

# **Everett Secondary Plan Master Servicing Plan**

## **Class Environmental Assessment**

### **ADDENDUM**

**Township of Adjala-Tosorontio**

**January 2016**

**Greenland Project No. 15-G-3399**

## 1 BACKGROUND

In 2012, the Township of Adjala-Tosorontio (Township) retained Greenland Consulting Engineers (Greenland) to undertake a Master Servicing Plan (MSP) addressing Transportation, Stormwater Management, and Water and Wastewater Servicing issues within the Community of Everett.

The purpose of this Master Servicing Plan (MSP) document was to support technical requirements for servicing of the proposed Secondary Plan at that time. The MSP was completed as a Schedule 'B' Class Environmental Assessment (Class EA) in accordance with the Municipal Engineers Association (MEA) recommended Environmental Assessment process for Master Plans.

The notice of completion for the MSP was issued on January 24<sup>th</sup>, 2013 (see **Appendix A**), with a subsequent Schedule 'C' Class EA being completed in support of the surface water discharge Wastewater Treatment Plant (WWTP) recommended in the MSP. The notice of completion for the Schedule 'C' Process was issued on September 12<sup>th</sup>, 2014.

### 1.1 Summary of Previously Recommended Wastewater Servicing Solutions

The recommended preferred Wastewater Servicing Master Plan for the Everett Secondary Plan Area included the following general characteristics:

- Approximately 1,400m of gravity trunk sewer as shown in **OPTION WWC-B** (see **Appendix A**), ranging in diameter from 375mm to 525mm, located along Wales Ave. and discharging at a new SPS in the R&M Homes (now Farsight) Subdivision. Under ultimate build-out conditions, this pump should be capable of delivering a peak flow conveyance capacity of 14.86 ML/d with a depth of 5.5 m (232.2 m).
- A gravity based sanitary sewer collection network upstream of the trunk sewer which includes approximately 17,500 m of pipe, ranging in diameter from 200mm – 375mm.
- Wastewater Treatment Plant (WWTP) to be located north-east of the Farsight Subdivision in accordance with **Option WWT-9** (see **Appendix A**); and,
- WWTP to be constructed with surface water discharge forcemain to the Pine River to facilitate future development.

In addition, a Schedule 'C' Class EA was completed for the proposed WWTP, to accommodate the recommendations for surface water discharge outlined in the MSP. The preferred design determined in this process had the following characteristics:

- Wastewater Treatment & Process to be MBR with no primary clarification and offsite disposal of solids (**Design Strategy WWP-5**);
- A WWTP Site Plan to include buffer between Office and Equipment Room with Head-Works & MBR to the South (**Design Concept SP-3**); and,
- The Forcemain Alignment shall go west through the Farsight subdivision property, Outfall Design Concept FM-3 with Mitigation Option B (effluent polishing) to be investigated at the detailed design stage.

The preferred solution will allow currently approved developments to proceed with the least financial impacts to future developments or existing residents to connect to all options evaluated. The Township can plan for the expansion of the WWTP in conjunction with developers to optimize growth while ensuring effective recovery of capital costs.

This solution will also allow for the New Horizon's WWTP to be decommissioned after the new WWTP and trunk sewer are constructed.

## 1.2 Scope and Purpose of Addendum

Since the completion of the Everett MSP and subsequent Schedule 'C' Class EA for the Everett Wastewater Treatment Plant & Surface Water Outfall, additional wastewater conveyance solutions and technologies have come to the Township's attention; specifically, a low-slope gravity sewer system with lot-level pre-treatment.

This relatively new technology was presented to the Township and evaluated by Greenland and was found to be a technically viable alternative to conventional gravity sewer networks, and that its use should be evaluated for any potential benefits within the context of sanitary servicing for communities within the Township. A summary of correspondence between Greenland & a proponent of this technology is provided in **Appendix B**.

This technology requires proper evaluation against the previously selected Everett MSP wastewater conveyance solution before being considered as a potential servicing solution, in accordance with Environmental Assessment Act.

As such, this Addendum will evaluate the viability of low-slope gravity sewers with lot-level pre-treatment, in accordance with the recommendations of the Class EA process against the previously selected sewage collection and disposal technology.

It should be noted that this Addendum applies only to the wastewater conveyance component of the Everett MSP, and does not affect the recommendations of the MSP (transportation, water or stormwater management) or the Schedule 'C' WWTP & Surface Water Outfall Class EA.

## 2 CONVEYANCE TECHNOLOGY OPTIONS

The focus of this Addendum is to evaluate technically feasible wastewater conveyance technologies which can provide gravity based servicing as per the preferred solution identified in the MSP, **OPTION WWC-B** (See **Appendix A**). Two (2) viable alternative technologies have been evaluated as part of this addendum, specifically; conventional gravity trunk sewer ranging in diameter from 375mm to 525mm (**Option CT-A**); and, a low-slope gravity sewer system with lot-level pre-treatment (**Option CT-B**).

### 2.1 Option CT-A: Conventional Gravity Sewer

This sewage conveyance technology option would provide communal servicing to existing and proposed development via standard gravity sewers ranging in diameter from 375mm to 525mm with concrete manholes and a maximum depth of 5.5 m at the sewage pumping station (SPS) located at the downstream end of the system in the Farsight Subdivision. Flows would then be pumped from the SPS to the communal WWTP for treatment.

The main strengths of this system are flexibility of phasing, location of all infrastructure within the municipal right of way (i.e. less interruption to residents both during construction and for maintenance purposes) and the fact that construction methods associated with this system are highly standardized and widely accepted.

Weaknesses of this option include deeper sewers at the downstream end of the system and high capital costs associated with installation of the infrastructure and associated restoration. Trenchless installation methods could offset some of the restoration costs for construction in existing areas. Fused or pressure rated piping would need to be utilized for sewers located in source-water protection areas to prevent exfiltration and associated threats to source-water.

### 2.2 Option CT-B: Low Slope Small Diameter Sewer with Lot Level Pre-Treatment Tanks

This sewage conveyance technology begins with lot-level solids removal and digestion tanks. Due to the removal of solids in each tank, liquids can be conveyed to the downstream SPS and communal WWTP using a reduced slope, small diameter gravity sewer network located within the municipal right-of-way (ROW). Non-enterable system access points are included in the system for maintenance as an alternative to conventional manholes. Utilizing this Option would include continued use of the New Horizon WWTP as a primary treatment system, with liquid stage effluent being discharged to the trunk collection system for ultimate treatment at the communal WWTP downstream. Filter beds currently utilized by the New Horizon WWTP would be decommissioned. A summary of this system and associated technical review is provided in **Appendix B**.

Strengths of this system are centred on the reduced depth and slope requirements of the conveyance system. In areas where servicing is to be provided to existing residents, the system may have reduced capital costs as the smaller piping can be installed with relative ease via directional drilling (which in turn will reduce restoration costs in existing areas), at pipe slopes as low as 0.15%. Drilled pipe will also be fused which will help to mitigate exfiltration and associated sourcewater protection issues.

Less construction spoilage associated with smaller trenches, or trenchless installation will also have positive environmental impacts as compared to conventional sewer installations which require deep excavation.

Reuse of the New Horizon WWTP for solids management will allow for decommissioning of the current subsurface disposal beds, which has positive environmental implications, however current operation & maintenance issues associated with the RBC WWTP at New Horizon's will remain.

Weaknesses of this system are mainly associated with the placement of tanks on private property. In addition to the requirement for access to private property both during construction and for ongoing maintenance, large scale implementation of lot level pre-treatment systems is not consistent with centralized treatment advocated in environmental policy objectives associated with wastewater disposal in the province of Ontario. Easements may also be required to most efficiently facilitate trunk infrastructure.

The lot level tanks are also proposed to be installed at a shallow depth to facilitate the low slope conveyance system. As such gravity drainage from the basements will not be possible, and sewage pumps will be required in many homes connected to the system.

The system would also require deviations from current standards in Adjala-Tosorontio, as the standard for sewage conveyance is at least 0.5% pipe slope, depth of at least 2.75 m, and a manhole every 110 m.

Flexibility is limited under this option as well, as low-slope gravity trunk conveyance will require future development areas connecting to the trunks to also utilize low-slope gravity system with pre-treatment of solids.

Despite some advantages of the proposed decommissioning of secondary treatment and subsurface disposal systems at the New Horizon WWTP, reuse of the facility for primary treatment as proposed under this option will require continued maintenance of the facility.

### 3 EVALUATION CRITERIA

In order to evaluate the proposed alternative conveyance technologies, each of the options presented in **Chapter 2** were assessed with respect to their strengths and weaknesses in terms of the following general criteria:

- Natural Environment Impacts:
  - Impacts of the option to vegetation and wildlife ; and,
  - Impacts of the option to surface and/or groundwater quality.
- Social / Cultural Environment Impacts:
  - Land Use & Archaeological Considerations;
  - Visual landscape and aesthetic impacts of the option;
  - Traffic Impacts (i.e. during construction); and,
  - Interruption to Residents
- Technical/Operational Considerations:
  - Difficulty to construct or implement the Option relative to other alternatives; and,
  - Efficiency of the Option from an operations and maintenance perspective.
- Economic Impacts:
  - Capital construction costs associated with the option;
  - Long term operational costs for the option;
  - Payment structure, cost recovery options for the Municipality; and,
  - Phasing Flexibility.

As part of the Class EA evaluation process, options are submitted to a preliminary screening to eliminate any option which does not satisfy one or more of these criteria (i.e. options which could clearly not be implemented due to prohibitive costs, detrimental environmental effects, or technical infeasibility).

In the case of this Addendum, as both **Options CT-A** and **CT-B** appeared to be feasible within the context of these criteria, they were “short-listed” as alternative solutions and evaluated further in terms of their relative advantages and disadvantages within each evaluation criteria category. The do nothing option was previously identified as an infeasible option in the 2013 MSP for Everett. The results of this evaluation are provided in **Table 1**.

<b>Table 1: Everett MSP EA Addendum - Conveyance Technology (CT) Options &amp; Evaluation</b>		
<b>Evaluation Criteria</b>	<b>Option CT-A</b> Conventional Wastewater Conveyance Technology, Including Gravity Sewers, Manholes etc.	<b>Option CT-B</b> Low Slope Sewer with Lot Level Pre-Treatment Tanks for Solids, non-enterable maintenance cleanouts etc.
<b>Natural Environment Impacts</b>		
Impacts of the option to vegetation, wildlife and the Natural Environment	Minimal Impacts as Sewers will be installed in Municipal ROW. Greater construction spoilage due to depth of sewers.	Similar Impacts to Option CT-A, but less construction spoilage etc. due to lower depth of installation.
Surface and Groundwater Quality Implications	Pumping/PTTW Likely Required Due to Depth of Sewers. Typical infiltration to pipes. Pressure rated pipe required in source-water protection areas.	Minimal Groundwater Impact due to shallow depth of installation and reduced infiltration due to use of fused pipe.
<b>Natural Environment Overall Rating</b>		
<b>Social / Cultural Environment Impacts</b>		
Land Use & Archaeological Considerations (Including First Nations)	All Servicing contained within Municipal ROW except services from buildings to the ROW.	Servicing to existing areas will require access to all private properties connected to the system. Easements may also be required.
Visual landscape and Aesthetic impacts, Traffic impacts & interruption to residents	Potentially longer construction time due to depth of sewers, but no installations on private property except services from buildings.	Shorter construction time possible for sewers but interruptions to residents as a result of tank installations on private property.
<b>Social / Cultural Environment Overall Rating</b>		
<b>Technical/Operational Considerations</b>		
Difficulty to construct or implement the Option relative to other alternatives	Some deeper sewers at downstream end of system, but Option would utilize widely accepted construction methods. Trenchless options available to help reduce restoration.	Shallower sewers possible and trenchless methods preferred to help reduce restoration. Similar difficulty to implement due to complications which could arise from property access etc.
Operation & Maintenance Efficiency	SPS & sewers will require typical maintenance.	SPS & sewers will require typical maintenance. Lot level pre-treatment tanks will also require a maintenance program. New Horizon WWTP will continue to require maintenance.
<b>Technical/Operational Considerations Rating</b>		
<b>Economic Impacts</b>		
Capital construction costs	Servicing costs will be typical of municipal gravity sewer installation, some savings could be possible with use of trenchless installation methods in existing areas.	Option provides some potential for cost savings for installations in existing areas due to lower road restoration and slope, small diameter sewers, smaller maintenance access points and trenchless installation opportunities - less advantageous in Greenfield installation areas.
Long term operation & maintenance cost burden	Maintenance costs will be typical of a municipal gravity sewer system.	Similar cost to Option CT-A, potential for less challenging maintenance on main sewers and communal WWTP than Option CT-A due to reduced solids, but added requirements for onsite tank maintenance program & continued maintenance of New Horizon WWTP.
Payment structure, cost recovery options for Municipality, Phasing Flexibility	Greater flexibility as downstream sewers will include capacity for upstream gravity sewer installation at any time in the future.	Less flexibility for future development as low slope gravity mains will require all future and existing developments connecting to the system to utilize the same pre-treatment systems.
<b>Economic Ranking</b>		
<b>Overall Ranking:</b>		

#### 4 PROJECT APPROVAL REQUIREMENTS

In addition to Class EA requirements completed to date, it is anticipated that MOE Environmental Compliance Approvals (ECA’s) will be required for all projects associated with **Options CT-A or CT-B**. NVCA Approvals may also be required, specifically where watercourse crossings are required. The anticipated Class EA schedules for the various phases of the construction are outlined in **Table 2** below.

Table 2 – Wastewater Conveyance Project Class EA Schedules	
Project Description	Class EA Schedule & Approvals Requirements
Option CT-A: Construct Sanitary Sewers within the Farsight Subdivision, including Oversized Trunk Sewers to Service Existing & Proposed Development – Conventional Wastewater Conveyance Technology, Including Gravity Sewers, Manholes etc.	Schedule A: Requires an MOE ECA, NVCA Approval Required for Watercourse Crossings
Option CT-A: Construct Additional Trunk Sewers outside of Farsight Subdivision to Service Existing Development Areas – Conventional Wastewater Conveyance Technology, Including Gravity Sewers, Manholes etc.	Schedule A: Requires an MOE ECA, NVCA Approval Required for Watercourse Crossings
Option CT-A: Construct Non-Trunk Gravity Sewers to Service Existing Residents – Conventional Wastewater Conveyance Technology, Including Gravity Sewers, Manholes etc.	Schedule A: Requires an MOE ECA, NVCA Approval Required for Watercourse Crossings
Option CT-B: Construct Sanitary Sewers within the Farsight Subdivision, including Oversized Trunk Sewers to Service Existing & Proposed Development – Low Slope Sewer with Lot Level Pre-Treatment Tanks for Solids, non-enterable maintenance cleanouts etc.	Schedule A: Requires an MOE ECA, & Deviations to Town Standards, NVCA Approval Required for Watercourse Crossings
Option CT-B: Construct Additional Trunk Sewers outside of Farsight Subdivision to Service Existing Development Areas – Low Slope Sewer with Lot Level Pre-Treatment Tanks for Solids, non-enterable maintenance cleanouts etc.	Schedule A: Requires an MOE ECA, & Deviations to Town Standards, NVCA Approval Required for Watercourse Crossings
Option CT-B: Construct Non-Trunk Gravity Sewers to Service Existing Residents – Low Slope Sewer with Lot Level Pre-Treatment Tanks for Solids, non-enterable maintenance cleanouts etc.	Schedule A: Requires an MOE ECA, & Deviations to Town Standards, NVCA Approval Required for Watercourse Crossings

It should be noted that Schedule A projects are exempt from requirements for further analysis or public notification under the Class EA process.

## 5 MITIGATION AND MONITORING REQUIREMENTS

It is recommended that environmental requirements be reviewed for each sanitary servicing project on a case by case basis to maximize the effectiveness of any environmental protection strategy. Routine inspections during Construction phases of all projects associated with the preferred option will need to be carried out to ensure adherence to design specifications. **Table 3** summarizes the potential impacts and methods of mitigation.

**Table 3 – Wastewater Conveyance Project Impact Mitigation Strategies**

Potential Impact	Mitigation Strategy
Infringement on Environmental Protection Areas and Hazard Setbacks	<ul style="list-style-type: none"> <li>All gravity and/or low slope sewer to be constructed within existing or future municipal Right of Ways (ROW's), with use of trenchless installation wherever possible.</li> <li>Watercourse crossings recommended for completion by trenchless construction method.</li> </ul>
Sediment & Erosion Control	<ul style="list-style-type: none"> <li>Sedimentation and erosion control strategies will be developed for each individual project prior to construction.</li> </ul>
Traffic & Impacts to Private Property	<ul style="list-style-type: none"> <li>Affected Property Owners will be notified in advance of construction schedule and duration</li> <li>Homeowners should be consulted on placement of services (Option CT-A &amp; B) and treatment tanks (Option CT-B)</li> <li>Consultation with Ministry of Transportation, County of Simcoe, local utilities and school boards may be required prior to or during construction.</li> </ul>
Removal of Vegetation and Temporary Impacts (e.g. noise & vibration)	<ul style="list-style-type: none"> <li>Recommended Solution minimizes impacts to existing vegetation</li> <li>Construction activities will be limited to day-light hours to minimize impacts to residents.</li> <li>Work areas will be limited to municipal ROW areas and easements.</li> <li>Dust and storm water controls to be implemented during construction.</li> </ul>
Construction in Source Water Protection Areas	<ul style="list-style-type: none"> <li>All sewers installed within identified source water protection areas should be designed as zero infiltration/exfiltration pipe (i.e. fused or pressure rated piping, installed using trenchless methods wherever possible and pressure tested to applicable standards for watermains).</li> </ul>

## 6 CLOSURE

Based on the foregoing information, Greenland has concluded that **Option CT-A & Option CT-B** are equally viable technologies for the purpose of achieving the servicing goals outlined in the Everett MSP preferred sanitary servicing solution, **OPTION WWC-B** (see **Appendix A**).

We trust that the findings of this MSP Amendment are satisfactory. Please do not hesitate to contact the undersigned with any questions or if you require clarification to the analysis presented herein.

We look forward to proceeding with the next steps of this important project.

Yours truly,

**GREENLAND INTERNATIONAL CONSULTING LTD.**



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