ENGLOBE

August 26th, 2025

Municipality of East Hants
15 Commerce Court
Elmsdale, NS B2S 3K5
Attention: Rachel Gilbert, MCIP, LPP

Subject: **Lantz Secondary Planning Strategy**
Municipal Servicing Memorandum (Final)
Englobe reference: 2400537.000

1 Introduction

This Municipal Servicing Memorandum has been prepared in support of the development of a **Secondary Planning Strategy** for the area northwest of the new Lantz Interchange on Highway 102, located within the Municipality of East Hants (East Hants). The subject lands are currently **undeveloped** and lie **outside the existing municipal servicing boundary**, though they are identified for future urban expansion in the East Hants Municipal Planning Strategy and the 2021 Strategic Plan.

The recent completion of the **Lantz Interchange on Highway 102** has significantly improved access to the area, making it a strategic location for accommodating future residential and commercial growth. The Municipality has recognized the need to proactively plan for this growth through a comprehensive secondary planning process, of which this servicing report forms a foundational component.

A **conceptual road network and land use plan** has been prepared as part of the Secondary Planning Strategy process, and submitted to the client separately. This plan forms the basis of the servicing evaluation, providing a framework for identifying logical phasing, estimating infrastructure demand, and aligning servicing strategies with proposed land uses and transportation corridors.

The purpose of this memo is to:

- Summarize our review of the provided background documentation and clearly state assumptions taken from each relevant document focusing on the following:
  - Review of the existing service capacity of the Regional Wastewater Treatment Plant (**WWTP**) in Lantz;
  - Review of the capacity and withdrawal permits of the Regional Water Treatment Facility (**WTP**) in Enfield;
- Provide recommendations for a development build out that includes considerations for the water and wastewater loadings on the existing system;
- Identify **servicing constraints and opportunities**, including the need for a **single utility crossing of Highway 102** to connect to existing infrastructure;
- Estimate water demand (Total Annual, 3-day average maximum, 30-day average volume) and wastewater generated for each of the proposed phases.

- Investigate stormwater management needs and options, and propose potential location for municipal operated stormwater management ponds/ features.
- Recommend additional investigations and studies.

This memo is informed by a review of relevant background documents provided by the Municipality as discussed in detail in Section 2.

It is important to note that **no detailed hydraulic or servicing modeling was completed** as part of this investigation. The findings and recommendations presented are based on a high-level review of available background information, conceptual planning inputs, and professional judgment. Further technical studies, including modeling and detailed design, will be required at subsequent planning and development stages.

2 Background Document Review

This section documents the background reports, memos and information provided by East Hants to complete the servicing evaluation and further details what data was referenced in each report.

2.1 Enfield Water Treatment Plant

Englobe undertook a review of the documentation, correspondence, and data sets, provided by the East Hants, listed below to evaluate the current rated capacity of the Enfield Water Treatment Plant (WTP):

- East Hants Regional Water Treatment Plant (WTP) Upgrade - Technical Memorandum – prepared by Dillon Consulting Ltd. (November 2021);
- Email from Mr. Dwayne Lightle summarising design and operational capacities;
- Regional Water Output - Yearly, Monthly Excel (data up to March 2025).

Table 1 presents key quantitative inputs from the *Dillon Consulting Memo (November 2021),* the primary use for this memo, and assumptions/ limitations.

Table 1 - Key Data inputs and assumptions applied in the Enfield WTP Capacity Assessment from Dillon Consulting Memo

Key points pulled into the memo	Primary use	Limitations and Key Assumptions
<u>WTP Treatment Capacities:</u> ○ WTP capacity (2021) = 3,820 m³/day ○ **WTP Post Phase 4 upgrade capacity = 7,090 m³/day**	Sets the WTP design capacity to 7,090m³/day (note that this capacity was confirmed by Dwayne's email below).	Assumes phase 4 is implemented exactly as described and no regulatory changes.

Key points pulled into the memo	Primary use	Limitations and Key Assumptions
Withdrawal Limitations (NSE Approval) ○ 6,000 m^3/day, averaged over any consecutive three day period. i.e. 18000 m^3 ○ 4,770 m^3 /day, averaged over any consecutive 30 day period. i.e. 143 100 m^3	Used as max 3-day and average 30-day benchmark.	Assumes that the withdrawal permit remains consistent.
Unit Rates: SCADA data identified 376L/cap/day for withdrawal.	376L/cap/day was used to determine all future water demands for residential developments.	This assumes that the withdrawal rate remains constant. The HW Guideline specifies 375L/cap/day as the standard for water consumption.
Maximum Day Peaking Factor : A maximum day peaking factor of 1.9 was recommended	This value was compared to a peaking factor of 2.0, which is commonly applied to municipalities of this size. A peaking factor of **2.0** was used for this analysis.	Assumes a more conservative peaking factor than what was proposed.

Table 2 presents the operator-reported flow capacities from *Mr. Lightle's April 10th, 2025* email, converted from U.S. gpm to cubic metres per day (m^3/day).

Table 2 - Operator Reported Treatment and Conveyance Capacities (Lightle Email, April 10th, 2025)

Scenario / subsystem	Quoted flow (US gpm)	Approximate flow (m^3/ day)	Notes
Dissolved-air flotation (DAF) units	1,200	≈ 6,540	Normal operation of the two DAF filters
Two small slow-sand (ST) plants	500	≈ 2,730	Supplementary treatment capacity
Total physical treatment (DAF + ST)	1,700	≈ 9,270	
Firm Treatment Capacity "NSE Requirement"	1,400	≈ 7 630	Removes the largest 300 gpm filter from service, as required by NSE

Scenario / subsystem	Quoted flow (US gpm)	Approximate flow (m³/ day)	Notes
Realistic net output @ ~90 % efficiency	1,250 - 1,300	≈ 6,810 - 7,090	90% of Max Capacity 'NSE Requirement"
Distribution pumping limit	750	≈ 4,090	Limitation of the Distribution Pumps

In brief:

- **Full WTP capacity**—with both DAF units and the two slow-sand filters running—treatment approaches **9,300 m³/day**.
- **Regulatory (firm) capacity** falls to approximately **7,630 m³/day** once the “largest-filter-out” rule required by Nova Scotia Environment (NSE) is applied.
- Allowing for a typical **90% operational efficiency**, the **sustained output** realistically lies between **≈ 6,800 and 7,100 m³/day.**

Figure 1 illustrates the monthly average raw-water withdrawal recorded at the Enfield WTP between January 2024 and March 2025, as exported from the plant SCADA system and summarised in the *Regional Water Output - Yearly/Monthly* workbook. Each coloured bar represents the mean of daily withdrawals for the indicated month, expressed in cubic metres per day. Over the fourteen-month period, demand clustered around **3,000 - 4,500 m³/day,** with an average monthly peak withdrawal occurring in February 2024 of roughly **3,750m³/day**. Peak data shows about **1,000m³/day** (20%) withdrawal capacity remains under the NSE 30-day rolling limit of 4,770m³/day.

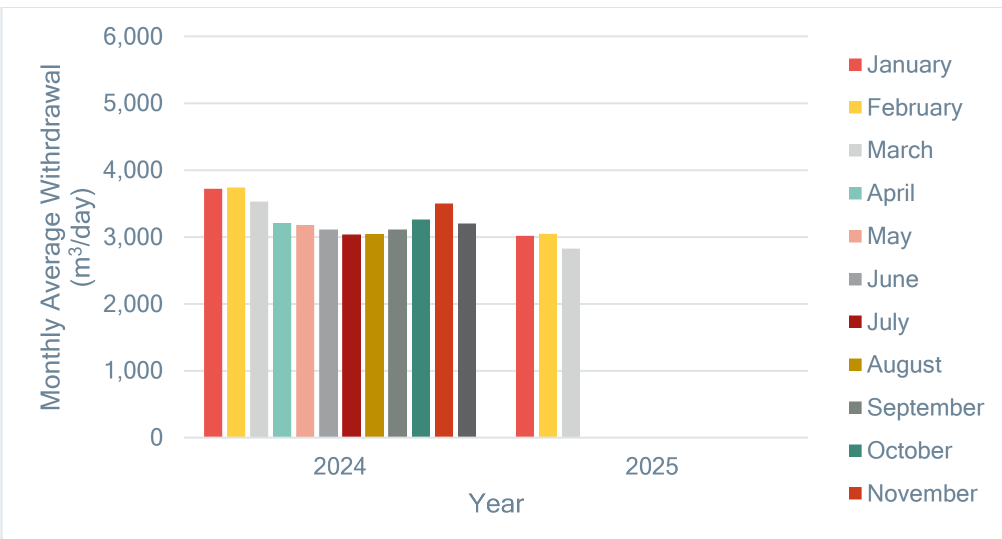


Figure 1 - Monthly Average Water Withdrawal, Enfield WTP (January 2024 to March 2025)

Figure 2 plots the *maximum* daily raw-water withdrawal recorded in each month, based on SCADA exports from the *Regional Water Output - Yearly/Monthly* dataset. Monthly maxima during 2024 varied between roughly **3,500 m³/day** (August) and **4,900 m³/day** (September - October), remaining approximately 20% below the NSE three-day licence limit of **6,000 m³ day.** This assumes peak flow lasted three consecutive days, which is unlikely and conservative.

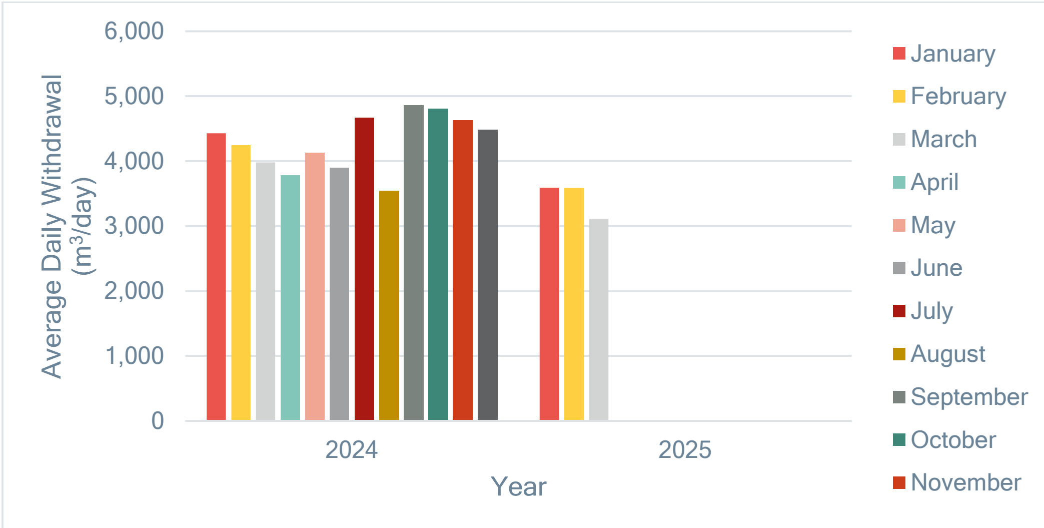


Figure 2 – Maximum Daily Raw-Water Withdrawal, Enfield WTP (January 2024 - March 2025)

Based on the data summarized above, **Table 3** shows the estimated remaining capacities according to current consumption and WTP limits.

Table 3 - Remaining Treatment and Withdrawal Capacity at Enfield WTP Relative to Peak-Month Demand (February 2024)

Description	Limit (m^3/day)	Peak Monthly Average Withdrawal - February 2024 (m^3/day)	Remaining Capacity (m^3/day)
Full WTP Capacity	9,300	3,750	5,550
Regulatory (firm) capacity	7,630	3,750	3,880
Realistic output (90% Efficient)	6,900	3,750	3,150
Withdrawal Limit (Monthly Rolling)	4,770	3,750	1,020

For this memo, Englobe will assess the WTP's ability to meet water demands using the current average monthly withdrawal limit of **4,770 m³/day**, the maximum 3-day withdrawal limit of **6,000 m³/day**, and the regulatory (firm) capacity of **7,630 m³/day**.

2.2 Lantz Regional Wastewater Treatment Plant (WWTP)

Englobe reviewed the single background document supplied by the Municipality of East Hants to establish the existing capacity of the Lantz Regional Wastewater Treatment Plant (WWTP):

- Regional Wastewater Treatment Plant – Optimization Study, Final Report – prepared by Dillon Consulting Ltd., (April, 2022)

No supplementary e-mails, SCADA downloads or hydraulic models were provided for the wastewater system, therefore all quantitative inputs have been drawn from this report.

Table 4 presents key quantitative inputs from the *Dillon Optimization Study (April 2022),* the primary use for this memo, and assumptions/ limitations.

Table 4 - Key Data inputs and assumptions applied in the Enfield WTP Capacity Assessment from Dillon Consulting Memo

Key points pulled into the memo	Primary use	Limitations and Key Assumptions
WWTP Treatment Capacities: WWTP capacity (2022) = 5,200 m^3/d	Sets the WWTP design capacity to **5,200 m^3/day**	Assumes that the WWTP capacity has remained consistent and no upgrades have been undertaken.
Annual Average Daily Flow Ranged from 4,111m^3/day to 5,026m^3/day from 2012 to 2020 with a mean annual average daily flow of 4,465m^3/day.	Used an average daily flow of **4,465 m^3/day** as the current baseline to compare new flows against the WWTP's capacity.	Assumes no change in Annual Average Daily Flow from 2020 to 2025.
Unit Rates: Future design flows were calculated using 340L/cap/day	340L/cap/day was used to determine all wastewater flows for residential developments.	This amount is marginally below the ACWWA guidelines of 380L/cap/day, but it is based on actual data to support the assumption.

In summary, the *Dillon Optimization Study (April 2022)* indicates that the Lantz Regional WWTP can reliably treat **≈ 5,200 m^3/day** under current aeration and lagoon geometry. Historical records (2012-2020) show a long-term **average-day flow of 4,465 m^3 /day**, leaving a **residual margin of only 735 m^3/day (14 %) remaining in capacity**.

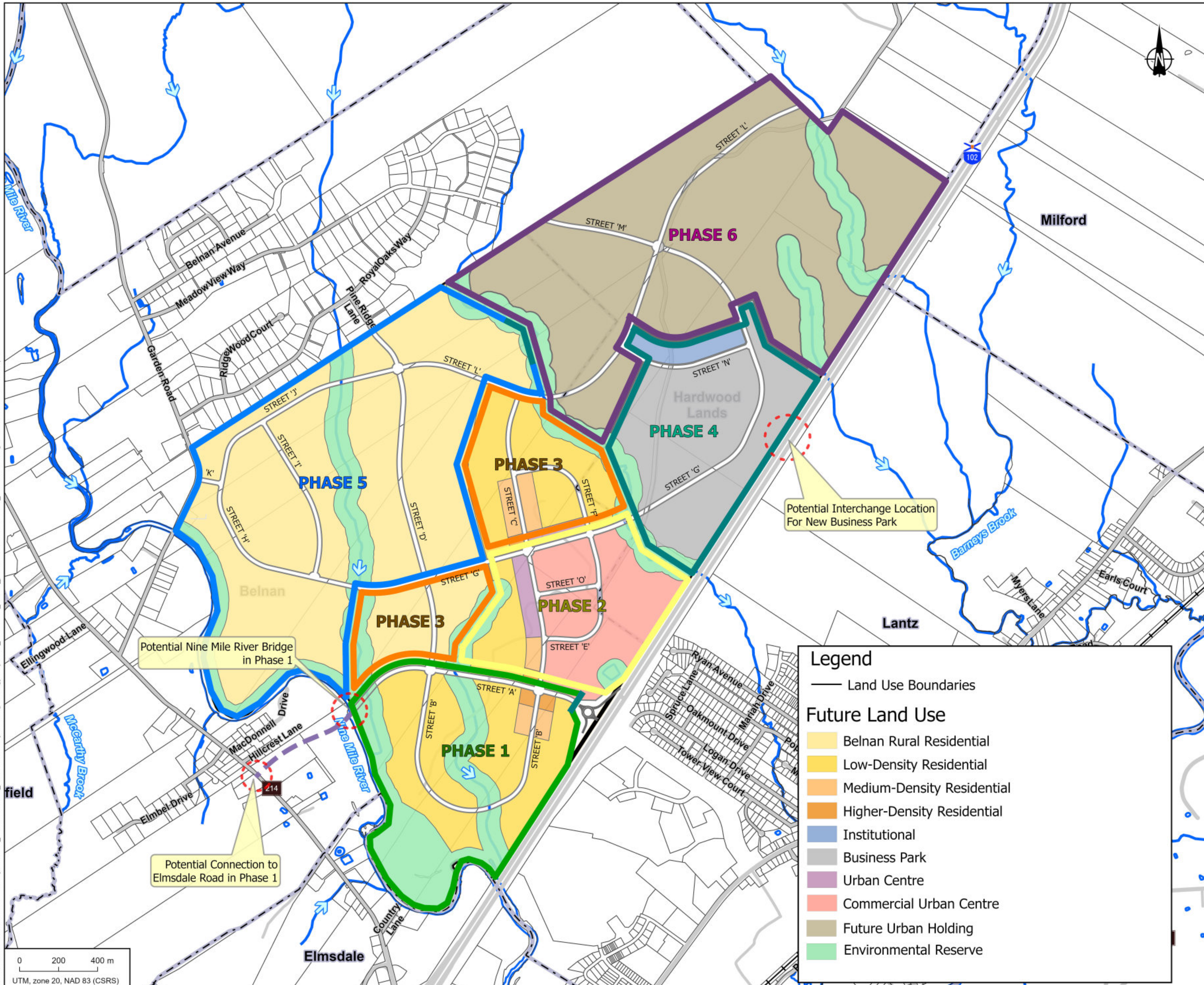
3 Conceptual Phasing Plan

This section provides a breakdown of the criteria that were considered in preparing the conceptual phasing plan for the new development.

Key drivers in determining the conceptual phasing plan are summarized below:

- Prioritize developing the area closest to Highway 102 first;
- Prioritize the construction of a new Arterial Connection from the Lantz interchange to the Elmsdale Road, as requested by Nova Scotia Public works, including a new crossing of the Nine Mile River;
- Minimize the number of new lift stations required,
- Address the increase in residential demand with an emphasis on a mixed-use urban centre and residential land-uses.

Considering these items, and correspondence with East Hants, **Schedule 3** presents the Phasing Plan.



Project Components

- Assessment Area (776.2 ha)
- Surrounding Properties
- Properties in the Assessment Area
- Community Boundaries
- 45093390 Parcel Identifier Number (PID) in the Assessment Area

Hydrography

- Waterbody
- Flow Direction
- Watercourse

Infrastructures

- Highway
- Local Street
- Collector Highway
- Railroad

Municipality of East Hants

Lantz Land Survey Analysis

Schedule 3 - Phasing Plan

Sources :

Base : Orthophoto, © 2014 DigitalGlobe Image courtesy of USGS
Boundaries, Atlas du Canada, RNCan, decembre 2005
CANVec, 1 /250 000, RNCan, 2019
CANVec, 1 /1 000 000, RNCan, 2019
Nova Scotia Property Records Database (NSPRD) property boundaries, Service
Stea, R. R., Conley, H., and Brown, Y. (compilers) 1992. Surficial Geology of the province of Nova Scotia; Nova Scotia Department of Natural Resources, Map 92-3, Scale 1:500 000

Mapping : Englobe, 2023

August 2025

ENGLOBE FBM

Project manager : K. McConnell — Date : 2025-08-22

Prepared : K. McConnell — Drawn : G. Buote — Verified : K. McConnell

Department	Project	Sub-phase	Disc.	Type	Drawing n°	Rev.
148	02400537-000	0103	CI	F	01	0A

Table 5 describes each phase, the proposed land uses, key details and justification for phasing order. For descriptions on the land uses, please refer the planning documents.

Table 5 - Phase-by-Phase Land-Use Summary and Phasing Rationale

Phase No.	Land Uses	Key Details	Justification for Phasing Order
1	Residential (Serviced): ○ High Density ○ Medium Density ○ Low Density	The area lies west of the Lantz interchange and features a new arterial road linking the interchange to Elmsdale Road across the Nine-Mile River. The highest-density land uses are concentrated at the east end near the interchange. Areas designated for lower density land use are situated further within the development. All proposed land uses will be serviced with municipal water and wastewater.	The new arterial roadway meets the Nova Scotia Public Works requirement for an arterial road through the development and offers a secondary access point to the site in the first phase. The residential development is designed to address the current demand for housing in the area.
2	Residential (Serviced): ○ High Density ○ Medium Density ○ Low Density Commercial/ Residential Mixed-Use Centre Commercial – Urban Centre	The area lies north of the Lantz interchange and north of the proposed arterial roadway. This area consists of a variety of residential densities, including a mixed use and urban center land uses. All proposed land uses will be serviced with municipal water and wastewater.	The mixed-use and urban centers present opportunities for combined residential and commercial development, helping meet the increasing demand for housing.
3	Residential (Serviced): ○ Low Density Residential (Un-serviced) ○ Low Density	This phase consists of two separate areas, both located north of Phase 1 and 2 and will be serviced. The area north of phase 1 consists of low density un-serviced developments. The area north of Phase 2, consists of a combination of medium and low density land-uses.	This phase continues to provide residential development opportunity to address the demand.
4	Business Park and Institutional	This phase consists of a new serviced Business Park and Institutional land uses located north-east of Phase 3. There is also the possibility to include a new on/off ramp from Highway 102 following approval with NS Public Works.	This phase introduces a business park to meet anticipated demand for this land use.

Phase No.	Land Uses	Key Details	Justification for Phasing Order
5	Residential (Un-serviced): ○ Low Density	This phase involves the development of a new, un-serviced low density residential area, which will have a density comparable to that of the adjacent northern development. A connection to Pine Ridge Lane is proposed.	This phase addresses residential demand while aligning with the character of the northern development.
6	Future Urban Holding	This phase is reserved for future development depending on forecasted needs	Located the furthest away from the interchange, this area is not a priority for development.

Alternative phasing options were evaluated with East Hants, and this option was chosen as it meets forecasting needs, supports East Hants' urban centre goals, and satisfies NS Public Works requirements.

4 Municipal Servicing Evaluation

This section of the report focuses on evaluating the impacts of the new development, on the existing WTP and WWTP, as described in Section 2.

It is important to note that the servicing study is limited to Phases 1-4. Phase 5, consists of un-serviced low-density residential units, to match the neighboring development to the North. Phase 6 consists of undecided urban holding land use and likely won't be developed for several years.

4.1 Population Estimates

Table 6 summarises the residential density factors that convert proposed land-use designations into estimated populations. Assumptions were based on data provided by FBM regarding population and assumed development densities. These estimated populations drive the servicing calculations developed later in this section.

Table 6 - Residential Density Assumptions and Population Factors

Land Use	No. of Units per Acre	Population per No. of units	Population per Acre	Population per Hectare[1]
Residential Low Density (Un-serviced)	1	3.5	3.5	8.6
Residential Low Density (Serviced)	8	2.4	19.2	47.4
Residential Medium Density and Mixed Use (Serviced)	32	1.9	60.8	150.2

Land Use	No. of Units per Acre	Population per No. of units	Population per Acre	**Population per Hectare[1]**
Residential High Density (Serviced)	46	1.9	87.4	216.0

[1] Population per hectare values were calculated using 1 ha = 2.471 acres.

Table 7 summarizes the land uses for each development phase, including gross areas in acres and hectares, as well as the estimated population based on the densities outlined in **Table 6**. These population figures are used in estimating servicing requirements in the subsequent sections. The table excludes un-serviced Residential-Low-Density land-use, as these land-uses do not affect sanitary or water supply considerations. The Commercial – Urban Centre and Business Park/Institutional populations are set to 0, as their water and sanitary impacts will be estimated using industry standards.

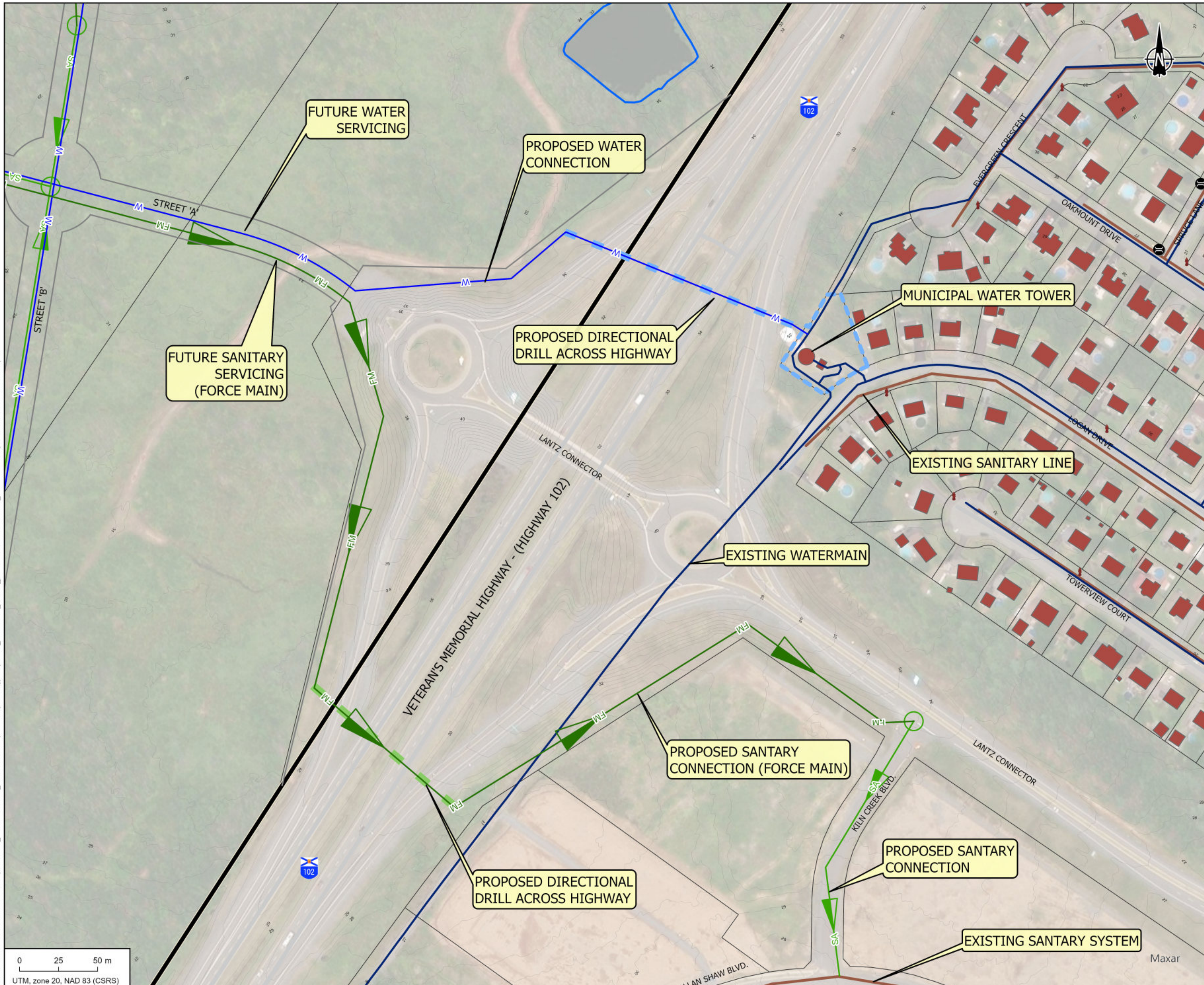
Table 7 - Phase-by-Phase Land-Use Allocation, Site Area and Estimated Population (for Serviced Land-Uses)

Phase No.	Land Use	Total Area (acres)	Sum of Total Area (hectares)	Sum of Estimated Population
1	Residential - Higher-Density Multiplex	4	1.62	349.6
	Residential - Low-Density - Serviced	123	49.79	2361.6
	Residential - Medium-Density Multiplex	6	2.43	364.8
	Subtotal Phase 1	**133**	**53.84**	**3076**
2	Commercial - Urban Centre	97	39.26	0
	Mixed-Use Centre (considered Medium Density)	14	5.67	851.2
	Residential - Higher-Density Multiplex	4	1.62	349.6
	Residential - Low-Density - Serviced	31	12.55	595.2
	Residential - Medium-Density Multiplex	3	1.22	182.4
	Subtotal Phase 2	**149**	**60.32**	**1978.4**
3	Residential - Low-Density - Serviced	78	31.57	1514
	Residential - Medium-Density Multiplex	12	4.86	706
	Subtotal Phase 3	**90**	**36.43**	**2227.2[1]**
4	Business Park/ Institutional	182	73.66	0
	Subtotal Phase 4	**182**	**73.66**	**0**
	Grand Total	554	224.25	7281.6

[1]Excludes consideration for the un-serviced low-density land use approximately 51 acres with a population of approximately 178.5.

4.2 Conceptual Municipal Servicing Connection

Figure 4 illustrates the preferred alignment for extending both potable-water and wastewater services from the existing Lantz network, east of Highway 102, into the new growth area on the west side. The crossing is conceived as an **entirely trenchless installation, i.e. directional drill** to eliminate traffic disruption and preserve the new interchange embankments. These crossings were reviewed and conceptually approved by NS Public Works.The proposed connection for the water system is near the existing water tower, while the proposed connection for the sanitary sewer system is at the new sanitary sewer on Allan Shaw Boulevard.



Project Components

- Assessment Area (776.2 ha)
- Surrounding Properties
- Properties in the Assessment Area
- Community Boundaries
- 45093390 Parcel Identifier Number (PID) in the Assessment Area

Hydrography

- Waterbody
- Flow Direction
- Watercourse

Existing Infrastructure

- Highway
- Local Street
- Collector Highway
- Railroad
- Water Line
- Sewer Line

Proposed Infrastructure

- Water Line
- Sanitary Main Line (Gravity)
- Sanitary Force Main
- Flow Arrow

Municipality of East Hants

Lantz Land Survey Analysis

Figure 4
Conceptual Municipal Servicing Connections

Sources :

Base : Orthophoto, © 2014 DigitalGlobe Image courtesy of USGS
Boundaries, Atlas du Canada, RNCan, decembre 2005
CANVec, 1 /250 000, RNCan, 2019
CANVec, 1 /1 000 000, RNCan, 2019
Nova Scotia Property Records Database (NSPRD) property boundaries, Service
Stea, R. R., Conley, H., and Brown, Y. (compilers) 1992. Surficial Geology of the province of Nova Scotia; Nova Scotia Department of Natural Resources, Map 92-3, Scale 1:500 000

Mapping : Englobe, 2023

August 2025

Project manager : K. McConnell | Date : 2025-08-22

Prepared : K. McConnell | Drawn : G. Buote | Verified : K. McConnell

Department	Project	Sub-phase	Disc.	Type	Drawing n°	Rev.
148	02400537-000	0103	CI	F	04	0A

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4.3 Municipal Water Servicing

4.3.1 Water Demand Estimates

The following assumptions were applied to estimate the average daily water demand and max daily water demand for each development phase:

- Residential demand: 0.376 m^3/capita/day from the *Dillon Consulting Memo (November 2021)*. This assumes that the average withdrawal rate is equivalent to the average demand.
- Non-residential demand: 35m^3/ha/day for the Urban Centre and the Industrial and/ Institutional zones, which aligns with ACWWA planning guidance.
- Max Day Peaking Factor: 2.0

Applying these rates to the population and land-use areas in **Table 7** produces the average daily demand and max daily demand tabulated in **Table 8**.

Table 8 - Projected Average Daily Demand and Max Day Demand by Development Phase

Phase	Average Daily Demand (m^3/day)	Cumulative Average Daily Demand Flow (m^3/day)	Max Day Demand (m^3/day)	Cumulative Max Day Demand (m^3/day)
1	1,157	1,157	2,313	2,313
2	2,118	3,275	4,236	6,549
3	837	4,112	1,675	8,224
4	2,578	6,690	5,156	13,380
Grand Total	6690		13,380	

Table 9 converts the cumulative average day demands established for each phase into annual withdrawal volumes by applying a 365-day operating factor.

Table 9 - Projected Cumulative Annual Demand by Development Phase

Phase	Cumulative Average Annual Demand (m^3/year)
1	422,305
2	1,195,375
3	1,500,880
4	2,441,850

4.3.2 WTP Capacity Evaluation

Table 10 combines the **baseline withdrawal rates** of 3,750 m^3/day(average-day) and 4,900 m^3/day (maximum-day) with the incremental demands from each development phase. The results are compared with three critical thresholds:

- **Regulatory average-day limit:** 4,770 m^3/day (30-day rolling; NSE Approval)

- **Regulatory 3-day limit:** 6,000 m³/day (NSE Approval)
- **Realistic WTP output:** 6,950 m³/day (90 % of the plant's firm 7 630 m³/day capacity)

Values exceeding a withdrawal limit are **bolded**; those surpassing the plant's realistic output are shown in red.

Table 10 – Combined Average Day Flow Versus Lantz WWTP Capacity

Phase	Combined Average Daily Demand (m^3/day)	Combined Max Day Demand (m^3/day)
1	**4,907**	7,213
2	7,025	11,449
3	7,862	13,124
4	10,440	18,280

Key Observations:

- **Immediate compliance breach –** Phase 1 pushes average-day demand 137 m³/day above the NSE 30-day average limit and drives maximum-day demand greater than 7,000 m³/day, exceeding both the 6,000 m³/day 3-day limit and the WTP's realistic output of 6,950 m³/day.
- **Rapid capacity erosion** – By Phase 2 the average daily demand exceeds the plant's realistic output by **+/-75 %**.
- **Strategic implication** – A withdrawal-permit amendment, and a major WTP expansion (or new source) must be advanced **before Phase 1** is fully connected; deferral is not feasible without interim water-supply restrictions.
- **System-wide context** – These projections exclude other developments currently under Municipal review and in construction. Their inclusion will further accelerate the timing and scale of required WTP upgrades and should be integrated into the final expansion strategy.

4.4 Municipal Wastewater Servicing

4.4.1 Wastewater Flow Estimates

The following assumptions were applied to estimate the average dry weather daily flows for each development phase:

- Residential flow: 0.34 m³/capita/day from the *Dillon Optimization Study (April 2022)*.
- Non-residential flow: 35m^3/ha/day for the Urban Centre and the Industrial and/ Institutional zones, which aligns with ACWWA planning guidance.

Applying these rates to the population and land-use areas in **Table 7** produces the average day dry weather flows tabulated in **Table 11**.

Table 11 - Projected Average Daily Dry Weather Wastewater Flow by Development Phase

Phase	Average Daily Dry Weather Flow (m^3/day)	Cumulative Flow (m^3/day)
1	1,046	1,046
2	2,047	3,093
3	757	3,850
4	2,578	6,428
Grand Total	**6,428**	

4.4.2 WWTP Capacity Evaluation

Table 12 compares the baseline average daily flow of 4,465m^3/day with the cumulative average day dry-weather flow for each development phase. Values in red show where the combined load exceeds the WWTP's capacity of **5200m^3/day**.

Table 12 – Combined Average Day Flow Versus Lantz WWTP Capacity

Phase	Existing Baseline Flow (2012-2020) (m^3/day)	Cumulative Average Daily Dry Weather Flow from Phase (m^3/day)	Combined Average Daily Flow (m^3/day)	Margin to 5,200 m^3/day Capacity (m^3/day)
1	4,465	1046	5511	-311
2	4,465	3093	7558	-2358
3	4,465	3850	8315	-3115
4	4,465	6428	10893	-5693

Key Observations:

- **Immediate capacity breach:** Phase 1 alone drives the plant **311 m³/day (+/- 6 %)** over its firm capacity, rendering the WWTP non-compliant as soon as the first stage is fully occupied unless interim measures are in place.
- **Cumulative Impact**: By Phase 4 the combined average-day load climbs to **+/- 10,900 m³/day**, more than **6400 m³/day (+/- 144 %)** above the current baseline and **double** the permitted capacity.
- **Strategic Implications:** These results confirm that a substantial capacity intervention—whether a retrofit of the existing WWTP, or a new WWTP must precede or run in parallel with Phase 1 servicing.
- **System-wide context** – These projections exclude other developments currently under Municipal review or outside the base-line flows. Their inclusion will further accelerate the timing and scale of required WTP upgrades and should be integrated into the final expansion strategy.

4.4.3 Conceptual Wastewater Servicing Plan

Figure 5, presents a conceptual layout of gravity trunks, lift-station locations, and tie-ins to the existing Lantz collection network. Lift-station locations shown are preliminary only; they follow present surface contours and **assume** that the existing lagoon is upgraded i.e. all flow is directed to the existing system at Lantz. Final locations and sizing will be completed during detailed design. If a new WWTP is investigated, the layout for the lift-stations should also be revisited.

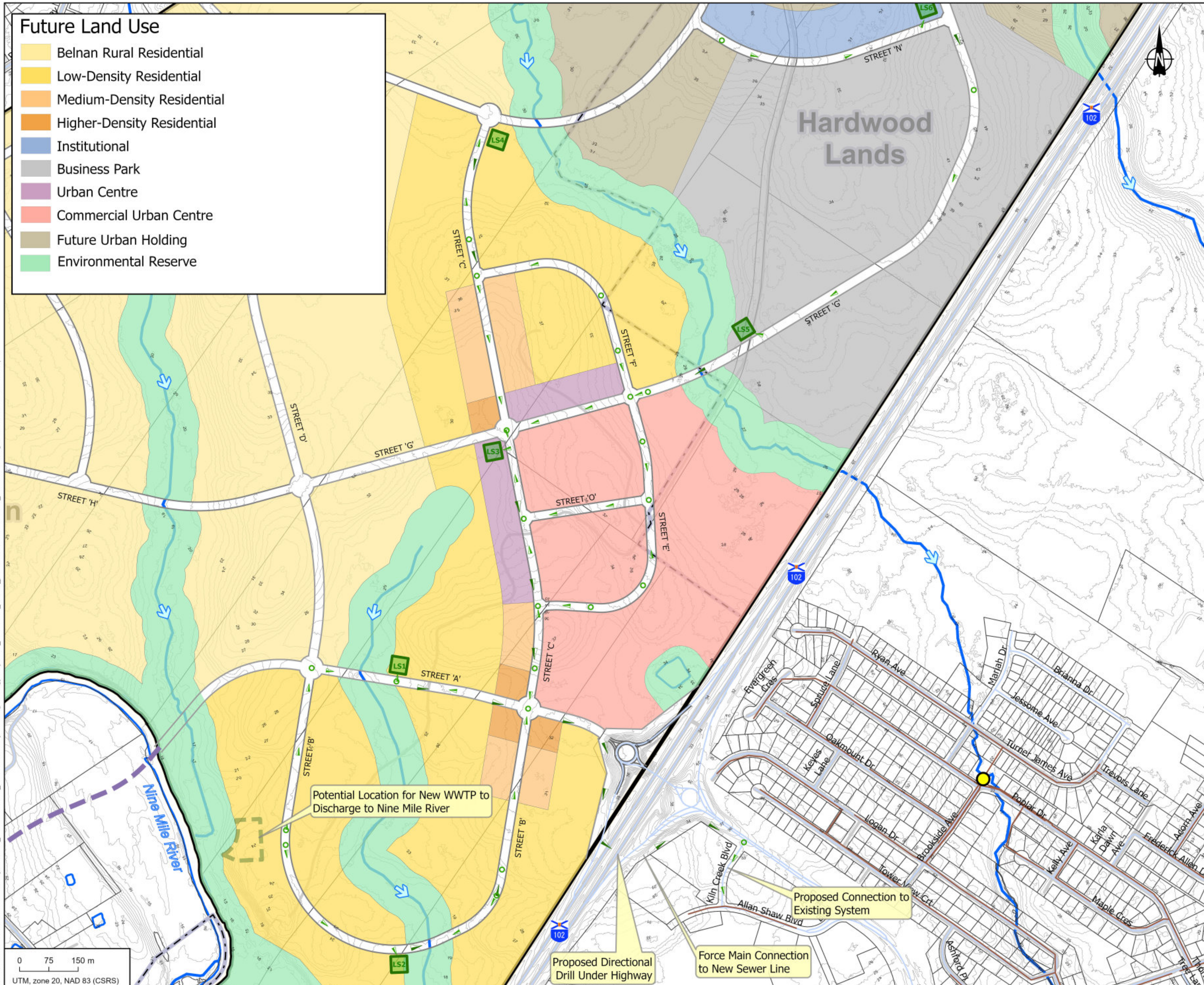
Key wastewater servicing features are summarized in **Table 13**, based on each Phase.

Table 13 - Phase-Specific Servicing Elements (Conceptual)

Phase No.	Key Servicing Elements	Functionality
1	• **Horizontal Directional Drill (HDD) crossing beneath Hwy 102** to tie the development into the Allan Shaw Boulevard trunk. • **Lift Station 1 (LS-1)** – primary pumping facility for the entire growth area; wet-well, pumps and forcemain sized for **ultimate (Ph 1-4) peak flow**. • **Lift Station 2 (LS-2)** – small, local station required by internal topography in the south-west quadrant. • **Conceptual Site for a new WWTP** identified on land near Nine-Mile River, offering a gravity outfall for treated effluent if new plant is pursued.	LS-1 conveys all Phase 1 wastewater (and, ultimately, Phase 2 to 4 flows) to the existing Lantz system. LS-2 feeds LS-1.
2	• **Lift Station 3 (LS-3)** constructed at the central low point.	LS-3 receives gravity flow from Phases 2 and ultimately pumped flow Phase 3 and 4 and pumps forward to LS-1/
3	• **Lift Station 4 (LS-4)** added to service the northern pocket of Phase 3 that cannot drain by gravity.	LS-4 pumps to LS-3; the remainder of Phase 3 drains by gravity to LS-3.
4	• **Lift Station 5 (LS-5)** located at the extreme north to capture flow from the north. • **Lift Station 6 (LS-6)** – located on the border of Phase 2 and 4, at local minimum.	LS-5 pumps to LS-6. LS-6 directs flow to Phase 2.

The conceptual servicing plan **assumes** that the Allan Shaw Boulevard trunk and the downstream Lantz gravity-sewer network can accept the additional flows generated by Phases 1–4 and convey them to the existing WWTP. Because those phases will **almost double** the current average-day loading, that assumption is unlikely to hold without improvements of key wastewater mains and lift stations.

A **Sanitary Capacity Study** completed for the Municipality by RVA Anderson in **August 2023** identified several pipes and pump stations that are already near or at capacity; however, the study did **not** include consideration for the subject development. To provide a defensible basis for design, **Englobe recommends that the Municipality update the study to account for the proposed phasing**.



Municipality of East Hants

Lantz Land Survey Analysis

Figure 5
Conceptual Wastewater Servicing Plan

Sources :

Base : Orthophoto, © 2014 DigitalGlobe Image courtesy of USGS
Boundaries, Atlas du Canada, RNCan, decembre 2005
CANVec, 1 /250 000, RNCan, 2019
CANVec, 1 /1 000 000, RNCan, 2019
Nova Scotia Property Records Database (NSPRD) property boundaries, Service
Stea, R. R., Conley, H., and Brown, Y. (compilers) 1992. Surficial Geology of the province of Nova Scotia; Nova Scotia Department of Natural Resources, Map 92-3, Scale 1:500 000

Mapping : Englobe, 2023

August 2025

ENGLOBE FBM

Project manager : K. McConnell | Date : 2025-08-22

Prepared : K. McConnell | Drawn : G. Buote | Verified : K. McConnell

Department	Project	Sub-phase	Disc.	Type	Drawing n°	Rev.
148	02400537-000	0103	CI	F	05	0A

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5 Stormwater Management

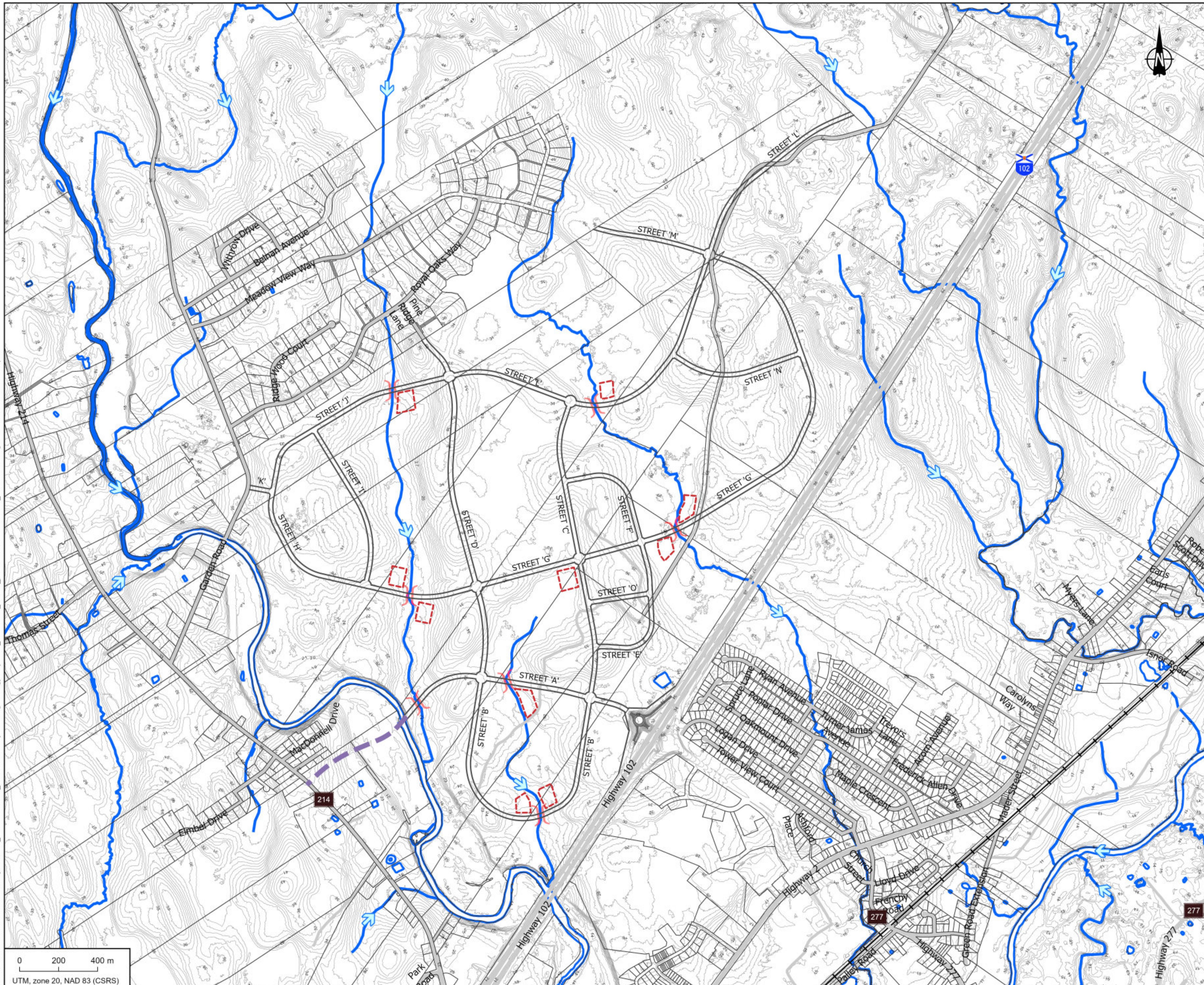
The purpose of this section is to outline a high-level stormwater management strategy for the study area. The Municipality of East Hants requires that **post-development stormwater runoff rates do not exceed pre-development conditions**, in accordance with its Municipal Standards. This ensures that downstream infrastructure such as natural watercourses, wetlands and existing piping are protected from flooding, erosion and degradation. The principle of flow balancing, is the central approach to the stormwater management strategy for the study area.

5.1 Conceptual Strategy

Given the topography, environmental constraints (e.g. wetlands, watercourses), and the proposed development layout the following conceptual design elements are recommended:

- Storm Sewer Infrastructure
  - Given the proposed roadway cross-section, roadside ditching will likely not be used to convey stormwater in the urban center, or along the main corridors. Instead piping systems will be used. Storm sewers should be designed to handle minor storm events (1:5 year events) without surcharging while major stormwater events are conveyed overland to stormwater management facilities as indicated in the Municipal Standards.
- Stormwater Management Ponds
  - Multiple regional ponds are proposed throughout the study area to provide quantity and quality control. These ponds were strategically located to align with natural drainage patterns, minimize land disruption and the phasing strategy.
- Low Impact Development (LID) Measures
  - Although not a requirement in the current municipal guidelines, Englobe recommends considering LID measures through the design process. Common LID strategies are as follows:
    - Bioswales and vegetated swales;
    - Rain gardens;
    - Permeable pavements;
    - Green roofs;
    - Infiltration trenches; and
    - Rain water harvesting systems.
  - LIDs help reduce runoff volumes; improve water quality and promote groundwater infiltration.
- Cross Culverts
  - Cross culverts will be incorporated under roadways to maintain existing drainage connectivity to ensure flow between natural drainage features. These culverts shall be designed in accordance with the Municipalities Design Standard and the Department of Environment’s requirements.
- Floodplain Considerations
  - The development area is located within the Flood Plain for the Nine-Mile River, this will be taken into consideration.

Please refer to **Figure 6** for a conceptual stormwater management plan including proposed locations for major cross culverts.



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Project Components

- Assessment Area (776.2 ha)
- Surrounding Properties
- Properties in the Assessment Area
- Community Boundaries
- 45093390 Parcel Identifier Number (PID) in the Assessment Area

Hydrography

- Waterbody
- Flow Direction
- Watercourse

Existing Infrastructure

- 102 Highway
- Local Street
- 214 Collector Highway
- Railroad
- Water Line

Proposed Infrastructure

- Major Culvert
- Conceptual Storm Water Management Pond (SWMP)

Municipality of East Hants

Lantz Land Survey Analysis

Figure 6
Conceptual Stormwater Management Plan

Sources :

Base : Orthophoto, © 2014 DigitalGlobe Image courtesy of USGS
Boundaries, Atlas du Canada, RNCan, decembre 2005
CANVec, 1 /250 000, RNCan, 2019
CANVec, 1 /1 000 000, RNCan, 2019
Nova Scotia Property Records Database (NSPRD) property boundaries, Service
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Department	Project	Sub-phase	Disc.	Type	Drawing n°	Rev.
148	02400537-000	0103	CI	F	03	0A

6 Recommendations

The servicing analysis demonstrates that both treatment plants (WTP and WWTP) reach, or exceed, their regulatory or hydraulic limits as soon as **Phase 1** is occupied. To maintain compliance and preserve development momentum, the Municipality should advance the investigations and design tasks listed in **Table 14.**

Table 14 - Priority Investigations and Studies

Action	Purpose	Timing
Existing vs New Water Treatment Plant Study Investigate expanding the existing WTP and review the option of constructing a new WTP to service the new development. It is recommended that a review of amending the NSE water-withdrawal approval be conducted.	Phase 1 pushes average day demand 137 m³/day above the NSE 30-day average withdrawal limit and drives maximum-day demand > 7,000 m³/day, eclipsing both the 6,000 m³/day 3-day limit and the WTP's realistic output of 6,950 m³/day.	Immediate (before Phase 1 Design).
Water Distribution Capacity Update Revisit and refresh the RVA Water Distribution Capacity Assessment report (and model) to consider the new development.	Evaluate upgrades required to the existing network to service the new development.	After the Existing vs New Water Treatment Plant Study is completed, as the model updates may be impacted by the recommended solution of this study.
Existing vs New Wastewater Treatment Plant Study Investigate expanding the existing WWTP and/or review the option of constructing a new WWTP to service the new development.	Phase 1 alone exceeds the WWTP's capacity by 311 m³/day (≈ 6%), making it non-compliant once the first stage is fully occupied	Immediate (before Phase 1 Design)
Wastewater Distribution Capacity Assessment Update Revisit and refresh the RVA Wastewater Distribution Capacity Assessment (and model) to consider the new development.	Evaluate upgrades required to the existing network (sanitary sewer mains, lift stations, forcemains, etc) to service the new development.	After the Existing vs New Wastewater Treatment Plant Study as the as the model updates may be impacted by the recommended solution of this study.

7 Closing

This memorandum demonstrates that the study area can proceed **only with a coordinated, front-loaded investment programme** that increases capacity at both treatment plants (water and wastewater), and conveyance capacities ahead of Phase 1 occupancy, and secures the required raw-water approvals. Alternatively, new WTP and WWTP can be explored to service the new development. Adoption of the recommended follow-up studies will move the secondary planning process from concept to implementation, ensuring that East Hants accommodates growth while maintaining regulatory compliance, level-of-service, and fiscal responsibility.

Yours very truly,

Englobe Corp.

Kyle McConnell, P.Eng.,
Project Manager

C.C.:	James Coons, MCIP, LPP	Senior Planner	FBM
	Kieron Hunt,	Planning Studio Lead	FBM

Revisions and publications log

REVISION No.	DATE	DESCRIPTION
0A	July 11th, 2025	Preliminary version published for comments
1A	August 26th, 2025	Final Version

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