



Huron Meadows Subdivision

Preliminary Servicing Report

Project Location:

70786 Bluewater Highway
Grand Bend, ON

Prepared for:

Tridon Group
609 William St, London, ON

Prepared by:

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July 18, 2019

Revised: September 21, 2021

MTE File No.: 46339-104





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1.0 Introduction

MTE Consultants Inc. was retained by Tridon Group to complete a Functional Servicing Report in support of a zoning bylaw amendment and a draft plan application for the proposed Huron Meadows Subdivision (Phase 1). This report assesses the feasibility of servicing this site to support residential development.

The site is located in the Municipality of South Huron, north-east of the main intersection at the former Oakwood Resort Golf Course. The subject site consists of approximately 12.2 hectares of land, generally bounded by agricultural lands to the north, the Walker Drain to the south-east, and Hwy 21 to the west, as shown in Figure 1. The subject lands fall within the boundaries of the Municipality of South Huron.

A Scoped Secondary Plan of Subdivision for the proposed development has been prepared by Tridon Group and forms the basis for the proposed servicing concepts. The Draft Plan Application proposes to develop the site as a residential subdivision with single-family homes (92 lots), street townhomes (25 units) and a medium density block (71 units). The proposed draft plan is included in Appendix 'A'.

2.0 Existing Topographical Characteristics

The proposed site is located on the north and east side of the Oakwood Resort Golf Course. The Oakwood Resort Golf Course currently remains in its prior state; predominantly grass covered with mixed areas of sparse and dense tree coverage. The Course is bisected by the Walker Drain from east to west. The proposed site is located on the north side of the Walker drain.

The existing grading of the site is comprised of moderate slopes generally grading towards the Walker Drain and flowing towards the Hwy 21 culvert crossing to the west. Excluding the flood plain, the developable area has a difference in elevation of 2.0m between the east and west ends of the site.

3.0 Sanitary Servicing

The Municipalities of South Huron, Lambton Shores, and Bluewater have identified the need for upgrading and extending the existing sanitary sewers and treatment infrastructure in Grand Bend. In 2008, the partnering Municipalities implemented a strategic plan to facilitate future growth and development of the community while addressing the concerns of the aging sanitary collection systems servicing the existing population. The strategic plan was largely based off of the findings put forth in the *Grand Bend and Area Sanitary Sewage Master Plan, 2006* prepared by Dillon Consulting. The report urged the need for an expansion of the Grand Bend Wastewater Treatment Facility in conjunction with gravity and low pressure trunk sewers servicing Bluewater, South Huron, Lambton Shores, and Dashwood. In 2011 the Grand Bend Wastewater Treatment Facility was upgraded to a capacity of 1,891 m³/day.

As part of the implementation process, Gamsby and Mannerow Engineers were retained by the Municipalities of South Huron to complete an Environmental Assessment (EA) for a proposed trunk sanitary sewer to service future growth areas. The EA focused on routing options for the sanitary trunk sewer along Highway 21 and upgrades to Pumping Station 2 located on Main St. and Gill Rd. The preferred primary alternative was determined to be solution B1, which identified the trunk sewer to be installed on the west side of the Hwy 21 ROW from PS2 to Huron County Rd 83. The project was proposed in 2 phases. It is understood that at this time phase 1 has been approved by council, and is scheduled for construction in 2021.

Table 3.1 - Municipal Trunk Sanitary Sewer Phases

Phase	Operation	Service Population
1	<ul style="list-style-type: none"> Extend Trunk Sewer from PS2 through Municipal Dr. to Hwy 21, extending up the west corridor to Indian Rd PS2 upgrades for worn items and control monitoring system 	Existing – 590 Future – 218
2	<ul style="list-style-type: none"> Extend Trunk Sewer from Indian Rd to Huron County Road 83 PS2 upgrade of pumps, motor control center, main power unit and other miscellaneous items 	Existing – 65 Future – 537

The current plans for the trunk sewer are to have Phase 1 terminate immediately north of the Indian Road intersection with Hwy 21. The proposed development is located on the east side of Hwy 21 approximately 500 m north of Indian road.

3.1 Huron Meadows Phase 1 Development Strategy

In order for the Huron Meadows (Phase 1) development lands to proceed, a sanitary outlet to the municipal sewer system will be required. The municipal sanitary project noted above contemplates the extension of the trunk sanitary sewer to a location that could service this development in the next few years. This sewer project is identified as part of the DC charge in the South Huron 2020 Development Charges bylaw.

However, if the planned phase 2 trunk sewer cannot proceed in a timely manner MTE has reviewed an alternative sanitary outlet for the phase 1 development lands. MTE has confirmed that the Oakwood Links Pump station (municipally owned) which is located immediately west of the proposed development and highway 21 has sufficient capacity to service this first phase.

MTE has completed a thorough review of the capacity and existing use of the Oakwood Links pump station (summarized in 3.2 below) and determined that the pump station has sufficient unused and uncommitted capacity available to provide sanitary servicing for the first phase of the Huron Meadows development if the municipal trunk gravity sewer construction is delayed.

Contributing Flows from the Proposed Development

As noted, the proposed draft plan of subdivision contemplates 92 low density residential lots, 25 street townhome units (in 4 blocks), and a medium density block that could yield up to 71 units.

Based on this proposed draft plan of subdivision the maximum lot density and contributing sanitary flows have been estimated.

The following design criteria has been used to determine the Peak Residential Flows;

- PPU= 3.0 (lot basis)
- Per capita flow = 230 l/cap/day,
- PF= 0.8x Harmon peaking factor,
- Uncertainty Factor = 1.1
- I/I = 8640 l/ha/day (0.1 l/ha/s)

Accordingly, the anticipated flow from the proposed subdivision is as follows;

Table 3.2 - Draft Plan Contributing Flows

Residential Units	Population	Peak Residential Flow (L/s)
92 SF	276	3.86
25 MD	75	1.02
71 MD	213	2.79
188 Total	564	7.68

Based on this preliminary analysis of the sanitary sewage conveyance from the proposed subdivision a minimum of 7.68 l/s of uncommitted capacity will be required in the Oakwood Links Pump station for this development.

3.2 Oakwood Links Pumping Station

The Oakwood Links Pumping Station is a municipally owned sewage pumping station located directly across Hwy 21 from the proposed development, just north of the Walker Drain. The Oakwood Links Pumping Station was designed to handle flows from the adjacent Oakwood Links Condominium Development, along with two other nearby vacant properties shown in Figure 1. Inflow data for the pumping station was retrieved from the Final Design Notes prepared by BM Ross. The flow allocations are listed in Table 3.3 below.

Table 3.3 - Oakwood Links Pumping Station Design Flows

Area	Allocated Peak Flow (L/s)	Existing Flows* (L/s)	Available Flows	Equivalent Single Family Homes
F1	6.10	0	6.10	
F2	1.69	1.17	0.52	
F3	2.32	0	2.32	
Existing Capacity of Pump Station (10 L/s)				
F1+F2+F3	10.08	1.17	8.94	261

*Corrected to 2019 South Huron Municipal Standards and actual buildout

At this time, the only contributing flow to the pump station is the Oakwood Links Condominium Development (Area F2). Thus, the pump station has approximately 8.4 L/s of spare capacity which is adequate to service the full buildout of the proposed development. There are no anticipated capacity constraints in the downstream sewer systems under the existing capacity of the pumping station.

A desktop review of the existing pump station was conducted to determine its ultimate capacity to handle sewage flow. The existing pump curves were obtained and analysed based on their as-built state. The results of this review has been summarized in a technical memo found in Appendix A. The resulting ultimate capacity of the pump station was determined to be 10.3 L/s. The anticipated sewage flows from the proposed development as noted above is 7.68 l/s.

All of the proposed Huron Meadows Phase 1 development can be serviced by the existing pumping station as an interim condition until the Municipality is able to extend the trunk sanitary sewer across the frontage of the development.



LEGEND

- F1 OAKWOOD TENNIS CLUB (UNDEVELOPED)
- F2 OAKWOOD LINKS CONDOMINIUMS (28 UNITS)
- F3 FUTURE CONDOMINIUM DEVELOPMENT (UNDEVELOPED)
- WALKER DRAIN
- DIRECTION OF FLOW
- DEVELOPMENT BOUNDARY
- FUTURE TRUNK SANITARY SEWER

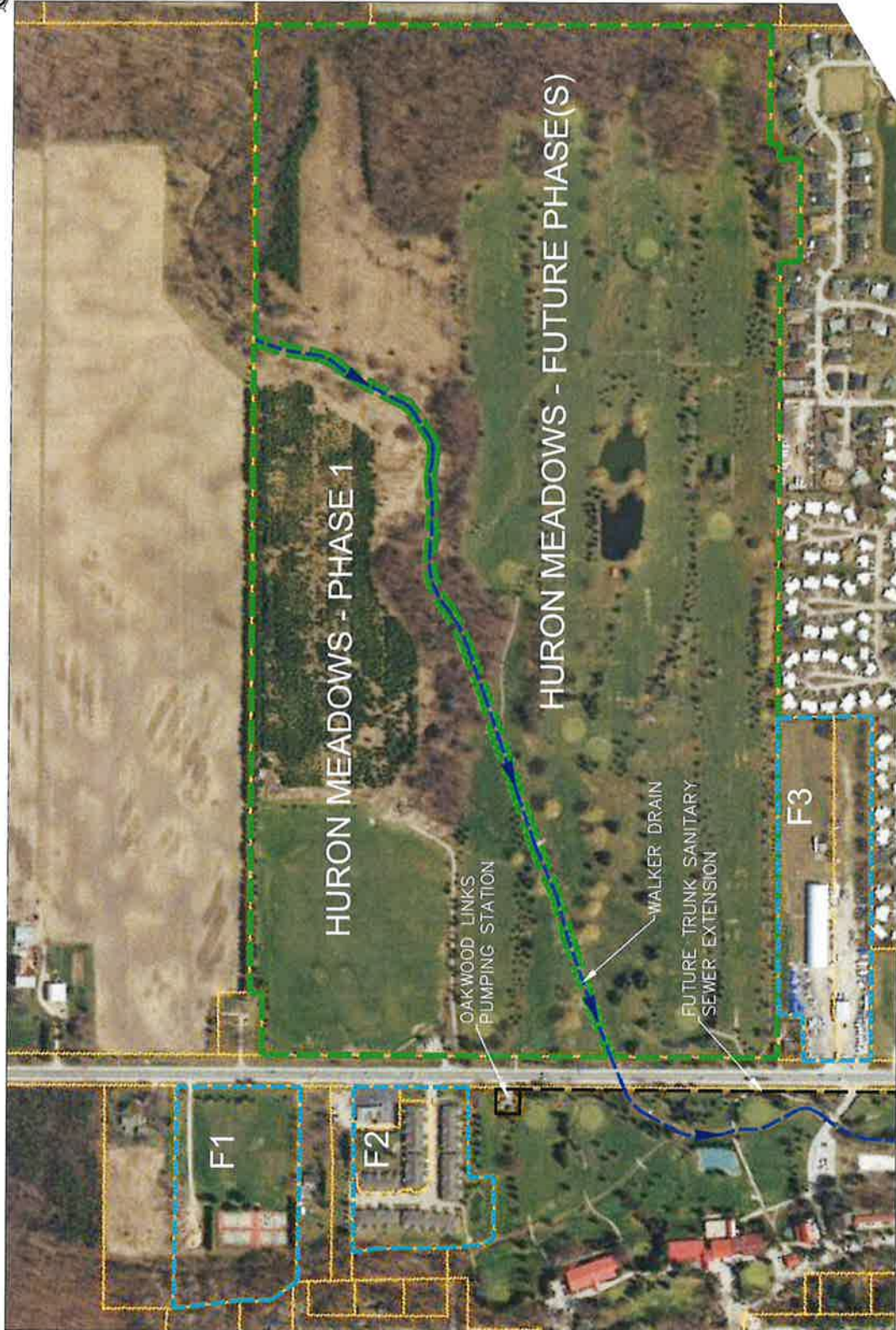


FIGURE 1
DATE: MAR 2022
SCALE: N.T.S.
PUMPING STATION CONTRIBUTING FLOWS
HURON MEADOWS SUBDIVISION

Project No.: 46339-104

4.0 Stormwater Management

4.1 SWM Criteria

In consultation with the Ausable Bayfield Conservation Authority (ABCA) the following criteria have been identified:

- Post-development flows will be controlled to pre-development flow rates for all storm events.
- Enhanced level of quality control is required.

4.2 SWM Approach Options

There are two main approaches to SWM in Ontario. The conventional approach is to construct a single large end of pipe wet pond facility designed to receive uncontrolled flow from the entire site and provide the appropriate amount of quality and quantity control before releasing the runoff to the downstream receiver. The second approach is an at-source approach consisting of many small infiltration or conveyance systems located across a site. This is commonly referred to as Low Impact Development or LID.

The conventional approach has the advantage of being centrally located and is generally more land efficient. An LID approach provides many benefits to the environment and is more flexible in implementation. LIDs are generally more favourable where native soils are conducive to infiltration but are encouraged by Conservation Authorities in all types of soils. LIDs also have the benefit of reducing sewer requirements as flows are controlled at-source and released slower than under the typical pipe design methodology. LIDs can also help with balancing the ground water table elevation, helping match post development to predevelopment levels.

4.3 Proposed SWM Approach

It is proposed that a conventional end-of-pipe facility be utilized to service the site. The SWM facility will be designed in accordance with the Ministry of Environment, Conservation and Parks (MECP) and the Ausable Bayfield Conservation Authority (ABCA) criteria, providing the required levels of quantity and quality control which will be determined in consultation with the ABCA.

Given the generally flat terrain, it is recommended that LIDs be utilized in conjunction with the conventional end-of-pipe SWM system. Where possible, roof and rear yard runoff can be directed to passive LID features located in the rear yards. Directing water to LID features can help reduce the quantity of runoff directed to the storm sewer system and promote infiltration. The conventional end-of-pipe SWM facility will be utilized to control runoff rates to pre-development peak flows and provide quality control. The storm sewer system will be designed for the Municipality of South Huron 5 year storm event with overland flow routes generally following the proposed road allowances.

In conclusion, the proposed development's stormwater runoff can be adequately managed by the proposed SWM strategy. Quality control measures can be addressed in the proposed SWM facilities prior to entering the Walker Drain

5.0 Water Distribution

Water for domestic and fire suppression flows is available for the proposed subdivision via the existing 350mm watermain on Hwy 21. Municipal staff have advised that the existing main is currently oversized and has sufficient capacity and pressure available to service the proposed subdivision. The proposed subdivision will be serviced by live tapping the main in two locations. This method will minimize any disruption in the downstream distribution system. Connection points will be located at the proposed entrance and north limit of the subdivision providing a continuous loop through the development.

6.0 Roadworks

The subject property abuts an arterial highway governed by the Ministry of Transportation (MTO). Prior to final approval of the subdivision plan, coordination with MTO will continue for all works within the MTO corridor control area. Approvals will be obtained for all works within the MTO corridor control including;

- Entrance permit for subdivision
- Turning lanes as required on highway 21
- Sanitary sewer outlet crossing of highway 21 ROW.
- Water main service connection within ROW.
- Storm water management reviews within MTO corridor control area

A complete traffic study for this development has been prepared by Paradigm Transportation Solutions and has been provided under separate cover.

7.0 Utilities

Hydro servicing for the proposed development will be through Hydro One. It is understood that a transmission pole line exists at the northwest property line. Correspondence with Hydro One will be required to assess the demand of the proposed development.

8.0 Conclusions and Recommendations

The main findings of this functional servicing report for the proposed Huron Meadows Subdivision are:

1. There are no existing gravity sanitary outlets for the Huron Meadows development site. The preferred sanitary sewer outlet for the Huron Meadows Subdivision is the proposed municipal gravity trunk sewer contemplated to be constructed by the municipality in the next few years. If the municipal trunk sewer construction timing is delayed, MTE has identified that interim servicing for the phase 1 lands can be accommodated by connecting to the existing Oakwood Links Sanitary pump station.
2. Water supply for the proposed development can be provided through two connections to the existing municipal watermain along Hwy 21.
3. Stormwater management for the development can be accommodated through a combination of lot-level Low Impact Development controls (LIDs) and a conventional end-of-pipe SWM facility located adjacent to the regulatory buffer of the Walker Drain. The final SWM facility configuration will be provided during the detailed design process.
4. MTO Entrance permits will be required for the proposed access from highway 21.
5. Infrastructure for electrical, communications and gas will be provided through connections and expansions of exiting utilities along highway 21.

All of which is respectfully submitted,

MTE Consultants Inc.



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JJM

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Appendix A



LAND USE SCHEDULE

MINIMUM LOT AREA (sq. m)	1,100
MINIMUM LOT AREA (sq. ft.)	12,000
MINIMUM FRONT SETBACK (m)	1.5
MINIMUM FRONT SETBACK (ft.)	5
MINIMUM SIDE SETBACK (m)	1.5
MINIMUM SIDE SETBACK (ft.)	5
MINIMUM REAR SETBACK (m)	1.5
MINIMUM REAR SETBACK (ft.)	5

ADDITIONAL INFORMATION
 ZONING DISTRICT: R-1 (Residential Single-Family)
 ZONING BY-LAW: 2011-01-01
 ZONING AMENDMENT: 2011-01-01

OWNER'S CERTIFICATE
 I, the undersigned, being the owner of the land described herein, do hereby certify that the information contained herein is true and correct to the best of my knowledge and belief.

SUBDIVISION CERTIFICATE
 I, the undersigned, being the owner of the land described herein, do hereby certify that the information contained herein is true and correct to the best of my knowledge and belief.

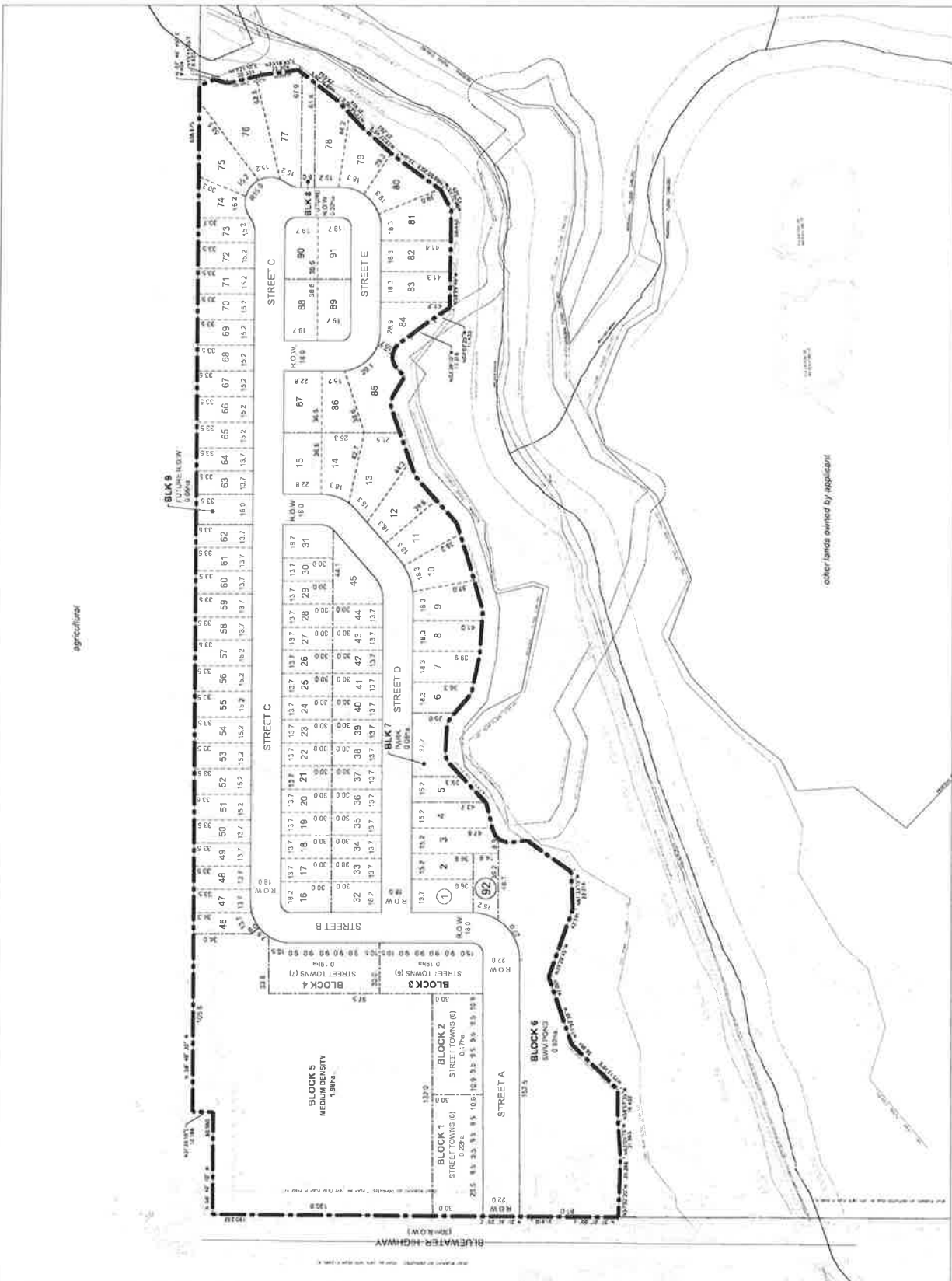
Project Name:
 PART OF LOTS 2, 3 AND 4
 LAKE ROAD EAST CONCESSION
 LAKE ROAD WEST CONCESSION
 LAKE ROAD WEST CONCESSION
 GEOGRAPHIC TOWNSHIP OF STEPHEN
 MUNICIPALITY OF SOUTH HURON
 COUNTY OF HURON

BAKER
 Planning Group

DRAFT PLAN OF SUBDIVISION

Sheet No: 1
 DP-1

Scale: 1:1000 METRIC
 Date: 11/03/2020
 Drawn By: J. STREET





Project Name: Oakwood Development, Grand Bend

MTE File No.: 46339-104

To: Bill Veitch, MTE

Date: March 20, 2020

cc: Morgan Crane, MTE

From: Dave Wilhelm, P.Eng.

RE: Oakwood Sanitary Pumping Station Duty Point Review

MTE was retained to conduct a desktop review into the duty point of the Oakwood Sanitary Pumping Station (SPS). The SPS is located on the northwest side of the Bluewater Highway (Highway 21) just south of Oakwood Links Lane. The SPS services the Oakwood Links Development on the outskirts of Grand Bend. The Municipality of South Huron has requested a supplementary review of the capacity of the existing SPS in its as-constructed state.

The ex. Oakwood SPS discharges through a meter room in the basement of the generator building. The discharge piping is combined into a 100 mm header prior to exiting the building. The 100 mm diameter forcemain runs along the Bluewater Highway (Highway 21) for a length of approximately 585 m based on the As Recorded Drawings (attached). The forcemain connects through a reducer and to a tee on a 200 mm diameter forcemain. The 200 mm diameter forcemain continues approximately 100 m along Hwy. 21 prior to discharging into a sanitary manhole and gravity sewer. The elevation of the 200 mm diameter forcemain discharge could not be independently confirmed for this analysis. As such, the details of the 200 mm diameter forcemain presented in the BM Ross design notes were assumed to be valid in the absence of as recorded information or field verification.

The system curve for the pump station and forcemain was calculated using two different methods. The first method used the Bentley Flowmaster program to determine the duty point at a given flow. The second method used a spreadsheet to calculate the system curve over a range of flow rates and plotted the curve against the pump curve. Both methods generally agree with the BM Ross design. The theoretical pump duty point found with both methods was 10.3 L/s at 19.7 m TDH whereas BM Ross had a duty point of 10.5 L/s at 19.7 m TDH. The difference between these two flows is negligible.

It is important to note that there is a shared section of 200 mm diameter forcemain that has been assumed to be used only by the Oakwood SPS flows. At the point where the forcemain increases to 200 mm diameter, there is a future connection for another pump station. It has been assumed that this second pump station has not been installed. If installed, it would interfere with and reduce the pump rate of the Oakwood SPS when both stations are operating at the same time.

Additional information such as pump run times, measured flow rates, high level alarm records, metered daily flows and /or pump drawdown test would assist to further evaluate the operation of the existing station.

Under the conditions stated above, there are no preliminary concerns with including additional flows from the proposed Oakwood Subdivision, given the flows stay within the prescribed duty flows stated above.