



**VALDOR ENGINEERING INC.**  
Municipal • Land Development • Water Resources  
Site Development • Project Management • Contract Administration  
Consulting Engineers - est. 1992

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February 14, 2022

**Township of Cavan Monaghan**  
Cavan Monaghan Municipal Office,  
988 County Rd 10  
Millbrook, ON  
L0A 1G0

**Attention: John Connolly, Executive Director, Planning & Development**

**RE: Servicing Design Brief-Bromont Homes**  
**Request for Minister's Zoning Order ("MZO")**  
**CSU Developments Inc., CSU2 Developments Inc.**  
**Vargas Properties Inc., Vargas P Inc.**  
**TBG Project No.s: 20697, 20698, 20699**

Valdor Engineering Inc. has been retained by Bromont Homes to provide consulting engineering services for the proposed planning applications as shown on the attached plan.

This Brief identifies the general design elements for the proposed applications, including water supply, sanitary sewers, storm drainage, stormwater management and access.

The land on Fallis Line, west of County Road 10 is identified as the Fallis West Lands. The land adjacent to the east side of County Road 10 and to the east of County Road 10 is identified as the Fallis East Lands.

The servicing of both of these land parcels has been reviewed in great detail. Functional Servicing Reports and other engineering studies including environmental, geotechnical and transportation studies have been previously circulated to the Township, the Conservation Authority and to the County of Peterborough identifying in greater detail the servicing concepts.

## **WATER SERVICING**

The existing Millbrook water servicing system consists of a water treatment facility, with water taken from three local wells, a water storage tank and a network of watermains that service most of the existing urban area of the community.

The existing Millbrook Water Treatment Plant (WTP) consists of 3 wells, each with 25L/s capacity, chlorine disinfection and a chlorine contact tank. The existing water storage tank was built in 1976 and is located on the east end of Millbrook on a local high point of land. The existing 10.4m diameter tank has a useable storage capacity of 1,410m<sup>3</sup> with a top water level at an elevation of 278.0m.



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The municipal water system was expanded including the northerly extension of a watermain with a water storage tank constructed on the site of the Township's municipal office. The water system was further expanded to service the existing subdivision to the east, the Towerhill Residential Subdivision.

The Township is currently undergoing a Growth Management and Master Servicing Study in which a presentation was made to Council on October 18, 2021 by RV Anderson Associates Limited and Watson & Associates. These lands are included in the study area for planned expansion.

### **Local Watermains & Service Connections**

The local water distribution system within the 2 developments will consist of watermains ranging in diameter from 150mm to 250mm. Watermain connections are available for Fallis West lands from Fallis Line and from existing Pristine Trail from the existing Towerhill Development to the east.

Fallis East will be serviced through an existing 250mm watermain stub on Fallis Line just east of County Road 10 and from a watermain stub on existing Nina Court to the south which was designed to extend northerly through the subject property.

Water connections will be provided to each lot as per Municipal and Building Code requirements and to meet the necessary requirements for fire protection.

## **WASTEWATER SERVICING**

The community of Millbrook is currently serviced by the existing Millbrook Wastewater Treatment Plant (WWTP) located at the east limit of Centennial Lane. This WWTP was built in 1975 and the plant was upgraded in 2004 to improve the treatment quality. The WWTP has recently been expanded and upgraded to accommodate the additional flow from the urban expansion area which included a high-level tertiary treatment that would be able to provide improved effluent quality to meet the new effluent discharge criteria.

The Township as mentioned has recently initiated a Water and Wastewater Master Servicing Study and Growth Management Study as part of a Municipal Class Environmental Assessment to examine water and wastewater servicing alternatives within the current urban boundary and beyond.

A 250mm sanitary sewer stub exists at the westerly limit of Pristine Trail which can be extended to service the Fallis West development. This sewer ultimately leads to the Centennial Lane WWTP that currently has capacity to service additional lands with plans by the Township to upgrade or increase its treatment capacity in the future as per the Water and Wastewater Master Servicing Study currently on going. The Township however was also reviewing the feasibility of a new treatment facility within the Fallis West Lands. We are therefore proposing as an alternative to construct a new wastewater treatment facility within the south stormwater management block. The plant will be designed in accordance with all Ministry requirements and regulations and can be upgraded in the future to accommodate additional development. Additional details will be provided at the detailed design stage. The development will be serviced by a sanitary sewer system ranging in size from 200mm to 300mm and eventually lead to the new wastewater treatment plant.

A 525 mm sanitary sewer stub already exists for the Fallis East lands at the northerly limit of Nina Court. The sewer will be extended northerly to service the proposed lands as well as potential future development north of Fallis Line. The Fallis East lands will be serviced by the existing WWTP.

## **STORM CONVEYANCE SYSTEM**

The subject developments are located in the Baxter Creek watershed, which is one of the twelve watersheds under the jurisdiction of the Otonabee Region Conservation Authority (ORCA). Baxter Creek originates from the Oak Ridges Moraine and flows in an easterly direction and outlets into the Otonabee River. Baxter Creek meets the Otonabee River approximately 20 km upstream of Rice Lake.

In accordance with Township standards, a major / minor system storm conveyance concept will be incorporated and the sizing of storm sewer pipes will be determined during the detailed design stage. Storm sewers will discharge to stormwater management facilities for treatment prior to discharging to the natural watercourse.

## **STORMWATER MANAGEMENT**

The Fallis West Lands, under existing conditions, drainage from the subject site is generally split between two separate tributaries of Baxter Creek, located to the north and south of the site. The northern half of the site drains northward to a tributary of Baxter Creek (referred to as the North Tributary via an existing 600 mm CSP culvert under Fallis Line. It is noted that this tributary will be realigned as part of the Millbrook Subdivision, Phase 2, located on the north side of Fallis Line. The southern half of the site drains southward to a tributary of the Baxter Creek (referred to as the South Tributary). The North and South Tributaries join at a confluence approximately 2.2 km east of County Road 10. Due to the 2 distinct tributaries there is a need to provide 2 stormwater management facilities, the North SWM Pond and the South SWM Pond. As mentioned before the proposed WWTP will also be located within the south SWM Block.

Only one SWM Pond is being proposed for the Fallis East Lands and located in the Southwest area of the development.

All ponds have been sized to satisfy the following criteria within their designated Blocks as per the requirements of the Ministry of the Environment (MOE), Otonabee Region Conservation Authority (ORCA) and Township of Cavan Monaghan.

- **Quality control:** The permanent pool shall be sized to provide Enhanced (Level 1) treatment of stormwater runoff for the proposed development.
- **Erosion control:** Stormwater runoff from the 25 mm storm event shall be stored and released over a minimum 24-hour period.
- **Flood control:** Flood storage and control shall be provided to maintain peak outflows from the pond at or below pre-development levels for the critical of the 6, 12 & 24-hour SCS, 6, 12 & 24-hour AES storm distributions, and 4-hour Chicago storm distribution, for the 2-year through 100-year design storm events.

## **Site Water Balance**

In accordance with the requirements of the ORCA, a site water balance assessment for the subject development areas was completed by GHD Ltd. The goal of the water balance assessment is to determine the overall infiltration deficit under proposed conditions and to design infiltration mitigation measures as part of an overall mitigation strategy to maintain pre-development infiltration volumes. The water balance assessments were completed based on the preliminary draft plans.

The water balance calculations will be updated at detailed design once the final subdivision configuration and grading plan has been confirmed. The engineering plans will include the locations of all infiltration LID's at the detailed design stage.

## **VEHICULAR & PEDESTRIAN ACCESS**

The layout of the proposed developments has been developed with consideration for efficient and safe access and circulation of both vehicular and pedestrian traffic.

### **Municipal Roads**

Fallis West has frontage on Fallis Line which is an original 20.0m wide concession road which is operated and maintained by the Township. This municipal road allowance consists of a two lane rural paved road with roadside ditches.

The vehicular access to the subdivision will be facilitated by connections to Fallis Line as well as to Pristine Trail which was constructed in the adjacent subdivision to the east. The municipal roads will have an 8.5m pavement, crowned with 2% cross fall and edged with concrete curb and gutter. The longitudinal slope of the road will generally be 0.50% with some length of road ranging up to 5% slope. The structural design of the roads will be based on Township design criteria or the geotechnical report as recommended by the geotechnical consultant.

Fallis East will have to connections to Fallis Line which will be extended to the east of CR 10.

### **Sidewalks, Walkways & Trails**

Internal pedestrian access will be provided by standard 1.5m wide concrete sidewalks to safely guide residents through the subdivisions for access to the proposed sidewalks on Fallis Line as well as the proposed sidewalks within the adjacent subdivision to the east. Sidewalks will generally be constructed on one side of each road.

Walkway blocks will be provided in both developments to facilitate access to adjacent open space lands.

## **GRADING**

As is typical with all subdivision, earthmoving is required, to varying degrees, in order to achieve the municipal design criteria and accommodate the development form.

## **Grading Criteria**

The subject sites are to be graded in accordance with the Township grading criterion which dictates that road grades are to range from 0.5% to 5.0% and that sodded yard areas are to range from 2.0% to 5.0%. For large grade differentials, a maximum slope 3H : 1V can be used for sodded embankments. In areas where space is limited, retaining walls can be utilized to accommodate grade differentials, however, their use should be minimized.

In Fallis East, due to the steeper grade of the main north-south road, south of Fallis Line it is recommended that Commercial Development be located to north of Fallis Line where the terrain is flatter. Commercial Development is much more ideal in areas where the terrain is flatter in order to avoid large slopes and retaining walls thus maximizing the use of the block.

## **EROSION & SEDIMENT CONTROL DURING CONSTRUCTION**

Construction activity, especially operations involving the handling of earthen material, dramatically increases the availability of particulate matter for erosion and transport by surface drainage. In order to mitigate the adverse environmental impacts caused by the release of silt-laden stormwater runoff into receiving watercourses, measures for erosion and sediment control are required for construction sites. This is an extremely important component of land development that plays a large role in the protection of downstream watercourses and aquatic habitat.

The impact of construction on the environment is recognized by the Greater Golden Horseshoe Area Conservation Authorities. In December 2006 they released their document titled Erosion & Sediment Control Guidelines for Urban Construction (ESC Guideline). This document provides guidance for the preparation of effective erosion and sediment control plans.

Control measures will be selected that are appropriate for the erosion potential of the site and it is important that they be implemented and modified on a staged basis to reflect the site activities. Furthermore, their effectiveness decreases with sediment loading and therefore inspection and maintenance is required.

## **UTILITIES**

While some external upgrades may be necessary by the utility providers, it is anticipated that utilities such as hydro, natural gas, cable television, and telephone service will be available to service the subject development. As per standard practice in subdivisions, utilities will be installed underground. Co-ordination with the local hydro authority, Hydro One Networks Inc., and the various utility companies including Enbridge Gas Distribution Inc. (natural gas) and Nexicom Inc. (cable & telephone) will be undertaken at the detailed engineering design stage to determine appropriate locations for pedestals, transformers and street lights.

It is recommended that the utility installation be in the form of a four party joint trench. The process of joint trenching allows all of the utility companies to co-ordinate the placement of their lines in a common trench excavated by a single utility contractor. Four party joint trenching maximizes the efficiency of the available area in the utility corridor and provides for a safe installation.

## **SUMMARY**

Based on the analysis contained herein, the proposed subject sites can be adequately serviced with full municipal services (watermain, wastewater and storm) in accordance with the standards of the Township of Cavan Monaghan, the County of Peterborough and the Otonabee Region Conservation Authority design criteria and consists of the following:

### **Water**

- The community of Millbrook is currently serviced by a well based water system with a treatment plant and water storage tank. A trunk watermain was constructed on County Road 10 which extends to a water storage tank located on the existing site of the municipal offices.

The Fallis West Lands can be serviced by extending the trunk watermain on Fallis Line to the west as well as through an existing watermain stub on Pristine Trail from the existing development to the east.

The Fallis East Lands (including the Commercial lands) will be serviced through the extension of a 250mm watermain stub on Fallis Line along with extension of an existing watermain stub located on Nina Court to the south.

- There is sufficient reserve capacity in the existing system to service additional lands with plans by the Municipality to expand the existing water supply as per the Growth Management Study and Master Servicing Strategy currently underway.
- The water service connections for the individual dwelling units will be 25mm diameter.

### **Waste Water**

- Sanitary Sewer outfalls exist for both Fallis West and Fallis East lands.
- Fallis West can be serviced through an existing 250mm sewer stub on Pristine Trail and through a proposed wastewater treatment plant within the south stormwater management block which can be expanded to service future development.
- Fallis East (including the Commercial Block north of Fallis Line) can be serviced through an existing 525 sanitary sewer stub on Nina Court to the south which will be extended northerly within the subject property.
- Availability of treatment capacity to service new development in the existing WWTP is currently being reviewed by the Township of Cavan Monaghan and based on the information available to date there is sufficient reserve capacity to service additional population. In addition, the Township has been searching for a location to construct a new treatment facility in order to meet its projected growth target over the long term. A second treatment facility is therefore being proposed on the Fallis West site to service the subject lands which can be phased to also service future development. Treatment capacity will therefore be available either through the existing WWTP or the proposed WWTP and it will be a condition of development that will need to be satisfied for registration and release of building permits. As such it is expected that prior to approval there will be sufficient planned capacity in a centralized waste water treatment facility to service the proposed development.



- The subject sites will be serviced by local sanitary systems consisting of minimum 200mm diameter sewers. Each dwelling unit will be provided with a 100mm diameter single connection in accordance with Township standards.

### **Storm Drainage**

- The subject sites are located in the Baxter Creek subwatershed. The Baxter Creek drains to the Otonabee River which discharges to Rice Lake.
- In accordance with Township criteria, the subject sites will be serviced by minor system comprised of a municipal storm sewer sized for the 5-year storm event. The storm sewer system will outlet to the proposed SWM ponds.
- The major system will be comprised of an overland flow route which will convey runoff from rainfall events in excess of the capacity of the municipal storm sewer to a safe outlet.

### **Stormwater Management**

- Two SWM ponds will be constructed to service the Fallis West Lands due to two different natural drainage sheds. The Fallis East Lands will have one SWM Block. These facilities have been designed as wet ponds to provide Enhanced (Level 1) water quality treatment, extended detention for erosion control and flood control using the calculated pre-development flow targets up to and including the 100-year storm event. The SWM ponds will consist of a sediment forebay and a main cell separated by a forebay berm.
- A site water balance assessment has been undertaken to ensure that pre-development infiltration volumes are maintained. Based on the analysis it was determined that the pre-development infiltration volumes can be achieved through a combination of roof downspout disconnections and enhanced infiltration measures such as infiltration trenches, which will be designed at detailed design.

### **Vehicular & Pedestrian Access**

- Vehicular access for Fallis West to the subject site will be provided by road connections to Fallis Line as well as a road connection to Pristine Trail in the adjacent subdivision to the east.
- Vehicular access for Fallis East (including the Commercial Lands) will be through the extension of Fallis Line east of County Road 10.
- The proposed local roads will be constructed to urban standards having an 8.5m pavement width within 18.0m and 20.0m wide road allowances.
- Pedestrian access will be provided by 1.5m wide concrete sidewalks which are to be generally located on one side of each road. In addition, walkway connections will be provided to the open space lands.

### **Grading**

- As is typical with large subdivision projects, earthmoving will be required to achieve the proposed subdivision grading necessary to meet the criteria of the Township. A detailed analysis of the earthworks will be conducted at the detailed design stage to optimize the cut and fill volumes. Based on the preliminary design, no significant difficulties are anticipated in achieving the municipal grading design standards.
- Since the subject sites are located in an area regulated by the ORCA, a permit will be required from their office prior to commencing earthworks.

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**Erosion & Sediment Control During Construction**

- Erosion and sediment control (ESC) measures are to be implemented during construction to prevent silt laden runoff downstream in accordance with the Erosion & Sediment Control Guidelines for Urban Construction (December 2006). The ESC plans are to be prepared at the detailed engineering design stage and are to reflect the various construction stages.

**Subdivision Engineering Design**

- Detailed design for the proposed developments is to be prepared at the subdivision engineering stage. This detailed design is to include servicing and grading plans as well as a stormwater management report based on the criteria established in this Functional Servicing Report. Additional design details can be found in the Functional Servicing Reports previously submitted.

Respectfully Submitted,

**VALDOR ENGINEERING INC.**



**Peter Zourntos, P.Eng., C.Eng.**  
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Attachments:

1. Proposed Zoning Plan



Carner Line

Highway 115

East  
1st Street

Country Road 10

King Street W

## Legend

- Subject Lands
- Low Density Residential
- Commercial / Mixed Use
- Hazard Land Zone
- Parkland
- Stormwater Management Pond and Wastewater Infrastructure