0.0	0%
2.7.2	New Sanitary Sewer Main C_SE_011 (450mm PVC) - Supply & Install		lm	$675	440	$ 297,000	$ 29,700	$ 103,950	$ 430,650	252.3	8%	32.3	13%	24.4	10%	26.8	11%	21.7	9%	0.0	0%	0.0	0%
2.7.3	New Manhole (1200mm) - Supply & Install		each	$12,000	6	$ 75,000	$ 7,500	$ 26,250	$ 108,750	252.3	8%	32.3	13%	24.4	10%	26.8	11%	21.7	9%	0.0	0%	0.0	0%
	Subtotal					**$ 490,000.00**	**$ 49,000.00**	**$ 171,500.00**	**$ 710,500.00**		**$ 57,740.00**		**$ 91,070.00**		**$ 68,630.00**		**$ 75,470.00**		**$ 61,250.00**				
Section 2.8 - SubZone SE IND 303																							
2.8.1	New Sanitary Sewer Main C_SE_012 (450mm PVC) - Supply & Install	3	lm	$675	52	$ 36,000	$ 3,600	$ 12,600	$ 52,200	231.8	9%	32.3	14%	24.4	11%	26.8	12%	21.7	9%	0.0	0%	0.0	0%
2.8.2	New Sanitary Sewer Main C_SE_014 (450mm PVC) - Supply & Install		lm	$675	634	$ 429,000	$ 42,900	$ 150,150	$ 622,050	205.0	0%	32.3	16%	24.4	12%	0.0	0%	21.7	11%	0.0	0%	0.0	0%
2.8.3	New Manhole (1200mm) - Supply & Install		each	$12,000	7	$ 82,000	$ 8,200	$ 28,700	$ 118,900	231.8	9%	32.3	14%	24.4	11%	26.8	12%	21.7	9%	0.0	0%	0.0	0%
	Subtotal					**$ 547,000.00**	**$ 54,700.00**	**$ 191,450.00**	**$ 793,150.00**		**$ 24,750.00**		**$ 106,980.00**		**$ 80,620.00**		**$ 32,350.00**		**$ 71,950.00**				
Section 2.9 - SubZone SE IND 304																							
2.9.1	New Sanitary Sewer Main C_SE_015 (450mm PVC) - Supply & Install	3	lm	$675	89	$ 60,000	$ 6,000	$ 21,000	$ 87,000	172.6	0%	0.0	0%	24.4	14%	0.0	0%	21.7	13%	0.0	0%	0.0	0%
2.9.2	New Sanitary Sewer Main C_SE_016 (200mm PVC) - Supply & Install		lm	$300	380	$ 115,000	$ 11,500	$ 40,250	$ 166,750	24.4	0%	0.0	0%	24.4	100%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.9.3	New Sanitary Sewer Main C_SE_017 (375mm PVC) - Supply & Install		lm	$575	367	$ 212,000	$ 21,200	$ 74,200	$ 307,400	148.3	0%	0.0	0%	0.0	0%	0.0	0%	21.7	15%	0.0	0%	0.0	0%
2.9.4	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 96,000	$ 9,600	$ 33,600	$ 139,200	172.6	0%	0.0	0%	24.4	14%	0.0	0%	21.7	13%	0.0	0%	0.0	0%
	Subtotal					**$ 483,000.00**	**$ 48,300.00**	**$ 169,050.00**	**$ 700,350.00**						**$ 198,680.00**				**$ 73,580.00**				
Section 2.10 - SubZone SE IND 305																							
2.10.1	New Sanitary Sewer Main C_SE_013 (200mm PVC) - Supply & Install	3	lm	$300	471	$ 142,000	$ 14,200	$ 49,700	$ 205,900	26.8	0%	0.0	0%	0.0	0%	26.8	100%	0.0	0%	0.0	0%	0.0	0%
2.10.2	New Manhole (1200mm) - Supply & Install		each	$12,000	5	$ 60,000	$ 6,000	$ 21,000	$ 87,000	26.8	0%	0.0	0%	0.0	0%	26.8	100%	0.0	0%	0.0	0%	0.0	0%
	Subtotal					**$ 202,000.00**	**$ 20,200.00**	**$ 70,700.00**	**$ 292,900.00**								**$ 292,900.00**						
Section 2.11 - SubZone SE IND 306																							
2.11.1	New Sanitary Sewer Main C_SE_018 (375mm PVC) - Supply & Install	3	lm	$575	438	$ 252,000	$ 25,200	$ 88,200	$ 365,400	121.3	0%	0.0	0%	0.0	0%	0.0	0%	21.7	18%	0.0	0%	0.0	0%
2.11.2	New Sanitary Sewer Main C_SE_019 (375mm PVC) - Supply & Install		lm	$575	274	$ 158,000	$ 15,800	$ 55,300	$ 229,100	121.3	0%	0.0	0%	0.0	0%	0.0	0%	21.7	18%	0.0	0%	0.0	0%
2.11.3	New Manhole (1200mm) - Supply & Install		each	$12,000	7	$ 84,000	$ 8,400	$ 29,400	$ 121,800	121.3	0%	0.0	0%	0.0	0%	0.0	0%	21.7	18%	0.0	0%	0.0	0%
	Subtotal					**$ 494,000.00**	**$ 49,400.00**	**$ 172,900.00**	**$ 716,300.00**										**$ 128,400.00**				
Section 2.12 - SubZone SE COMM U01																							
2.12.1	New Sanitary Sewer Main C_SE_021 (600mm PVC) - Supply & Install	ULT	lm	$900	403	$ 364,000	$ 36,400	$ 127,400	$ 527,800	175.2	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	68.6	39%	68.3	39%
2.12.2	New Sanitary Sewer Main C_SE_022 (450mm PVC) - Supply & Install		lm	$675	640	$ 433,000	$ 43,300	$ 151,550	$ 627,850	68.6	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	68.6	100%	0.0	0%
2.12.3	New Sanitary Sewer Main C_SE_023 (600mm PVC) - Supply & Install		lm	$900	411	$ 371,000	$ 37,100	$ 129,850	$ 537,950	106.6	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	68.3	64%
2.12.4	New Manhole (1200mm) - Supply & Install		each	$12,000	13	$ 159,000	$ 15,900	$ 55,650	$ 230,550	175.2	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	68.6	39%	68.3	39%
	Subtotal					**$ 1,327,000.00**	**$ 132,700.00**	**$ 464,450.00**	**$ 1,924,150.00**												**$ 924,640.00**		**$ 640,570.00**
Section 2.13 - SubZone SE COMM U02																							
2.13.1	New Sanitary Sewer Main C_SE_024 (600mm PVC) - Supply & Install	ULT	lm	$900	453	$ 408,000	$ 40,800	$ 142,800	$ 591,600	106.6	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	68.3	64%
2.13.2	New Sanitary Sewer Main C_SE_025 (450mm PVC) - Supply & Install		lm	$675	667	$ 451,000	$ 45,100	$ 157,850	$ 653,950	68.3	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	68.3	100%
2.13.3	New Sanitary Sewer Main C_SE_026 (450mm PVC) - Supply & Install		lm	$675	356	$ 240,000	$ 24,000	$ 84,000	$ 348,000	38.3	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.13.4	New Manhole (1200mm) - Supply & Install		each	$12,000	13	$ 160,000	$ 16,000	$ 56,000	$ 232,000	106.6	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	68.3	64%
	Subtotal					**$ 1,259,000.00**	**$ 125,900.00**	**$ 440,650.00**	**$ 1,825,550.00**														**$ 1,181,790.00**
Section 2.14 - SubZone SE COMM U03																							
2.14.1	New Sanitary Sewer Main C_SE_027 (450mm PVC) - Supply & Install	ULT	lm	$675	160	$ 109,000	$ 10,900	$ 38,150	$ 158,050	38.3	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.14.2	New Sanitary Sewer Main C_SE_028 (200mm PVC) - Supply & Install		lm	$300	268	$ 81,000	$ 8,100	$ 28,350	$ 117,450	38.3	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.14.3	New Sanitary Sewer Main C_SE_029 (450mm PVC) - Supply & Install		lm	$675	160	$ 109,000	$ 10,900	$ 38,150	$ 158,050	38.3	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.14.4	New Sanitary Sewer Main C_SE_030 (450mm PVC) - Supply & Install		lm	$675	268	$ 181,000	$ 18,100	$ 63,350	$ 262,450	38.3	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.14.5	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 99,000	$ 9,900	$ 34,650	$ 143,550	38.3	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
	Subtotal					**$ 579,000.00**	**$ 57,900.00**	**$ 202,650.00**	**$ 839,550.00**														
Section 2.15 - SubZone SE IND U01																							
2.15.1	New Sanitary Sewer Main C_SE_031 (250mm PVC) - Supply & Install	ULT	lm	$300	616	$ 185,000	$ 18,500	$ 64,750	$ 268,250	27.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%

City of Camrose Sanitary Sewer Assessment
Future Upgrade Cost Estimate
Section 2.0 - South East Commercial Industrial

Item	Description	Phase	Unit	Estimated Rate	Estimate Quantity	Estimated Material Cost	Engineering (10%)	Contingencies (35%)	Estimated Conceptual Cost	Total Contributing Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution
											SE IND 302		SE IND 303		SE IND 304		SE IND 305		SE IND 306		SE COMM U01		SE COMM U02
2.15.2	New Manhole (1200mm) - Supply & Install	ULT	each	$12,000	6	$ 75,000	$ 7,500	$ 26,250	$ 108,750	27.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
Subtotal						**$ 260,000**	**$ 26,000**	**$ 91,000**	**$ 377,000**														
Section 2.16 - SubZone SE IND U02																							
2.16.1	New Sanitary Sewer Main C_SE_032 (375mm PVC) - Supply & Install	ULT	lm	$575	431	$ 248,000	$ 24,800	$ 86,800	$ 359,600	99.6	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.16.2	New Sanitary Sewer Main C_SE_033 (250mm PVC) - Supply & Install		lm	$375	402	$ 151,000	$ 15,100	$ 52,850	$ 218,950	37.9	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.16.3	New Sanitary Sewer Main C_SE_034 (375mm PVC) - Supply & Install		lm	$575	387	$ 223,000	$ 22,300	$ 78,050	$ 323,350	61.7	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.16.4	New Manhole (1200mm) - Supply & Install		each	$12,000	11	$ 135,000	$ 13,500	$ 47,250	$ 195,750	99.6	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
Subtotal						**$ 757,000.00**	**$ 75,700.00**	**$ 264,950.00**	**$ 1,097,650.00**														
Section 2.17 - SubZone SE IND U03																							
2.17.1	New Sanitary Sewer Main C_SE_035 (375mm PVC) - Supply & Install	ULT	lm	$575	193	$ 111,000	$ 11,100	$ 38,850	$ 160,950	61.7	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.17.2	New Sanitary Sewer Main C_SE_036 (250mm PVC) - Supply & Install		lm	$375	472	$ 177,000	$ 17,700	$ 61,950	$ 256,650	46.7	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.17.3	New Sanitary Sewer Main C_SE_037 (375mm PVC) - Supply & Install		lm	$575	373	$ 215,000	$ 21,500	$ 75,250	$ 311,750	61.7	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.17.4	New Sanitary Sewer Main C_SE_038 (375mm PVC) - Supply & Install		lm	$575	392	$ 226,000	$ 22,600	$ 79,100	$ 327,700	15.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.17.5	New Manhole (1200mm) - Supply & Install		each	$12,000	13	$ 156,000	$ 15,600	$ 54,600	$ 226,200	61.7	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
Subtotal						**$ 885,000.00**	**$ 88,500.00**	**$ 309,750.00**	**$ 1,283,250.00**														
Section 2.0 - Grand Total						**$ 11,006,000**	**$ 1,100,600**	**$ 3,852,100**	**$ 15,958,700**														

Notes & Assumptions:

1 Unit prices are based on past experience, comparable tenders, and some engineering judgement.

2 Manhole quantity assumed based on 120m spacing

City of Camrose Sanitary Sewer Assessment
Future Upgrade Cost Estimate
Section 2.0 - South East Commercial Industrial

Item	Description	Phase	Unit	Estimated Rate	Estimate Quantity	Estimated Material Cost	Engineering (10%)	Contingencies (35%)	Estimated Conceptual Cost	Total Contributing Area (Ha)	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution
												SE COMM U03		SE IND U01		SE IND U02		SE IND U03		E COMM U02
Section 2.1 - SubZone SE RES 101																				
2.1.1	New Sanitary Sewer Main C_SE_001A (525mm PVC) - Supply & Install	1	lm	$788	369	$ 291,000	$ 29,100	$ 101,850	$ 421,950	329.7	0.0	0%	27.0	8%	37.9	11%	46.7	14%	15.0	5%
2.1.2	New Manhole (1200mm) - Supply & Install		each	$12,000	4	$ 50,000	$ 5,000	$ 17,500	$ 72,500	329.7	0.0	0%	27.0	8%	37.9	11%	46.7	14%	15.0	5%
	Subtotal					**$ 341,000.00**	**$ 34,100.00**	**$ 119,350.00**	**$ 494,450.00**					**$ 40,430.00**		**$ 56,840.00**		**$ 70,050.00**		**$ 22,440.00**
Section 2.2 - SubZone SE RES 201																				
2.2.1	New Sanitary Sewer Main C_SE_001B (525mm PVC) - Supply & Install	2	lm	$788	476	$ 375,000	$ 37,500	$ 131,250	$ 543,750	325.2	0.0	0%	27.0	8%	37.9	12%	46.7	14%	15.0	5%
2.2.2	New Manhole (1200mm) - Supply & Install		each	$12,000	5	$ 60,000	$ 6,000	$ 21,000	$ 87,000	325.2	0.0	0%	27.0	8%	37.9	12%	46.7	14%	15.0	5%
	Subtotal					**$ 435,000.00**	**$ 43,500.00**	**$ 152,250.00**	**$ 630,750.00**					**$ 52,290.00**		**$ 73,510.00**		**$ 90,590.00**		**$ 29,020.00**
Section 2.3 - SubZone SE IND 201																				
2.3.1	New Sanitary Sewer Main C_SE_002 (525mm PVC) - Supply & Install	2	lm	$788	331	$ 262,000	$ 26,200	$ 91,700	$ 379,900	290.0	0.0	0%	27.0	9%	37.9	13%	46.7	16%	15.0	5%
2.3.2	New Sanitary Sewer Main C_SE_003 (200mm PVC) - Supply & Install		lm	$300	460	$ 138,000	$ 13,800	$ 48,300	$ 200,100	37.7	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.3.3	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 92,000	$ 9,200	$ 32,200	$ 133,400	290.0	0.0	0%	27.0	9%	37.9	13%	46.7	16%	15.0	5%
	Subtotal					**$ 492,000.00**	**$ 49,200.00**	**$ 172,200.00**	**$ 713,400.00**					**$ 47,720.00**		**$ 67,090.00**		**$ 82,680.00**		**$ 26,490.00**
Section 2.4 - SubZone SE RES 301																				
2.4.1	New Sanitary Sewer Main C_SE_007 (300mm PVC) - Supply & Install	3	lm	$450	571	$ 258,000	$ 25,800	$ 90,300	$ 374,100	20.6	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.4.2	New Manhole (1200mm) - Supply & Install		each	$12,000	6	$ 70,000	$ 7,000	$ 24,500	$ 101,500	20.6	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
	Subtotal					**$ 328,000.00**	**$ 32,800.00**	**$ 114,800.00**	**$ 475,600.00**											
Section 2.5 - SubZone SE COMM 301																				
2.5.1	New Sanitary Sewer Main C_SE_005 (600mm PVC) - Supply & Install	3	lm	$900	225	$ 203,000	$ 20,300	$ 71,050	$ 294,350	265.5	38.3	14%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.5.2	New Sanitary Sewer Main C_SE_006 (600mm PVC) - Supply & Install		lm	$900	648	$ 584,000	$ 58,400	$ 204,400	$ 846,800	265.5	38.3	14%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.5.3	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 100,000	$ 10,000	$ 35,000	$ 145,000	265.5	38.3	14%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
	Subtotal					**$ 887,000.00**	**$ 88,700.00**	**$ 310,450.00**	**$ 1,286,150.00**			**$ 185,530.00**								
Section 2.6 - SubZone SE IND 301																				
2.6.1	New Sanitary Sewer Main C_SE_008 (600mm PVC) - Supply & Install	3	lm	$900	429	$ 387,000	$ 38,700	$ 135,450	$ 561,150	243.1	38.3	16%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.6.2	New Sanitary Sewer Main C_SE_009 (375mm PVC) - Supply & Install		lm	$575	599	$ 345,000	$ 34,500	$ 120,750	$ 500,250	67.9	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.6.3	New Sanitary Sewer Main C_SE_010 (600mm PVC) - Supply & Install		lm	$900	392	$ 353,000	$ 35,300	$ 123,550	$ 511,850	175.2	38.3	22%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.6.4	New Manhole (1200mm) - Supply & Install		each	$12,000	13	$ 155,000	$ 15,500	$ 54,250	$ 224,750	243.1	38.3	16%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
	Subtotal					**$ 1,240,000.00**	**$ 124,000.00**	**$ 434,000.00**	**$ 1,798,000.00**			**$ 235,650.00**								
Section 2.7 - SubZone SE IND 302																				
2.7.1	New Sanitary Sewer Main C_SE_004 (450mm PVC) - Supply & Install	3	lm	$675	175	$ 118,000	$ 11,800	$ 41,300	$ 171,100	252.3	0.0	0%	27.0	11%	37.9	15%	46.7	19%	15.0	6%
2.7.2	New Sanitary Sewer Main C_SE_011 (450mm PVC) - Supply & Install		lm	$675	440	$ 297,000	$ 29,700	$ 103,950	$ 430,650	252.3	0.0	0%	27.0	11%	37.9	15%	46.7	19%	15.0	6%
2.7.3	New Manhole (1200mm) - Supply & Install		each	$12,000	6	$ 75,000	$ 7,500	$ 26,250	$ 108,750	252.3	0.0	0%	27.0	11%	37.9	15%	46.7	19%	15.0	6%
	Subtotal					**$ 490,000.00**	**$ 49,000.00**	**$ 171,500.00**	**$ 710,500.00**					**$ 75,920.00**		**$ 106,740.00**		**$ 131,540.00**		**$ 42,140.00**
Section 2.8 - SubZone SE IND 303																				
2.8.1	New Sanitary Sewer Main C_SE_012 (450mm PVC) - Supply & Install	3	lm	$675	52	$ 36,000	$ 3,600	$ 12,600	$ 52,200	231.8	0.0	0%	27.0	12%	37.9	16%	46.7	20%	15.0	6%
2.8.2	New Sanitary Sewer Main C_SE_014 (450mm PVC) - Supply & Install		lm	$675	634	$ 429,000	$ 42,900	$ 150,150	$ 622,050	205.0	0.0	0%	27.0	13%	37.9	18%	46.7	23%	15.0	7%
2.8.3	New Manhole (1200mm) - Supply & Install		each	$12,000	7	$ 82,000	$ 8,200	$ 28,700	$ 118,900	231.8	0.0	0%	27.0	12%	37.9	16%	46.7	20%	15.0	6%
	Subtotal					**$ 547,000.00**	**$ 54,700.00**	**$ 191,450.00**	**$ 793,150.00**					**$ 89,190.00**		**$ 125,390.00**		**$ 154,530.00**		**$ 49,500.00**
Section 2.9 - SubZone SE IND 304																				
2.9.1	New Sanitary Sewer Main C_SE_015 (450mm PVC) - Supply & Install	3	lm	$675	89	$ 60,000	$ 6,000	$ 21,000	$ 87,000	172.6	0.0	0%	27.0	16%	37.9	22%	46.7	27%	15.0	9%
2.9.2	New Sanitary Sewer Main C_SE_016 (200mm PVC) - Supply & Install		lm	$300	380	$ 115,000	$ 11,500	$ 40,250	$ 166,750	24.4	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.9.3	New Sanitary Sewer Main C_SE_017 (375mm PVC) - Supply & Install		lm	$575	367	$ 212,000	$ 21,200	$ 74,200	$ 307,400	148.3	0.0	0%	27.0	18%	37.9	26%	46.7	32%	15.0	10%
2.9.4	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 96,000	$ 9,600	$ 33,600	$ 139,200	172.6	0.0	0%	27.0	16%	37.9	22%	46.7	27%	15.0	9%
	Subtotal					**$ 483,000.00**	**$ 48,300.00**	**$ 169,050.00**	**$ 700,350.00**					**$ 91,210.00**		**$ 128,230.00**		**$ 158,030.00**		**$ 50,620.00**
Section 2.10 - SubZone SE IND 305																				
2.10.1	New Sanitary Sewer Main C_SE_013 (200mm PVC) - Supply & Install	3	lm	$300	471	$ 142,000	$ 14,200	$ 49,700	$ 205,900	26.8	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.10.2	New Manhole (1200mm) - Supply & Install		each	$12,000	5	$ 60,000	$ 6,000	$ 21,000	$ 87,000	26.8	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
	Subtotal					**$ 202,000.00**	**$ 20,200.00**	**$ 70,700.00**	**$ 292,900.00**											
Section 2.11 - SubZone SE IND 306																				
2.11.1	New Sanitary Sewer Main C_SE_018 (375mm PVC) - Supply & Install	3	lm	$575	438	$ 252,000	$ 25,200	$ 88,200	$ 365,400	121.3	0.0	0%	0.0	0%	37.9	31%	46.7	39%	15.0	12%
2.11.2	New Sanitary Sewer Main C_SE_019 (375mm PVC) - Supply & Install		lm	$575	274	$ 158,000	$ 15,800	$ 55,300	$ 229,100	121.3	0.0	0%	0.0	0%	37.9	31%	46.7	39%	15.0	12%
2.11.3	New Manhole (1200mm) - Supply & Install		each	$12,000	7	$ 84,000	$ 8,400	$ 29,400	$ 121,800	121.3	0.0	0%	0.0	0%	37.9	31%	46.7	39%	15.0	12%
	Subtotal					**$ 494,000.00**	**$ 49,400.00**	**$ 172,900.00**	**$ 716,300.00**							**$ 218,790.00**		**$ 269,640.00**		**$ 86,380.00**
Section 2.12 - SubZone SE COMM U01																				
2.12.1	New Sanitary Sewer Main C_SE_021 (600mm PVC) - Supply & Install	ULT	lm	$900	403	$ 364,000	$ 36,400	$ 127,400	$ 527,800	175.2	38.3	22%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.12.2	New Sanitary Sewer Main C_SE_022 (450mm PVC) - Supply & Install		lm	$675	640	$ 433,000	$ 43,300	$ 151,550	$ 627,850	68.6	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.12.3	New Sanitary Sewer Main C_SE_023 (600mm PVC) - Supply & Install		lm	$900	411	$ 371,000	$ 37,100	$ 129,850	$ 537,950	106.6	38.3	36%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.12.4	New Manhole (1200mm) - Supply & Install		each	$12,000	13	$ 159,000	$ 15,900	$ 55,650	$ 230,550	175.2	38.3	22%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
	Subtotal					**$ 1,327,000.00**	**$ 132,700.00**	**$ 464,450.00**	**$ 1,924,150.00**			**$ 358,940.00**								
Section 2.13 - SubZone SE COMM U02																				
2.13.1	New Sanitary Sewer Main C_SE_024 (600mm PVC) - Supply & Install	ULT	lm	$900	453	$ 408,000	$ 40,800	$ 142,800	$ 591,600	106.6	38.3	36%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.13.2	New Sanitary Sewer Main C_SE_025 (450mm PVC) - Supply & Install		lm	$675	667	$ 451,000	$ 45,100	$ 157,850	$ 653,950	68.3	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.13.3	New Sanitary Sewer Main C_SE_026 (450mm PVC) - Supply & Install		lm	$675	356	$ 240,000	$ 24,000	$ 84,000	$ 348,000	38.3	38.3	100%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.13.4	New Manhole (1200mm) - Supply & Install		each	$12,000	13	$ 160,000	$ 16,000	$ 56,000	$ 232,000	106.6	38.3	36%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
	Subtotal					**$ 1,259,000.00**	**$ 125,900.00**	**$ 440,650.00**	**$ 1,825,550.00**			**$ 643,770.00**								
Section 2.14 - SubZone SE COMM U03																				
2.14.1	New Sanitary Sewer Main C_SE_027 (450mm PVC) - Supply & Install	ULT	lm	$675	160	$ 109,000	$ 10,900	$ 38,150	$ 158,050	38.3	38.3	100%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.14.2	New Sanitary Sewer Main C_SE_028 (200mm PVC) - Supply & Install		lm	$300	268	$ 81,000	$ 8,100	$ 28,350	$ 117,450	38.3	38.3	100%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.14.3	New Sanitary Sewer Main C_SE_029 (450mm PVC) - Supply & Install		lm	$675	160	$ 109,000	$ 10,900	$ 38,150	$ 158,050	38.3	38.3	100%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.14.4	New Sanitary Sewer Main C_SE_030 (450mm PVC) - Supply & Install		lm	$675	268	$ 181,000	$ 18,100	$ 63,350	$ 262,450	38.3	38.3	100%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
2.14.5	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 99,000	$ 9,900	$ 34,650	$ 143,550	38.3	38.3	100%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
	Subtotal					**$ 579,000.00**	**$ 57,900.00**	**$ 202,650.00**	**$ 839,550.00**			**$ 839,560.00**								
Section 2.15 - SubZone SE IND U01																				
2.15.1	New Sanitary Sewer Main C_SE_031 (250mm PVC) - Supply & Install	ULT	lm	$300	616	$ 185,000	$ 18,500	$ 64,750	$ 268,250	27.0	0.0	0%	27.0	100%	0.0	0%	0.0	0%	0.0	0%

City of Camrose Sanitary Sewer Assessment
Future Upgrade Cost Estimate
Section 2.0 - South East Commercial Industrial

Item	Description	Phase	Unit	Estimated Rate	Estimate Quantity	Estimated Material Cost	Engineering (10%)	Contingencies (35%)	Estimated Conceptual Cost	Total Contributing Area (Ha)	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution
												SE COMM U03		SE IND U01		SE IND U02		SE IND U03		E COMM U02
2.15.2	New Manhole (1200mm) - Supply & Install	ULT	each	$12,000	6	$ 75,000	$ 7,500	$ 26,250	$ 108,750	27.0	0.0	0%	27.0	100%	0.0	0%	0.0	0%	0.0	0%
	Subtotal					**$ 260,000**	**$ 26,000**	**$ 91,000**	**$ 377,000**					$ 377,010.00						
Section 2.16 - SubZone SE IND U02																				
2.16.1	New Sanitary Sewer Main C_SE_032 (375mm PVC) - Supply & Install	ULT	lm	$575	431	$ 248,000	$ 24,800	$ 86,800	$ 359,600	99.6	0.0	0%	0.0	0%	37.9	38%	46.7	47%	15.0	15%
2.16.2	New Sanitary Sewer Main C_SE_033 (250mm PVC) - Supply & Install		lm	$375	402	$ 151,000	$ 15,100	$ 52,850	$ 218,950	37.9	0.0	0%	0.0	0%	37.9	100%	0.0	0%	0.0	0%
2.16.3	New Sanitary Sewer Main C_SE_034 (375mm PVC) - Supply & Install		lm	$575	387	$ 223,000	$ 22,300	$ 78,050	$ 323,350	61.7	0.0	0%	0.0	0%	0.0	0%	46.7	76%	15.0	24%
2.16.4	New Manhole (1200mm) - Supply & Install		each	$12,000	11	$ 135,000	$ 13,500	$ 47,250	$ 195,750	99.6	0.0	0%	0.0	0%	37.9	38%	46.7	47%	15.0	15%
	Subtotal					**$ 757,000.00**	**$ 75,700.00**	**$ 264,950.00**	**$ 1,097,650.00**							**$ 430,330.00**		**$ 505,410.00**		**$ 161,910.00**
Section 2.17 - SubZone SE IND U03																				
2.17.1	New Sanitary Sewer Main C_SE_035 (375mm PVC) - Supply & Install	ULT	lm	$575	193	$ 111,000	$ 11,100	$ 38,850	$ 160,950	61.7	0.0	0%	0.0	0%	0.0	0%	46.7	76%	15.0	24%
2.17.2	New Sanitary Sewer Main C_SE_036 (250mm PVC) - Supply & Install		lm	$375	472	$ 177,000	$ 17,700	$ 61,950	$ 256,650	46.7	0.0	0%	0.0	0%	0.0	0%	46.7	100%	0.0	0%
2.17.3	New Sanitary Sewer Main C_SE_037 (375mm PVC) - Supply & Install		lm	$575	373	$ 215,000	$ 21,500	$ 75,250	$ 311,750	61.7	0.0	0%	0.0	0%	0.0	0%	46.7	76%	15.0	24%
2.17.4	New Sanitary Sewer Main C_SE_038 (375mm PVC) - Supply & Install		lm	$575	392	$ 226,000	$ 22,600	$ 79,100	$ 327,700	15.0	0.0	0%	0.0	0%	0.0	0%	0.0	0%	15.0	100%
2.17.5	New Manhole (1200mm) - Supply & Install		each	$12,000	13	$ 156,000	$ 15,600	$ 54,600	$ 226,200	61.7	0.0	0%	0.0	0%	0.0	0%	46.7	76%	15.0	24%
	Subtotal					**$ 885,000.00**	**$ 88,500.00**	**$ 309,750.00**	**$ 1,283,250.00**									**$ 785,980.00**		**$ 497,260.00**
	Section 2.0 - Grand Total					**$ 11,006,000**	**$ 1,100,600**	**$ 3,852,100**	**$ 15,958,700**											

Notes & Assumptions:

1 Unit prices are based on past experience, comparable tenders, and some engineering judgement.

2 Manhole quantity assumed based on 120m spacing

City of Camrose Sanitary Sewer Assessment
Future Upgrade Cost Estimate
Section 3.0 - South West Residential

Item	Description	Phase	Unit	Estimated Rate	Estimate Quantity	Estimated Material Cost	Engineering (10%)	Contingencies (35%)	Estimated Conceptual Cost	Total Contributing Area (Ha)	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution
Section 3.1 - SubZone SW RES 301												**SW RES 201**		**SW RES 301**		**SW RES 302**		**SW RES 303**
3.1.1	New Sanitary Sewer Main C_SW_003 (450mm PVC) - Supply & Install	3	lm	$675	387	$ 262,000	$ 26,200	$ 91,700	$ 379,900	132.4	0.0	0%	39.5	30%	0.0	0%	0.0	0%
3.1.2	New Manhole (1200mm) - Supply & Install		each	$12,000	4	$ 52,000	$ 5,200	$ 18,200	$ 75,400	132.4	0.0	0%	39.5	30%	0.0	0%	0.0	0%
Subtotal						**$ 314,000.00**	**$ 31,400.00**	**$ 109,900.00**	**$ 455,300.00**					**$ 135,730.00**				
Section 3.2 - SubZone SW RES 302																		
3.2.1	New Sanitary Sewer Main C_SW_004_A (600mm PVC) - Supply & Install	3	lm	$900	313	$ 282,000	$ 28,200	$ 98,700	$ 408,900	731.7	51.8	7%	39.5	5%	22.7	3%	29.3	4%
3.2.2	New Sanitary Sewer Main Rail_C_SW_004 (600mm PVC) - Supply & Install		lm	$2,000	18	$ 37,000	$ 3,700	$ 12,950	$ 53,650	731.7	51.8	7%	39.5	5%	22.7	3%	29.3	4%
3.2.3	New Sanitary Sewer Main C_SW_004_B (600mm PVC) - Supply & Install		lm	$900	70	$ 63,000	$ 6,300	$ 22,050	$ 91,350	731.7	51.8	7%	39.5	5%	22.7	3%	29.3	4%
3.2.4	New Sanitary Sewer Main Creek_C_SW_004 (600mm PVC) - Supply & Install		lm	$2,000	15	$ 30,000	$ 3,000	$ 10,500	$ 43,500	731.7	51.8	7%	39.5	5%	22.7	3%	29.3	4%
3.2.5	New Sanitary Sewer Main C_SW_004_C (600mm PVC) - Supply & Install		lm	$900	52	$ 48,000	$ 4,800	$ 16,800	$ 69,600	731.7	51.8	7%	39.5	5%	22.7	3%	29.3	4%
3.2.6	New Sanitary Sewer Main C_SW_005 (300mm PVC) - Supply & Install		lm	$450	296	$ 134,000	$ 13,400	$ 46,900	$ 194,300	22.7	0.0	0%	0.0	0%	22.7	100%	0.0	0%
3.2.7	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 101,000	$ 10,100	$ 35,350	$ 146,450	731.7	51.8	7%	39.5	5%	22.7	3%	29.3	4%
Subtotal						**$ 695,000.00**	**$ 69,500.00**	**$ 243,250.00**	**$ 1,007,750.00**			**$ 57,620.00**		**$ 43,880.00**		**$ 219,580.00**		**$ 32,620.00**
Section 3.3 - SubZone SW RES 303																		
3.3.1	New Sanitary Sewer Main C_SW_006 (600mm PVC) - Supply & Install	3	lm	$900	285	$ 257,000	$ 25,700	$ 89,950	$ 372,650	524.7	0.0	0%	0.0	0%	0.0	0%	29.3	6%
3.3.2	New Sanitary Sewer Main C_SW_007 (600mm PVC) - Supply & Install		lm	$800	521	$ 417,000	$ 41,700	$ 145,950	$ 604,650	464.2	0.0	0%	0.0	0%	0.0	0%	0.0	0%
3.3.3	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 94,000	$ 9,400	$ 32,900	$ 136,300	524.7	0.0	0%	0.0	0%	0.0	0%	29.3	6%
Subtotal						**$ 768,000.00**	**$ 76,800.00**	**$ 268,800.00**	**$ 1,113,600.00**									**$ 28,460.00**
Section 3.4 - SubZone SW RES 304																		
3.4.1	New Sanitary Sewer Main C_SW_008 (300mm PVC) - Supply & Install	3	lm	$450	767	$ 346,000	$ 34,600	$ 121,100	$ 501,700	31.2	0.0	0%	0.0	0%	0.0	0%	0.0	0%
3.4.2	New Manhole (1200mm) - Supply & Install		each	$12,000	7	$ 89,000	$ 8,900	$ 31,150	$ 129,050	31.2	0.0	0%	0.0	0%	0.0	0%	0.0	0%
Subtotal						**$ 435,000.00**	**$ 43,500.00**	**$ 152,250.00**	**$ 630,750.00**									
Section 3.5 - SubZone SW RES U01																		
3.5.1	New Sanitary Sewer Main C_SW_009 (300mm PVC) - Supply & Install	ULT	lm	$450	1,135	$ 511,000	$ 51,100	$ 178,850	$ 740,950	84.3	0.0	0%	0.0	0%	0.0	0%	0.0	0%
3.5.2	New Force Main FM_SW_001 (300mm HDPE) - Supply & Install		lm	$2,000	283	$ 567,000	$ 56,700	$ 198,450	$ 822,150	92.9	0.0	0%	0.0	0%	0.0	0%	0.0	0%
3.5.3	New Liftstation LS_SW_001 (Pump + Pumphouse) - Supply & Install		each	$2,500,000	1	$ 2,500,000	$ 250,000	$ 875,000	$ 3,625,000	92.9	0.0	0%	0.0	0%	0.0	0%	0.0	0%
3.5.4	New Manhole (1200mm) - Supply & Install		each	$12,000	12	$ 138,000	$ 13,800	$ 48,300	$ 200,100	92.9	0.0	0%	0.0	0%	0.0	0%	0.0	0%
Subtotal						**$ 3,716,000.00**	**$ 371,600.00**	**$ 1,300,600.00**	**$ 5,388,200.00**									
Section 3.6 - SubZone SW RES U02																		
3.6.1	New Sanitary Sewer Main C_SW_010 (300mm PVC) - Supply & Install	ULT	lm	$300	395	$ 119,000	$ 11,900	$ 41,650	$ 172,550	8.6	0.0	0%	0.0	0%	0.0	0%	0.0	0%
3.6.2	New Manhole (1200mm) - Supply & Install		each	$12,000	4	$ 52,000	$ 5,200	$ 18,200	$ 75,400	8.6	0.0	0%	0.0	0%	0.0	0%	0.0	0%
Subtotal						**$ 171,000.00**	**$ 17,100.00**	**$ 59,850.00**	**$ 247,950.00**									
Section 3.7 - SubZone SW RES U03																		
3.7.1	New Sanitary Sewer Main C_SW_011 (600mm PVC) - Supply & Install	ULT	lm	$900	384	$ 346,000	$ 34,600	$ 121,100	$ 501,700	464.2	0.0	0%	0.0	0%	0.0	0%	0.0	0%
3.7.2	New Sanitary Sewer Main C_SW_012 (600mm PVC) - Supply & Install		lm	$900	423	$ 381,000	$ 38,100	$ 133,350	$ 552,450	396.8	0.0	0%	0.0	0%	0.0	0%	0.0	0%
3.7.3	New Sanitary Sewer Main C_SW_013 (300mm PVC) - Supply & Install		lm	$450	757	$ 341,000	$ 34,100	$ 119,350	$ 494,450	67.4	0.0	0%	0.0	0%	0.0	0%	0.0	0%
3.7.4	New Sanitary Sewer Main C_SW_014 (450mm PVC) - Supply & Install		lm	$675	762	$ 515,000	$ 51,500	$ 180,250	$ 746,750	396.8	0.0	0%	0.0	0%	0.0	0%	0.0	0%
3.7.5	New Manhole (1200mm) - Supply & Install		each	$12,000	14	$ 170,000	$ 17,000	$ 59,500	$ 246,500	464.2	0.0	0%	0.0	0%	0.0	0%	0.0	0%
Subtotal						**$ 1,753,000.00**	**$ 175,300.00**	**$ 613,550.00**	**$ 2,541,850.00**									
Section 3.0 - Grand Total						**$ 7,852,000**	**$ 785,200**	**$ 2,748,200**	**$ 11,385,400**									

Notes & Assumptions:

1 Unit prices are based on past experience, comparable tenders, and some engineering judgement.

2 Manhole quantity assumed based on 120m spacing

City of Camrose Sanitary Sewer Assessment
Future Upgrade Cost Estimate
Section 3.0 - South West Residential

Item	Description	Phase	Unit	Estimated Rate	Estimate Quantity	Estimated Material Cost	Engineering (10%)	Contingencies (35%)	Estimated Conceptual Cost	Total Contributing Area (Ha)	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution
Section 3.1 - SubZone SW RES 301												**SW RES 304**		**SW RES U01**		**SW RES U02**		**SW RES U03**
3.1.1	New Sanitary Sewer Main C_SW_003 (450mm PVC) - Supply & Install	3	lm	$675	387	$ 262,000	$ 26,200	$ 91,700	$ 379,900	132.4	0.0	0%	84.3	64%	8.6	6%	0.0	0%
3.1.2	New Manhole (1200mm) - Supply & Install		each	$12,000	4	$ 52,000	$ 5,200	$ 18,200	$ 75,400	132.4	0.0	0%	84.3	64%	8.6	6%	0.0	0%
Subtotal						**$ 314,000.00**	**$ 31,400.00**	**$ 109,900.00**	**$ 455,300.00**					**$ 290,000.00**		**$ 29,570.00**		
Section 3.2 - SubZone SW RES 302																		
3.2.1	New Sanitary Sewer Main C_SW_004_A (600mm PVC) - Supply & Install	3	lm	$900	313	$ 282,000	$ 28,200	$ 98,700	$ 408,900	731.7	31.2	4%	84.3	12%	8.6	1%	67.4	9%
3.2.2	New Sanitary Sewer Main Rail_C_SW_004 (600mm PVC) - Supply & Install		lm	$2,000	18	$ 37,000	$ 3,700	$ 12,950	$ 53,650	731.7	31.2	4%	84.3	12%	8.6	1%	67.4	9%
3.2.3	New Sanitary Sewer Main C_SW_004_B (600mm PVC) - Supply & Install		lm	$900	70	$ 63,000	$ 6,300	$ 22,050	$ 91,350	731.7	31.2	4%	84.3	12%	8.6	1%	67.4	9%
3.2.4	New Sanitary Sewer Main Creek_C_SW_004 (600mm PVC) - Supply & Install		lm	$2,000	15	$ 30,000	$ 3,000	$ 10,500	$ 43,500	731.7	31.2	4%	84.3	12%	8.6	1%	67.4	9%
3.2.5	New Sanitary Sewer Main C_SW_004_C (600mm PVC) - Supply & Install		lm	$900	52	$ 48,000	$ 4,800	$ 16,800	$ 69,600	731.7	31.2	4%	84.3	12%	8.6	1%	67.4	9%
3.2.6	New Sanitary Sewer Main C_SW_005 (300mm PVC) - Supply & Install		lm	$450	296	$ 134,000	$ 13,400	$ 46,900	$ 194,300	22.7	0.0	0%	0.0	0%	0.0	0%	0.0	0%
3.2.7	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 101,000	$ 10,100	$ 35,350	$ 146,450	731.7	31.2	4%	84.3	12%	8.6	1%	67.4	9%
Subtotal						**$ 695,000.00**	**$ 69,500.00**	**$ 243,250.00**	**$ 1,007,750.00**			**$ 34,700.00**		**$ 93,750.00**		**$ 9,560.00**		**$ 74,960.00**
Section 3.3 - SubZone SW RES 303																		
3.3.1	New Sanitary Sewer Main C_SW_006 (600mm PVC) - Supply & Install	3	lm	$900	285	$ 257,000	$ 25,700	$ 89,950	$ 372,650	524.7	31.2	6%	0.0	0%	0.0	0%	67.4	13%
3.3.2	New Sanitary Sewer Main C_SW_007 (600mm PVC) - Supply & Install		lm	$800	521	$ 417,000	$ 41,700	$ 145,950	$ 604,650	464.2	0.0	0%	0.0	0%	0.0	0%	67.4	15%
3.3.3	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 94,000	$ 9,400	$ 32,900	$ 136,300	524.7	31.2	6%	0.0	0%	0.0	0%	67.4	13%
Subtotal						**$ 768,000.00**	**$ 76,800.00**	**$ 268,800.00**	**$ 1,113,600.00**			**$ 30,280.00**						**$ 153,220.00**
Section 3.4 - SubZone SW RES 304																		
3.4.1	New Sanitary Sewer Main C_SW_008 (300mm PVC) - Supply & Install	3	lm	$450	767	$ 346,000	$ 34,600	$ 121,100	$ 501,700	31.2	31.2	100%	0.0	0%	0.0	0%	0.0	0%
3.4.2	New Manhole (1200mm) - Supply & Install		each	$12,000	7	$ 89,000	$ 8,900	$ 31,150	$ 129,050	31.2	31.2	100%	0.0	0%	0.0	0%	0.0	0%
Subtotal						**$ 435,000.00**	**$ 43,500.00**	**$ 152,250.00**	**$ 630,750.00**			**$ 630,740.00**						
Section 3.5 - SubZone SW RES U01																		
3.5.1	New Sanitary Sewer Main C_SW_009 (300mm PVC) - Supply & Install	ULT	lm	$450	1,135	$ 511,000	$ 51,100	$ 178,850	$ 740,950	84.3	0.0	0%	84.3	100%	0.0	0%	0.0	0%
3.5.2	New Force Main FM_SW_001 (300mm HDPE) - Supply & Install		lm	$2,000	283	$ 567,000	$ 56,700	$ 198,450	$ 822,150	92.9	0.0	0%	84.3	91%	8.6	9%	0.0	0%
3.5.3	New Liftstation LS_SW_001 (Pump + Pumphouse) - Supply & Install		each	$2,500,000	1	$ 2,500,000	$ 250,000	$ 875,000	$ 3,625,000	92.9	0.0	0%	84.3	91%	8.6	9%	0.0	0%
3.5.4	New Manhole (1200mm) - Supply & Install		each	$12,000	12	$ 138,000	$ 13,800	$ 48,300	$ 200,100	92.9	0.0	0%	84.3	91%	8.6	9%	0.0	0%
Subtotal						**$ 3,716,000.00**	**$ 371,600.00**	**$ 1,300,600.00**	**$ 5,388,200.00**					**$ 4,958,190.00**		**$ 430,010.00**		
Section 3.6 - SubZone SW RES U02																		
3.6.1	New Sanitary Sewer Main C_SW_010 (300mm PVC) - Supply & Install	ULT	lm	$300	395	$ 119,000	$ 11,900	$ 41,650	$ 172,550	8.6	0.0	0%	0.0	0%	8.6	100%	0.0	0%
3.6.2	New Manhole (1200mm) - Supply & Install		each	$12,000	4	$ 52,000	$ 5,200	$ 18,200	$ 75,400	8.6	0.0	0%	0.0	0%	8.6	100%	0.0	0%
Subtotal						**$ 171,000.00**	**$ 17,100.00**	**$ 59,850.00**	**$ 247,950.00**							**$ 247,950.00**		
Section 3.7 - SubZone SW RES U03																		
3.7.1	New Sanitary Sewer Main C_SW_011 (600mm PVC) - Supply & Install	ULT	lm	$900	384	$ 346,000	$ 34,600	$ 121,100	$ 501,700	464.2	0.0	0%	0.0	0%	0.0	0%	67.4	15%
3.7.2	New Sanitary Sewer Main C_SW_012 (600mm PVC) - Supply & Install		lm	$900	423	$ 381,000	$ 38,100	$ 133,350	$ 552,450	396.8	0.0	0%	0.0	0%	0.0	0%	0.0	0%
3.7.3	New Sanitary Sewer Main C_SW_013 (300mm PVC) - Supply & Install		lm	$450	757	$ 341,000	$ 34,100	$ 119,350	$ 494,450	67.4	0.0	0%	0.0	0%	0.0	0%	67.4	100%
3.7.4	New Sanitary Sewer Main C_SW_014 (450mm PVC) - Supply & Install		lm	$675	762	$ 515,000	$ 51,500	$ 180,250	$ 746,750	396.8	0.0	0%	0.0	0%	0.0	0%	0.0	0%
3.7.5	New Manhole (1200mm) - Supply & Install		each	$12,000	14	$ 170,000	$ 17,000	$ 59,500	$ 246,500	464.2	0.0	0%	0.0	0%	0.0	0%	67.4	15%
Subtotal						**$ 1,753,000.00**	**$ 175,300.00**	**$ 613,550.00**	**$ 2,541,850.00**									**$ 603,130.00**
Section 3.0 - Grand Total						**$ 7,852,000**	**$ 785,200**	**$ 2,748,200**	**$ 11,385,400**									

Notes & Assumptions:

1 Unit prices are based on past experience, comparable tenders, and some engineering judgement.

2 Manhole quantity assumed based on 120m spacing

City of Camrose Sanitary Sewer Assessment
Future Upgrade Cost Estimate
Section 3.0 - South West Residential

Item	Description	Phase	Unit	Estimated Rate	Estimate Quantity	Estimated Material Cost	Engineering (10%)	Contingencies (35%)	Estimated Conceptual Cost	Total Contributing Area (Ha)	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution
Section 3.1 - SubZone SW RES 301												**NW RES U02**		**NW COMM U02**		**NW RES U01**
3.1.1	New Sanitary Sewer Main C_SW_003 (450mm PVC) - Supply & Install	3	lm	$675	387	$ 262,000	$ 26,200	$ 91,700	$ 379,900	132.4	0.0	0%	0.0	0%	0.0	0%
3.1.2	New Manhole (1200mm) - Supply & Install		each	$12,000	4	$ 52,000	$ 5,200	$ 18,200	$ 75,400	132.4	0.0	0%	0.0	0%	0.0	0%
Subtotal						**$ 314,000.00**	**$ 31,400.00**	**$ 109,900.00**	**$ 455,300.00**							
Section 3.2 - SubZone SW RES 302																
3.2.1	New Sanitary Sewer Main C_SW_004_A (600mm PVC) - Supply & Install	3	lm	$900	313	$ 282,000	$ 28,200	$ 98,700	$ 408,900	731.7	168.5	23%	8.6	1%	53.9	7%
3.2.2	New Sanitary Sewer Main Rail_C_SW_004 (600mm PVC) - Supply & Install		lm	$2,000	18	$ 37,000	$ 3,700	$ 12,950	$ 53,650	731.7	168.5	23%	8.6	1%	53.9	7%
3.2.3	New Sanitary Sewer Main C_SW_004_B (600mm PVC) - Supply & Install		lm	$900	70	$ 63,000	$ 6,300	$ 22,050	$ 91,350	731.7	168.5	23%	8.6	1%	53.9	7%
3.2.4	New Sanitary Sewer Main Creek_C_SW_004 (600mm PVC) - Supply & Install		lm	$2,000	15	$ 30,000	$ 3,000	$ 10,500	$ 43,500	731.7	168.5	23%	8.6	1%	53.9	7%
3.2.5	New Sanitary Sewer Main C_SW_004_C (600mm PVC) - Supply & Install		lm	$900	52	$ 48,000	$ 4,800	$ 16,800	$ 69,600	731.7	168.5	23%	8.6	1%	53.9	7%
3.2.6	New Sanitary Sewer Main C_SW_005 (300mm PVC) - Supply & Install		lm	$450	296	$ 134,000	$ 13,400	$ 46,900	$ 194,300	22.7	0.0	0%	0.0	0%	0.0	0%
3.2.7	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 101,000	$ 10,100	$ 35,350	$ 146,450	731.7	168.5	23%	8.6	1%	53.9	7%
Subtotal						**$ 695,000.00**	**$ 69,500.00**	**$ 243,250.00**	**$ 1,007,750.00**			**$ 187,290.00**		**$ 9,570.00**		**$ 59,910.00**
Section 3.3 - SubZone SW RES 303																
3.3.1	New Sanitary Sewer Main C_SW_006 (600mm PVC) - Supply & Install	3	lm	$900	285	$ 257,000	$ 25,700	$ 89,950	$ 372,650	524.7	168.5	32%	8.6	2%	53.9	10%
3.3.2	New Sanitary Sewer Main C_SW_007 (600mm PVC) - Supply & Install		lm	$800	521	$ 417,000	$ 41,700	$ 145,950	$ 604,650	464.2	168.5	36%	8.6	2%	53.9	12%
3.3.3	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 94,000	$ 9,400	$ 32,900	$ 136,300	524.7	168.5	32%	8.6	2%	53.9	10%
Subtotal						**$ 768,000.00**	**$ 76,800.00**	**$ 268,800.00**	**$ 1,113,600.00**			**$ 382,850.00**		**$ 19,550.00**		**$ 122,470.00**
Section 3.4 - SubZone SW RES 304																
3.4.1	New Sanitary Sewer Main C_SW_008 (300mm PVC) - Supply & Install	3	lm	$450	767	$ 346,000	$ 34,600	$ 121,100	$ 501,700	31.2	0.0	0%	0.0	0%	0.0	0%
3.4.2	New Manhole (1200mm) - Supply & Install		each	$12,000	7	$ 89,000	$ 8,900	$ 31,150	$ 129,050	31.2	0.0	0%	0.0	0%	0.0	0%
Subtotal						**$ 435,000.00**	**$ 43,500.00**	**$ 152,250.00**	**$ 630,750.00**							
Section 3.5 - SubZone SW RES U01																
3.5.1	New Sanitary Sewer Main C_SW_009 (300mm PVC) - Supply & Install	ULT	lm	$450	1,135	$ 511,000	$ 51,100	$ 178,850	$ 740,950	84.3	0.0	0%	0.0	0%	0.0	0%
3.5.2	New Force Main FM_SW_001 (300mm HDPE) - Supply & Install		lm	$2,000	283	$ 567,000	$ 56,700	$ 198,450	$ 822,150	92.9	0.0	0%	0.0	0%	0.0	0%
3.5.3	New Liftstation LS_SW_001 (Pump + Pumphouse) - Supply & Install		each	$2,500,000	1	$ 2,500,000	$ 250,000	$ 875,000	$ 3,625,000	92.9	0.0	0%	0.0	0%	0.0	0%
3.5.4	New Manhole (1200mm) - Supply & Install		each	$12,000	12	$ 138,000	$ 13,800	$ 48,300	$ 200,100	92.9	0.0	0%	0.0	0%	0.0	0%
Subtotal						**$ 3,716,000.00**	**$ 371,600.00**	**$ 1,300,600.00**	**$ 5,388,200.00**							
Section 3.6 - SubZone SW RES U02																
3.6.1	New Sanitary Sewer Main C_SW_010 (300mm PVC) - Supply & Install	ULT	lm	$300	395	$ 119,000	$ 11,900	$ 41,650	$ 172,550	8.6	0.0	0%	0.0	0%	0.0	0%
3.6.2	New Manhole (1200mm) - Supply & Install		each	$12,000	4	$ 52,000	$ 5,200	$ 18,200	$ 75,400	8.6	0.0	0%	0.0	0%	0.0	0%
Subtotal						**$ 171,000.00**	**$ 17,100.00**	**$ 59,850.00**	**$ 247,950.00**							
Section 3.7 - SubZone SW RES U03																
3.7.1	New Sanitary Sewer Main C_SW_011 (600mm PVC) - Supply & Install	ULT	lm	$900	384	$ 346,000	$ 34,600	$ 121,100	$ 501,700	464.2	168.5	36%	8.6	2%	53.9	12%
3.7.2	New Sanitary Sewer Main C_SW_012 (600mm PVC) - Supply & Install		lm	$900	423	$ 381,000	$ 38,100	$ 133,350	$ 552,450	396.8	168.5	42%	8.6	2%	53.9	14%
3.7.3	New Sanitary Sewer Main C_SW_013 (300mm PVC) - Supply & Install		lm	$450	757	$ 341,000	$ 34,100	$ 119,350	$ 494,450	67.4	0.0	0%	0.0	0%	0.0	0%
3.7.4	New Sanitary Sewer Main C_SW_014 (450mm PVC) - Supply & Install		lm	$675	762	$ 515,000	$ 51,500	$ 180,250	$ 746,750	396.8	168.5	42%	8.6	2%	53.9	14%
3.7.5	New Manhole (1200mm) - Supply & Install		each	$12,000	14	$ 170,000	$ 17,000	$ 59,500	$ 246,500	464.2	168.5	36%	8.6	2%	53.9	12%
Subtotal						**$ 1,753,000.00**	**$ 175,300.00**	**$ 613,550.00**	**$ 2,541,850.00**			**$ 823,220.00**		**$ 42,040.00**		**$ 263,330.00**
Section 3.0 - Grand Total						**$ 7,852,000**	**$ 785,200**	**$ 2,748,200**	**$ 11,385,400**							

Notes & Assumptions:

1 Unit prices are based on past experience, comparable tenders, and some engineering judgement.

2 Manhole quantity assumed based on 120m spacing

City of Camrose Sanitary Sewer Assessment
Future Upgrade Cost Estimate
Section 3.0 - South West Residential

Item	Description	Phase	Unit	Estimated Rate	Estimate Quantity	Estimated Material Cost	Engineering (10%)	Contingencies (35%)	Estimated Conceptual Cost	Total Contributing Area (Ha)	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution
Section 3.1 - SubZone SW RES 301												**NW COMM U01**		**NW RES U02**
3.1.1	New Sanitary Sewer Main C_SW_003 (450mm PVC) - Supply & Install	3	lm	$675	387	$ 262,000	$ 26,200	$ 91,700	$ 379,900	132.4	0.0	0%	0.0	0%
3.1.2	New Manhole (1200mm) - Supply & Install		each	$12,000	4	$ 52,000	$ 5,200	$ 18,200	$ 75,400	132.4	0.0	0%	0.0	0%
Subtotal						**$ 314,000.00**	**$ 31,400.00**	**$ 109,900.00**	**$ 455,300.00**					
Section 3.2 - SubZone SW RES 302														
3.2.1	New Sanitary Sewer Main C_SW_004_A (600mm PVC) - Supply & Install	3	lm	$900	313	$ 282,000	$ 28,200	$ 98,700	$ 408,900	731.7	89.0	12%	76.8	10%
3.2.2	New Sanitary Sewer Main Rail_C_SW_004 (600mm PVC) - Supply & Install		lm	$2,000	18	$ 37,000	$ 3,700	$ 12,950	$ 53,650	731.7	89.0	12%	76.8	10%
3.2.3	New Sanitary Sewer Main C_SW_004_B (600mm PVC) - Supply & Install		lm	$900	70	$ 63,000	$ 6,300	$ 22,050	$ 91,350	731.7	89.0	12%	76.8	10%
3.2.4	New Sanitary Sewer Main Creek_C_SW_004 (600mm PVC) - Supply & Install		lm	$2,000	15	$ 30,000	$ 3,000	$ 10,500	$ 43,500	731.7	89.0	12%	76.8	10%
3.2.5	New Sanitary Sewer Main C_SW_004_C (600mm PVC) - Supply & Install		lm	$900	52	$ 48,000	$ 4,800	$ 16,800	$ 69,600	731.7	89.0	12%	76.8	10%
3.2.6	New Sanitary Sewer Main C_SW_005 (300mm PVC) - Supply & Install		lm	$450	296	$ 134,000	$ 13,400	$ 46,900	$ 194,300	22.7	0.0	0%	0.0	0%
3.2.7	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 101,000	$ 10,100	$ 35,350	$ 146,450	731.7	89.0	12%	76.8	10%
Subtotal						**$ 695,000.00**	**$ 69,500.00**	**$ 243,250.00**	**$ 1,007,750.00**			**$ 98,930.00**		**$ 85,380.00**
Section 3.3 - SubZone SW RES 303														
3.3.1	New Sanitary Sewer Main C_SW_006 (600mm PVC) - Supply & Install	3	lm	$900	285	$ 257,000	$ 25,700	$ 89,950	$ 372,650	524.7	89.0	17%	76.8	15%
3.3.2	New Sanitary Sewer Main C_SW_007 (600mm PVC) - Supply & Install		lm	$800	521	$ 417,000	$ 41,700	$ 145,950	$ 604,650	464.2	89.0	19%	76.8	17%
3.3.3	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 94,000	$ 9,400	$ 32,900	$ 136,300	524.7	89.0	17%	76.8	15%
Subtotal						**$ 768,000.00**	**$ 76,800.00**	**$ 268,800.00**	**$ 1,113,600.00**			**$ 202,230.00**		**$ 174,530.00**
Section 3.4 - SubZone SW RES 304														
3.4.1	New Sanitary Sewer Main C_SW_008 (300mm PVC) - Supply & Install	3	lm	$450	767	$ 346,000	$ 34,600	$ 121,100	$ 501,700	31.2	0.0	0%	0.0	0%
3.4.2	New Manhole (1200mm) - Supply & Install		each	$12,000	7	$ 89,000	$ 8,900	$ 31,150	$ 129,050	31.2	0.0	0%	0.0	0%
Subtotal						**$ 435,000.00**	**$ 43,500.00**	**$ 152,250.00**	**$ 630,750.00**					
Section 3.5 - SubZone SW RES U01														
3.5.1	New Sanitary Sewer Main C_SW_009 (300mm PVC) - Supply & Install	ULT	lm	$450	1,135	$ 511,000	$ 51,100	$ 178,850	$ 740,950	84.3	0.0	0%	0.0	0%
3.5.2	New Force Main FM_SW_001 (300mm HDPE) - Supply & Install		lm	$2,000	283	$ 567,000	$ 56,700	$ 198,450	$ 822,150	92.9	0.0	0%	0.0	0%
3.5.3	New Liftstation LS_SW_001 (Pump + Pumphouse) - Supply & Install		each	$2,500,000	1	$ 2,500,000	$ 250,000	$ 875,000	$ 3,625,000	92.9	0.0	0%	0.0	0%
3.5.4	New Manhole (1200mm) - Supply & Install		each	$12,000	12	$ 138,000	$ 13,800	$ 48,300	$ 200,100	92.9	0.0	0%	0.0	0%
Subtotal						**$ 3,716,000.00**	**$ 371,600.00**	**$ 1,300,600.00**	**$ 5,388,200.00**					
Section 3.6 - SubZone SW RES U02														
3.6.1	New Sanitary Sewer Main C_SW_010 (300mm PVC) - Supply & Install	ULT	lm	$300	395	$ 119,000	$ 11,900	$ 41,650	$ 172,550	8.6	0.0	0%	0.0	0%
3.6.2	New Manhole (1200mm) - Supply & Install		each	$12,000	4	$ 52,000	$ 5,200	$ 18,200	$ 75,400	8.6	0.0	0%	0.0	0%
Subtotal						**$ 171,000.00**	**$ 17,100.00**	**$ 59,850.00**	**$ 247,950.00**					
Section 3.7 - SubZone SW RES U03														
3.7.1	New Sanitary Sewer Main C_SW_011 (600mm PVC) - Supply & Install	ULT	lm	$900	384	$ 346,000	$ 34,600	$ 121,100	$ 501,700	464.2	89.0	19%	76.8	17%
3.7.2	New Sanitary Sewer Main C_SW_012 (600mm PVC) - Supply & Install		lm	$900	423	$ 381,000	$ 38,100	$ 133,350	$ 552,450	396.8	89.0	22%	76.8	19%
3.7.3	New Sanitary Sewer Main C_SW_013 (300mm PVC) - Supply & Install		lm	$450	757	$ 341,000	$ 34,100	$ 119,350	$ 494,450	67.4	0.0	0%	0.0	0%
3.7.4	New Sanitary Sewer Main C_SW_014 (450mm PVC) - Supply & Install		lm	$675	762	$ 515,000	$ 51,500	$ 180,250	$ 746,750	396.8	89.0	22%	76.8	19%
3.7.5	New Manhole (1200mm) - Supply & Install		each	$12,000	14	$ 170,000	$ 17,000	$ 59,500	$ 246,500	464.2	89.0	19%	76.8	17%
Subtotal						**$ 1,753,000.00**	**$ 175,300.00**	**$ 613,550.00**	**$ 2,541,850.00**			**$ 434,850.00**		**$ 375,280.00**
Section 3.0 - Grand Total						**$ 7,852,000**	**$ 785,200**	**$ 2,748,200**	**$ 11,385,400**					

Notes & Assumptions:

1 Unit prices are based on past experience, comparable tenders, and some engineering judgement.

2 Manhole quantity assumed based on 120m spacing

City of Camrose Sanitary Sewer Assessment
Future Upgrade Cost Estimate
Section 4.0 - North West Residential Commercial

Item	Description	Phase	Unit	Estimated Rate	Estimate Quantity	Estimated Material Cost	Engineering (10%)	Contingencies (35%)	Estimated Conceptual Cost	Total Contributing Area (Ha)	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution
												NW COMM 101		NW RES 101		NW RES 201		NW RES 202		NW RES 203		NW COMM 201		NW RES 301		NW COMM 301		NW RES 302		NW COMM 302		NW RES U01
Section 4.1 - SubZone NW RES 101																																
4.1.1	New Sanitary Sewer Main C_NW_016 (300mm PVC) - Remove & Replace	1	lm	$1,200	671	$ 806,000	$ 80,600	$ 282,100	$ 1,168,700	17.5	0.0	0%	2.85	16%	14.6	84%	0.0	0%	0.0	0%	23.0	131%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
4.1.2	New Manhole (1200mm) - Remove & Replace		each	$12,000	5	$ 60,000	$ 6,000	$ 21,000	$ 87,000	17.5	0.0	0%	2.85	16%	14.6	84%	0.0	0%	0.0	0%	23.0	131%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
Section 4.2 - SubZone NW COMM 101															$ 204,850.89		$ 1,050,849.11														
4.2.1	New Sanitary Sewer Main C_NW_002A (250mm PVC) - Supply & Install	1	lm	$375	176	$ 66,000	$ 6,600	$ 23,100	$ 95,700	29.1	6.2	21%	0.00	0%	0.0	0%	0.0	0%	0.0	0%	23.0	79%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
4.2.2	New Manhole (1200mm) - Supply & Install		each	$12,000	3	$ 30,000	$ 3,000	$ 10,500	$ 43,500	29.1	6.2	21%	0.00	0%	0.0	0%	0.0	0%	0.0	0%	23.0	79%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
	Subtotal					**$ 96,000.00**	**$ 9,600.00**	**$ 33,600.00**	**$ 139,200.00**			$ 29,410.00										$ 109,790.00										
Section 4.3 - SubZone NW RES 201																																
4.3.1	New Sanitary Sewer Main C_NW_001 (300mm PVC) - Supply & Install	2	lm	$450	621	$ 280,000	$ 28,000	$ 98,000	$ 406,000	73.2	0.0	0%	0.00	0%	73.2	100%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
4.3.2	New Manhole (1200mm) - Supply & Install		each	$12,000	6	$ 75,000	$ 7,500	$ 26,250	$ 108,750	73.2	0.0	0%	0.00	0%	73.2	100%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
	Subtotal					**$ 355,000.00**	**$ 35,500.00**	**$ 124,250.00**	**$ 514,750.00**							$ 514,750.00																
Section 4.4 - SubZone NW RES 202																																
4.4.1	New Sanitary Sewer Main C_NW_003 (300mm PVC) - Supply & Install	2	lm	$450	150	$ 68,000	$ 6,800	$ 23,800	$ 98,600	25.7	0.0	0%	0.00	0%	0.0	0%	7.3	28%	0.0	0%	0.0	0%	0.0	0%	18.4	72%	0.0	0%	0.0	0%	0.0	0%
4.4.2	New Manhole (1200mm) - Supply & Install		each	$12,000	2	$ 28,000	$ 2,800	$ 9,800	$ 40,600	25.7	0.0	0%	0.00	0%	0.0	0%	7.3	28%	0.0	0%	0.0	0%	0.0	0%	18.4	72%	0.0	0%	0.0	0%	0.0	0%
	Subtotal					**$ 96,000.00**	**$ 9,600.00**	**$ 33,600.00**	**$ 139,200.00**								$ 39,610.00								$ 99,580.00						
Section 4.5 - SubZone NW RES 203																																
4.5.1	New Sanitary Sewer Main C_NW_004 (200mm PVC) - Supply & Install	2	lm	$300	241	$ 73,000	$ 7,300	$ 25,550	$ 105,850	14.6	0.0	0%	0.00	0%	0.0	0%	0.0	0%	14.6	100%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
4.5.2	New Manhole (1200mm) - Supply & Install		each	$12,000	3	$ 38,000	$ 3,800	$ 13,300	$ 55,100	14.6	0.0	0%	0.00	0%	0.0	0%	0.0	0%	14.6	100%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
	Subtotal					**$ 111,000.00**	**$ 11,100.00**	**$ 38,850.00**	**$ 160,950.00**											$ 160,950.00												
Section 4.6 - SubZone NW COMM 201																																
4.6.1	New Sanitary Sewer Main C_NW_002B (250mm PVC) - Supply & Install	2	lm	$375	528	$ 199,000	$ 19,900	$ 69,650	$ 288,550	23.0	0.0	0%	0.00	0%	0.0	0%	0.0	0%	0.0	0%	23.0	100%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
4.6.2	New Manhole (1200mm) - Supply & Install		each	$12,000	6	$ 66,000	$ 6,600	$ 23,100	$ 95,700	23.0	0.0	0%	0.00	0%	0.0	0%	0.0	0%	0.0	0%	23.0	100%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
	Subtotal					**$ 265,000.00**	**$ 26,500.00**	**$ 92,750.00**	**$ 384,250.00**													$ 384,250.00										
Section 4.7 - SubZone NW RES 301																																
4.7.1	New Sanitary Sewer Main C_NW_006 (250mm PVC) - Supply & Install	3	lm	$375	1,039	$ 390,000	$ 39,000	$ 136,500	$ 565,500	35.6	0.0	0%	0.00	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	35.6	100%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
4.7.2	New Manhole (1200mm) - Supply & Install		each	$12,000	10	$ 117,000	$ 11,700	$ 40,950	$ 169,650	35.6	0.0	0%	0.00	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	35.6	100%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
	Subtotal					**$ 507,000.00**	**$ 50,700.00**	**$ 177,450.00**	**$ 735,150.00**															$ 735,150.00								
Section 4.8 - SubZone NW COMM 301																																
4.8.1	New Sanitary Sewer Main C_NW_005 (300mm PVC) - Supply & Install	3	lm	$450	452	$ 204,000	$ 20,400	$ 71,400	$ 295,800	18.4	0.0	0%	0.00	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	18.4	100%	0.0	0%	0.0	0%	0.0	0%
4.8.2	New Manhole (1200mm) - Supply & Install		each	$12,000	5	$ 58,000	$ 5,800	$ 20,300	$ 84,100	18.4	0.0	0%	0.00	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	18.4	100%	0.0	0%	0.0	0%	0.0	0%
	Subtotal					**$ 262,000.00**	**$ 26,200.00**	**$ 91,700.00**	**$ 379,900.00**																	$ 379,900.00						
Section 4.9 - SubZone NW RES 302																																
4.9.1	New Sanitary Sewer Main C_NW_008 (450mm PVC) - Supply & Install	3	lm	$675	2,373	$ 1,602,000	$ 160,200	$ 560,700	$ 2,322,900	168.5	0.0	0%	0.00	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	168.5	100%	0.0	0%
4.9.2	New Forcemain FM_NW_001 (300mm HDPE) - Supply & Install		lm	$375	2,251	$ 845,000	$ 84,500	$ 295,750	$ 1,225,250	396.8	0.0	0%	0.00	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	168.5	42%	8.6	2%
4.9.3	New Liftstation LS_NW_001 (Pump + Pumphouse) - Supply & Install		each	$1,000,000	1	$ 1,000,000	$ 100,000	$ 350,000	$ 1,450,000	396.8	0.0	0%	0.00	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	168.5	42%	8.6	2%
4.9.4	New Manhole (1200mm) - Supply & Install		each	$12,000	21	$ 250,000	$ 25,000	$ 87,500	$ 362,500	396.8	0.0	0%	0.00	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	168.5	42%	8.6	2%
	Subtotal					**$ 3,697,000.00**	**$ 369,700.00**	**$ 1,293,950.00**	**$ 5,360,650.00**																				$ 3,612,780.00		$ 65,870.00	
Section 4.10 - SubZone NW COMM 302																																
4.10.1	New Sanitary Sewer Main C_NW_007 (450mm PVC) - Supply & Install	3	lm	$675	276	$ 187,000	$ 18,700	$ 65,450	$ 271,150	177.1	0.0	0%	0.00	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	168.5	95%	8.6	5%
4.10.2	New Manhole (1200mm) - Supply & Install		each	$12,000	3	$ 41,000	$ 4,100	$ 14,350	$ 59,450	177.1	0.0	0%	0.00	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	168.5	95%	8.6	5%
	Subtotal					**$ 228,000.00**	**$ 22,800.00**	**$ 79,800.00**	**$ 330,600.00**																				$ 314,540.00		$ 16,060.00	
Section 4.11 - SubZone NW RES U01																																
4.11.1	New Sanitary Sewer Main C_NW_012 (300mm PVC) - Supply & Install	ULT	lm	$450	375	$ 169,000	$ 16,900	$ 59,150	$ 245,050	53.9	0.0	0%	0.00	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	53.9	100%
4.11.2	New Sanitary Sewer Main C_NW_013 (300mm PVC) - Supply & Install		lm	$450	338	$ 153,000	$ 15,300	$ 53,550	$ 221,850	53.9	0.0	0%	0.00	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	53.9	100%
4.11.3	New Manhole (1200mm) - Supply & Install		each	$12,000	7	$ 84,000	$ 8,400	$ 29,400	$ 121,800	53.9	0.0	0%	0.00	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	53.9	100%
	Subtotal					**$ 406,000.00**	**$ 40,600.00**	**$ 142,100.00**	**$ 588,700.00**																							$ 588,700.00
Section 4.12 - SubZone NW COMM U01																																
4.12.1	New Sanitary Sewer Main C_NW_009 (600mm PVC) - Supply & Install	ULT	lm	$900	402	$ 362,000	$ 36,200	$ 126,700	$ 524,900	219.7	0.0	0%	0.00	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	53.9	25%
4.12.2	New Sanitary Sewer Main C_NW_010 (375mm PVC) - Supply & Install		lm	$575	802	$ 461,000	$ 46,100	$ 161,350	$ 668,450	89.0	0.0	0%	0.00	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
4.12.3	New Manhole (1200mm) - Supply & Install		each	$12,000	11	$ 134,000	$ 13,400	$ 46,900	$ 194,300	219.7	0.0	0%	0.00	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	53.9	25%
	Subtotal					**$ 957,000.00**	**$ 95,700.00**	**$ 334,950.00**	**$ 1,387,650.00**																							$ 176,430.00
Section 4.13 - SubZone NW RES U02																																
4.13.1	New Sanitary Sewer Main C_NW_011 (300mm PVC) - Supply & Install	ULT	lm	$450	290	$ 131,000	$ 13,100	$ 45,850	$ 189,950	76.8	0.0	0%	0.00	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
4.13.2	New Sanitary Sewer Main C_NW_014 (300mm PVC) - Supply & Install		lm	$450	330	$ 149,000	$ 14,900	$ 52,150	$ 216,050	76.8	0.0	0%	0.00	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
4.13.3	New Sanitary Sewer Main C_NW_015 (300mm PVC) - Supply & Install		lm	$450	824	$ 372,000	$ 37,200	$ 130,200	$ 539,400	76.8	0.0	0%	0.00	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
4.13.4	New Manhole (1200mm) - Supply & Install		each	$12,000	13	$ 158,000	$ 15,800	$ 55,300	$ 229,100	76.8	0.0	0%	0.00	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
	Subtotal					**$ 810,000.00**	**$ 81,000.00**	**$ 283,500.00**	**$ 1,174,500.00**																							
	Section 4.0 - Grand Total					$ 7,790,000	$ 779,000	$ 2,726,500	$ 11,295,500																							

Notes & Assumptions:

1 Unit prices are based on past experience, comparable tenders, and some engineering judgement.

2 Manhole quantity assumed based on 120m spacing

City of Camrose Sanitary Sewer Assessment
Future Upgrade Cost Estimate
Section 4.0 - North West Residential Commercial

Item	Description	Phase	Unit	Estimated Rate	Estimate Quantity	Estimated Material Cost	Engineering (10%)	Contingencies (35%)	Estimated Conceptual Cost	Total Contributing Area (Ha)	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution
												NW_COMM U01		NW RES U02
Section 4.1 - SubZone NW RES 101														
4.1.1	New Sanitary Sewer Main C_NW_016 (300mm PVC) - Remove & Replace	1	lm	$1,200	671	$ 806,000	$ 80,600	$ 282,100	$ 1,168,700	17.5	0.0	0%	0.0	0%
4.1.2	New Manhole (1200mm) - Remove & Replace		each	$12,000	5	$ 60,000	$ 6,000	$ 21,000	$ 87,000	17.5	0.0	0%	0.0	0%
Section 4.2 - SubZone NW COMM 101														
4.2.1	New Sanitary Sewer Main C_NW_002A (250mm PVC) - Supply & Install	1	lm	$375	176	$ 66,000	$ 6,600	$ 23,100	$ 95,700	29.1	0.0	0%	0.0	0%
4.2.2	New Manhole (1200mm) - Supply & Install		each	$12,000	3	$ 30,000	$ 3,000	$ 10,500	$ 43,500	29.1	0.0	0%	0.0	0%
	Subtotal					**$ 96,000.00**	**$ 9,600.00**	**$ 33,600.00**	**$ 139,200.00**					
Section 4.3 - SubZone NW RES 201														
4.3.1	New Sanitary Sewer Main C_NW_001 (300mm PVC) - Supply & Install	2	lm	$450	621	$ 280,000	$ 28,000	$ 98,000	$ 406,000	73.2	0.0	0%	0.0	0%
4.3.2	New Manhole (1200mm) - Supply & Install		each	$12,000	6	$ 75,000	$ 7,500	$ 26,250	$ 108,750	73.2	0.0	0%	0.0	0%
	Subtotal					**$ 355,000.00**	**$ 35,500.00**	**$ 124,250.00**	**$ 514,750.00**					
Section 4.4 - SubZone NW RES 202														
4.4.1	New Sanitary Sewer Main C_NW_003 (300mm PVC) - Supply & Install	2	lm	$450	150	$ 68,000	$ 6,800	$ 23,800	$ 98,600	25.7	0.0	0%	0.0	0%
4.4.2	New Manhole (1200mm) - Supply & Install		each	$12,000	2	$ 28,000	$ 2,800	$ 9,800	$ 40,600	25.7	0.0	0%	0.0	0%
	Subtotal					**$ 96,000.00**	**$ 9,600.00**	**$ 33,600.00**	**$ 139,200.00**					
Section 4.5 - SubZone NW RES 203														
4.5.1	New Sanitary Sewer Main C_NW_004 (200mm PVC) - Supply & Install	2	lm	$300	241	$ 73,000	$ 7,300	$ 25,550	$ 105,850	14.6	0.0	0%	0.0	0%
4.5.2	New Manhole (1200mm) - Supply & Install		each	$12,000	3	$ 38,000	$ 3,800	$ 13,300	$ 55,100	14.6	0.0	0%	0.0	0%
	Subtotal					**$ 111,000.00**	**$ 11,100.00**	**$ 38,850.00**	**$ 160,950.00**					
Section 4.6 - SubZone NW COMM 201														
4.6.1	New Sanitary Sewer Main C_NW_002B (250mm PVC) - Supply & Install	2	lm	$375	528	$ 199,000	$ 19,900	$ 69,650	$ 288,550	23.0	0.0	0%	0.0	0%
4.6.2	New Manhole (1200mm) - Supply & Install		each	$12,000	6	$ 66,000	$ 6,600	$ 23,100	$ 95,700	23.0	0.0	0%	0.0	0%
	Subtotal					**$ 265,000.00**	**$ 26,500.00**	**$ 92,750.00**	**$ 384,250.00**					
Section 4.7 - SubZone NW RES 301														
4.7.1	New Sanitary Sewer Main C_NW_006 (250mm PVC) - Supply & Install	3	lm	$375	1,039	$ 390,000	$ 39,000	$ 136,500	$ 565,500	35.6	0.0	0%	0.0	0%
4.7.2	New Manhole (1200mm) - Supply & Install		each	$12,000	10	$ 117,000	$ 11,700	$ 40,950	$ 169,650	35.6	0.0	0%	0.0	0%
	Subtotal					**$ 507,000.00**	**$ 50,700.00**	**$ 177,450.00**	**$ 735,150.00**					
Section 4.8 - SubZone NW COMM 301														
4.8.1	New Sanitary Sewer Main C_NW_005 (300mm PVC) - Supply & Install	3	lm	$450	452	$ 204,000	$ 20,400	$ 71,400	$ 295,800	18.4	0.0	0%	0.0	0%
4.8.2	New Manhole (1200mm) - Supply & Install		each	$12,000	5	$ 58,000	$ 5,800	$ 20,300	$ 84,100	18.4	0.0	0%	0.0	0%
	Subtotal					**$ 262,000.00**	**$ 26,200.00**	**$ 91,700.00**	**$ 379,900.00**					
Section 4.9 - SubZone NW RES 302														
4.9.1	New Sanitary Sewer Main C_NW_008 (450mm PVC) - Supply & Install	3	lm	$675	2,373	$ 1,602,000	$ 160,200	$ 560,700	$ 2,322,900	168.5	0.0	0%	0.0	0%
4.9.2	New Forcemain FM_NW_001 (300mm HDPE) - Supply & Install		lm	$375	2,251	$ 845,000	$ 84,500	$ 295,750	$ 1,225,250	396.8	89.0	22%	76.8	19%
4.9.3	New Liftstation LS_NW_001 (Pump + Pumphouse) - Supply & Install		each	$1,000,000	1	$ 1,000,000	$ 100,000	$ 350,000	$ 1,450,000	396.8	89.0	22%	76.8	19%
4.9.4	New Manhole (1200mm) - Supply & Install		each	$12,000	21	$ 250,000	$ 25,000	$ 87,500	$ 362,500	396.8	89.0	22%	76.8	19%
	Subtotal					**$ 3,697,000.00**	**$ 369,700.00**	**$ 1,293,950.00**	**$ 5,360,650.00**			**$ 681,350.00**		**$ 588,020.00**
Section 4.10 - SubZone NW COMM 302														
4.10.1	New Sanitary Sewer Main C_NW_007 (450mm PVC) - Supply & Install	3	lm	$675	276	$ 187,000	$ 18,700	$ 65,450	$ 271,150	177.1	0.0	0%	0.0	0%
4.10.2	New Manhole (1200mm) - Supply & Install		each	$12,000	3	$ 41,000	$ 4,100	$ 14,350	$ 59,450	177.1	0.0	0%	0.0	0%
	Subtotal					**$ 228,000.00**	**$ 22,800.00**	**$ 79,800.00**	**$ 330,600.00**					
Section 4.11 - SubZone NW RES U01														
4.11.1	New Sanitary Sewer Main C_NW_012 (300mm PVC) - Supply & Install	ULT	lm	$450	375	$ 169,000	$ 16,900	$ 59,150	$ 245,050	53.9	0.0	0%	0.0	0%
4.11.2	New Sanitary Sewer Main C_NW_013 (300mm PVC) - Supply & Install		lm	$450	338	$ 153,000	$ 15,300	$ 53,550	$ 221,850	53.9	0.0	0%	0.0	0%
4.11.3	New Manhole (1200mm) - Supply & Install		each	$12,000	7	$ 84,000	$ 8,400	$ 29,400	$ 121,800	53.9	0.0	0%	0.0	0%
	Subtotal					**$ 406,000.00**	**$ 40,600.00**	**$ 142,100.00**	**$ 588,700.00**					
Section 4.12 - SubZone NW COMM U01														
4.12.1	New Sanitary Sewer Main C_NW_009 (600mm PVC) - Supply & Install	ULT	lm	$900	402	$ 362,000	$ 36,200	$ 126,700	$ 524,900	219.7	89.0	41%	76.8	35%
4.12.2	New Sanitary Sewer Main C_NW_010 (375mm PVC) - Supply & Install		lm	$575	802	$ 461,000	$ 46,100	$ 161,350	$ 668,450	89.0	89.0	100%	0.0	0%
4.12.3	New Manhole (1200mm) - Supply & Install		each	$12,000	11	$ 134,000	$ 13,400	$ 46,900	$ 194,300	219.7	89.0	41%	76.8	35%
	Subtotal					**$ 957,000.00**	**$ 95,700.00**	**$ 334,950.00**	**$ 1,387,650.00**			**$ 959,790.00**		**$ 251,430.00**
Section 4.13 - SubZone NW RES U02														
4.13.1	New Sanitary Sewer Main C_NW_011 (300mm PVC) - Supply & Install	ULT	lm	$450	290	$ 131,000	$ 13,100	$ 45,850	$ 189,950	76.8	0.0	0%	76.8	100%
4.13.2	New Sanitary Sewer Main C_NW_014 (300mm PVC) - Supply & Install		lm	$450	330	$ 149,000	$ 14,900	$ 52,150	$ 216,050	76.8	0.0	0%	76.8	100%
4.13.3	New Sanitary Sewer Main C_NW_015 (300mm PVC) - Supply & Install		lm	$450	824	$ 372,000	$ 37,200	$ 130,200	$ 539,400	76.8	0.0	0%	76.8	100%
4.13.4	New Manhole (1200mm) - Supply & Install		each	$12,000	13	$ 158,000	$ 15,800	$ 55,300	$ 229,100	76.8	0.0	0%	76.8	100%
	Subtotal					**$ 810,000.00**	**$ 81,000.00**	**$ 283,500.00**	**$ 1,174,500.00**					**$ 1,174,500.00**
	Section 4.0 - Grand Total					**$ 7,790,000**	**$ 779,000**	**$ 2,726,500**	**$ 11,295,500**					

Notes & Assumptions:

1 Unit prices are based on past experience, comparable tenders, and some engineering judgement.

2 Manhole quantity assumed based on 120m spacing

City of Camrose Sanitary Sewer Assessment
Future Upgrade Cost Estimate
Section 5.0 - North Residential

Item	Description	Phase	Unit	Estimated Rate	Estimate Quantity	Estimated Material Cost	Engineering (10%)	Contingencies (35%)	Estimated Conceptual Cost	Total Contributing Area (Ha)	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution
												N RES 301		N RES 302		N RES 303		N RES 304		N RES U01		N RES U02
Section 5.1 - SubZone N RES 301																						
5.1.1	New Sanitary Sewer Main C_N_001 (250mm PVC) - Supply & Install	3	lm	$375	689	$ 259,000	$ 25,900	$ 90,650	$ 375,550	72.2	72.2	100%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
5.1.2	New Manhole (1200mm) - Supply & Install		each	$12,000	7	$ 82,000	$ 8,200	$ 28,700	$ 118,900	72.2	72.2	100%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	0.0	0%
	Subtotal					**$ 341,000.00**	**$ 34,100.00**	**$ 119,350.00**	**$ 494,450.00**			**$ 494,450.00**										
Section 5.2 - SubZone N RES 302																						
5.2.1	New Sanitary Sewer Main C_N_005 (450mm PVC) - Supply & Install	3	lm	$800	364	$ 292,000	$ 29,200	$ 102,200	$ 423,400	127.4	0.0	0%	16.6	13%	0.0	0%	0.0	0%	0.0	0%	110.9	87%
5.2.2	New Sanitary Sewer Main C_N_002 (600mm PVC) - Supply & Install		lm	$800	234	$ 188,000	$ 18,800	$ 65,800	$ 272,600	166.1	0.0	0%	16.6	10%	0.0	0%	30.4	18%	8.3	5%	110.9	67%
5.2.3	New Manhole (1200mm) - Supply & Install		each	$12,000	3	$ 38,000	$ 3,800	$ 13,300	$ 55,100	166.1	0.0	0%	16.6	10%	0.0	0%	30.4	18%	8.3	5%	110.9	67%
5.2.3	New Manhole (1500mm) - Supply & Install		each	$20,000	1	$ 20,000	$ 2,000	$ 7,000	$ 29,000	166.1	0.0	0%	16.6	10%	0.0	0%	30.4	18%	8.3	5%	110.9	67%
	Subtotal					**$ 538,000.00**	**$ 53,800.00**	**$ 188,300.00**	**$ 780,100.00**					**$ 90,680.00**				**$ 65,300.00**		**$ 17,770.00**		**$ 606,350.00**
Section 5.3 - SubZone N RES 303																						
5.3.1	New Sanitary Sewer Main C_N_000 (450mm PVC) - Supply & Install	3	lm	$675	218	$ 148,000	$ 14,800	$ 51,800	$ 214,600	42.7	0.0	0%	0.0	0%	42.7	100%	0.0	0%	0.0	0%	0.0	0%
5.3.1	New Sanitary Sewer Main C_N_006 (375mm PVC) - Supply & Install		lm	$575	782	$ 450,000	$ 45,000	$ 157,500	$ 652,500	42.7	0.0	0%	0.0	0%	42.7	100%	0.0	0%	0.0	0%	0.0	0%
5.3.2	New Sanitary Sewer Main C_N_007 (300mm PVC) - Supply & Install		lm	$450	30	$ 14,000	$ 1,400	$ 4,900	$ 20,300	42.7	0.0	0%	0.0	0%	42.7	100%	0.0	0%	0.0	0%	0.0	0%
5.3.3	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 94,000	$ 9,400	$ 32,900	$ 136,300	42.7	0.0	0%	0.0	0%	42.7	100%	0.0	0%	0.0	0%	0.0	0%
	Subtotal					**$ 706,000.00**	**$ 70,600.00**	**$ 247,100.00**	**$ 1,023,700.00**							**$ 1,023,700.00**						
Section 5.4 - SubZone N RES 304																						
5.4.1	New Sanitary Sewer Main C_N_003A (300mm PVC) - Supply & Install	3	lm	$450	167	$ 76,000	$ 7,600	$ 26,600	$ 110,200	38.7	0.0	0%	0.0	0%	0.0	0%	30.4	79%	8.3	21%	0.0	0%
5.4.2	New Sanitary Sewer Main Creek_C_N_003 (300mm PVC) - Supply & Install		lm	$2,000	54	$ 108,000	$ 10,800	$ 37,800	$ 156,600	38.7	0.0	0%	0.0	0%	0.0	0%	30.4	79%	8.3	21%	0.0	0%
5.4.3	New Sanitary Sewer Main C_N_003B (300mm PVC) - Supply & Install		lm	$450	234	$ 106,000	$ 10,600	$ 37,100	$ 153,700	38.7	0.0	0%	0.0	0%	0.0	0%	30.4	79%	8.3	21%	0.0	0%
5.4.4	New Sanitary Sewer Main C_N_004 (250mm PVC) - Supply & Install		lm	$375	253	$ 96,000	$ 9,600	$ 33,600	$ 139,200	30.4	0.0	0%	0.0	0%	0.0	0%	30.4	100%	0.0	0%	0.0	0%
5.4.5	New Manhole (1200mm) - Supply & Install		each	$12,000	8	$ 96,000	$ 9,600	$ 33,600	$ 139,200	38.7	0.0	0%	0.0	0%	0.0	0%	30.4	79%	8.3	21%	0.0	0%
	Subtotal					**$ 482,000.00**	**$ 48,200.00**	**$ 168,700.00**	**$ 698,900.00**									**$ 579,170.00**		**$ 119,730.00**		
Section 5.5 - SubZone N RES U01																						
5.5.1	New Sanitary Sewer Main C_N_009 (250mm PVC) - Supply & Install	ULT	lm	$375	86	$ 33,000	$ 3,300	$ 11,550	$ 47,850	8.3	0.0	0%	0.0	0%	0.0	0%	0.0	0%	8.3	100%	0.0	0%
5.5.2	New Manhole (1200mm) - Supply & Install		each	$12,000	2	$ 22,000	$ 2,200	$ 7,700	$ 31,900	8.3	0.0	0%	0.0	0%	0.0	0%	0.0	0%	8.3	100%	0.0	0%
	Subtotal					**$ 55,000.00**	**$ 5,500.00**	**$ 19,250.00**	**$ 79,750.00**											**$ 79,750.00**		
Section 5.6 - SubZone N RES U02																						
5.6.1	New Sanitary Sewer Main C_N_008 (375mm PVC) - Supply & Install	ULT	lm	$575	86	$ 50,000	$ 5,000	$ 17,500	$ 72,500	110.9	0.0	0	0.0	0%	0.0	0%	0.0	0%	0.0	0	110.9	100%
5.6.2	New Manhole (1200mm) - Supply & Install		each	$12,000	2	$ 22,000	$ 2,200	$ 7,700	$ 31,900	110.9	0.0	0	0.0	0%	0.0	0%	0.0	0%	0.0	0	110.9	100%
	Subtotal					**$ 72,000.00**	**$ 7,200.00**	**$ 25,200.00**	**$ 104,400.00**													**$ 104,400.00**
	Section 5.0 - Grand Total					**$ 2,194,000**	**$ 219,400**	**$ 767,900**	**$ 3,181,300**													

Notes & Assumptions:

1 Unit prices are based on past experience, comparable tenders, and some engineering judgement.

2 Manhole quantity assumed based on 120m spacing

City of Camrose Sanitary Sewer Assessment
Future Upgrade Cost Estimate
Section 6.0 - Sanitary Trunk Upgrade

Item	Description	Phase	Unit	Estimated Rate	Estimate Quantity	Estimated Material Cost	Engineering (10%)	Contingencies (35%)	Estimated Conceptual Cost	Total Contributing Area (Ha)	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution	Subzone Area (Ha)	Subzone Percent Contribution
												N RES 301		N RES 302		N RES 303		N RES 304		N RES U01		N RES U02		EXISTING
Section 6.1 - Upstream of Camrose Visitor Information Centre																								
6.1.1	New Sanitary Sewer Main (750mm PVC) - Remove & Replace	3	lm	$3,000	1,622	$ 4,866,000	$ 486,600	$ 1,703,100	$ 7,055,700	604.5	72.2	12%	16.6	3%	42.7	7%	30.4	5%	8.3	1%	110.9	18%	323.4	53%
6.1.2	New Manhole (1800mm) - Remove & Replace		each	$35,000	15	$ 525,000	$ 52,500	$ 183,750	$ 761,250	604.5	72.2	12%	16.6	3%	42.7	7%	30.4	5%	8.3	1%	110.9	18%	323.4	53%
Subtotal						**$ 5,391,000.00**	**$ 539,100.00**	**$ 1,886,850.00**	**$ 7,816,950.00**			**$ 934,250.00**		**$ 214,410.00**		**$ 552,360.00**		**$ 393,290.00**		**$ 107,020.00**		**$ 1,433,680.00**		**$ 4,181,930.00**
Section 6.2 - Downstream of Camrose Visitor Information Centre																								
6.2.1	New Sanitary Sewer Main (750mm PVC) - Remove & Replace	3	lm	$3,000	586	$ 1,759,000	$ 175,900	$ 615,650	$ 2,550,550	812.7	72.2	9%	16.6	2%	42.7	5%	30.4	4%	8.3	1%	110.9	14%	531.6	65%
6.2.2	New Manhole (1800mm) - Remove & Replace		each	$35,000	8	$ 280,000	$ 28,000	$ 98,000	$ 406,000	812.7	72.2	9%	16.6	2%	42.7	5%	30.4	4%	8.3	1%	110.9	14%	531.6	65%
Subtotal						**$ 2,039,000.00**	**$ 203,900.00**	**$ 713,650.00**	**$ 2,956,550.00**			**$ 262,810.00**		**$ 60,320.00**		**$ 155,380.00**		**$ 110,640.00**		**$ 30,110.00**		**$ 403,310.00**		**$ 1,933,980.00**
Section 6.0 - Grand Total						$ 7,430,000	$ 743,000	$ 2,600,500	$ 10,773,500															

Notes & Assumptions:

1 Unit prices are based on past experience, comparable tenders, and some engineering judgement.

2 Manhole quantity assumed based on 120m spacing

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McElhanney

CANADA BEST MANAGED COMPANIES