

CONSULTANTS:

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SEAL:

PROJECT NAME:

IMPALA SUBDIVISION -
PHASE 1

PROJECT ADDRESS:

SOUTH LANCASTER, ON

OWNER/CLIENT:

IMPALA DEVELOPMENT
INC.

REVISIONS:

1	MAR 16 2026	ISSUED FOR COORDINATION	
IS	RE	DATE	DESCRIPTION

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PROJECT NUMBER:

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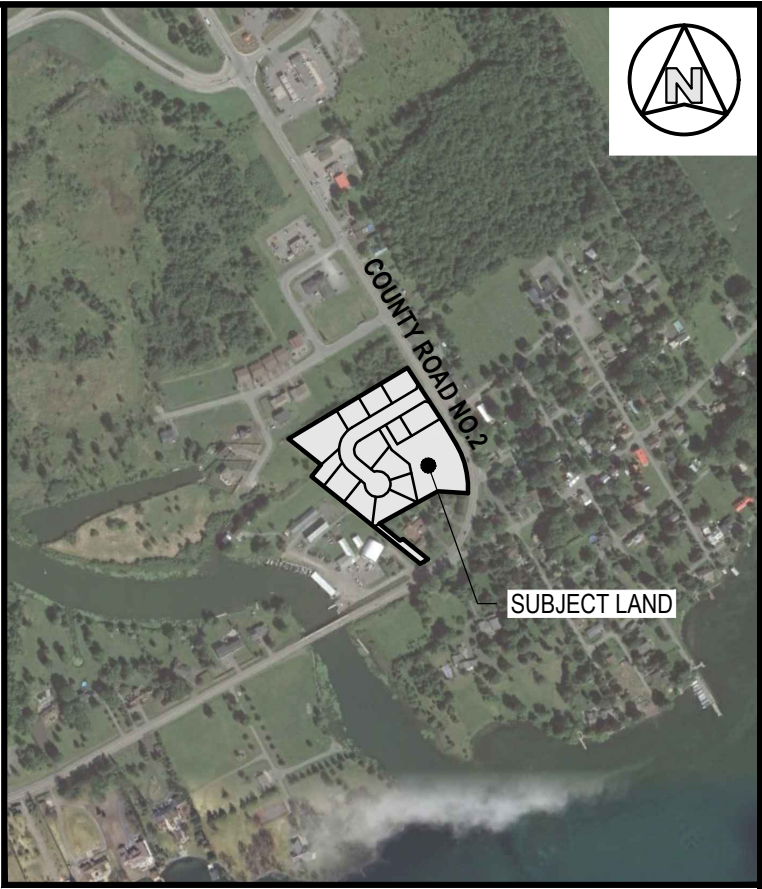
SHEET NAME:

SITE PLAN



1 ARCHITECTURAL SITE PLAN
1" = 50'-0"

ISSUED FOR CONSTRUCTION



SCALE: 1:400	JOB NO: 25001
DESIGNED BY: T.H.	DATE: 2025/02/28
DRAWN BY: K.B.W./B.K.N.	DRAWING NO. DP1.1
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20361 County Road 2, South Glengarry

Planning Rationale
Draft Plan of Subdivision + Zoning By-law Amendment
April 24, 2026



Prepared for Impala Developments

Prepared by Fotenn Planning + Design
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1.0 Introduction

Fotenn Planning + Design has been retained by Impala Development Inc. to prepare this Planning Justification Report. Impala Development Inc. owns the lands located at 20361 County Road 2 (the “subject property”), in South Lancaster within the Township of South Glengarry. The property is located east of the Raisin River Marine, within the curve of County Road 2, just south of Andrea Avenue. The subject property has two access points from the road. The property was formerly developed with a motel use which was demolished around 2012. The site is currently vacant.

The Planning Justification Report has been prepared in support of a Draft Plan of Subdivision (DPOS) application and a Zoning By-law Amendment (ZBA) application to permit development of the property with three apartment blocks (1 high-rise, 2 low-rise), eight townhouse blocks, two semi-detached blocks, one new public road and a stormwater management facility. The proposed development will introduce 52 residential dwelling units, with a further 72 units as part of the high-rise apartment block.

A pre-application consultation meeting was held with Township staff on May 15th, 2025, during which a preliminary concept was reviewed, and application requirements were confirmed. It was identified that the existing zoning does not permit the proposed use and that a Zoning By-law Amendment would be required to rezone the property from Commercial to Residential (R3, R4 and exception R4). During the meeting, it was also noted that the Raisin River Conservation Authority (RRCA) will not require a stormwater quantity management plan based on the hydrological considerations and existing floodplain mapping. The RRCA recommended an application for a fill permit be filed to eliminate any flood plain considerations. It was acknowledged that discharges to the river may be subject to RRCA permitting to ensure that erosion impacts from outflows are mitigated. In addition, an Environmental Impact Study has not been required as part of this application due to the highly disturbed nature of the subject lands with prior development.

The following supporting materials have been included in this submission for the Draft Plan of Subdivision and Zoning By-law Amendment applications:

- / Completed Application forms and fees;
- / This Planning Justification Report;
- / The conceptual Site Plan Drawing, prepared by Wilson Architectural Design, dated March 16, 2026;
- / Draft Plan of Subdivision, prepared by EVB Engineering, dated February 28, 2025
- / Transportation Impact Study, prepared by GHD, dated December 10, 2025
- / Preliminary Servicing & Stormwater Management Report, prepared by EVB Engineering, dated March 6, 2026; and
- / An Archaeological Screening Form

The purpose of this Planning Justification Report is to assess the appropriateness of the proposed development and the requested amendments in the context of the surrounding neighbourhood and applicable policy/regulatory framework.

2.0

Site Context and Surrounding Area

The subject property is located within the Township of South Glengarry, which forms part of the United Counties of Stormont, Dundas and Glengarry. The Township comprises of eight hamlets, including Glen Walter, Lancaster, North Lancaster, South Lancaster, Bainsville, Green Valley, Martintown, and Williamstown. The subject property is situated within South Lancaster, which functions as a small, established residential community with a predominantly low-rise, low-density character.



Figure 1: Aerial image showing the subject property indicated in red.

The property is irregularly shaped and located along County Road 2 where the road curves northward, south of Andrea Avenue. County Road 2 runs along the eastern boundary of the site providing two points of access to the property. Vehicular access is taken from the northern portion of County Road 2, south of Andrea Ave, and pedestrian access can also be taken from the southern portion of County Road 2. The subject property is a large lot situated within a low-rise context. To the north, between the property and Andrea Avenue, are several vacant parcels and few detached dwelling units. To the east, across County Road 2, the area includes small-scale commercial uses, such as motor vehicle repair shops along Church St. To the south and west, the surrounding area is occupied by detached dwellings with accessory structures operating marine equipment storage uses. The site is in proximity to the Raisin River located to the west of the subject property, which drains into the St. Lawrence River.

Previously, the property was developed with a motel use (see Figure 2) which was demolished around 2012. The site is currently vacant (see Figure 3).



Figure 2: 2009 streetview image showing the former motel buildings on the subject lands.



Figure 3: 2023 streetview image showing the current condition of the subject property.

3.0

Proposed Site Context and Surrounding Area

The proposed development represents the redevelopment of underutilized lands with residential uses of varying densities which align with the surrounding residential character and supports the need for a broader range of housing types in South Lancaster. The subject property has a total developable area of approximately 2.76 ha and a frontage of approximately 187 metres along County Road 2.

The Draft Plan of Subdivision is required to implement the intended block plan comprised of a total of 15 blocks featuring 1 high-rise apartment block, 2 low-rise apartment blocks, 8 townhouse blocks, 2 semi-detached blocks, one new public road and an area between the two residential apartments dedicated to a stormwater management facility.

The Zoning By-law Amendment is required to rezone the property under Township of South Glengarry Zoning By-law 38-09 from Highway Commercial (HC) to Residential Type 3 (R3) zone, Residential Type 4 (R4) zone, and Residential Type 4 Exception (R4-XX) zone to permit the proposed land uses and establish site-specific performance standards.

The proposal includes two low-rise apartments (16 units), eight townhouses (32 units) and two semi-detached buildings (4 units). An additional apartment block for a higher-density built form with approximately 72 units is also proposed to front onto County Road 4. All blocks are organized and oriented around a new L-shaped public road which terminates in a cul-de-sac. Vehicular access to the new public road is taken from County Road 2. Parking is provided within individual lots for the townhouse and semi-detached blocks, and within a surface parking area for the apartment blocks.



The apartment buildings are proposed to be 3.5 storeys in height and the townhouse and semi-detached buildings will be 2 storeys. This approach supports a low-rise compact form that remains consistent with nearby built form. The design of the 3.5 storey apartment building will be referencing features for a similarly approved development by the same applicant. Concept images can be found below for reference.



Figure 5: Draft Plan of Subdivision.



Figure 6: Concept image of the architectural design proposed for the 3.5 storey apartment buildings.

4.0 Supporting Technical Studies

4.1 Preliminary Servicing and Stormwater Management Report

A Preliminary Servicing and Stormwater Management Report was prepared by EVB Engineering, dated March 2026. The report discusses sanitary sewage collection, stormwater collection, water distribution and stormwater management for the proposed development. The report states that full municipal services will be provided to the development, including sanitary sewers, watermains, storm sewers (including rear yard catch basins), an oil and grit separator, asphalt roadways, street lighting, and utilities (Bell, gas and hydro). With regards to the sanitary sewer system, report states that the proposed development can connect to the existing sanitary sewer network located along County Road 2. Peak flows from the development were calculated and were found to be consistent with the Ministry of the Environment, Conservation and Parks (MECP) Design Guidelines for Sewage Works. With regards to water supply, the report states that a new watermain will be connected to the existing watermain located along County Road 2 to supply water to the proposed development, and a new fire hydrant will be installed within the cul-de-sac. The watermain will be designed to be consistent with the MOE Design Guidelines for Drinking Water Systems. With regards to stormwater management, the report states that a representative of the Raisin Region Conservation Authority confirmed that a stormwater quantity management is not required based on hydrologic considerations.

4.2 Traffic Impact Study

A Traffic Impact Study (TIS) was prepared by GHD, dated December 2025. The purpose of the TIS is to assess the proposed development from a transportation perspective, to determine the forecasted traffic impacts to the adjacent road network, and to identify any mitigation measures required to accommodate the proposed development. The study reviewed current and future intersection operations and assessed sightline safety. In summary, the TIS demonstrates that the proposed subdivision will not adversely affect traffic operations or safety at key intersections in the study area. An analysis conducted of existing and future scenarios, including projected growth to 2032 indicates that all intersections will continue to operate at a high level of service, with no critical delays or capacity concerns during the AM/PM peak periods. A sightline assessment was conducted at the intersection of Bethune Street and County Road 2 and finds that existing sightlines are adequate and the anticipated increase in traffic is not anticipated to create additional safety concerns. The report made a recommendation to extend the posted 50 km/h speed limit through the curve to improve safety through the curve for all road users and help ensure the available sight distance remains adequate for turning manoeuvres. Overall, the TIS' findings suggest that the development can proceed without requiring additional traffic mitigation measures.

5.0 Policy and Regulatory Framework

This section provides an overview of the key land use policies relevant to the proposed development and demonstrates how the proposal conforms to the relevant policy objectives.

5.1 Provincial Planning Statement (2024)

The 2024 Provincial Planning Statement (PPS) provides policy direction on matters of provincial interest related to land use planning and development in Ontario municipalities. As a key part of Ontario's policy-led planning system, this document sets the policy foundation for the development and use of land. The 2024 PPS came into force on October 20th, 2024.

The PPS is a streamlined province-wide land use planning policy framework that replaces both the Provincial Policy Statement, 2020 and A Place to Grow: Growth Plan for the Greater Golden Horseshoe, 2019 while building upon housing-supportive policies from both documents. The decisions of municipal councils must be consistent with the 2024 PPS, which provides direction for issues such as the efficient use of land and infrastructure, the protection of natural and cultural heritage resources, maintaining a housing stock that appropriately addresses the demographic and economic diversity of households and preserving natural resources for their future use.

Concerning the proposed development, applicable policies are in italics, with responses outlined below:

Chapter 2 – Building Homes, Sustaining Strong and Competitive Communities

Chapter 2 of the 2024 PPS contains policies for Building Homes, Sustaining Strong and Competitive Communities. More specifically, Section 2.1 contains policies for Planning for People and Homes which state:

4. *To provide for an appropriate range and mix of housing options and densities required to meet proposed requirements of current and future residents of the regional market area, planning authorities shall:*
 - a) *maintain at all times the ability to accommodate residential growth for a minimum of 15 years through lands which are designated and available for residential development; and*
 - b) *maintain at all times where new development is to occur, land with servicing capacity sufficient to provide at least a three-year supply of residential units available through lands suitably zoned, including units in draft approved or registered plans.*
6. *Planning authorities should support the achievement of complete communities by:*
 - a) *accommodating an appropriate range and mix of land uses, housing options, transportation options with multimodal access, employment, public service facilities and other institutional uses (including schools and associated child care facilities, long-term care facilities, places of worship and cemeteries), recreation, parks and open space, and other uses to meet long-term needs;*
 - b) *improving accessibility for people of all ages and abilities by addressing land use barriers which restrict their full participation in society; and*
 - c) *improving social equity and overall quality of life for people of all ages, abilities, and incomes, including equity-deserving groups.*

Section 2.2 contains policies for Housing, which state:

1. *Planning authorities shall provide for an appropriate range and mix of housing options and densities to meet proposed needs of current and future residents of the regional market area by:*
 - a) *establishing and implementing minimum targets for the provision of housing that is affordable to low and moderate income households, and coordinating land use planning*

and planning for housing with Service Managers to address the full range of housing options including affordable housing needs;

- b) permitting and facilitating:

 - 1. all housing options required to meet the social, health, economic and wellbeing requirements of current and future residents, including additional needs housing and needs arising from demographic changes and employment opportunities; and*
 - 2. all types of residential intensification, including the development and redevelopment of underutilized commercial and institutional sites (e.g., shopping malls and plazas) for residential use, development and introduction of new housing options within previously developed areas, and redevelopment, which results in a net increase in residential units in accordance with policy 2.3.1.3;**
- c) promoting densities for new housing which efficiently use land, resources, infrastructure and public service facilities, and support the use of active transportation.*

Section 2.3 contains policies for Settlement Areas, which state:

- 1. Settlement areas shall be the focus of growth and development. Within settlement areas, growth should be focused in, where applicable, strategic growth areas, including major transit station areas.*
- 2. Land use patterns within settlement areas should be based on densities and a mix of land uses which:

 - a) efficiently use land and resources;*
 - b) optimize existing and planned infrastructure and public service facilities;*
 - c) support active transportation;*
 - d) are transit-supportive, as appropriate; and*
 - e) are freight-supportive.**
- 3. Planning authorities shall support general intensification and redevelopment to support the achievement of complete communities, including by planning for a range and mix of housing options and prioritizing planning and investment in the necessary infrastructure and public service facilities.*

Section 2.9 contains policies for Energy Conservation, Air Quality, and Climate Change which state:

- 1. Planning authorities shall plan to reduce greenhouse gas emissions and prepare for the impacts of a changing climate through approaches that:

 - a) support the achievement of compact, transit-supportive, and complete communities;*
 - b) incorporate climate change considerations in planning for and the development of infrastructure, including stormwater management systems, and public service facilities;*
 - c) support energy conservation and efficiency;*
 - d) promote green infrastructure, low impact development, and active transportation, protect the environment and improve air quality; and*
 - e) take into consideration any additional approaches that help reduce greenhouse gas emissions and build community resilience to the impacts of a changing climate.**

The proposed development aligns with the intent of applicable policies by supporting the creation of a complete community through the provision of a mix of housing options, including residential intensification within a residential context. It promotes the efficient use of land and infrastructure and contributes to the long-term housing supply within the regional market area. The development supports broader objectives related to housing affordability, accessibility, and social equity.

Chapter 3 – Infrastructure and Facilities

Chapter 3 contains policies for Infrastructure and Facilities. It provides direction on the coordinated, efficient, and cost-effective provision of infrastructure and public service facilities. It emphasizes optimizing the use of existing municipal services (3.1.2), promoting active transportation and connectivity, and ensuring public spaces and community design support healthy,

active (3.9), and inclusive communities for people of all ages and abilities. The policies also encourage infrastructure planning that supports compact growth and considers the impacts of a changing climate (3.6.2).

The proposed development supports the intent of Chapter 3 by making efficient use of existing infrastructure within a serviced settlement area, avoiding the need for major infrastructure expansions. The development's location and design promote connectivity to the surrounding community through pedestrian access and proximity to existing public spaces. Collectively, the proposal aligns with PPS objectives to deliver infrastructure-supported, compact, and socially connected communities.

Chapter 4 – Wise Use and Management of Resources

Chapter 4 of the 2024 PPS outlines policies for protecting natural heritage, water resources, agricultural lands, mineral and aggregate resources, and cultural heritage.

The subject property has been reviewed and no cultural heritage resources or archaeological potential have been identified on-site. While the property contains portions of the regulatory floodplain, it has been determined in communication with the Raisin Region Conservation Authority (RRCA) that since the subject lands have already been disturbed with the site's prior development as a motel use, an application for a fill permit should be filed to eliminate any future flood plain considerations. Consequently, no further assessments or conservation measures are required in relation to these features. In addition, an archaeological assessment was not deemed required given the highly disturbed nature of the subject lands. The proposed redevelopment respects the applicable provincial policies by ensuring that any nearby heritage or natural resources are protected and conserved as appropriate.

Chapter 5 – Protecting Public Health and Safety

Chapter 5 of the 2024 PPS generally directs development away from natural and human-made hazards. There are no hazards that represent an unacceptable risk to public health or safety in the vicinity of the subject lands.

It is our professional opinion that the proposed development is consistent with the policies of the Provincial Planning Statement (2024 PPS).

5.2 United Counties of Stormont, Dundas and Glengarry Official Plan

The United Counties of Stormont, Dundas and Glengarry Official Plan (County OP), adopted by County Council on July 17, 2017, and approved by the Ministry of Municipal Affairs and Housing on February 4, 2018, serves as the upper-tier planning document that guides land use and growth across the County. The Plan reflects a coordinated approach that balances provincial, County, and local interests.

The Township of South Glengarry has adopted the County Official Plan as its primary land use planning framework. The Plan outlines strategic directions for development consistent with the Planning Act and applicable provincial policies. It addresses a broad range of considerations, including environmental protection, agricultural preservation, natural resource management, economic development, housing, and the provision of transportation and public services.

The subject property is situated within the Urban Settlement Area and is designated Residential District in accordance with Land Use Schedule A6C of the Township of South Glengarry. The subject property is located within the South Lancaster community. Section 3.2 of the County OP outlines policies for Settlement Areas. Specifically, Section 3.2.1.2 characterizes

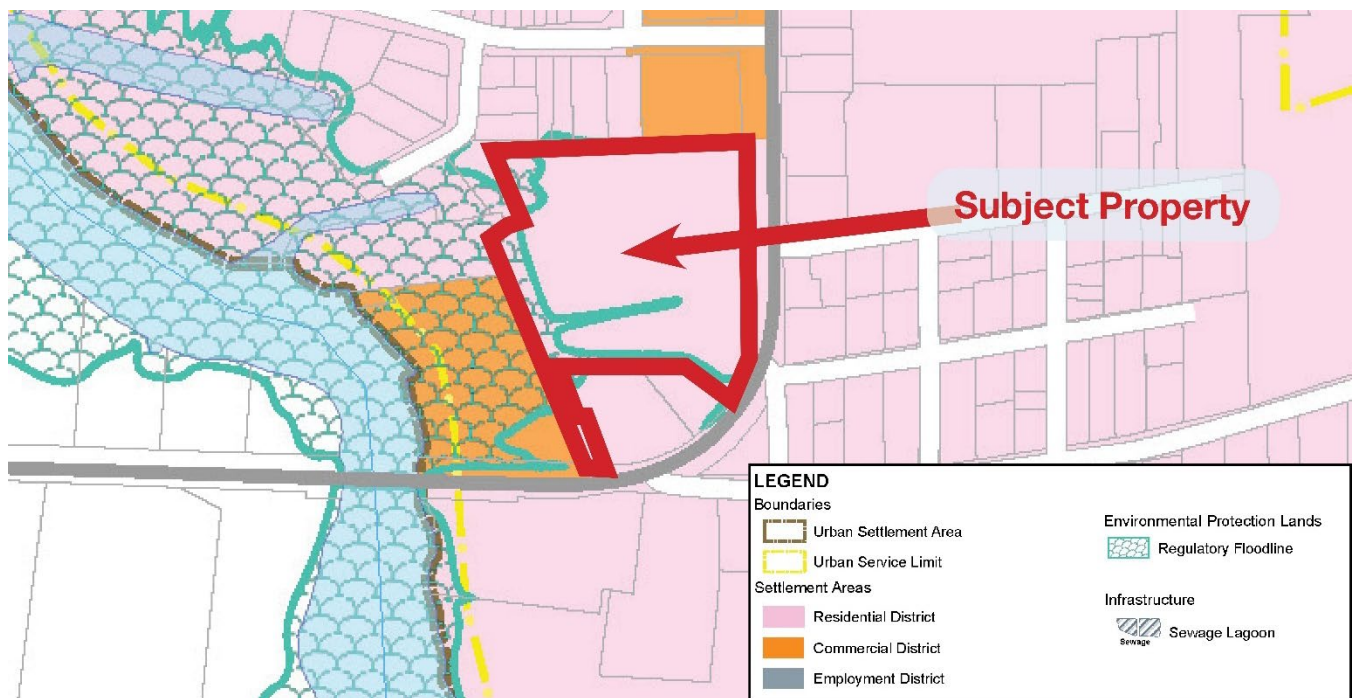


Figure 7: Schedule A6C of the Official Plan showing the subject property in red. The subject property was redesignated from Commercial to Residential District through the adoption of OPA 25.

Urban Settlement Areas as communities with a mix of land uses and full or partial municipal servicing. These areas are prioritized for accommodating future growth, and land division will primarily proceed by plan of subdivision.

Section 3.4 further organizes land across the County into Land Use Districts, within Urban Settlement Areas including Residential, Commercial, and Employment Districts. The permitted uses for Residential District includes:

- / Full range of low, medium and high-density housing
- / Specialized housing types (e.g. group homes, crisis care, social assisted, additional residential units)
- / Neighbourhood serving uses (e.g. convenience commercial, open space, institutional)

Permitted uses across all designations include:

- / Full range of infrastructure uses and utilities excluding waste management systems
- / Legally existing uses
- / Accessory uses to any main use (e.g. bed and breakfast establishments, garages, marine structures, administrative uses, home based businesses)
- / Conservation uses
- / Full range of open space, park and special purpose trail uses
- / Cemeteries
- / Institutional uses

The subject property is situated within the *Residential District* as per Schedule A6C of the Official Plan, which was amended by OPA 25. OPA 25 was adopted by Council in August 2024 by By-law No.5462 for the purpose of settlement boundary adjustment and redesignation of select sites to accommodate this change. The subject property was impacted by this OPA.

As per Schedule A of OPA 25,

17. Schedule "Q" Lancaster Lands within the Urban Settlement Area of Lancaster will be amended on Official Plan Land use Schedule A6 and A6e to redesignate lands from Employment District to Residential District and from Commercial District to Residential District.

Further, Appendix D to OPA 25 provides the following justification for the land use redesignation:

This property is more appropriately developed for residential purposes, given the location of residential subdivision adjacent to the site and additional commercial lands added to the north. Note in the Watson study a shortage of residential designated lands was identified in Lancaster

Section 3.5.1 of the County Official Plan outlines a series of planning principles to guide the review of development applications. These principles ensure that new development is appropriately serviced, compatible with surrounding uses, and aligned with broader policy goals. Section 3.5.1.1 requires that lot sizes be sufficient to accommodate all proposed and potential future uses, including setbacks, servicing, and access requirements.

Section 3.5.1.2 emphasizes the need to confirm the availability and adequacy of servicing capacity - including water, sewage, waste management, and school capacity - early in the planning process.

Section 3.5.1.3 stipulates that all development must have frontage on and access to an open and maintained public road and must meet the requirements of the applicable road authority.

To promote compatibility between land uses, Section 3.5.1.4 encourages the use of landscaping, buffering, and site planning measures to mitigate adverse effects such as noise, visual impact, and land use conflicts.

Section 3.5.1.6 supports the creation of accessible communities for people with disabilities and seniors.

Zoning provisions, as required under Section 3.5.1.7, must regulate a range of development criteria including lot size, setbacks, density, access, and parking, as well as outdoor storage and screening requirements. Additionally, Section 3.5.1.11 promotes the development of complete communities by encouraging compact, mixed-use development that integrates housing, employment, recreation, and transportation options while supporting long-term infrastructure viability and community well-being.

Section 3.5.1.9 promotes design and development which serves to protect or enhance the natural environment and the conservation of ecosystems.

Section 3.5.2 of the County Official Plan outlines a series of planning guidelines to be used by local Municipalities in reviewing development applications.

Section 3.5.2.1 stipulates that local municipalities will encourage compact development by directing development onto vacant lands within existing settlement areas.

Section 3.5.2.2 directs that residential areas shall be designed to be safe and liveable. The Official Plan directs that the following design criteria shall be considered by the County and Local Municipalities for residential areas:

- / 3.5.2.2.1: Residential developments of different heights and densities may be permitted where the scale and character is in keeping with existing or planned surrounding residential heights and densities.
- / 3.5.2.2.4. High density residential areas should be close to commercial areas or downtowns and have ready access to a major street.
- / 3.5.2.2.5. High density residential uses should only be permitted in fully serviced areas.
- / 3.5.2.2.6. All residential development should include a generous area devoted to open space to be utilized as privacy areas for occupants, snow storage area, and landscaping. Existing natural vegetation will be conserved where possible especially along waterways.
- / 3.5.2.2.7. Adequate parking shall be provided on-site or within a short walking distance. Parking areas should not impair views, block entrances and should be appropriately set back from habitable windows.
- / 3.5.2.2.9. Land use compatibility shall be considered in the design and development or redevelopment of residential areas. This includes establishing or respecting building setbacks, separation distances, and influence areas from incompatible uses.
- / 3.5.2.2.10 10. Service areas for delivery and waste disposal pick-up shall be provided for all medium and high density residential developments and shall be located to minimize or avoid any incompatible or health safety concern.
- / 3.5.2.2.11. Provision shall be made for proper vehicular access and circulation for firefighting and other emergency vehicles. This may include dedicated or posted fire lanes.
- / 3.5.2.2.12. Residential design should emphasize the retention, conservation or enhancement of the natural environment and consider the effects of climate change.
- / 3.5.2.2.14. Residential buildings shall be designed to be accessible where required under the *Accessibility for Ontarians with Disabilities Act*. Provision shall be made in medium and high density residential developments for accessible parking
- / 3.5.2.2.16. In the design of residential developments, Local Municipalities may regulate building elevations, location and spacing to protect views, vistas and solar access.

Section 3.5.2.6 outlines the County's 15% target for infill and residential intensification in built-up areas. The Official Plan states that infilling and redevelopment can occur on vacant lots of record or underutilized sites to consolidate development and optimize the use of existing services. The creation of new residential units is encouraged in built-up areas with sufficient existing and planned infrastructure to promote efficient development patterns and encourage complete communities.

Section 3.5.2.7 outlines the County's energy conservation green energy efforts through promoting compact form, building orientation and design and considering alternative development standards in the design and development of communities. Section 3.5.2.8 state that Municipalities shall have regard for the protection, conservation or enhancement or features or attributes of the natural environment and natural heritage features and areas through development.

Section 3.5.2.9 speaks to shoreline development and recognizes that there is the potential for marine archaeological remains from the pre-historic period through the modern era and that municipalities may require marine archaeological assessments where appropriate.

Section 4.3.3.4 stipulates that within Settlement Areas, within the Service Limits, development will be permitted only where there is sufficient reserve capacity. All proposed development within Service Limits shall be connected to full or partial services where such services are available and where there is sufficient capacity to accommodate the proposed development. Servicing capacity are to be included as part of a subdivision agreement or other appropriate instrument.

Stormwater management, as required under Section 4.3.4, must be part of the subdivision approval process and for multiple lot/unit residential development. Best management practices shall be used in the design, construction, and maintenance of stormwater management infrastructure, and groundwater recharge and discharge shall be considered to ensure no negative impacts.

The subject property is identified within an Area of Natural and Scientific Interest (ANSI) within Schedule B1 – Natural Hazards and Features (see Figure 5). Table 5.2 of the Official Plan outlines the following permitted and prohibited uses for these areas.

Resource Use	Permitted Uses	Prohibited Uses
Scientific Areas of Natural and Scientific Interest	/ Any use in the underlying land use designation subject to Sections 5.5.7 / Conservation Use / Legally existing uses, buildings or structures	/ Any development or site alteration which will have a negative impact on the natural features or ecological functions for which the ANSI has been identified (See Section 5.5) / Wayside pit or quarry

Section 5.5.2 speaks to policy as it relates to development on lands adjacent to natural heritage features. The Official Plan states that those areas within 120 metres of a coastal wetland are considered “adjacent lands”, and that development is prohibited on these lands unless its ecological function has been evaluated and an Environmental Impact Study has demonstrated that there will be no negative impacts on the natural features or ecological functions. Section 5.5.6 speaks to policy for wetlands and states that coastal wetlands are those wetlands located within 2 km upstream of the floodplain of the St. Lawrence River. The subject lands are considered adjacent lands to the Raisin River as per the Official Plan’s definition of adjacency and given the presence of a floodplain on the lands within 2 km of the St. Lawrence River, the lands are considered Coastal Wetlands. Section 5.5.6 states that development or site alteration on lands adjacent to coastal wetlands are subject to an Environmental Impact Study.

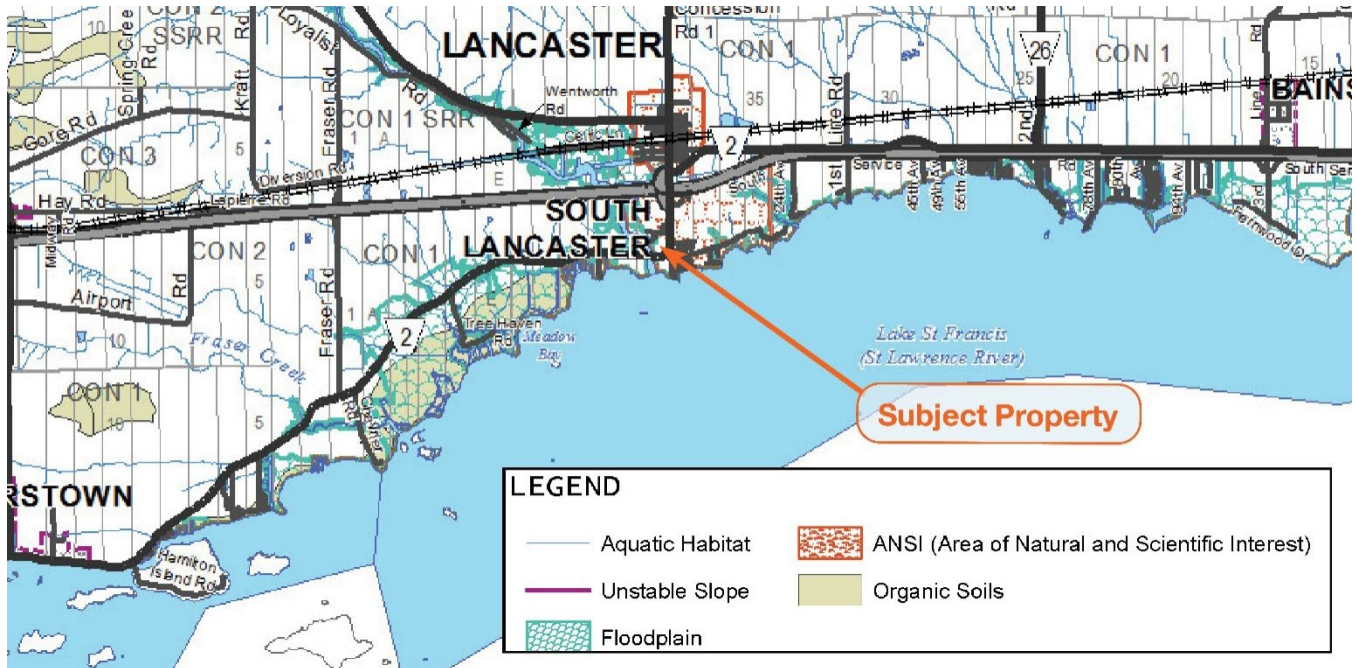


Figure 8: Schedule B1 (Natural Hazards and Features) indicating the location of the subject property in orange.

The subject property contains a portion of the Regulatory Floodline as per the Raisin River Conservation Authority (see Figure 6). The RRCA is a watershed based organization that reviews development applications with respect to natural hazards. As per the RRCA constraint mapping, the outer periphery of the subject lands fall within its regulatory authority. Development activities are prohibited within and adjacent to watercourses, hazardous lands and wetlands and may require a permit from the RRCA, according to the Conservation Authorities Act.



Figure 9: Raisin Region Conservation Authority Constraint Mapping showing the location of the subject property in red.

As per the pre-consultation meeting held in May 2025, the property's prior development as a motel use was acknowledged and the RRCA recommended an application for a fill permit to eliminate any future flood plain consideration. The RRCA modelled the effect that filling would have on the watercourse and concluded that it would be minimal. Further, the RRCA indicated that a stormwater quantity management plan will not be required as part of the application based on hydrological considerations at this location and existing flood plain mapping. It was acknowledged that discharges to the river may be subject to RRCA permitting to ensure that erosion impacts from outflows are mitigated.

Subsequent to the pre-consultation meeting, the applicant team submitted a Permit Application to permit the floodplain infill work as discussed. The work involves bringing off-site fill to the subject property to raise low-lying areas of the property to an elevation above the 1-100 year floodplain elevations while still maintaining positive drainage across the site. The RRCA authorized the permit in January 2026. The filling of the floodplain is anticipated to be a condition of the draft plan approval.

The proposed development conforms to the policy direction set out in the United Counties of Stormont, Dundas and Glengarry Official Plan (County OP) and the Township of South Glengarry's land use planning framework. The subject lands are located within the Urban Settlement Area and are designated Residential District under Schedule A6C of the Township's Official Plan, which permits a full range of housing types, including high-density residential development such as the proposed subdivision.

In accordance with Table 3.5 and Section 3.4, the development introduces a compatible housing form within the Residential District and contributes to the range of residential options available in the community. The proposal also reflects the principles outlined in Section 3.5.1, including ensuring sufficient lot size, efficient use of services, and compatibility with surrounding land uses.

The proposal is well-aligned with the County's goals for residential intensification as outlined in Section 3.5.2.6 which encourages infill and redevelopment on underutilized sites with sufficient infrastructure. Since the subject lands previously contained a motel use which is now demolished, the property is already appropriately serviced. Further, the proposal also satisfies the design criteria for residential areas as outlined in Section 3.5.2.2 which includes directing higher-density development to fully serviced locations near commercial areas with ready access to a major street. The subject property is well suited for residential intensification given its proximity to the South Lancaster Commercial District and frontage on County Road 2, a major corridor within the County.

The development supports broader policy goals identified in Section 3.5.1.11 including the promotion of complete communities and compact built form. It contributes to long-term housing supply, encourages efficient infrastructure use, and integrates well with the surrounding area, thereby fulfilling the objectives of both the County and Township planning frameworks.

The proposal aligns with the intent of Section 3.5.2.8, which calls for consideration of the protection, conservation, or enhancement of natural environmental features through development. While the subject lands are considered Coastal Wetlands, adjacent to the Raisin River, and contains a floodplain, municipal staff determined during the pre-consultation meeting that an Environmental Impact Assessment is not necessary for the subject lands due to the prior disturbance and development of lands as a motel use. In addition, the subject lands are separated from the Raisin River by the Marina property to the west. On recommendation by the Raisin Region Conservation Authority, the applicant has agreed to plan for infill work to raise the low-lying areas above the 1-100-year floodplain elevation will remove future floodplain considerations on the property.

The proposal is in consideration of Section 3.5.2.9 which speaks to the conservation of shoreline features, specifically the potential for marine archaeological remains on the subject lands. Given that the subject lands were previously disturbed during the development of a motel use, an archaeological assessment has not been deemed necessary as part of this application by municipal staff, and completion of the Criteria for Evaluating Archaeological Potential (Non-Specialist Checklist). The checklist has been included as part of this application. Nonetheless, it is anticipated that a standard clause will

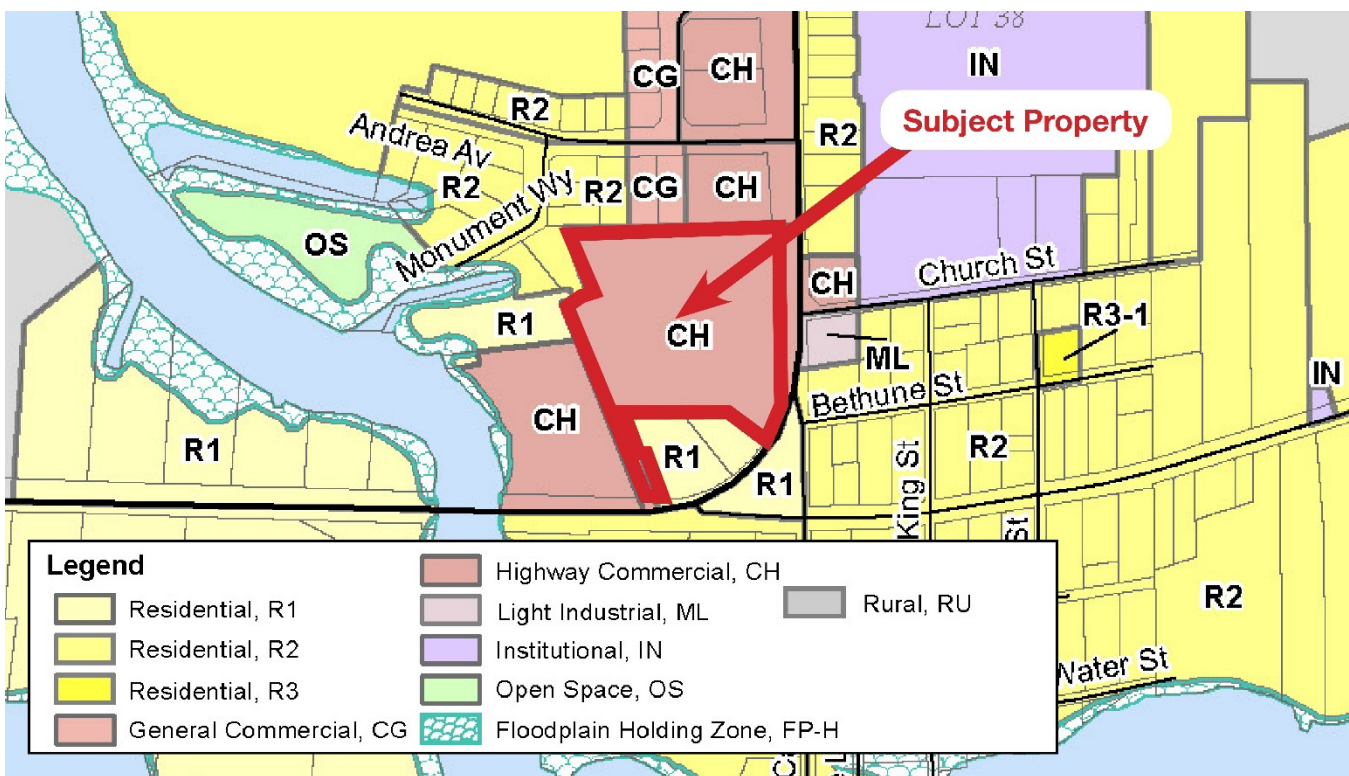
be included within the subdivision agreement that should deeply buried artifacts be found throughout the development process, the Owner will undertake an Archaeological Assessment as needed.

In accordance with Section 4.3.3.4 and 4.3.4, a servicing study and stormwater management study has been included as part of this application.

It is our professional opinion that the proposed development is consistent with the policies of the United Counties of Stormont, Dundas and Glengarry Official Plan.

5.3 Township of South Glengarry Zoning By-law 38-09

Zoning By-law 38-09 governs land use and development within the municipality. The subject property is currently zoned Highway Commercial (CH). Residential uses in the CH zone are restricted to detached housing. The CH zone permits a variety of commercial uses such as recreational commercial, restaurant, shopping centre, veterinary clinic, veterinary hospital and workshop.



The proposed built form and density are not permitted under the current CH zoning. Accordingly, a ZBA is required to rezone the lands from CH to the following:

- Residential Three (R3) zone
- Residential Four (R4) zone
- Residential Four Exception (R4-XX)

The proposed R4-XX zone will apply to the low-rise apartment blocks. The ZBA is necessary to facilitate the proposed residential use and incorporate a site-specific exception to density.

A summary of the key zoning provisions and the proposed site-specific modifications is provided in the table below.

Proposed Built form:

- Two semi-detached dwellings (2 units each) at 2 storeys
- Eight townhouse buildings (4 units each) at 2 storeys
- Two low-rise apartment buildings (8 units each) at 3.5 storeys
- One high-rise apartment building (future phase development)

Proposed Zone – Residential Type 3 (R3) – Semi-Detached and Low-rise Townhouse Blocks

Provision	Required	Proposed	Zoning Compliance
Permitted Uses	Single Detached Dwelling Semi-detached dwelling Duplex Dwelling Link dwelling Boarding or Rooming House Townhouses (group or street) Triplex Fourplex	2 semi-detached buildings (2 units each) 8 townhouses (4 units each) Total 36 dwelling units	Yes
Lot Area (minimum)	Townhouse: 165 m ² /DU Semi-Detached: 270 m ² /DU	Townhouse: 193 m ² / DU for the smallest interior units Semi-Detached: 329 m ² /unit	Yes
Lot Frontage (minimum)	Townhouse: Interior Lot: 5.5 m/DU Exterior Lot: 11.5 m/DU Semi-Detached: Interior Lot: 9 m/DU	Townhouse: Meets Semi-Detached: Meets	Yes
Yards (minimum, including private roads)	R3: Front yard: 6 m Exterior side yard: 6 m Interior Side Yard with Garage: 1.2 m Interior Side Yard Driveway Side: 3 m Interior Side Yard Other Side: 1.2 m Rear Yard: 6 m	Meets	Yes

Maximum Lot Coverage	40%	Meets	Yes
Maximum Building Height	11 m	Townhouses: 2 storeys Semi-detached: 2 storeys	Yes

Additional notes:

Standards for Semi-Detached Dwelling

- (a) Despite the above requirements for lot area, lot frontage and dwelling units per lot, a semi-detached may be severed and sold as an individual unit.

Proposed Zone – Residential Type 4 (R4) – Low-Rise Apartment Blocks

Provision	Required	Proposed	Zoning Compliance
Permitted Uses	Townhouses (group or street) Triplex Fourplex Converted Dwellings Rooming or Boarding House Apartment Building	2 low-rise apartments (8 units each) 16 units total	Yes
Lot Area (minimum)	Apartment : 62 DU / HA (25 DU/ ac)	Block 1 = 109 units / HA	Yes
Lot Frontage (minimum)	Apartment: 30 m	Proposed high-rise apartment block will have frontage on County Road 2	Yes
Dwelling Floor Area	Bachelor/Studio: 46 m ² 1 Bedroom apartment: 56 m ² 2 Bedroom apartment: 60 m ² 3 Bedroom apartment: 65 m ² Seniors apartment: 43 m ²	One Bedroom – 60.3 m ² Two Bedroom – 78.9 m ²	Yes
Yards (minimum, including private roads)	R4: Front yard: 6 m Exterior side yard: 6 m Interior Side Yard with Garage: 1.2 m Interior Side Yard Driveway Side: 3 m Interior Side Yard Other Side: 1.2 m Rear Yard: 6 m	Meets	Yes
Maximum Lot Coverage	40%	Meets	Yes
Maximum Building Height	11 m	High-Rise Apartment: 6 storeys	Yes

Proposed Zone – Residential Type 4 Exception (R4-XX) – Low-Rise Apartment Blocks

Provision	Required	Proposed	Zoning Compliance
Permitted Uses	Townhouses (group or street) Triplex Fourplex Converted Dwellings Rooming or Boarding House Apartment Building	2 low-rise apartments (8 units each) 16 units total	Yes
Lot Area (minimum)	Apartment : 62 DU / HA (25 DU/ ac)	Block 5 = 28 units / HA Block 7 = 43 units / HA	A zoning by-law amendment will be required to permit a minimum lot area of 1830 m ² .
Lot Frontage (minimum)	Apartment: 30 m	Proposed high-rise apartment block will have frontage on County Road 2	Yes
Dwelling Floor Area	Bachelor/Studio: 46 m ² 1 Bedroom apartment: 56 m ² 2 Bedroom apartment: 60 m ² 3 Bedroom apartment: 65 m ² Seniors apartment: 43 m ²	One Bedroom – 60.3 m ² Two Bedroom – 78.9 m ²	Yes
Yards (minimum, including private roads)	R4: Front yard: 6 m Exterior side yard: 6 m Interior Side Yard with Garage: 1.2 m Interior Side Yard Driveway Side: 3 m Interior Side Yard Other Side: 1.2 m Rear Yard: 6 m	Meets	Yes
Maximum Lot Coverage	40%	Meets	Yes
Maximum Building Height	11 m	Low-Rise Apartment: 3.5 storeys	Yes

General Provisions

Provision	Required	Proposed	Zoning Compliance
Landscape Buffering	3.23 (1) Any part of a lot which is not occupied by buildings, structures, parking areas, loading spaces, driveways, excavations, agricultural use, or permitted outdoor storage areas shall be maintained as landscaped open space.	There is adequate space to accommodate landscaping	Yes
	3.23 (2) Except as otherwise specifically provided herein, no part of any required front		Yes

	yard or required exterior side yard shall be used for any purpose other than <i>landscaped open space</i> . Where <i>landscaped open space</i> of any kind, including a planting strip, is required adjacent to any <i>lot</i> line or elsewhere on a <i>lot</i> , nothing in this By-law shall apply to prevent such <i>landscaped open space</i> from being traversed by pedestrian walkways or <i>permitted driveways</i> .		
	3.23 (3) No part of any <i>driveway</i> , <i>parking area</i> , <i>loading space</i> , stoop, roof-top terrace, balcony, swimming pool, or space enclosed within a <i>building</i> , other than a landscaped area located above an underground parking area, shall be considered part of the landscaped open space on a lot.		Yes
	3.23 (4)(b) The <i>landscaped buffer</i> area shall be kept free of all parking, <i>buildings</i> , or <i>structures</i> except for a legal boundary partition and used only for the placement of trees, shrubs, similar vegetation, fencing, and landscaping features and shall be landscaped and maintained by the owner of land on which such buffer area is required. Details of the landscaping and privacy <i>fence</i> or wall shall be provided in a site plan submitted to and approved by the Township.	There is adequate space to accommodate a landscape buffer area	Yes
	3.23 (5) <i>Lots</i> within Commercial, Industrial, Institutional and Residential Multiple <i>Zones</i> shall be landscaped in accordance with a site plan submitted to and approved by the Township.	There is adequate space to accommodate a landscape buffer area	Yes
	3.23 (6) The whole of any <i>yard</i> for a single <i>detached</i> , semi <i>detached</i> , or duplex <i>dwelling</i> within a Residential <i>Zone</i> in any Urban Settlement Area shall hereafter be landscaped except for areas of the site required for the main <i>dwelling</i> , <i>accessory buildings</i> , <i>structures</i> and <i>uses</i> , and <i>driveways</i> . Not greater than fifty percent (50%) of the front <i>yard</i> or exterior side <i>yard</i> of such <i>lots</i> shall be <i>used</i> for <i>driveways</i> and parking.	There is adequate space to accommodate a landscape buffer area	Yes
	3.29 NOT MORE THAN ONE MAIN DWELLING PER LOT Unless otherwise provided for in this By-law, in any <i>Zone</i> where a <i>single detached dwelling</i> , <i>semi-detached dwelling</i> , or duplex <i>dwelling</i> is <i>permitted</i> , not more than one (1) such <i>dwelling</i> shall be <i>erected</i> on a <i>lot</i> .		Yes

	3.38 SIGHT TRIANGLES Sight triangles shall hereafter be provided on all corner lots in accordance with the following provisions: 3.38 (1) No building, structure, or use which would obstruct the vision of drivers of motor vehicles on corner lots shall be permitted; 3.36 (2) No fence, wall, tree, hedge, bush, or other vegetation, greater than 0.76 metre (2.5 ft.) above the centre line of the street or road, other than agricultural crops shall be permitted; 3.38 (3) No portion of a delivery space, loading space, driveway or parking space, berm, or other ground surface which exceeds the elevation of the street by more than 0.6 metres (1.97 ft) shall be permitted. 3.38 (4) For the purposes of this By-law, a minimum dimension of 10 metres (32.8 ft.) along both lot lines shall be provided in all Commercial and Industrial Zones; and 6 metres (19.7 ft.) along both lot lines in all other Zones. 3.38 (5) Despite these provisions, sight triangle requirements of the Ontario Ministry of Transportation and the Roads Department of the United Counties of Stormont, Dundas, and Glengarry shall also be satisfied.		Yes, see Transportation Impact Study for Sightline Assessment details.
	3.39 (7) WATERCOURSES (a) All water bodies (e.g. lakes, rivers, streams, <i>Municipal Drains</i>, and <i>wetlands</i>) are considered as areas of direct or indirect <i>fish habitat</i>. It is a policy to protect areas of <i>fish habitat</i> for their values in compliance with the federal <i>Fisheries Act</i>. (c) Development and site <i>alteration</i> shall not be <i>permitted</i> within 30 metres of an area identified as <i>fish habitat</i> unless the ecological function of the area has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions, to the satisfaction of the <i>Municipality</i> and the Conservation Authority. No new development or site <i>alteration</i> shall be <i>permitted</i> within fifteen metres (15 m [48.75 ft.]) of <i>fish habitat</i> 3.39 (12) WETLANDS Development or site <i>alteration</i> within 120 metres of a PSW <i>Zone</i> will be subject to studies as identified within the County Official Plan. If it can be demonstrated that there will be no	The municipality has not requested an EIS for the proposed development.	Yes

	negative impacts on the wetland's natural features, ecological, and hydrologic functions, to the satisfaction of the <i>Municipality</i> and the Conservation Authority development or site alteration can occur no less than thirty metres (30 m [98.4 ft.]) of the wetland boundary.		
	3.45 YARD ENCROACHMENTS No part of any required <i>yard</i> shall be obstructed with any <i>structure</i> except as follows: 3.45 (2) An exterior staircase may encroach into a required side or rear <i>yard</i> to a maximum of one metre (1 m [3.28 ft.]). 3.45 (3) An unenclosed porch, and accessibility ramp and covered or uncovered steps. <i>Decks</i> including the stairs that access the <i>deck</i> from finished <i>grade</i> are <i>permitted</i> on any <i>lot</i> where residential <i>uses</i> are <i>permitted</i>, provided: (a) The maximum height of the <i>deck</i> from finished <i>grade</i> is one and two tenths metres (1.2 m [3.94 ft.]); (b) The <i>deck</i> is located no closer than three metres (3 m [9.84 ft.]) from the rear <i>lot</i> line; (c) The <i>deck</i> is located no closer than six-tenths of one metre (0.6 m [1.97 ft.]) from the interior side <i>lot</i> line; (d) In addition to the above, <i>decks</i> are also <i>permitted</i> in any <i>Zone</i> where nonresidential <i>uses</i> are <i>permitted</i>, provided no part of the <i>deck</i> is located in a required <i>yard</i>, <i>parking space</i>, aisle, or sight triangle. 3.45 (4) Canopies and awnings may project into any required side <i>yard</i> to a maximum of one-and-two-tenths metre (1.2 m [3.94 ft.]) but must retain a <i>setback</i> of not less than six-tenths of one metre (0.6 m [1.97 ft.]) from any <i>lot</i> line. 3.45 (5) Entry, Paths, and Landings may project into any front, rear, or exterior side <i>yard</i> but not into a <i>sight triangle</i>. 3.45 (6) Balconies may project into any required <i>yard</i> but not more than one metre (1 m [3.28 ft.]). 3.45 (7) Awnings, flagpoles, lighting fixtures and lampposts, garden trellises, <i>fences</i> are <i>permitted</i> as constructed and located in accordance with the Fence By-law requirements. Fountains, statues, monuments, recreational equipment that is <i>accessory</i> to the main <i>use</i> and similar accessories shall be <i>permitted</i> in any required		Yes

	yard, subject to meeting all other applicable provisions of this Bylaw. 3.45 (10) <i>Retaining walls</i> shall be <i>permitted</i> in any required <i>yard</i> provided a <i>setback</i> of one metre (1 m [3.28 ft.]) from all <i>lot</i> lines is maintained. 3.45 (11) Trees, shrubs, planters, and walkways and similar landscaping features shall be <i>permitted</i> in any required <i>yard</i>.		
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Parking and Loading Provisions

4.1 In any *Zone*, the owner of any *lot, building, or structure erected, altered, enlarged, or changed in use* after the passing of this By-law, shall provide off street parking *accessory* to a principal *use* in accordance with the following provisions:

Provision	Requirement	Proposed	Zoning Compliance																
Parking and Loading	Semi-Detached or Street Townhouse: 2 spaces per dwelling unit which may include 1 space in a garage or carport and 1 space in front of the garage or carport Apartment dwelling: 1.5 spaces per dwelling unit, 15% of which will be clearly marked and reserved for visitor parking	Semi-Detached and Townhouses:2 spaces proposed per dwelling unit Apartment: 12 parking spaces proposed per apartment block (1 accessible)	Yes																
Accessible Parking	<table><tr><th>No. of Required Parking Spaces</th><th>No. of Designated Spaces</th></tr><tr><td>1 to 9</td><td>No minimum, but minimum of 1 space for institutional, public authority uses, medical clinics, or medical offices</td></tr><tr><td>10 to 19</td><td>Minimum of 1 space</td></tr><tr><td>20-49</td><td>Minimum of 2 spaces</td></tr><tr><td>50-99</td><td>Minimum of 3 spaces</td></tr><tr><td>100-199</td><td>Minimum of 4 spaces</td></tr><tr><td>200-399</td><td>Minimum of 5 spaces</td></tr><tr><td>400+</td><td>Minimum of 6 spaces</td></tr></table>	No. of Required Parking Spaces	No. of Designated Spaces	1 to 9	No minimum, but minimum of 1 space for institutional, public authority uses, medical clinics, or medical offices	10 to 19	Minimum of 1 space	20-49	Minimum of 2 spaces	50-99	Minimum of 3 spaces	100-199	Minimum of 4 spaces	200-399	Minimum of 5 spaces	400+	Minimum of 6 spaces	1 accessible space provided for each apartment block	Yes
	No. of Required Parking Spaces	No. of Designated Spaces																	
	1 to 9	No minimum, but minimum of 1 space for institutional, public authority uses, medical clinics, or medical offices																	
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	20-49	Minimum of 2 spaces																	
	50-99	Minimum of 3 spaces																	
	100-199	Minimum of 4 spaces																	
	200-399	Minimum of 5 spaces																	
400+	Minimum of 6 spaces																		
Accessibility Parking standards	4.3 (3) The total number of <i>parking spaces</i> for the disabled shall be included within the parking requirements of the <i>permitted use</i>, as part of overall parking requirement total. Each off-street <i>parking space</i> for the disabled shall be a minimum of six metres (6 m [19.7 ft.]) long, three and seven-tenths metres (3.7 m [12.14 ft]) wide and have a vertical clearance of three metres (3 m [9.84 ft.]).	Total of 24 spaces provided across both apartment blocks	Yes																
	4.3 (5) <i>Parking spaces</i> for disabled persons shall be located in proximity to the primary entrance(s) to a <i>building</i> together with a pedestrian access or sidewalk along the façade of the <i>building</i> sufficiently wide so that a minimum one and onehalf metres (1.5 m [4.92 ft.]) is maintained between			Accessible parking spaces are located closest to the	Yes														

	the <i>building</i> face and the adjacent vehicles. In addition such <i>parking spaces</i> shall be hard surfaced, level, placed so as to be accessible to physically disabled persons whether via ramps, depressed curbs, or other appropriate means, and so placed as to permit easy access by such persons to or from a <i>motor vehicle</i> parked therein, and identified by authorized signs as per municipal By-laws and Provincial legislation.	apartment building entrances																
	4.4 Required parking in a Residential Zone shall be provided on the same <i>lot</i> as the <i>dwelling</i> unit. Parking may be <i>permitted</i> off the site only if specified in the individual zoning district. Further, where required parking is not provided on the same <i>lot</i> , the <i>lot</i> or part of the <i>lot</i> where the parking is located shall be in the same ownership or be <i>leased</i> by a ten (10) year agreement, with a renewable clause, and the <i>parking spaces</i> shall be retained for the duration of the <i>use</i> .	Required parking is provided on the same lot	Yes															
	4.8 Each parking space shall maintain a minimum size and area as indicated herein: <table><tr><th>Parking Space Type</th><th>Minimum Width</th><th>Minimum Length</th></tr><tr><td>Standard 90°</td><td>2.75 metres</td><td>5.5 metres</td></tr><tr><td>Angled – measured at right angles to lines</td><td>2.75 metres</td><td>5.75 metres</td></tr><tr><td>Parallel</td><td>2.75 metres</td><td>6.7 metres</td></tr><tr><td>Barrier-free</td><td>3.7 metres</td><td>6.0 metres</td></tr></table>	Parking Space Type	Minimum Width	Minimum Length	Standard 90°	2.75 metres	5.5 metres	Angled – measured at right angles to lines	2.75 metres	5.75 metres	Parallel	2.75 metres	6.7 metres	Barrier-free	3.7 metres	6.0 metres		Yes
Parking Space Type	Minimum Width	Minimum Length																
Standard 90°	2.75 metres	5.5 metres																
Angled – measured at right angles to lines	2.75 metres	5.75 metres																
Parallel	2.75 metres	6.7 metres																
Barrier-free	3.7 metres	6.0 metres																
	4.9 Where barrier-free access to a <i>building</i> is required under the <i>Building Code</i> , one barrier-free <i>parking space</i> shall be provided for every fifty (50) standard <i>parking spaces</i> or part thereof and shall be included in the total number of <i>parking spaces</i> required under the table of Minimum Parking Requirements and shall be located towards the edge of the <i>parking area</i> closest to the <i>building</i> or entry to the <i>building</i> .		Yes															
	4.10 PARKING SPACES FOR SINGLE DETACHED, SEMI-DETACHED, AND DUPLEX DWELLINGS IN RESIDENTIAL ZONES; SUPPLEMENTARY REGULATIONS 4.10 (1) The <i>driveway</i> and <i>parking space</i> shall be constructed of crushed stone or gravel, asphalt paving, concrete, pavers stones, or similar materials and shall be maintained and treated so as to reduce dust, scattering of stones, and similar potentially undesirable effects on adjoining properties. 4.10 (2) No more than fifty percent (50%) of the area of any required front yard shall be <i>used</i> or constructed as a <i>driveway</i> or <i>parking space</i> and the remainder of the area shall be landscaped. 4.10 (3) No more than fifty percent (50%) of the <i>lot frontage</i> as defined by this By-law shall be <i>used</i> or constructed as a <i>driveway</i> or <i>parking space</i> . 4.10 (4) Except as provided herein, no vehicles shall be parked or stored in conjunction with a residential use unless the vehicle is located within a garage, carport, driveway, designated parking area, or on a street as may be permitted by Municipal by-law. 4.10 (5) No parking space for a residential use shall be used for the outdoor parking or storage or a motor vehicle unless such vehicle is used in operations incidental to the residential use of the lot on which it is parked		Yes															

	or stored, and bears a motor vehicle license plate and sticker which is currently valid. 4.10 (6) Residential garages shall not exceed 100 m2 (1076 square feet) in gross floor area.										
	4.11 PARKING AREA FOR MORE THAN FOUR VEHICLES; SUPPLEMENTARY REGULATIONS 4.11 (1) The <i>parking area</i> shall be constructed of crushed stone, asphalt paving, concrete, pavers stones, or similar materials and shall be maintained and treated so as to reduce dust, scattering of stones, and similar undesirable effects on adjoining properties and shall incorporate drainage facilities that comply with the requirements of the Township.		Yes								
	4.11 (2) Notwithstanding Subsection (1), if a <i>parking area</i> is located within an Urban Settlement area as defined in the County <i>Official Plan</i> , the <i>parking area</i> shall be paved with concrete, asphalt, or pavers stones, or other hard surfaces.		Yes								
	4.11 (3) Ingress and egress directly to and from every <i>parking space</i> shall be by means of a driveway, <i>lane</i> , or manoeuvring aisle having the following width requirements: <table><tr><th>Angle of Parking</th><th>Minimum Aisle Width</th></tr><tr><td>0° to 55°</td><td>4 metres</td></tr><tr><td>56° to 75°</td><td>5.8 metres</td></tr><tr><td>90°</td><td>6 metres</td></tr></table>	Angle of Parking	Minimum Aisle Width	0° to 55°	4 metres	56° to 75°	5.8 metres	90°	6 metres		Yes
Angle of Parking	Minimum Aisle Width										
0° to 55°	4 metres										
56° to 75°	5.8 metres										
90°	6 metres										
	4.11 (4) A <i>driveway</i> or <i>lane</i> which does not provide ingress and egress directly to a <i>parking space</i> shall have a minimum width of 3 metres (9.84 ft.) where designed for one-way vehicular traffic and 6 metres (19.7 ft.) where designed for two-way vehicular circulation.		Yes								
	4.11 (5) No part of any <i>parking space</i> shall be closer than 1.5 metres (4.9 ft) along a <i>lot</i> line abutting the street/road in Commercial and Industrial Zones.		Yes								
	4.11 (7) The <i>Parking area</i> shall be included on any Site Plans submitted with an Application.		Yes								
	4.11 (8) No more than fifty percent (50%) of the lot frontage as defined by this By-law shall be used or constructed as a driveway or parking space.		Yes								
Landscape Buffering	4.12 (2) Where, in any <i>yard</i> in any <i>Zone</i> , a required <i>parking area</i> providing more than four (4) <i>parking spaces</i> abuts a street, then a strip of <i>landscaped open space</i> a minimum width of 3 metres (9.84 ft.) with, including a privacy <i>fence</i> , shall be provided along the <i>lot</i> line abutting the street and the landscaped strip shall be continuous except for aisles, <i>driveways</i> , and pedestrian areas required for access to the <i>parking area</i> .	There is adequate space to accommodate landscape buffering.	Yes								

A Zoning By-law Amendment is required to facilitate the proposed residential development, rezoning the site from Highway Commercial (HC) to Residential Three (R3) zone, Residential Four (R4) zone, and Residential Four Exception (R4-XX) zone.

Site-specific provisions are needed to accommodate the proposed residential intensification within the existing lot. An amendment is sought for the low-rise apartment blocks to seek relief from the minimum density requirement. A reduced

minimum density for apartment use of 28 dwelling units per hectare is sought to accommodate the two 3.5-storey apartments. This reduction is considered appropriate within the surrounding low-rise residential context and will be supported by the proposed townhouses and semi-detached built form, which will serve as a transition in density. The reduced minimum density is not anticipated to result in negative impacts.

It is therefore our professional opinion that the proposed development is consistent with the general intent and purpose of the Zoning By-law and will be consistent with the provisions of the Zoning By-law as amended.

6.0 Conclusion

The proposed development aligns with the overall intent and objectives of the applicable planning framework by promoting compact urban form, efficient land use, and an increased supply of housing options within a designated settlement area. It supports intensification in a location that is well-connected to existing infrastructure and services and is compatible with the surrounding residential and commercial context.

To facilitate the proposed development, an application for a Zoning By-law Amendment and Draft Plan of Subdivision is being submitted. If approved, the amendment will have the following effect:

- / The Zoning By-law amendment will rezone the subject property from the current Highway Commercial (CH) to a Residential Three (R3) zone, Residential Four (R4) zone and Residential Four Exception (R4-XX) Zone to permit the proposed higher density residential development.
- / The Draft Plan of Subdivision will establish a block plan comprised of 15 blocks featuring 1 high-rise apartment block, 2 low-rise apartment blocks, 8 townhouse blocks, 2 semi-detached blocks, one new public road and an area between the two residential apartments dedicated to a stormwater management facility.

The site-specific change is necessary to implement the proposed development concept in a manner that aligns with municipal design and land use objectives, while ensuring compatibility with adjacent uses and contributing to a complete and compact community.

It is our professional opinion that the proposed development is consistent with the Provincial Policy Statement, 2024, conforms with the growth management and land use policies of the United Counties of Stormont, Dundas and Glengarry Official Plan and the Township of South Glengarry Official Plan, and represents good planning that is in the public interest. The development makes efficient use of land and infrastructure, contributes to housing choice, and reflects an appropriate balance of intensification and compatibility with the surrounding neighbourhood.

Should you require any additional information, please do not hesitate to contact the undersigned at 416.789.4530 ext. 121.

Respectfully,



Michael Keene, MCIP, RPP
Principal Planning + Development
Fotenn Planning + Design



Yuki Naganuma, B.URPL.
Planner
Fotenn Planning + Design

7.0

Draft Zoning By-law Amendment

THE CORPORATION OF THE TOWNSHIP OF SOUTH GLENGARRY
BY-LAW NO. XX-2026

BEING A BY-LAW TO AMEND ZONING BY-LAW 38-09, AS AMENDED, FOR THE LANDS MUNICIPALLY KNOWN AS 20361 COUNTY ROAD 2 IN THE TOWNSHIP OF SOUTH GLENGARRY.

WHEREAS the Council of the Corporation of the Township of South Glengarry deems it advisable to amend Zoning By-law No 06-2023, as amended;

AND WHEREAS the proposed amendment conforms to the general intent and purpose of the Township of South Glengarry Official Plan;

NOW THEREFORE the Council of the Corporation of the Township of South Glengarry enacts as follows:

1. THAT "Schedule A" to By-law No XX-2026 is hereby amended by changing the zoning of the lands municipally known as 20361 County Road 4, from the Highway Commercial (CH) zone to Residential Three (R3) zone, Residential Four (R4) zone, and Residential Four Exception (R4-XX) zone, as shown on "Schedule A" attached hereto and forming part of this By-law.

2. THAT Section 6.2 Residential Type 4 Zone of By-law No. 38-09 is hereby amended by adding the following new Exception Zone R4-XX:

Notwithstanding the provisions of Section 6.4, on the lands zoned R4-XX, the following site-specific provisions shall apply:

- On lands zoned R4-XX, the lot area (minimum) shall be 1830 m².

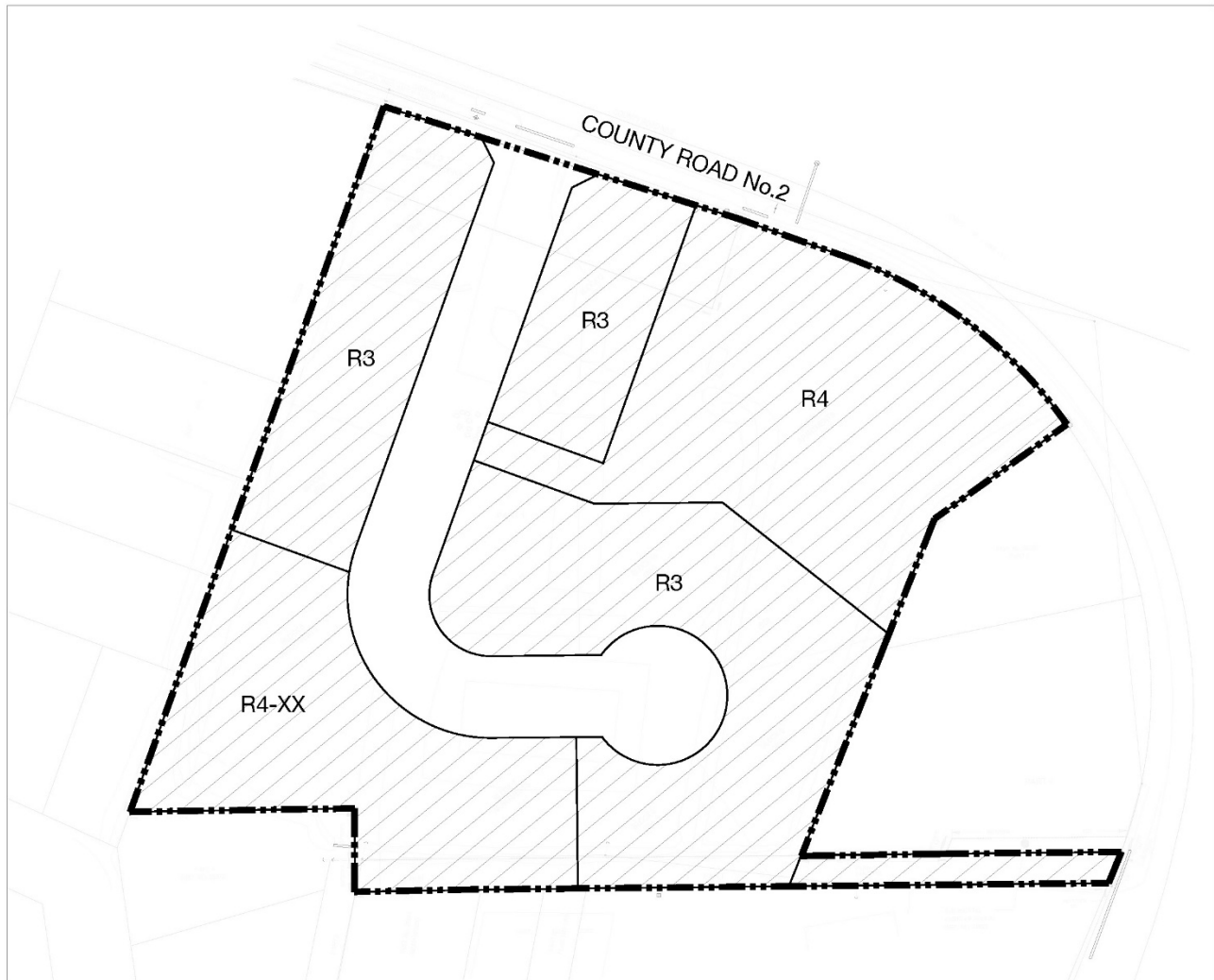
3. THAT this By-law shall come into force and take effect on the date of passing, subject to the provisions of the Planning Act, R.S.O. 1990, as amended.

READ and finally passed in Open Council this ____ day of ____, 2026.

Mayor

Clerk

This is "Schedule A" to By-law xx-2026
passed this ____ day of ___, 2026



The **purpose of the checklist** is to determine:

- if a property(ies) or project area may contain archaeological resources i.e., have archaeological potential
- it includes all areas that may be impacted by project activities, including – but not limited to:
 - the main project area
 - temporary storage
 - staging and working areas
 - temporary roads and detours

Processes covered under this checklist, such as:

- *Planning Act*
- *Environmental Assessment Act*
- *Aggregates Resources Act*
- *Ontario Heritage Act* – Standards and Guidelines for Conservation of Provincial Heritage Properties

Archaeological assessment

If you are not sure how to answer one or more of the questions on the checklist, you may want to hire a licensed consultant archaeologist (see page 4 for definitions) to undertake an archaeological assessment.

The assessment will help you:

- identify, evaluate and protect archaeological resources on your property or project area
- reduce potential delays and risks to your project

Note: By law, archaeological assessments **must** be done by a licensed consultant archaeologist. Only a licensed archaeologist can assess – or alter – an archaeological site.

What to do if you:

- **find an archaeological resource**

If you find something you think may be of archaeological value during project work, you must – by law – stop all activities immediately and contact a licensed consultant archaeologist

The archaeologist will carry out the fieldwork in compliance with the *Ontario Heritage Act* [s.48(1)].

- **unearth a burial site**

If you find a burial site containing human remains, you must immediately notify the appropriate authorities (i.e., police, coroner's office, and/or Registrar of Cemeteries) and comply with the *Funeral, Burial and Cremation Services Act*.

Other checklists

Please use a separate checklist for your project, if:

- you are seeking a Renewable Energy Approval under Ontario Regulation 359/09 – [separate checklist](#)
- your Parent Class EA document has an approved screening criteria (as referenced in Question 1)

Please refer to the Instructions pages when completing this form.

Project or Property Name

Impala Developments Lancaster Subdivision

Project or Property Location (upper and lower or single tier municipality)

Part of Lot L, Concession I - Front, Township of Charlottenburgh, County of Glengary

Proponent Name

Impala Development Inc.

Proponent Contact Information

Screening Questions

1. Is there a pre-approved screening checklist, methodology or process in place?

Yes ☐ No ☒

If Yes, please follow the pre-approved screening checklist, methodology or process.

If No, continue to Question 2.

2. Has an archaeological assessment been prepared for the property (or project area) and been accepted by MTCS?

Yes ☐ No ☒

If Yes, do **not** complete the rest of the checklist. You are expected to follow the recommendations in the archaeological assessment report(s).

The proponent, property owner and/or approval authority will:

- summarize the previous assessment
- add this checklist to the project file, with the appropriate documents that demonstrate an archaeological assessment was undertaken e.g., MTCS letter stating acceptance of archaeological assessment report

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g., environmental assessment document
- maintained by the property owner, proponent or approval authority

If No, continue to Question 3.

3. Are there known archaeological sites on or within 300 metres of the property (or the project area)?

Yes ☐ No ☒

4. Is there Aboriginal or local knowledge of archaeological sites on or within 300 metres of the property (or project area)?

Yes ☐ No ☒

5. Is there Aboriginal knowledge or historically documented evidence of past Aboriginal use on or within 300 metres of the property (or project area)?

Yes ☐ No ☒

6. Is there a known burial site or cemetery on the property or adjacent to the property (or project area)?

Yes ☐ No ☒

7. Has the property (or project area) been recognized for its cultural heritage value?

Yes ☐ No ☒

If Yes to any of the above questions (3 to 7), do **not** complete the checklist. Instead, you need to hire a licensed consultant archaeologist to undertake an archaeological assessment of your property or project area.

If No, continue to question 8.

8. Has the entire property (or project area) been subjected to recent, extensive and intensive disturbance?

Yes ☒ No ☐

If Yes to the preceding question, do **not** complete the checklist. Instead, please keep and maintain a summary of documentation that provides evidence of the recent disturbance.

An archaeological assessment is not required.

If No, continue to question 9.

9. Are there present or past water sources within 300 metres of the property (or project area)? Yes ☐ No ☐

If Yes, an archaeological assessment is required.

If No, continue to question 10.

10. Is there evidence of two or more of the following on the property (or project area)? Yes ☐ No ☐

- elevated topography
- pockets of well-drained sandy soil
- distinctive land formations
- resource extraction areas
- early historic settlement
- early historic transportation routes

If Yes, an archaeological assessment is required.

If No, there is low potential for archaeological resources at the property (or project area).

The proponent, property owner and/or approval authority will:

- summarize the conclusion
- add this checklist with the appropriate documentation to the project file

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g., under the *Environmental Assessment Act, Planning Act* processes
- maintained by the property owner, proponent or approval authority

Instructions

Please have the following available, when requesting information related to the screening questions below:

- a clear map showing the location and boundary of the property or project area
 - large scale and small scale showing nearby township names for context purposes
- the municipal addresses of all properties within the project area
- the lot(s), concession(s), and parcel number(s) of all properties within a project area

In this context, the following definitions apply:

- **consultant archaeologist** means, as defined in Ontario regulation as an archaeologist who enters into an agreement with a client to carry out or supervise archaeological fieldwork on behalf of the client, produce reports for or on behalf of the client and provide technical advice to the client. In Ontario, these people also are required to hold a valid professional archaeological licence issued by the Ministry of Tourism, Culture and Sport.
- **proponent** means a person, agency, group or organization that carries out or proposes to carry out an undertaking or is the owner or person having charge, management or control of an undertaking.

1. Is there a pre-approved screening checklist, methodology or process in place?

An existing checklist, methodology or process may be already in place for identifying archaeological potential, including:

- one prepared and adopted by the municipality e.g., archaeological management plan
- an environmental assessment process e.g., screening checklist for municipal bridges
- one that is approved by the Ministry of Tourism, Culture and Sport under the Ontario government's [Standards & Guidelines for Conservation of Provincial Heritage Properties](#) [s. B.2.]

2. Has an archaeological assessment been prepared for the property (or project area) and been accepted by MTCS?

Respond 'yes' to this question, if all of the following are true:

- an archaeological assessment report has been prepared and is in compliance with MTCS requirements
 - a letter has been sent by MTCS to the licensed archaeologist confirming that MTCS has added the report to the Ontario Public Register of Archaeological Reports (Register)
- the report states that there are no concerns regarding impacts to archaeological sites

Otherwise, if an assessment has been completed and deemed compliant by the MTCS, and the ministry recommends further archaeological assessment work, this work will need to be completed.

For more information about archaeological assessments, contact:

- approval authority
- proponent
- consultant archaeologist
- Ministry of Tourism, Culture and Sport at archaeology@ontario.ca

3. Are there known archaeological sites on or within 300 metres of the property (or project area)?

MTCS maintains a database of archaeological sites reported to the ministry.

For more information, contact MTCS Archaeological Data Coordinator at archaeology@ontario.ca.

4. Is there Aboriginal or local knowledge of archaeological sites on or within 300 metres of the property?

Check with:

- Aboriginal communities in your area
- local municipal staff

They may have information about archaeological sites that are not included in MTCS' database.

Other sources of local knowledge may include:

- property owner
- [local heritage organizations and historical societies](#)
- local museums
- [municipal heritage committee](#)
- published local histories

5. Is there Aboriginal knowledge or historically documented evidence of past Aboriginal use on or within 300 metres of the property (or property area)?

Check with:

- Aboriginal communities in your area
- local municipal staff

Other sources of local knowledge may include:

- property owner
- [local heritage organizations and historical societies](#)
- local museums
- [municipal heritage committee](#)
- published local histories

6. Is there a known burial site or cemetery on the property or adjacent to the property (or project area)?

For more information on known cemeteries and/or burial sites, see:

- Cemeteries Regulation Unit, Ontario Ministry of Consumer Services – for [database of registered cemeteries](#)
- Ontario Genealogical Society (OGS) – to [locate records of Ontario cemeteries](#), both currently and no longer in existence; cairns, family plots and burial registers
- Canadian County Atlas Digital Project – to [locate early cemeteries](#)

In this context, 'adjacent' means 'contiguous', or as otherwise defined in a municipal official plan.

7. Has the property (or project area) been recognized for its cultural heritage value?

There is a strong chance there may be archaeological resources on your property (or immediate area) if it has been listed, designated or otherwise identified as being of cultural heritage value by:

- your municipality
- Ontario government
- Canadian government

This includes a property that is:

- designated under *Ontario Heritage Act* (the OHA), including:
 - individual designation (Part IV)
 - part of a heritage conservation district (Part V)
 - an archaeological site (Part VI)
- subject to:
 - an agreement, covenant or easement entered into under the OHA (Parts II or IV)
 - a notice of intention to designate (Part IV)
 - a heritage conservation district study area by-law (Part V) of the OHA
- listed on:
 - a municipal register or inventory of heritage properties
 - Ontario government's list of provincial heritage properties
 - Federal government's list of federal heritage buildings
- part of a:
 - National Historic Site
 - UNESCO World Heritage Site
- designated under:
 - *Heritage Railway Station Protection Act*
 - *Heritage Lighthouse Protection Act*
- subject of a municipal, provincial or federal commemorative or interpretive plaque.

To determine if your property or project area is covered by any of the above, see:

- Part A of the MTCS Criteria for Evaluating Potential for Built Heritage and Cultural Heritage Landscapes

Part VI – Archaeological Sites

Includes five sites designated by the Minister under Regulation 875 of the Revised Regulation of Ontario, 1990 (Archaeological Sites) and 3 marine archaeological sites prescribed under Ontario Regulation 11/06.

For more information, check [Regulation 875](#) and [Ontario Regulation 11/06](#).

8. Has the entire property (or project area) been subjected to recent extensive and intensive ground disturbance?

Recent: after-1960

Extensive: over all or most of the area

Intensive: thorough or complete disturbance

Examples of ground disturbance include:

- quarrying
- major landscaping – involving grading below topsoil
- building footprints and associated construction area
 - where the building has deep foundations or a basement
- infrastructure development such as:
 - sewer lines
 - gas lines
 - underground hydro lines
 - roads
 - any associated trenches, ditches, interchanges. **Note:** this applies only to the excavated part of the right-of-way; the remainder of the right-of-way or corridor may not have been impacted.

A ground disturbance does **not** include:

- agricultural cultivation
- gardening
- landscaping

Site visits

You can typically get this information from a site visit. In that case, please document your visit in the process (e.g., report) with:

- photographs
- maps
- detailed descriptions

If a disturbance isn't clear from a site visit or other research, you need to hire a licensed consultant archaeologist to undertake an archaeological assessment.

9. Are there present or past water bodies within 300 metres of the property (or project area)?

Water bodies are associated with past human occupations and use of the land. About 80-90% of archaeological sites are found within 300 metres of water bodies.

Present

- Water bodies:
 - primary - lakes, rivers, streams, creeks
 - secondary - springs, marshes, swamps and intermittent streams and creeks
- accessible or inaccessible shoreline, for example:
 - high bluffs
 - swamps
 - marsh fields by the edge of a lake
 - sandbars stretching into marsh

Water bodies not included:

- man-made water bodies, for example:
 - temporary channels for surface drainage
 - rock chutes and spillways
 - temporarily ponded areas that are normally farmed
 - dugout ponds
- artificial bodies of water intended for storage, treatment or recirculation of:
 - runoff from farm animal yards
 - manure storage facilities
 - sites and outdoor confinement areas

Past

Features indicating past water bodies:

- raised sand or gravel beach ridges – can indicate glacial lake shorelines
- clear dip in the land – can indicate an old river or stream
- shorelines of drained lakes or marshes
- cobble beaches

You can get information about water bodies through:

- a site visit
- aerial photographs
- 1:10,000 scale [Ontario Base Maps](#) - or [equally detailed and scaled maps](#).

10. Is there evidence of two or more of the following on the property (or project area)?

- elevated topography
- pockets of well-drained sandy soil
- distinctive land formations
- resource extraction areas
- early historic settlement
- early historic transportation routes

• **Elevated topography**

Higher ground and elevated positions - surrounded by low or level topography - often indicate past settlement and land use.

Features such as eskers, drumlins, sizeable knolls, plateaus next to lowlands, or other such features are a strong indication of archaeological potential.

Find out if your property or project area has elevated topography, through:

- site inspection
- aerial photographs
- [topographical maps](#)

• **Pockets of well-drained sandy soil, especially within areas of heavy soil or rocky ground**

Sandy, well-drained soil - in areas characterized by heavy soil or rocky ground - may indicate archaeological potential

Find out if your property or project area has sandy soil through:

- site inspection
- [soil survey reports](#)

- **Distinctive land formations**

Distinctive land formations include – but are not limited to:

- waterfalls
- rock outcrops
- rock faces
- caverns
- mounds, etc.

They were often important to past inhabitants as special or sacred places. The following sites may be present – or close to – these formations:

- burials
- structures
- offerings
- rock paintings or carvings

Find out if your property or project areas has a distinctive land formation through:

- a site visit
- aerial photographs
- 1:10,000 scale [Ontario Base Maps](#) - or [equally detailed and scaled maps](#).

- **Resource extraction areas**

The following resources were collected in these extraction areas:

- food or medicinal plants e.g., migratory routes, spawning areas, prairie
- scarce raw materials e.g., quartz, copper, ochre or outcrops of chert
- resources associated with early historic industry e.g., fur trade, logging, prospecting, mining

Aboriginal communities may hold traditional knowledge about their past use or resources in the area.

- **Early historic settlement**

Early Euro-Canadian settlement include – but are not limited to:

- early military or pioneer settlement e.g., pioneer homesteads, isolated cabins, farmstead complexes
- early wharf or dock complexes
- pioneers churches and early cemeteries

For more information, see below – under the early historic transportation routes.

- **Early historic transportation routes** - such as trails, passes, roads, railways, portage routes, canals.

For more information, see:

- historical maps and/or historical atlases
 - for information on early settlement patterns such as trails (including Aboriginal trails), monuments, structures, fences, mills, historic roads, rail corridors, canals, etc.
- [Archives of Ontario](#) holds a large collection of historical maps and historical atlases
- digital versions of historic atlases are available on the [Canadian County Atlas Digital Project](#)
- commemorative markers or plaques such as local, [provincial](#) or [federal](#) agencies
- [municipal heritage committee](#) or other [local heritage organizations](#)
 - for information on early historic settlements or landscape features (e.g., fences, mill races, etc.)
 - for information on commemorative markers or plaques

PRELIMINARY SERVICING & STORMWATER
MANAGEMENT REPORT

IMPALA SUBDIVISION – PHASE 1

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PROJECT# 25001 | 2026.03.06
Prepared for Impala Developments
Revision #0 – Issued for Draft Plan

Revision #	Date	Issued For	Description of Revision
0	2026/03/06	Issued for Draft Plan	

This report is respectfully submitted to Impala Developments in support of a Draft Plan application and design services for the proposed Impala Subdivision – Phase 1 development in Lancaster, Ontario.

Prepared By:



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This report was prepared by EVB Engineering for Impala Development in accordance with the professional services agreement. The disclosure of any information contained in this report is the sole responsibility of the intended recipient. The material in it reflects EVB's best judgement in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decision to be made based on it are the responsibility of such third parties. EVB Engineering accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. This limitations statement is considered part of this report.

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Appendices

APPENDIX A – Draft Plan
Zoning Map
Official Plan Map

APPENDIX B – Preliminary Sanitary Sewer Design Sheets
Preliminary Storm Sewer Design Sheets

APPENDIX C – Weighted C Factor Calculations
Pre-Development & Post Development Runoff Calculations
Stormceptor Sizing Report

APPENDIX D – FIG. 1 - Pre-Development Stormwater Catchment Areas
FIG. 2 - Post-Development Stormwater Catchment Areas
FIG. 3 - Preliminary Sanitary Servicing Layout
FIG. 4 - Preliminary Storm Servicing Layout
FIG. 5 - Typical 20.0m Urban Cross Section

1 Introduction

1.1 Background

This preliminary servicing report is submitted on behalf of Impala Developments in support of the proposed draft plan for the Impala Subdivision. This preliminary servicing report, completed by EVB Engineering (EVB), includes sanitary sewage collection, stormwater collection, water distribution, and stormwater management for the proposed development.

1.2 General Description & Land Use

The Impala Subdivision is located East of Raisin River Marine, North and West of County Road 2, and South of Andrea Avenue. It is situated on parts 1,2,3, and 4 of Lot L, Concession I, Geographic Township of Charlottenburg, Township of South Glengarry, County of Glengarry, Ontario.

The subject land is designated as Residential District within the County's Official Plan, allowing for a full range of low, medium, and high-density housing types. The Township's zoning by-law designates the subject land as Commercial Highway (CH), however, the client is seeking to have the property re-zoned as Residential 4 – High Density with exceptions (R4-x) that will allow for the construction of the proposed residential development. A Planning Rationale will be prepared and submitted in parallel with the draft plan application in support of the zoning amendment.

The subject lands are approximately 2.76 hectares in size and are proposed to be developed with semi-detached dwelling units, townhouse units, and future apartment buildings. More specifically, two (2) semi-detached lots containing four (4) dwelling units and eight (8) row house lots containing thirty-two (32) dwelling units are proposed. The exact density and unit count for the proposed apartment buildings in Block 1 has not yet been determined; however preliminary estimates are around 72 units. Apartment blocks 5 and 7 are proposed to be 8 units each. The development is proposed to have a single access from County Road 2, north of the bend.

While the subdivision development is not proposed to be formally phased, it is anticipated that a Subdivision Agreement will be entered into following Draft Plan approval. The Subdivision Agreement will be supported by detailed design and will provide for the servicing of all residential semi-detached and row house lots, as well as Block 1 (future apartment building), with services available for future connection. Development of Block 1 will occur subsequent to registration of the subdivision and will be subject to Site Plan Control approval.

The Draft Plan (DP1.1), completed by EVB Engineering, includes a key plan which illustrates the subject property and surrounding lands. The referenced draft plan can be found in Appendix A. The lot fabric and overall subdivision layout have been developed in consideration of applicable Township and SDG Counties zoning regulations and policies.

1.3 Pre-Consultation

A pre-consultation meeting was held at the Township of South Glengarry's City Hall on May 15th, 2025. Several supporting studies were identified in the *Subdivision Pre-Consultation Applicant's Study and Plan Identification List* as being required for Draft Plan Submission including:

- Site Servicing Plan
- Lot Grading & Drainage plan
- Stormwater Management Report
- Transportation Impact Assessment

- Draft Plan of Subdivision
- Planning Rationale
- Phase 2 ESA
- Erosion & Sediment Control Plan
- Geotechnical Study

This report encompasses the Site Servicing Plan, Lot Grading & Drainage Plan, Stormwater Management Report, and the Erosion & Sediment Control Plan. Other Required Studies will be attached separately in Support of the Draft Plan Application.

2 Preliminary Servicing

In order to satisfy the requirements of the Draft Plan submission, EVB Engineering has prepared a Preliminary Servicing Plan based on the proposed Draft Plan. The Preliminary Servicing Plan illustrates the servicing of 36 residential dwelling units on approximately 1.50 hectares of land and also considers servicing availability for Blocks 1, 5, and 7 with the development of the future apartment buildings bringing the total unit count across the entire 2.76-hectare site to 124 units. Full municipal services will be provided, including sanitary sewers, watermains, storm sewers (including rear yard catch basins), an oil and grit separator, asphalt roadways, street lighting, and utilities (Bell, gas, and hydro).

The Township of South Glengarry will be required to allocate both water and sewage capacity to the development based on the available capacity at the Lancaster Water Treatment Plant and Lancaster wastewater lagoon system.

3 Servicing

3.1 Sanitary Collection System

A sewage collection system is proposed for the development to transport sewage to the Sanitary Pumping Station located at 20419 Old Montreal Road where it will be pumped to the Lancaster wastewater lagoon system, located North of Railside Road. Design of the collection system will be consistent with the *Ministry of Environment (MOE) Design Guidelines for Sewage Works (2008)*.

The proposed sanitary sewer for the Impala Subdivision will consist of new 200mm diameter sanitary sewer. There is an existing sanitary sewer along County Road 2, where it is proposed that a new manhole be installed on County Road 2 to connect the new sanitary to the existing network. The proposed sanitary sewer will be installed at a gradient of 0.4%, with the gradient between the upstream-most manholes being 0.8% as per the Township's Municipal Standards. This will ensure that minimum preferred depth of 2.00m is achieved within the low-lying area of the development as per the Townships Municipal Standards and limit the amount of fill required on site. The proposed sewer will eventually discharge to the existing sanitary pumping station located on Old Montreal Road where the sewage is then conveyed North via an existing 250mm diameter force main to the Lancaster Wastewater lagoon.

Peak flows from the development were calculated based on the assumptions below and is consistent with the Ministry of the Environment, Conservation and Parks (MECP) *Design Guidelines for Sewage Works (2008)*:

- ◆ 3.00 persons per dwelling,
- ◆ Average daily flow of 450 L/cap/day,
- ◆ Peaking factor as calculated from Harmon formula (minimum of 2, maximum of 4),
- ◆ Infiltration & inflow allowance of 0.19 L/s/ha,

Based on the assumptions above, the proposed development of the Impala Subdivision is anticipated to generate a theoretical peak sanitary flow of 7.75 L/s

As part of the detailed design phase, EVB will review the existing capacity of the pump station, evaluating any necessary upgrades that may be required for the proposed development.

Sanitary laterals will service each property and be installed from the main line sewer to the property boundary. Sanitary laterals will be installed with minimum and maximum slopes of 2% and 8% respectively, consistent with provincial standards.

The preliminary sanitary sewer servicing layout, sewer catchment areas, and design sheets may be found in Appendix D.

3.2 Water Supply

The proposed water supply for the Impala Subdivision will consist of a new watermain which will be connected to the existing 300 mm diameter watermain that is located along County Road 2. Due to the nature of the lot layout and the proximity of the development to the existing watermain, it is anticipated that there will be no opportunity to loop the water distribution system. As a result, a fire hydrant will be installed at the termination point of the watermain, located within the cul-de-sac, to provide adequate fire protection and flushing capabilities for the system.

The proposed water supply for the development will be designed to not exceed 700Kpa (100psi) under minimum hourly demand and not fall below 275 kPa (40 psi) during peak hourly demand consistent with the MOE Design Guidelines for Drinking Water Systems (2008). The watermain will also be designed so that normal operating pressures range between 350 kPa to 480 kPa (50 to 70 psi) under maximum day demand conditions and ensuring a minimum pressure of 140 kPa (20 psi) is met under maximum day plus fire flow conditions.

The Township of South Glengarry will be required to commit sufficient uncommitted reserve capacity from the Lancaster Water Treatment Plant to accommodate this proposed development.

3.3 Stormwater Management

The Ministry of the Environment, Conservation and Parks (MECP), the Township of South Glengarry, and the Raisin Region Conservation Authority (RRCA) typically require a minimum of 80% total suspended solids (TSS) removal and that post-development peak flows do not exceed pre-development peak flows for the 5-year and 100-year storm events.

In an email dated June 5, 2025, a representative of the Raisin Region Conservation Authority (RRCA) confirmed that stormwater quantity management is not required for this site based on hydrologic considerations. Specifically, the site is located within approximately 60 m of the Raisin River, which outlets to the St. Lawrence River within approximately 500 m of the proposed development. Given this proximity, any increase in stormwater runoff resulting from the proposed development is anticipated to have negligible effects on the hydrology of both the Raisin River and the St. Lawrence River, which convey significantly larger stormwater volumes. As a result, the incremental increase in runoff volume associated with the development is not expected to adversely impact downstream conditions.

As stormwater quantity control is not required, a dedicated stormwater management block and conventional stormwater management facility are not proposed. While a stormwater management facility can provide water quality treatment through extended detention and permanent pool storage, dedicating

a separate block for this purpose would result in a loss of developable land given the additional excavation volumes that would be required beyond those necessary to address water quality storage volumes only. An oil and grit separator (OGS) is instead proposed to provide the required stormwater quality treatment and achieve the applicable total suspended solids (TSS) removal requirements.

3.3.1 Site Overview and Catchment Areas

The existing drainage patterns were established based on a topographical survey completed by Ron M. Jason Surveying Ltd. In 2019. The topography of the site is such that the majority of the stormwater runoff flows overland and through drainage ditches to a drainage ditch on the west side of the property. The remainder of the stormwater runoff flows overland to the drainage ditch along County Road 2. Pre-development stormwater catchment areas are illustrated in Figure 1 in Appendix D.

The post development drainage patterns will be established based on the proposed lot fabric as described in the Draft Plan (DP.1). Typical split lot grading and/or back to front lot grading consistent with details in the Township of South Glengarry's Municipal Standards will direct stormwater runoff from the proposed lots to a stormwater collection system (rear yard swales, rear yard catchbasins, and storm sewers). For the purpose of this report, the total developable area (2.76 hectares) was taken under consideration with the assumption the entire site will be controlled and conveyed through the OGS unit. Post-development catchment areas are illustrated in Figure 2 in Appendix D.

3.3.2 Runoff Coefficients

Average runoff coefficients were applied based on The City of Cornwall's Subdivision Manual. Weighted runoff coefficients were determined for the pre-development and post-development conditions of the site. The pre-development runoff coefficients were determined by the surface areas and surface types of the site that were present when the site was surveyed in 2019. Runoff coefficients were taken to be 0.90 for asphalt/concrete, and 0.90 for roofs, 0.7 for gravel, 0.75 for precast paving, and 0.2 for grassed/undeveloped surface types. Post-development weighted runoff coefficients were determined by proposed development type. Runoff coefficients were taken to be 0.7 for apartments, 0.65 for rowhouses, 0.5 for semidetached, 0.45 for single detached, and 0.20 for grassed/undeveloped.

3.3.3 Quantitative Sizing

The rational method and associated criteria (runoff coefficients, time of concentration, rainfall intensity) were used to calculate the pre and post development runoff for storm events with return periods of 5 and 100-years respectively. These runoff values were then used to size the stormwater network. Storm sewer design calculations and runoff calculations can be found in appendices B and C respectively.

3.3.4 Qualitative Sizing

Stormwater quality treatment is proposed to be accomplished using a combination of an Oil Grit Separator (OGS) and grassed swales with reduced slopes, effectively functioning as enhanced swales. An OGS, model EFO10, was sized using Imbrium's Oil-Grit Separator Sizing Tool based on achieving 60% total suspended solids (TSS) removal for an ISO 14034 Environmental Technology Verification (ETV) particle size distribution, a catchment area of 2.76 hectares, and a weighted runoff coefficient of 0.64.

Historically, OGS units were commonly sized using manufacturer-specific particle size distributions, which for Imbrium were referred to as the "Fine PSD." Under this particle size distribution, the selected OGS model would be capable of achieving up to 80% TSS removal. More recently, OGS performance testing has been standardized to the ISO 14034 ETV particle size distribution, which contains a higher proportion of fine particles and therefore results in lower reported TSS removal efficiencies. This change in testing methodology accounts for the 60% TSS removal efficiency identified through the current sizing

approach. The requirement to apply the ISO 14034 ETV particle size distribution is not uniformly enforced across all municipalities.

Although a formal combined treatment efficiency calculation has not been provided, we are seeking approval based on the proposed OGS achieving 60% TSS removal under the conservative ETV particle size distribution, with residual fine particles receiving additional treatment within the downstream vegetated swales. The combined treatment train is therefore expected to meet the overall stormwater quality objectives for the site.

The Stormceptor sizing report may be found in Appendix C.

3.4 Minor & Major Drainage Systems

As per previous discussions with the Township, EVB is proposing one stormwater management facility for the ultimate development. This new facility will be located at the west corner of the subject property and discharge into the Raisin River through a drainage easement.

Stormwater runoff from the proposed development will be conveyed to the new stormwater management facility via lot grading, swales, and a series of proposed storm sewers.

The proposed minor drainage system will consist of storm sewers sized to accommodate the peak flow of the 5-year design storm event without surcharging. Design peak flows will be calculated using the Rational method and the design criteria described above, while a Manning roughness coefficient of 0.013 was used in sizing storm sewers.

The major system will consist of pressurized flows in the storm sewers for which a HGL calculation will be done to ensure that the storm sewer can convey the 100-year storm without flooding of the structures. Where necessary, overland flow in roadways could be achieved, which is expected to work well for this development as the proposed topography generally slopes towards the west corner of the property where the stormwater management facility is located.

Storm laterals will service each property and will be installed from the main line sewer to the property boundary. Storm laterals will be installed with minimum and maximum slopes of 2% and 8% respectively, consistent with provincial standards.

The preliminary storm sewer servicing layout and sewer catchment areas may be found in Appendix D.

3.5 Erosion & Sediment Control Measures

Straw Bale Flow Check Dams as per O.P.S.D. 219.180 are to be installed at the start of construction and are to be maintained throughout the project. Light-duty silt fences as per O.P.S.D. 219.130 are to be erected along the boundary of construction activities as well. Sediment control measures will be removed only once adequate grass cover has been achieved. It is anticipated that these measures will provide protection to minimize erosion and sediment transport during construction.

The contractor will be required to monitor the sediment control measures weekly and following any significant storm consisting of 13mm of precipitation or greater. The contractor will also be responsible for repairing the sediment control measures as required to ensure their proper operation.

4 Right-of-Way

Asphalt roadways will be constructed for the development consistent with the Township of South Glengarry's standards for an urban roadway cross-section with a road allowance of 20.0m. This can be generally summarized as an asphalt roadway consisting of two (2) 4.5m lanes, one (1) standard barrier curb and gutter for each side and a 1.5m wide sidewalk located on the south/west side of the right-of-way.

A cross section of the proposed 20.0m urban right-of-way, can be found in Appendix D.

5 Schedule

This preliminary servicing report is prepared in support of the Draft Plan approval. The Owner will be undertaking the detailed engineering design and executing a subdivision agreement with the Township of South Glengarry following Draft Plan approval.

Please do not hesitate to contact the undersigned should you have any questions or concerns.

Respectfully submitted,
EVB Engineering



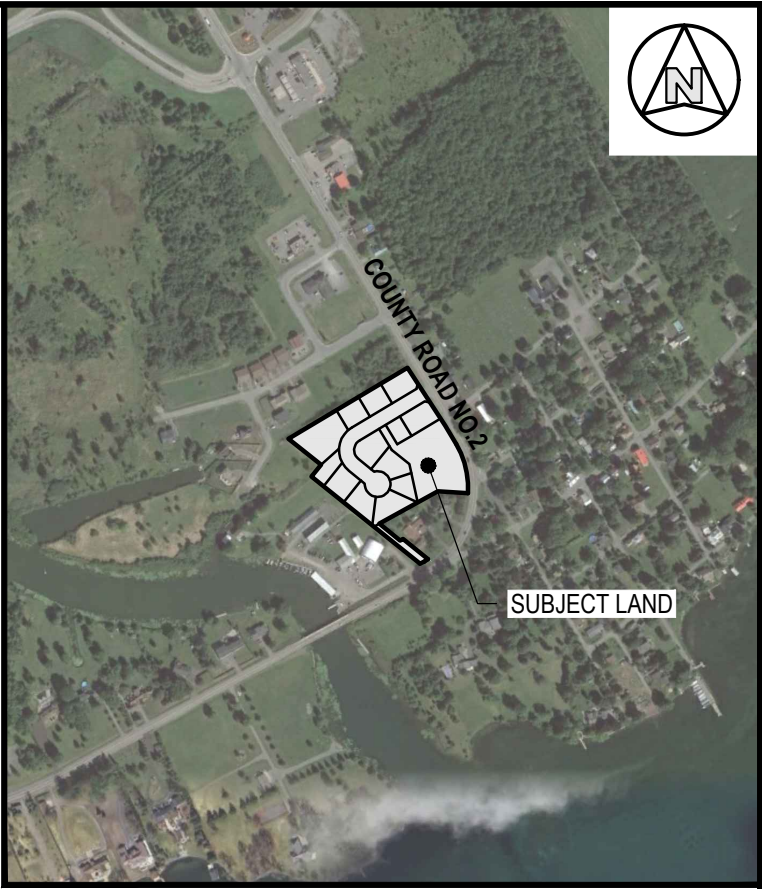
J. Thomas Harrison, B.Eng.
Municipal Designer



Kevin MacCulloch, P.Eng.
Senior Municipal Engineer

APPENDIX A

Draft Plan (DP1.1)
Zoning Map
Official Plan Map



SCALE: 1:400	JOB NO: 25001
DESIGNED BY: T.H.	DATE: 2025/02/28
DRAWN BY: K.B.W./B.K.N.	DRAWING NO. DP1.1
CHECKED BY: K.M.	

M:\2025\25001 - Impala Developments Lancaster Subdivision\6.0 Dwgs\6.3 Civil\3.0 Non-production\3.4 Draft Plan\25001-DP1-1.dwg Mar 06, 2026-10:15am BY: (thomas.harrison)

South Glengarry Zoning By-law #38-09

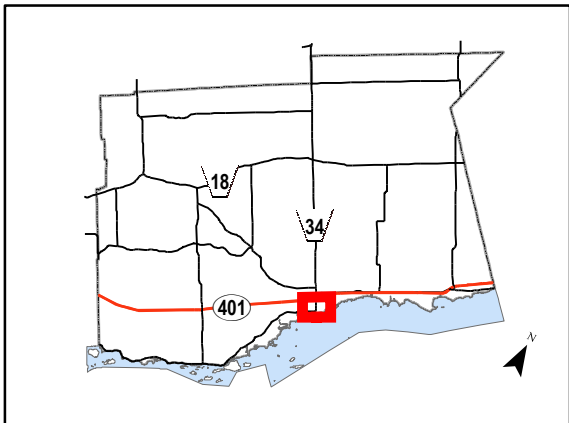


St.Lawrence Shoreline Part 9

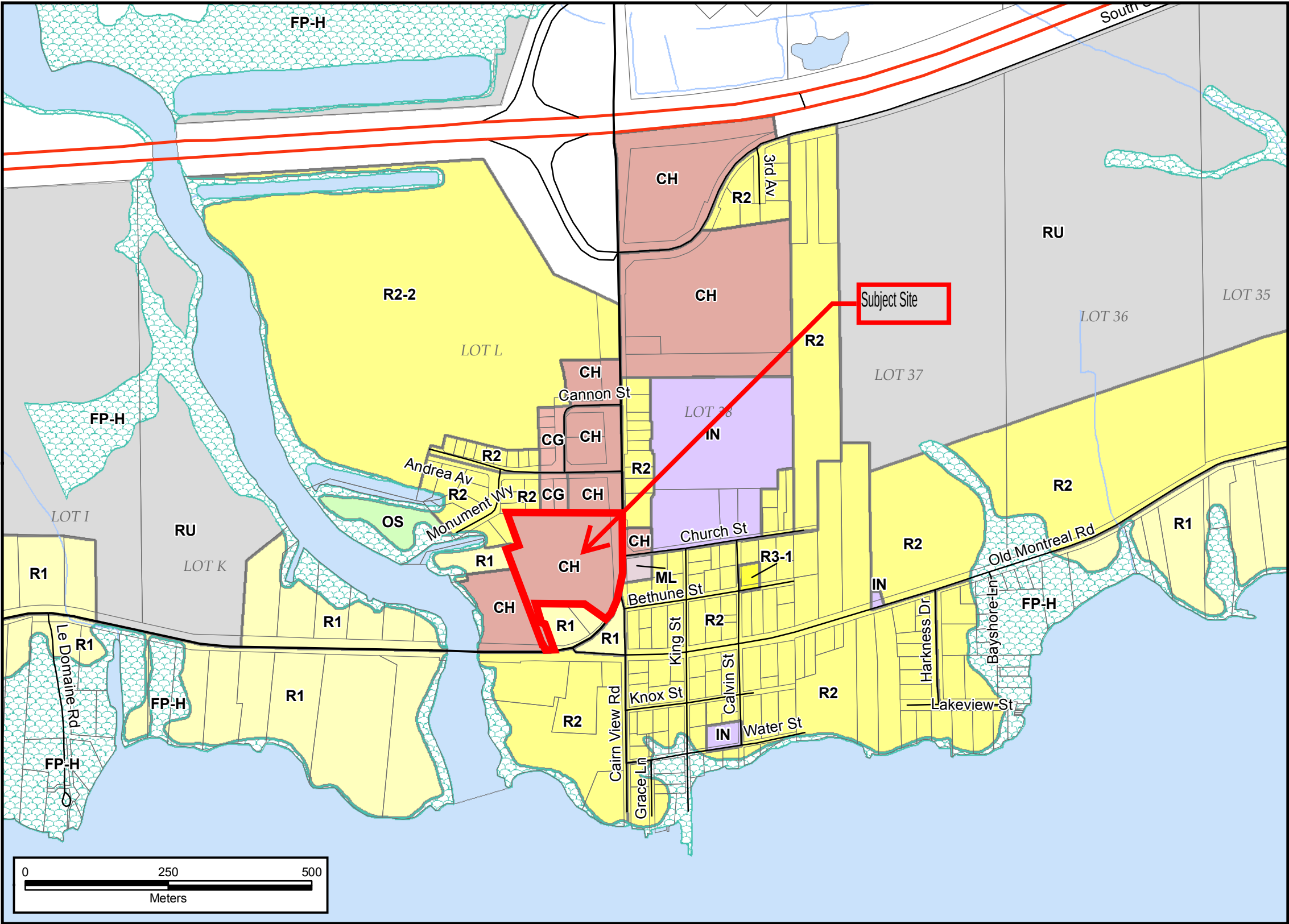
- Parcels
- Highway
- County Road
- Other Roads
- Railroad
- PowerLine
- Oil/Gas Pipeline

1:7,500

Township of South Glengarry
Key Map



0 5 10 20 30
Kilometers



Legend

- | | | |
|------------------------|-------------------------------|-----------|
| Residential, R1 | Highway Commercial, CH | Rural, RU |
| Residential, R2 | Light Industrial, ML | |
| Residential, R3 | Institutional, IN | |
| General Commercial, CG | Open Space, OS | |
| | Floodplain Holding Zone, FP-H | |



Schedule
S-9



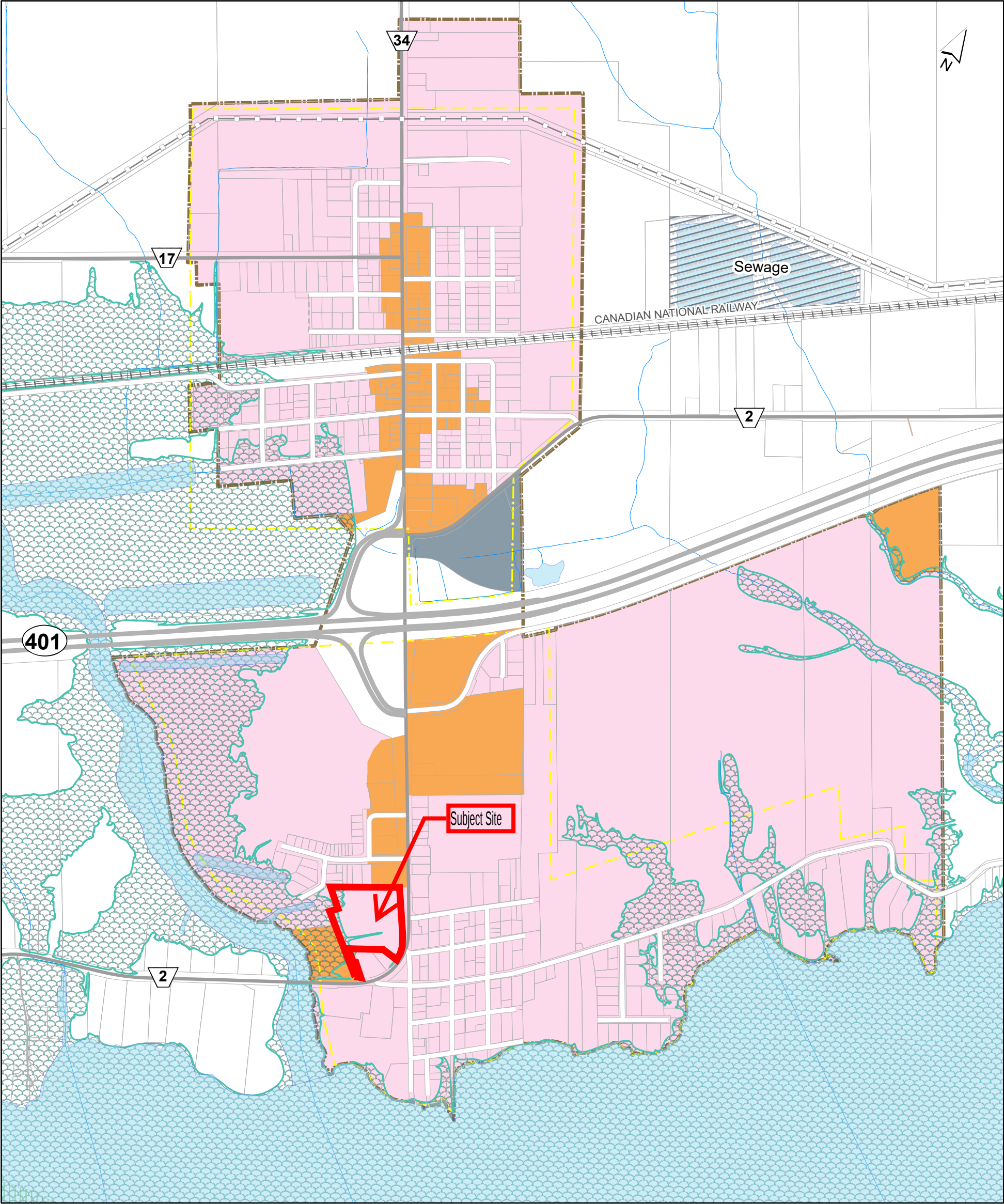
United Counties of Stormont Dundas and Glengarry

The United Counties of Stormont, Dundas & Glengarry, its employees, or agents, do not undertake to guarantee the validity of the contents of this digital or hardcopy map and will not be liable for any claims of damages or loss arising from its application or interpretation, by any party. It is not intended to replace a survey or be used for legal description.

Date: September 28, 2009

SCHEDULE A6c

South Lancaster / Lancaster



LEGEND

Boundaries

- Urban Settlement Area
- Urban Service Limit

Settlement Areas

- Residential District
- Commercial District
- Employment District

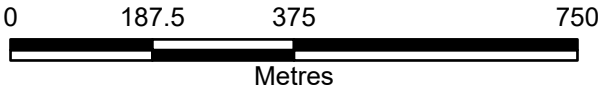
Environmental Protection Lands

- Regulatory Floodline

Infrastructure

- Sewage Lagoon

1:10,000



APPENDIX B

Sanitary Sewer Design Sheets
Storm Sewer Design Sheets

Sanitary Sewer Design Sheet

Client: Impala Developments



Service Location and Contributing Areas						Inlet Flow										Outlet Pipe Data									
Location	Manhole		Contributing Areas			Individual			Cumulative		q l/cap/d	Peaking Factor (M)	Peak Flow (l/s)	I*A (l/s)	Q (l/s)	SIZE (mm)	Slope (%)	Qcap (l/s)	Q/Qcap	Velocity (m/s)	Length (m)	Δ Elev (m)	Pipe Inverts		
						Population			Σ	Σ															
	From	To	No.	Ha	Σ Areas	No. Connections	Pop.	P(1000)	P(1000)	AREA (ha)															
PHASE 1	MH108	MH106	A1	0.82	A1	22	66	0.066	0.066	0.82	450	4.00	1.38	0.16	1.53	200	0.80%	29.34	0.05	0.93	62	0.496	47.22	46.73	
	SWMF	MH106	A2	0.03	A1-A2	0	0	0.000	0.066	0.85	450	4.00	1.38	0.16	1.54	--	--	--	--	--	--	--	--	--	
	MH106	MH104	A3	0.34	A1-A3	8	24	0.024	0.090	1.19	450	4.00	1.88	0.23	2.10	200	0.40%	20.74	0.10	0.66	32.5	0.130	46.67	46.54	
	MH104	MH102	A4	0.32	A1-A4	8	24	0.024	0.114	1.51	450	4.00	2.38	0.29	2.66	200	0.40%	20.74	0.13	0.66	39.5	0.158	46.48	46.32	
	BLOCK 1	MH102	A5	0.67	A5	72	216	0.216	0.216	0.67	450	4.00	4.50	0.13	4.63	200	0.80%	29.34	0.16	0.93	10	0.080	46.52	46.44	
	MH102	MH100	A6	0.58	A1-A-6	14	42	0.042	0.372	2.76	450	4.00	7.75	0.52	8.27	200	0.40%	20.74	0.40	0.66	95	0.380	46.29	45.91	
Design Parameters									Designed By:					Project:											
Coefficients Mannings n =0.0130Persons Per Lot3.0 Flows Average Daily Per Capita Flow (q):450 l/cap/dPeak Extrenuous Flow (l):0.19 l/s/ha									J. Thomas Harrison, B.Eng.					Impala Subdivision											
									Reviewed By:					Location:											
									Kevin MacCulloch, P.Eng					Lancaster, Ontario											
									Dwg. Reference:					Project Number:				Date:			Sheet Number:				
									FIG. 1- Sanitary Sewer Catchment Areas					25001				04-Mar-26			1/1				

Storm Sewer Design Sheet - 5 Year Storm



Service Location and Contributing Areas						Runoff Data						Outlet Pipe Data								
Location	Manhole		Contributing Area			C	AC	Σ AC	Tc (min.)	I (mm/hr)	Q (L/s)	Size (mm)	Slope (%)	Qcap (l/s)	Q/Qcap	Velocity (m/s)	Length (m)	Δ Elev (m)	Pipe Inverts	
	From	To	No.	Ha	Σ Areas														U/S	D/S
	MH206	MH204	A-200	0.350	A-200	0.65	0.228	0.228	20.0	57.1	36.38	250	0.80%	53.2	0.68	1.08	29	0.232	48.46	48.23
	MH204	MH202	A-201	0.230	A-200 to 201	0.58	0.133	0.361	20.4	56.2	56.83	375	0.30%	96.0	0.59	0.87	28.5	0.086	48.11	48.02
	Block 1	MH202	A-202	0.670	A-202	0.7	0.469	0.469	20.0	57.1	75.00	300	0.80%	86.5	0.87	1.22	10	0.080	48.18	48.10
	MH202	MH200	A-203	0.320	A-200 to 203	0.65	0.208	1.038	21.0	55.2	160.46	525	0.30%	235.6	0.68	1.09	42	0.126	47.87	47.74
	MH200	STCEF10	A-204	0.350	A-200 to 204	0.7	0.245	1.283	21.6	54.1	194.20	525	0.30%	235.6	0.82	1.09	21.5	0.065	47.68	47.62
	MH210	MH208	A-205	0.400	A-205	0.62	0.248	0.248	20.0	57.1	39.66	250	0.80%	53.2	0.75	1.08	50	0.400	48.26	47.86
	MH208	STCEF10	A-206	0.410	A-205 to 206	0.68	0.279	0.527	20.8	55.6	82.05	375	0.30%	96.0	0.85	0.87	13	0.039	47.73	47.70
	STCEF10	Outlet	--	--	A-200 to 207	--	--	1.810	22.0	53.5	271.06	600	0.30%	336.3	0.81	1.19	10	0.030	47.47	47.44
Design Parameters									Designed By:			Project:								
<u>Coefficients</u> Mannings n = 0.0130									J. Thomas Harrison			Impala Developments Lancaster Subdivision								
									Reviewed By:			Location:								
									Kevin MacCulloch			Lancaster, Ontario								
									Dwg. Reference:			Project Number:			Date:			Sheet Number:		
												25001			04-Mar-26			1/1		

APPENDIX C

**Weighted C Factor Calculations
Pre-Development & Post Development Runoff
Calculations
Stormceptor Sizing Report**

Weighted C Factor Calculations



Project Name: Impala Developments Lancaster Subdivis
Project No: 25001
Client: Impala Developments

Designed By: J. Thomas Harrison
Reviewed By: Kevin MacCulloch
Date: 2026-03-04

A1

Surface/Development Type	Coefficient	Area (m ²)
Asphalt/Concrete	0.9	366.2
Roof	0.9	0
Gravel	0.7	0
Precast Paving	0.75	0
Grassed & Undeveloped	0.2	4136.52
Σ Areas		4502.72
Weighted 'C' Factor		0.26

A2

Surface/Development Type	Coefficient	Area (m ²)
Asphalt/Concrete	0.9	1686.47
Roof	0.9	0
Gravel	0.7	90.17
Precast Paving	0.75	0
Grassed & Undeveloped	0.2	21297.48
Σ Areas		23074.12
Weighted 'C' Factor		0.25

A3

Surface/Development Type	Coefficient	Area (m ²)
Apartments	0.7	12597.71
Town & Row Housing	0.65	12769.69
Semi-Detached	0.5	1941.44
Single Family	0.45	0
Grassed & Undeveloped	0.2	254.8
Σ Areas		27563.64
Weighted 'C' Factor		0.66

Pre-Development & Post Development Runoff Calculations



Project Name: Impala Developments
Project No: 25001
Client: Impala Developments

Designed By: J. Thomas Harrison
Reviewed By: Kevin MacCulloch
Date: 2026-03-04

Pre-Development Peak Run-off Rates (Allowable)

Contributing Area		Runoff Data						
No.	Ha	C	AC	Tc (min.)	I (mm/hr)		Q (L/s)	
					5 Year	100 Year	5 Year	100 Year
A2	2.31	0.25	0.58	27.73	45.45	75.99	73.80	123.37
Total	2.31	0.25	0.58				73.80	123.37

Uncontrolled Post-Development Peak Run-off Rates

Contributing Area		Runoff Data						
No.	Ha	C	AC	Tc (min.)	I (mm/hr)		Q (L/s)	
					5 Year	100 Year	5 Year	100 Year
A3	2.76	0.66	1.81	20.00	57.12	95.48	288.03	481.51
Total	2.76	0.66	1.81				288.03	481.51

Allowable Release Rates (L/s)

5 Year	288.03
100 Year	481.51

01/09/2026

Project Name:	20361 County Rd. 2
Project Number:	-
Designer Name:	Jessica Steffler
Designer Company:	Rinker Materials
Designer Email:	jessica.steffler@RinkerPipe.com
Designer Phone:	519-239-6958
EOR Name:	Thomas Harrison
EOR Company:	EVB Engineering
EOR Email:	thomas.harrison@evbengineering.com
EOR Phone:	613-935-3775

Target TSS Removal (%):	60.0
-------------------------	------

Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	57.01
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	
Influent TSS Concentration (mg/L):	200
Estimated Average Annual Sediment Load (kg/yr):	1277
Estimated Average Annual Sediment Volume (L/yr):	1038

Net Annual Sediment (TSS) Load Reduction Sizing Summary	
Stormceptor Model	TSS Removal Provided (%)
EFO4	40
EFO5	45
EFO6	50
EFO8	56
EFO10	60
EFO12	62

Recommended Stormceptor EFO Model:	EFO10
Estimated Net Annual Sediment (TSS) Load Reduction (%):	60
Water Quality Runoff Volume Capture (%):	> 90



THIRD-PARTY TESTING AND VERIFICATION

► Stormceptor® EF and Stormceptor® EFO are the latest evolutions in the Stormceptor® oil-grit separator (OGS) technology series, and are designed to remove a wide variety of pollutants from stormwater and snowmelt runoff. These technologies have been third-party tested in accordance with the Canadian ETV Procedure for Laboratory Testing of Oil-Grit Separators and performance has been third-party verified in accordance with the ISO 14034 Environmental Technology Verification (ETV) protocol.

PERFORMANCE

► Stormceptor® EF and EFO remove stormwater pollutants through gravity separation and floatation, and feature a patent-pending design that generates positive removal of total suspended solids (TSS) throughout each storm event, including high-intensity storms. Captured pollutants include sediment, free oils, and sediment-bound pollutants such as nutrients, heavy metals, and petroleum hydrocarbons. Stormceptor is sized to remove a high level of TSS from the frequent rainfall events that contribute the vast majority of annual runoff volume and pollutant load. The technology incorporates an internal bypass to convey excessive stormwater flows from high-intensity storms through the device without resuspension and washout (scour) of previously captured pollutants. Proper routine maintenance ensures high pollutant removal performance and protection of downstream waterways.

PARTICLE SIZE DISTRIBUTION (PSD)

► The Canadian ETV PSD shown in the table below was used, or in part, for this sizing. This is the identical PSD that is referenced in the Canadian ETV *Procedure for Laboratory Testing of Oil-Grit Separators* for both sediment removal testing and scour testing. The Canadian ETV PSD contains a wide range of particle sizes in the sand and silt fractions, and is considered reasonably representative of the particle size fractions found in typical urban stormwater runoff.

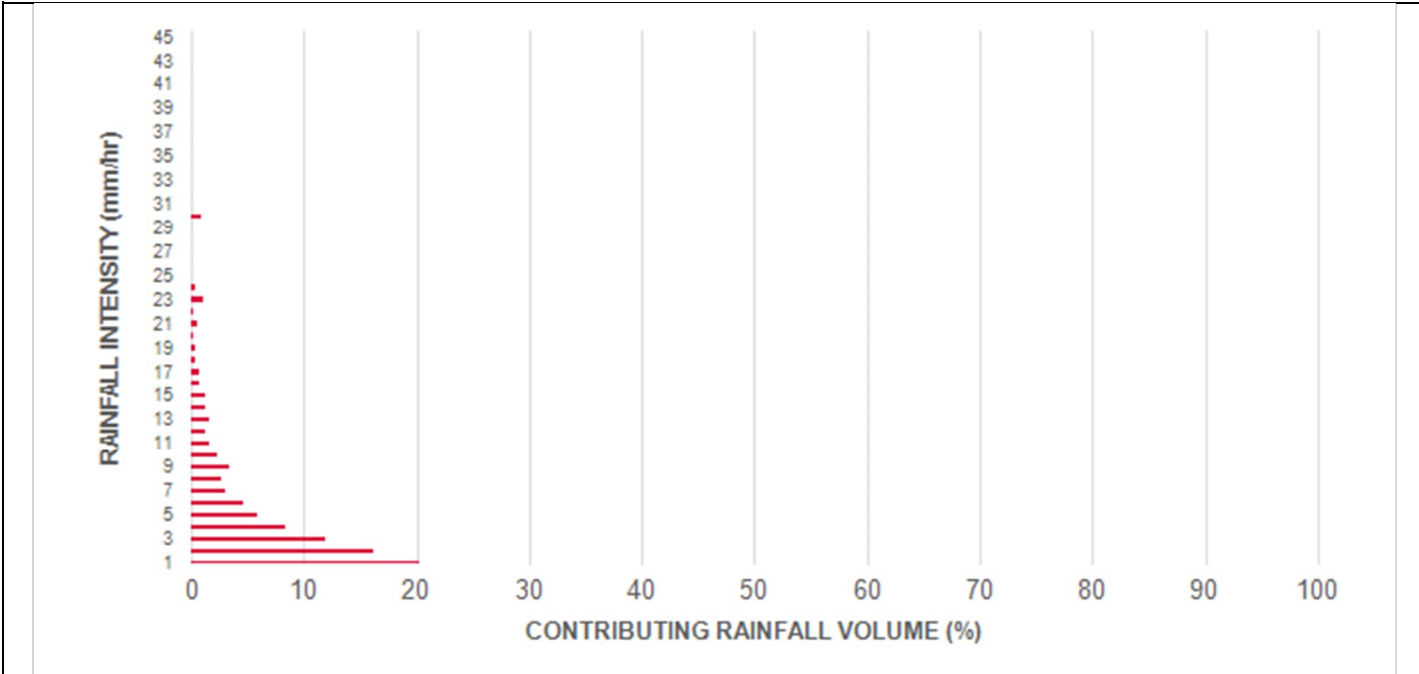
Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5



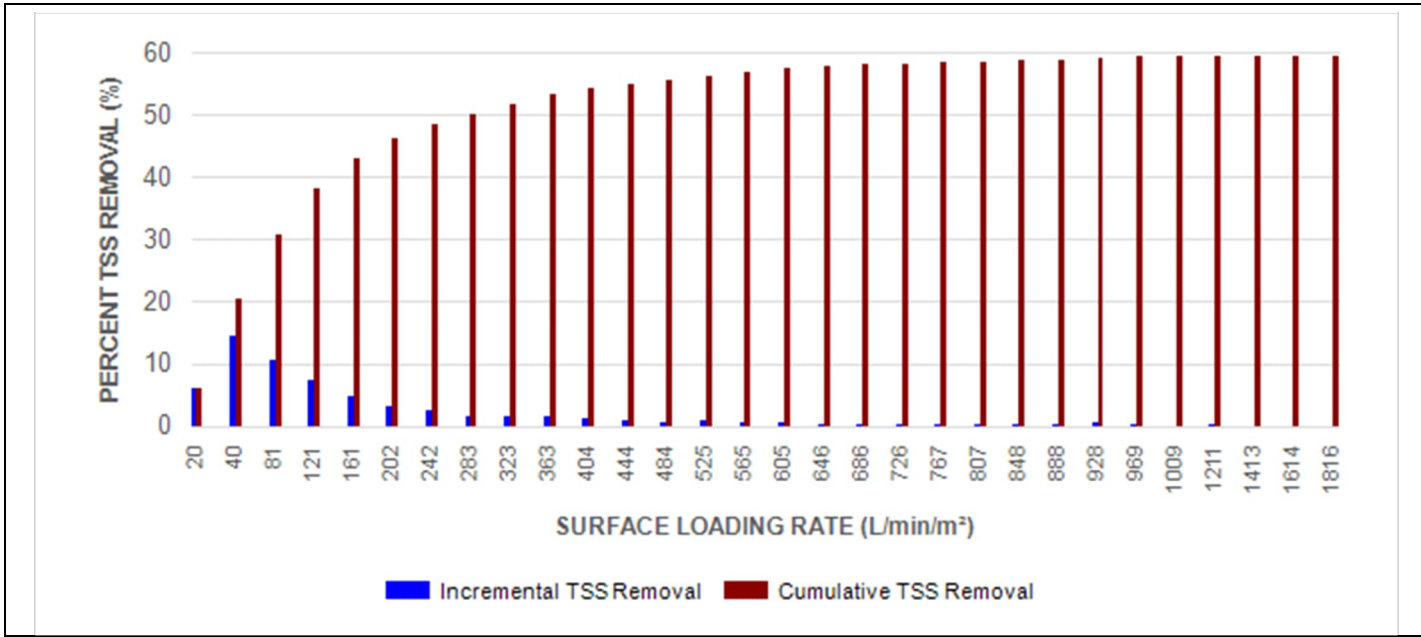
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.50	8.6	8.6	2.46	147.0	20.0	70	6.1	6.1
1.00	20.3	29.0	4.91	295.0	40.0	70	14.3	20.4
2.00	16.2	45.2	9.82	589.0	81.0	64	10.4	30.8
3.00	12.0	57.2	14.73	884.0	121.0	61	7.3	38.0
4.00	8.4	65.6	19.64	1179.0	161.0	57	4.8	42.9
5.00	5.9	71.6	24.55	1473.0	202.0	54	3.2	46.1
6.00	4.6	76.2	29.46	1768.0	242.0	53	2.4	48.5
7.00	3.1	79.3	34.37	2062.0	283.0	52	1.6	50.1
8.00	2.7	82.0	39.28	2357.0	323.0	50	1.4	51.5
9.00	3.3	85.3	44.20	2652.0	363.0	49	1.6	53.1
10.00	2.3	87.6	49.11	2946.0	404.0	48	1.1	54.2
11.00	1.6	89.2	54.02	3241.0	444.0	47	0.7	55.0
12.00	1.3	90.5	58.93	3536.0	484.0	46	0.6	55.6
13.00	1.7	92.2	63.84	3830.0	525.0	44	0.8	56.3
14.00	1.2	93.5	68.75	4125.0	565.0	43	0.5	56.9
15.00	1.2	94.6	73.66	4420.0	605.0	42	0.5	57.4
16.00	0.7	95.3	78.57	4714.0	646.0	42	0.3	57.7
17.00	0.7	96.1	83.48	5009.0	686.0	42	0.3	58.0
18.00	0.4	96.5	88.39	5303.0	726.0	41	0.2	58.1
19.00	0.4	96.9	93.30	5598.0	767.0	41	0.2	58.3
20.00	0.2	97.1	98.21	5893.0	807.0	41	0.1	58.4
21.00	0.5	97.5	103.12	6187.0	848.0	41	0.2	58.6
22.00	0.2	97.8	108.03	6482.0	888.0	41	0.1	58.7
23.00	1.0	98.8	112.94	6777.0	928.0	40	0.4	59.1
24.00	0.3	99.1	117.85	7071.0	969.0	40	0.1	59.2
25.00	0.0	99.1	122.76	7366.0	1009.0	40	0.0	59.2
30.00	0.9	100.0	147.32	8839.0	1211.0	37	0.3	59.5
35.00	0.0	100.0	171.87	10312.0	1413.0	34	0.0	59.5
40.00	0.0	100.0	196.42	11785.0	1614.0	30	0.0	59.5
45.00	0.0	100.0	220.98	13259.0	1816.0	26	0.0	59.5
Estimated Net Annual Sediment (TSS) Load Reduction =								60 %

Climate Station ID: 6105978 Years of Rainfall Data: 20

RAINFALL DATA FROM OTTAWA CDA RCS RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL
FOR THE RECOMMENDED STORMCEPTOR® MODEL



Maximum Pipe Diameter / Peak Conveyance

Stormceptor EF / EFO	Model Diameter		Min Angle Inlet / Outlet Pipes	Max Inlet Pipe Diameter		Max Outlet Pipe Diameter		Peak Conveyance Flow Rate	
	(m)	(ft)		(mm)	(in)	(mm)	(in)	(L/s)	(cfs)
EF4 / EFO4	1.2	4	90	609	24	609	24	425	15
EF5 / EFO5	1.5	5	90	762	30	762	30	710	25
EF6 / EFO6	1.8	6	90	914	36	914	36	990	35
EF8 / EFO8	2.4	8	90	1219	48	1219	48	1700	60
EF10 / EFO10	3.0	10	90	1828	72	1828	72	2830	100
EF12 / EFO12	3.6	12	90	1828	72	1828	72	2830	100

SCOUR PREVENTION AND ONLINE CONFIGURATION

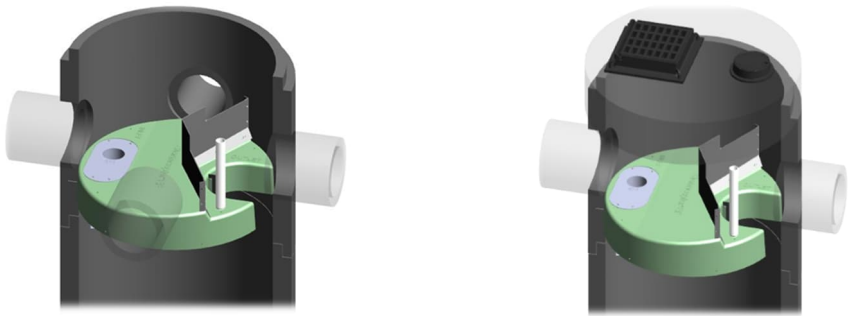
► Stormceptor® EF and EFO feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV Procedure for Laboratory Testing of Oil-Grit Separators, and the exceptional scour test performance has been third-party verified in accordance with the ISO 14034 ETV protocol. As a result, Stormceptor EF and EFO are approved for online installation, eliminating the need for costly additional bypass structures, piping, and installation expense.

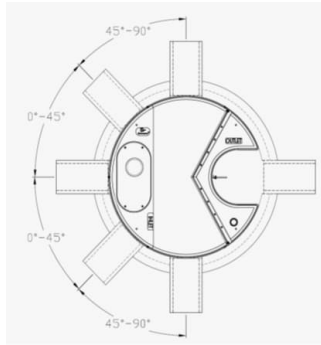
DESIGN FLEXIBILITY

► Stormceptor® EF and EFO offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle, and can be modified to ensure performance in submerged conditions.

OIL CAPTURE AND RETENTION

► While Stormceptor® EF will capture and retain oil from dry weather spills and low intensity runoff, Stormceptor® EFO has demonstrated superior oil capture and greater than 99% oil retention in third-party testing according to the light liquid re-entrainment testing provisions of the Canadian ETV Procedure for Laboratory Testing of Oil-Grit Separators. Stormceptor EFO is recommended for sites where oil capture and retention is a requirement.



**INLET-TO-OUTLET DROP**

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.

0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.

45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

HEAD LOSS

The head loss through Stormceptor EF is similar to that of a 60-degree bend structure. The applicable K value for calculating minor losses through the unit is 1.1. For submerged conditions the applicable K value is 3.0.

Pollutant Capacity

Stormceptor EF / EFO	Model Diameter		Depth (Outlet Pipe Invert to Sump Floor)		Oil Volume		Recommended Sediment Maintenance Depth *		Maximum Sediment Volume *		Maximum Sediment Mass **	
	(m)	(ft)	(m)	(ft)	(L)	(Gal)	(mm)	(in)	(L)	(ft³)	(kg)	(lb)
EF4 / EFO4	1.2	4	1.52	5.0	265	70	203	8	1190	42	1904	5250
EF5 / EFO5	1.5	5	1.62	5.3	420	111	305	10	2124	75	2612	5758
EF6 / EFO6	1.8	6	1.93	6.3	610	160	305	12	3470	123	5552	15375
EF8 / EFO8	2.4	8	2.59	8.5	1070	280	610	24	8780	310	14048	38750
EF10 / EFO10	3.0	10	3.25	10.7	1670	440	610	24	17790	628	28464	78500
EF12 / EFO12	3.6	12	3.89	12.8	2475	655	610	24	31220	1103	49952	137875

*Increased sump depth may be added to increase sediment storage capacity

** Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft³)

Feature	Benefit	Feature Appeals To
Patent-pending enhanced flow treatment and scour prevention technology	Superior, verified third-party performance	Regulator, Specifying & Design Engineer
Third-party verified light liquid capture and retention for EFO version	Proven performance for fuel/oil hotspot locations	Regulator, Specifying & Design Engineer, Site Owner
Functions as bend, junction or inlet structure	Design flexibility	Specifying & Design Engineer
Minimal drop between inlet and outlet	Site installation ease	Contractor
Large diameter outlet riser for inspection and maintenance	Easy maintenance access from grade	Maintenance Contractor & Site Owner

STANDARD STORMCEPTOR EF/EFO DRAWINGS

For standard details, please visit <http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef>

STANDARD STORMCEPTOR EF/EFO SPECIFICATION

For specifications, please visit <http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef>

Table of TSS Removal vs Surface Loading Rate Based on Third-Party Test Results
 Stormceptor® EFO

SLR (L/min/m²)	TSS % REMOVAL	SLR (L/min/m²)	TSS % REMOVAL	SLR (L/min/m²)	TSS % REMOVAL	SLR (L/min/m²)	TSS % REMOVAL
1	70	660	42	1320	35	1980	24
30	70	690	42	1350	35	2010	24
60	67	720	41	1380	34	2040	23
90	63	750	41	1410	34	2070	23
120	61	780	41	1440	33	2100	23
150	58	810	41	1470	32	2130	22
180	56	840	41	1500	32	2160	22
210	54	870	41	1530	31	2190	22
240	53	900	41	1560	31	2220	21
270	52	930	40	1590	30	2250	21
300	51	960	40	1620	29	2280	21
330	50	990	40	1650	29	2310	21
360	49	1020	40	1680	28	2340	20
390	48	1050	39	1710	28	2370	20
420	47	1080	39	1740	27	2400	20
450	47	1110	38	1770	27	2430	20
480	46	1140	38	1800	26	2460	19
510	45	1170	37	1830	26	2490	19
540	44	1200	37	1860	26	2520	19
570	43	1230	37	1890	25	2550	19
600	42	1260	36	1920	25	2580	18
630	42	1290	36	1950	24	2600	26

STANDARD PERFORMANCE SPECIFICATION FOR “OIL GRIT SEPARATOR” (OGS) STORMWATER QUALITY TREATMENT DEVICE

PART 1 – GENERAL

1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program's **Procedure for Laboratory Testing of Oil-Grit Separators**

1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The minimum sediment & petroleum hydrocarbon storage capacity shall be as follows:

2.1.1	4 ft (1219 mm) Diameter OGS Units:	1.19 m ³ sediment / 265 L oil
	5 ft (1524 mm) Diameter OGS Units:	1.95 m ³ sediment / 420 L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m ³ sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m ³ sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m ³ sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m ³ sediment / 2,476 L oil

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these

pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing of the OGS shall be determined by use of a minimum ten (10) years of local historical rainfall data provided by Environment Canada. Sizing shall also be determined by use of the sediment removal performance data derived from the ISO 14034 ETV third-party verified laboratory testing data from testing conducted in accordance with the Canadian ETV protocol Procedure for Laboratory Testing of Oil-Grit Separators, as follows:

3.2.1 Sediment removal efficiency for a given surface loading rate and its associated flow rate shall be based on sediment removal efficiency demonstrated at the seven (7) tested surface loading rates specified in the protocol, ranging 40 L/min/m² to 1400 L/min/m², and as stated in the ISO 14034 ETV Verification Statement for the OGS device.

3.2.2 Sediment removal efficiency for surface loading rates between 40 L/min/m² and 1400 L/min/m² shall be based on linear interpolation of data between consecutive tested surface loading rates.

3.2.3 Sediment removal efficiency for surface loading rates less than the lowest tested surface loading rate of 40 L/min/m² shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m². No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m².

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m² shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m², and shall be calculated using a simple proportioning formula, with 1400 L/min/m² in the numerator and the higher surface loading rate in the denominator, and multiplying the resulting fraction times the sediment removal efficiency at 1400 L/min/m².

The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**.

3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m².

3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid Re-entrainment Simulation Testing in accordance with the Canadian ETV **Program's Procedure for Laboratory Testing of Oil-Grit Separators**, with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-entrainment testing is conducted with the device pre-loaded with low density polyethylene (LDPE) plastic beads as a surrogate for light liquids such as oil and fuel. Testing is conducted on the same OGS unit tested for sediment removal to assess whether light liquids captured after a spill are effectively retained at high flow rates.

3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates

(ranging 200 L/min/m² to 2600 L/min/m²) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**. However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.

APPENDIX D

Fig.1 - Pre-Development Storm Catchment Areas

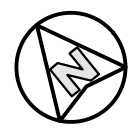
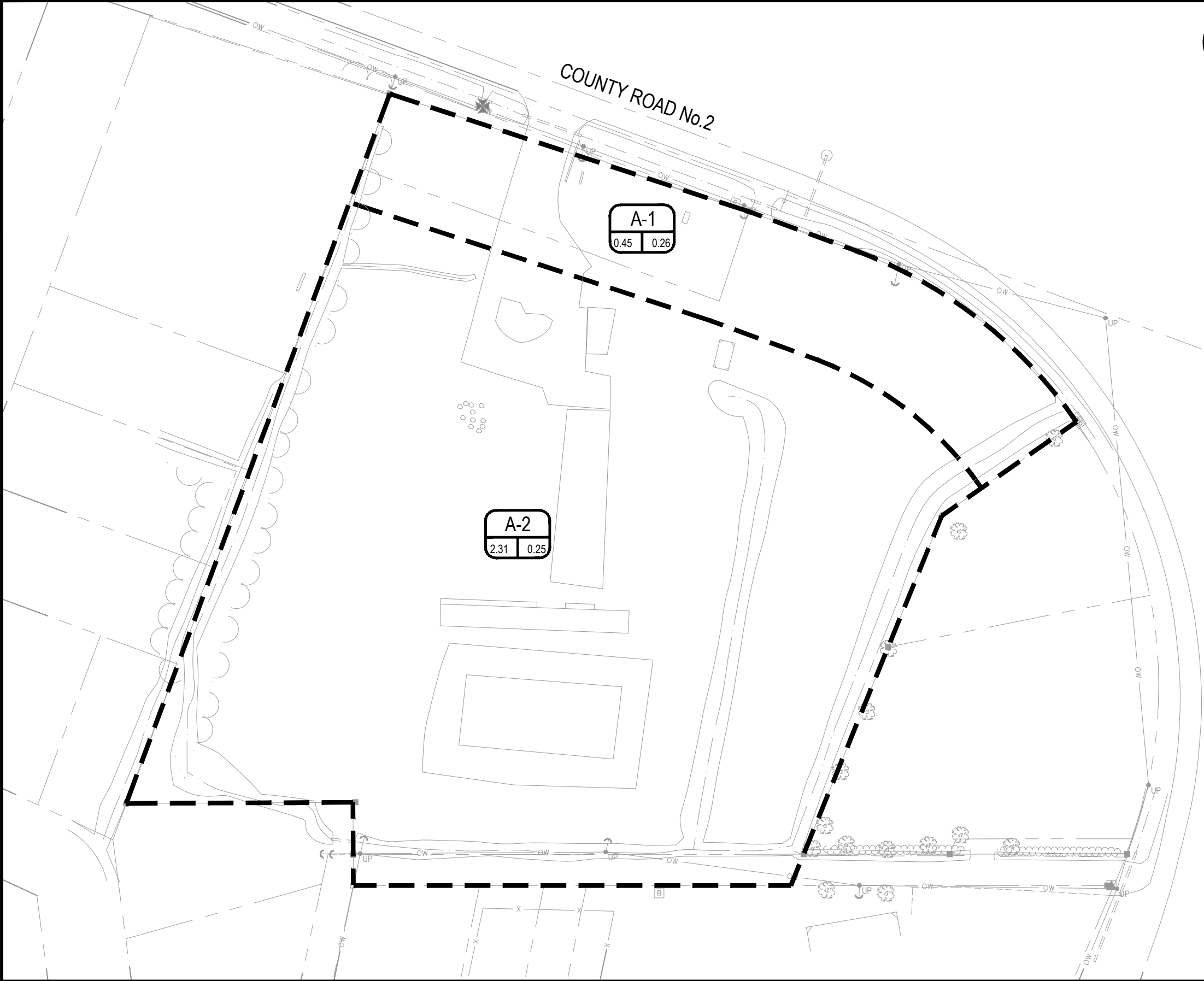
Fig.2 - Post Development Storm Catchment Areas

Fig.3 - Preliminary Sanitary Servicing Layout

Fig.4 - Preliminary Storm Servicing Layout

Fig.5 - Typical 20.0m Urban Cross-Section

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LEGEND:

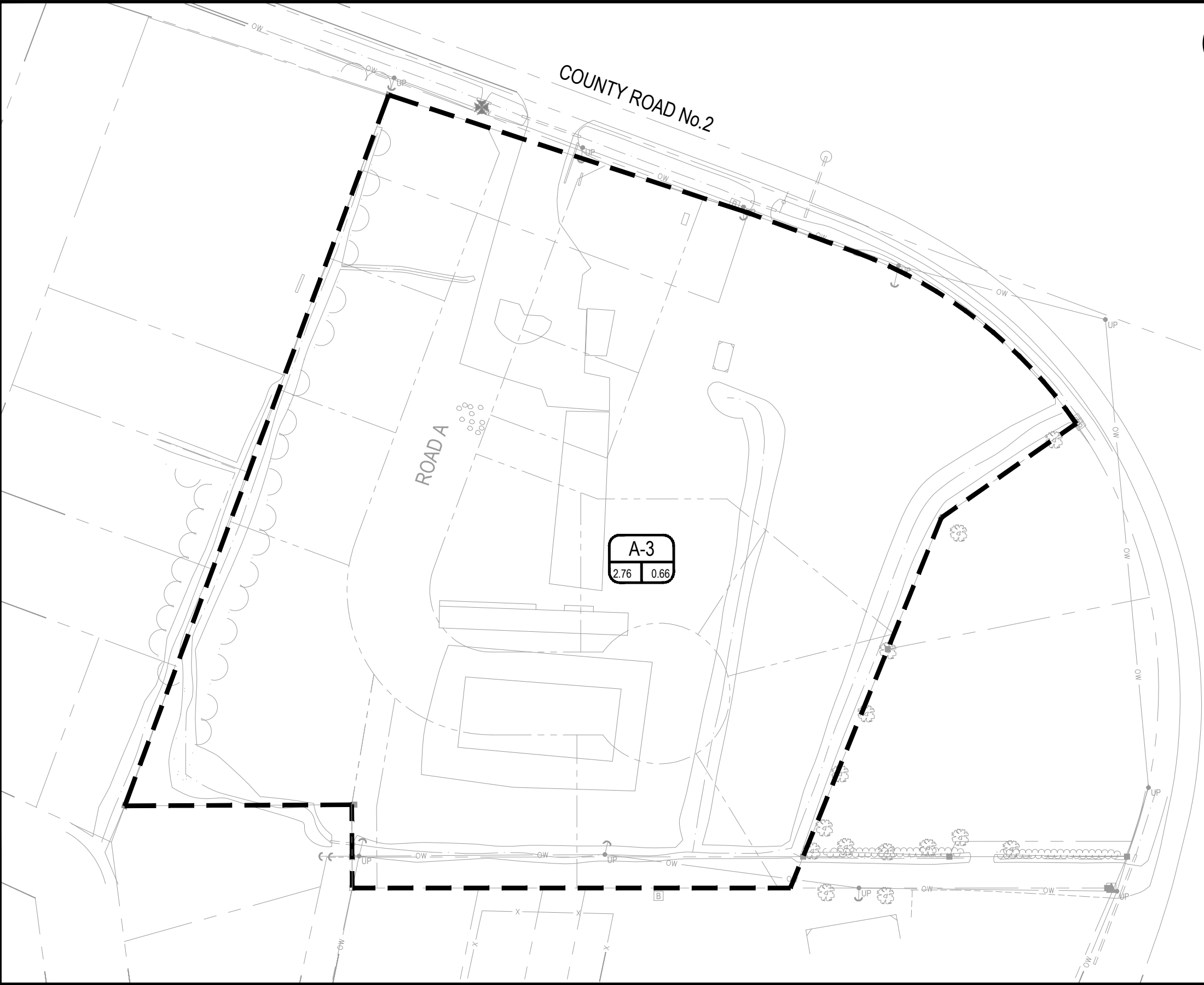
- STORM DRAINAGE BUBBLE
- AREA LABEL
- COEFFICIENT
- AREA IN HECTARES
- STORM DRAINAGE LIMIT



800 SECOND STREET WEST
CORNWALL, ONTARIO CANADA, K6J 1H6
TEL: 613-935-3775 | FAX: 613-935-6450
WEBSITE: EVBengineering.com

CLIENT:	
IMPALA DEVELOPMENTS	
PROJECT:	
IMPALA DEVELOPMENTS LANCASTER SUBDIVISION	
TITLE:	
PRE-DEVELOPMENT STORMWATER CATCHMENT AREAS	
SCALE: 1:1000	JOB NO: 25001
DESIGNED BY: T.H.	DATE: 2026/03/04
DRAWN BY: B.K.N.	DRAWING NO.
CHECKED BY: K.M.	FIG.1

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LEGEND:

- STORM DRAINAGE BUBBLE
- A1 → AREA LABEL
- 0.78 | 0.45 → COEFFICIENT
- AREA IN HECTARES
- STORM DRAINAGE LIMIT



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CLIENT:

IMPALA DEVELOPMENTS

PROJECT:

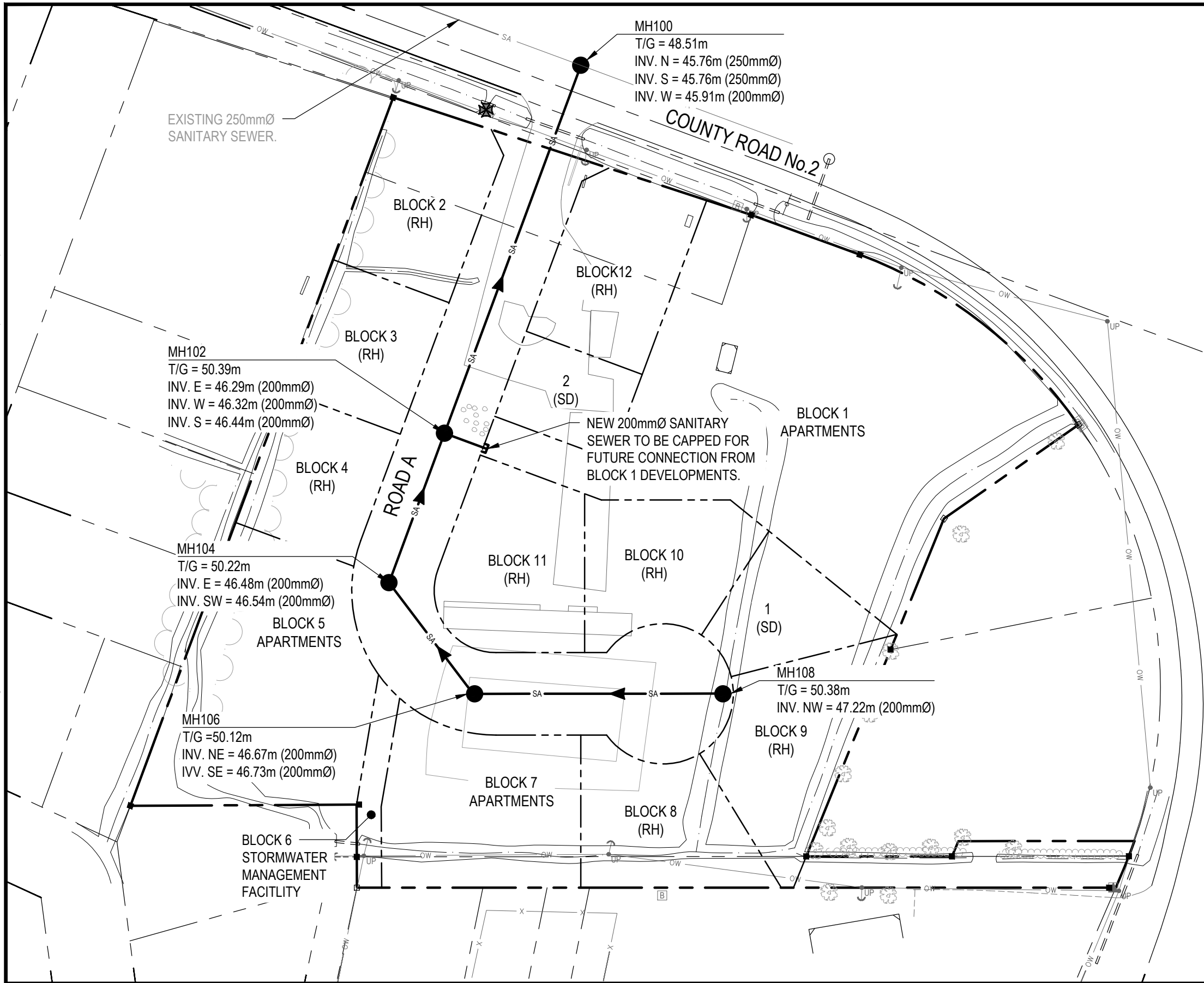
IMPALA DEVELOPMENTS
LANCASTER SUBDIVISION

TITLE:

POST-DEVELOPMENT
STORMWATER CATCHMENT
AREAS

SCALE: 1:1000	JOB NO: 25001
DESIGNED BY: T.H.	DATE: 2026/03/04
DRAWN BY: B.K.N.	DRAWING NO.
CHECKED BY: K.M.	FIG.2

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LEGEND

- NEW PROPERTY LINE
- NEW LOT LINE
- SA NEW SANITARY SEWER
- NEW SANITARY MANHOLE



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TEL: 613-935-3775 | FAX: 613-935-6450
WEBSITE: EVBengineering.com

CLIENT:

IMPALA DEVELOPMENTS

PROJECT:

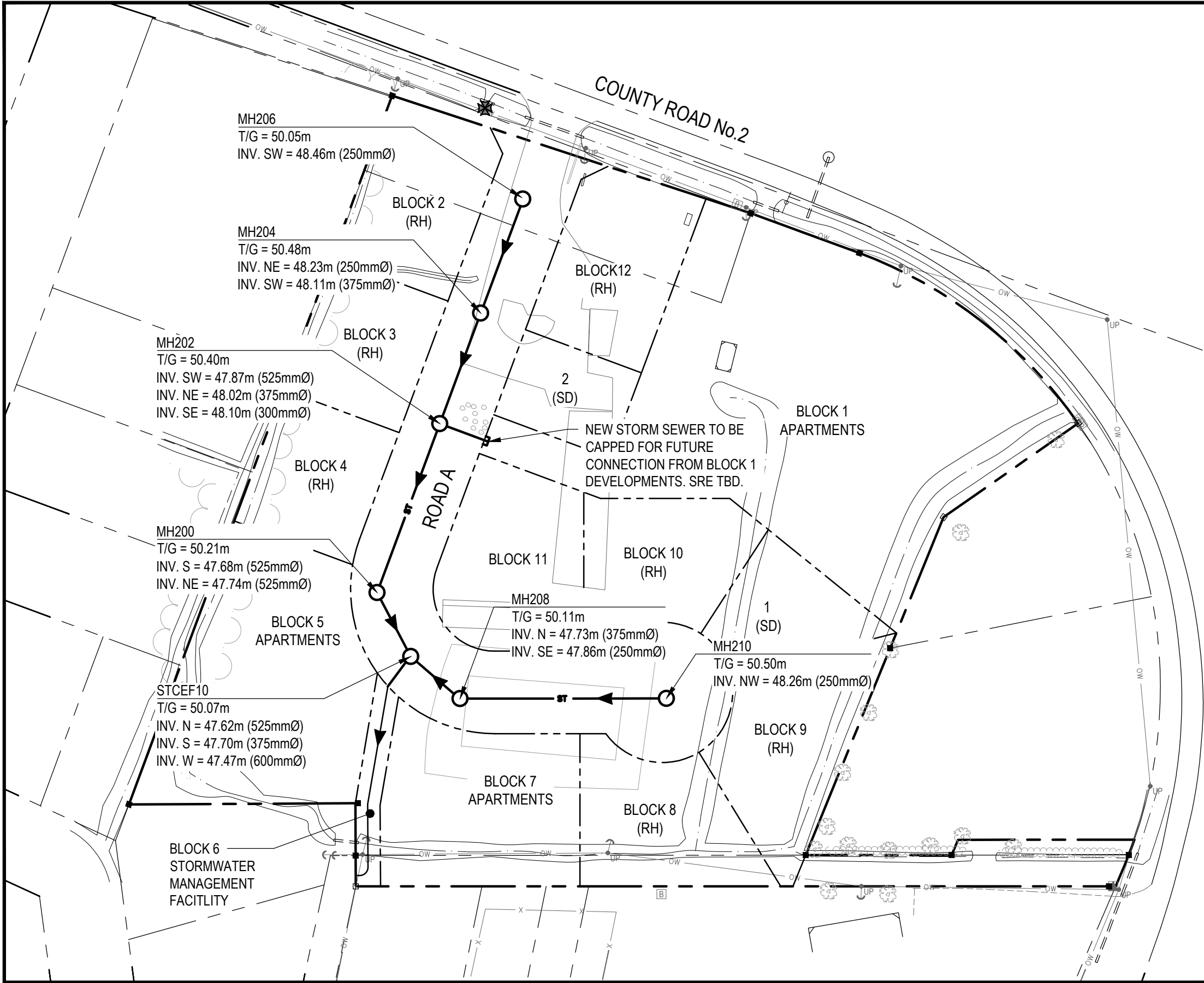
IMPALA DEVELOPMENTS
LANCASTER SUBDIVISION

TITLE:

PRELIMINARY SANITARY
SEWER SERVICING LAYOUT

SCALE: 1:1000	JOB NO: 25001
DESIGNED BY: T.H.	DATE: 2026/03/04
DRAWN BY: B.K.N.	DRAWING NO.
CHECKED BY: K.M.	FIG.3

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LEGEND

- NEW PROPERTY LINE
- NEW LOT LINE
- ST NEW STORM SEWER
- NEW STORM MANHOLE



800 SECOND STREET WEST
CORNWALL, ONTARIO CANADA, K6J 1H6
TEL: 613-935-3775 | FAX: 613-935-6450
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CLIENT:

IMPALA DEVELOPMENTS

PROJECT:

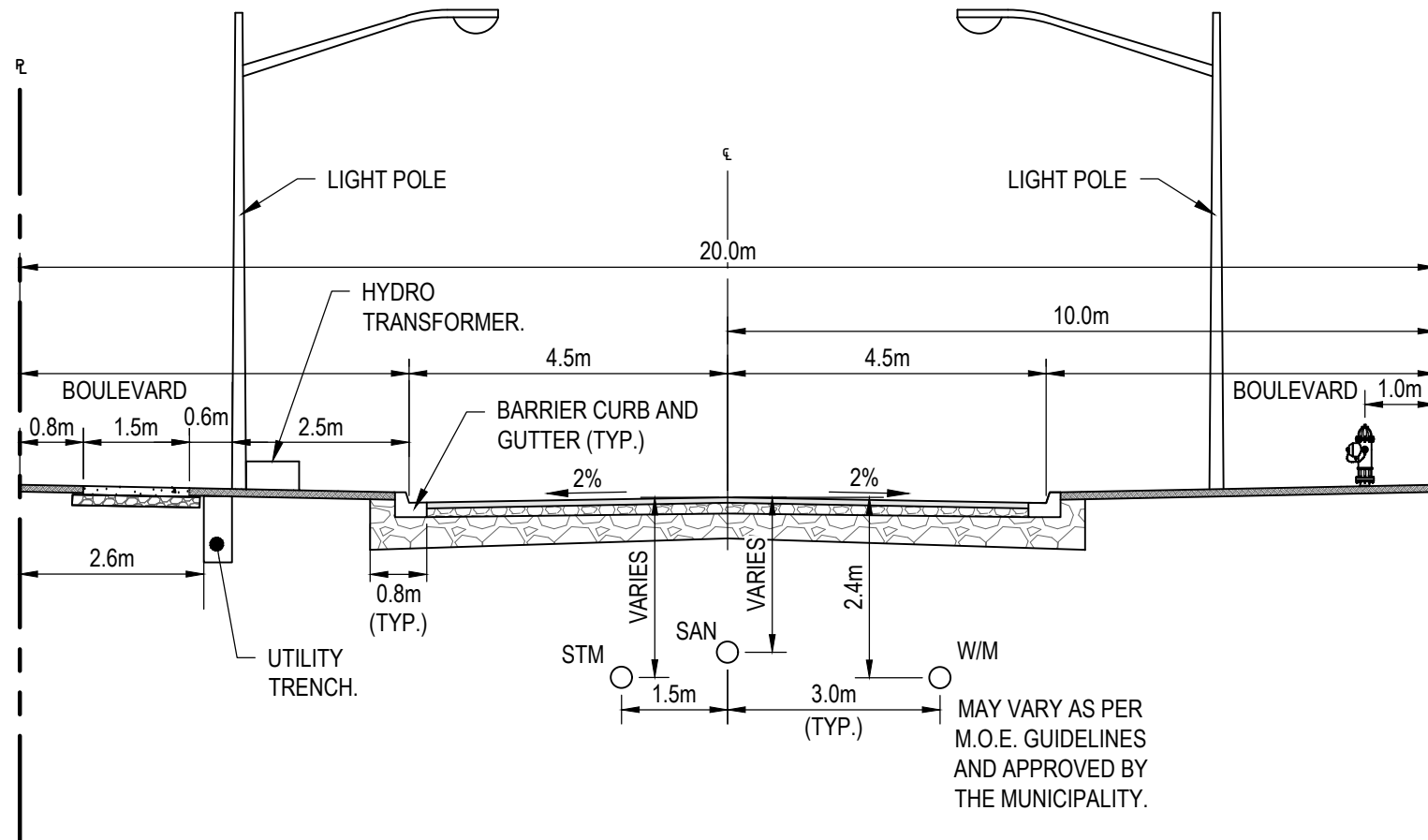
IMPALA DEVELOPMENTS
LANCASTER SUBDIVISION

TITLE:

PRELIMINARY STORM
SEWER SERVICING LAYOUT

SCALE: 1:1000	JOB NO: 25001
DESIGNED BY: T.H.	DATE: 2026/03/04
DRAWN BY: B.K.N.	DRAWING NO.
CHECKED BY: K.M.	FIG.4

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NOTE:

1. TO BE READ IN CONJUNCTION WITH TOWNSHIP STANDARDS.
2. THE OVERALL DEPTH OF ASPHALT AND GRANULARS SHALL BE RECOMMENDED BY A SOILS CONSULTANT BUT UNDER NO CIRCUMSTANCE WILL IT BE LESS THAN AS STIPULATED IN TOWNSHIP STANDARDS.
3. ALL MATERIALS TO BE SUPPLIES AND PLACED AS PER O.P.S.S.
4. WHERE POSSIBLE, GAS MAIN TO BE LOCATED ON OPPOSITE SIDE OF STREET FROM HYDRANT.
5. SUBDRAINS TO BE PROVIDED IF RECOMMENDED BY GEOTECHNICAL CONSULTANT.
6. ALL CURBS TO BE CONSTRUCTED PER O.P.S.D. 600.040.



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WEBSITE: EVBengineering.com

CLIENT:

IMPALA DEVELOPMENTS

PROJECT:

**IMPALA DEVELOPMENTS
LANCASTER SUBDIVISION**

TITLE:

**TYPICAL ROAD CROSS
SECTION**

SCALE: AS SHOWN	JOB NO: 25001
DESIGNED BY: T.H.	DATE: 2026/03/04
DRAWN BY: B.K.N.	DRAWING NO.
CHECKED BY: K.M.	FIG.5

Our ref: 12684162

10 December 2025

Mr. Thomas Harrison
EVb Engineering
800 Second St. W
Cornwall, ON K6J 1H6

**Traffic Impact Study (TIS) for Proposed Impala Developments Subdivision at 20361 County Road 2
Lancaster, Ontario**

Dear Mr. Harrison,

This Traffic Impact Study (TIS) assesses the traffic impacts of the proposed Impala Developments subdivision at 20361 County Road 2, Lancaster, Ontario. The study reviews current and future intersection operations and assesses sightline safety.

1. Project Description

The proposed Impala Developments subdivision is located at 20361 County Road 2, Lancaster, Ontario, within the Township of South Glengarry, United Counties of Stormont, Dundas and Glengarry. The site is situated to the north of the intersection of Bethune Street and Cairn View Road on County Road 2. The proposed development consists of 44 units of semi-detached and rowhouse blocks on approximately 2.2 hectares of land, and an apartment block with two six-storey buildings, providing 72 units on a parcel of 0.6 hectare. Access to the site will be provided by a 210 m access road connecting directly to County Road 2. The Concept Plan is presented in **Appendix A**.

The study evaluates the full build-out of the development as a single project, with horizon years including the anticipated build-out year 2027 and five-years post-completion 2032. This report summarizes the results of intersection capacity analyses conducted for the four scenarios described below.

1. **Existing Conditions** – baseline traffic levels and network configuration;
2. **Future Conditions**
 - **2027 Future Background** – traffic levels expected in the opening year without implementation of the proposed development;
 - **2027 Future Total** – traffic levels expected in the opening year with implementation of the proposed development; and
 - **2032 Future Total** – traffic levels expected in the 2032 horizon with implementation of the proposed development.

The analysis for each scenario was performed for both the weekday AM and PM peak hours.

2. Existing Conditions

2.1 Road Network

The study area roadways and intersection layouts are described below and illustrated in Figure 1:

- County Road 2 runs east-west through the United Counties of Stormont, Dundas and Glengarry. In the study area, the road consists of two lanes, with a posted speed limit of 50 km/h to the north of Church Street and 60 km/h to the south. Bike lanes are provided on both sides of the road, but there are no sidewalks along this segment.
- Bethune Street is a local east-west road with two lanes and a posted speed limit of 50 km/h. There are no designated active transportation facilities on this roadway.
- Cairn View Road is a local north-south road with two lanes and a posted speed limit of 50 km/h. There are no designated active transportation facilities on this roadway.
- Old Montreal Road is a local east-west road with two lanes and a posted speed limit of 50 km/h. There are no designated active transportation facilities on this roadway.

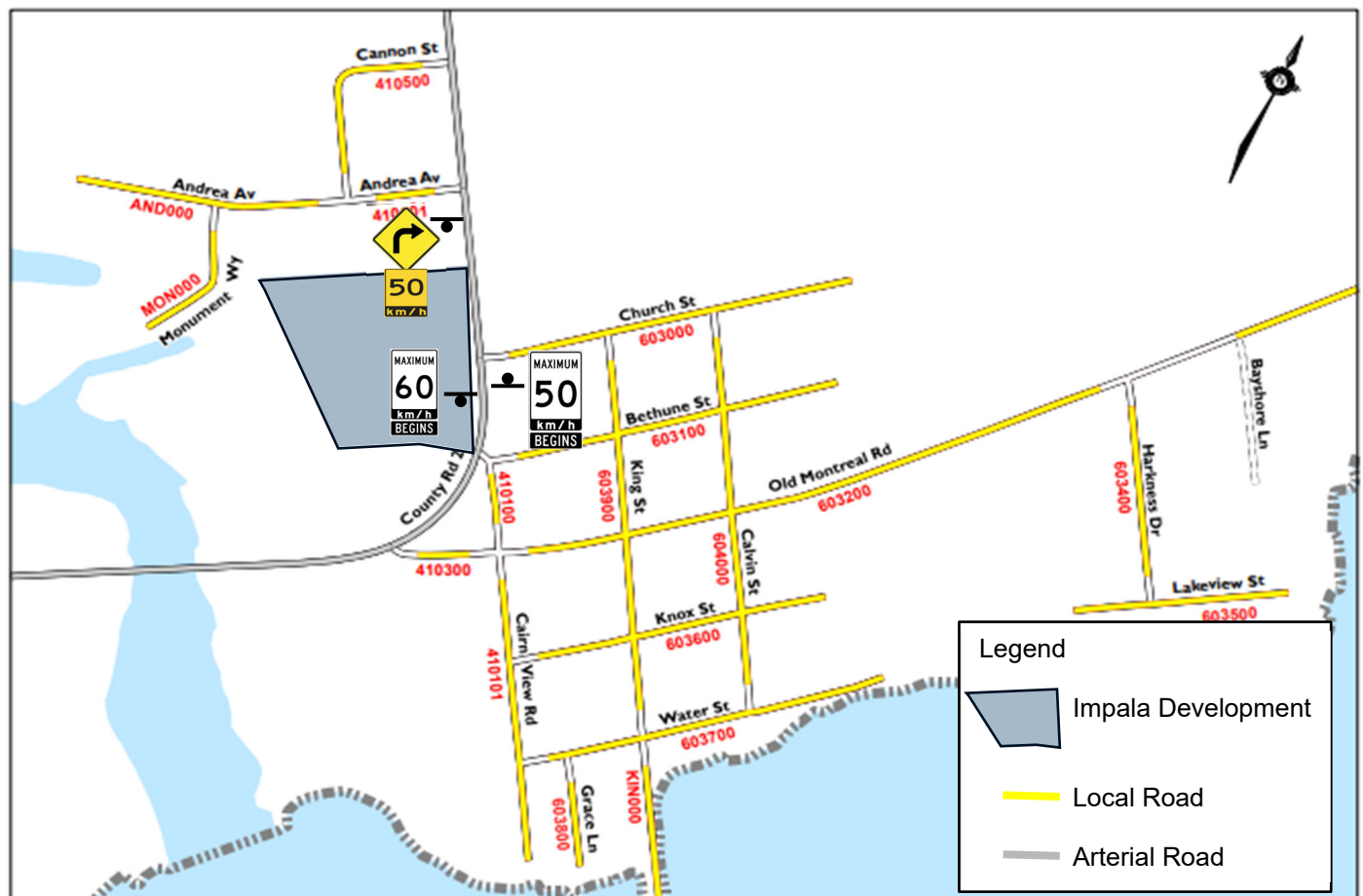


Figure 1 South Lancaster Roadside Environment

2.2 Baseline Traffic Volumes for 2025

Existing traffic volume data were collected November 6, 2025, at Bethune Street and County Road 2 during AM and PM peak hours. **Figure 2** shows the baseline traffic volumes.

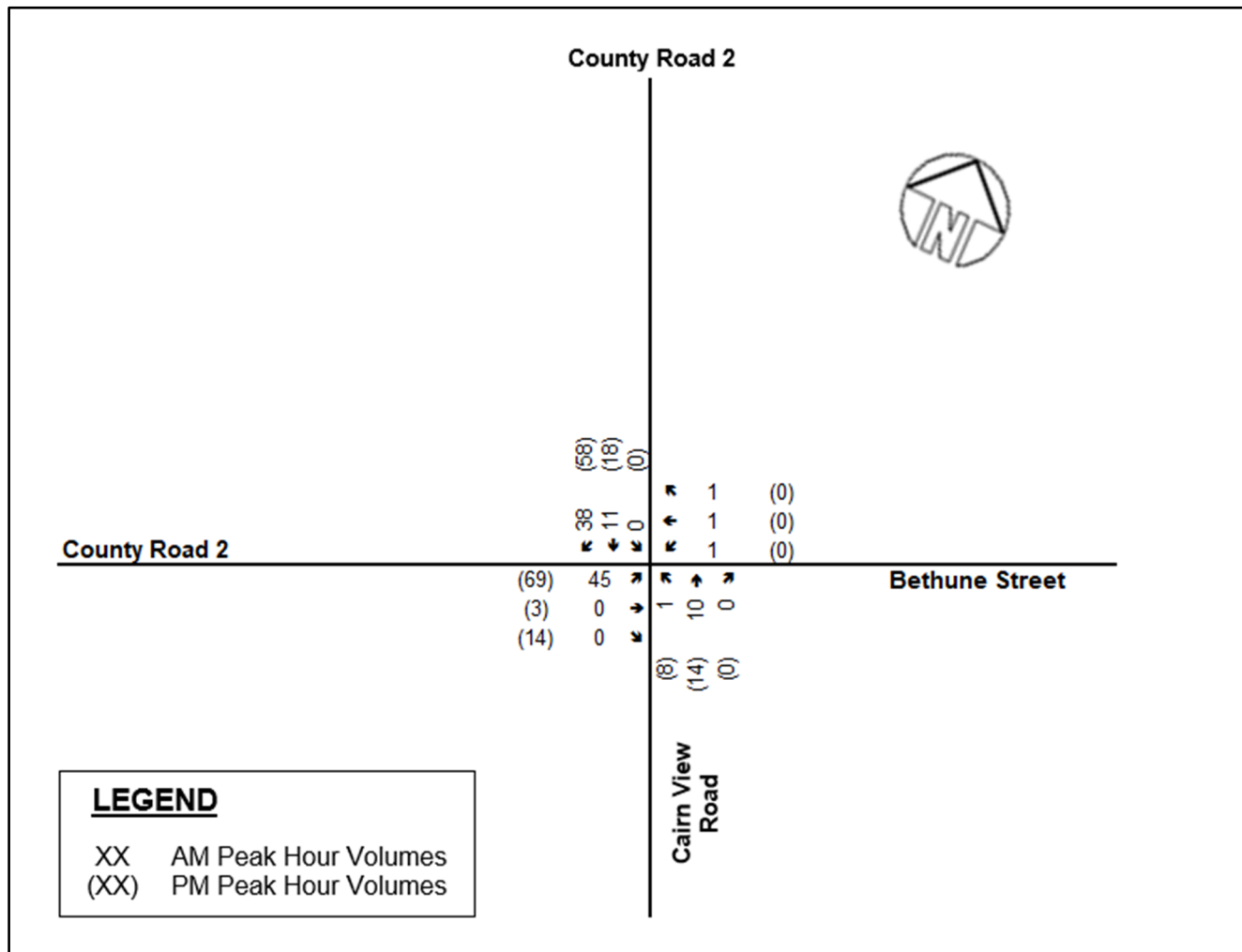


Figure 2 Baseline Traffic Volumes for 2025

2.3 Intersection Capacity Analysis

The intersection capacity analysis was performed using Synchro Traffic Analysis Software (11th Edition) following the methodology outlined in the Highway Capacity Manual (HCM, 6th Edition). Two different measures of effectiveness were used to assess the intersections in this study, as described below.

Level of service (LOS) is defined in terms of average control delay per vehicle according to the criteria of the HCM and is used to describe the quality of service of a transportation facility. There are six levels defined, ranging from LOS 'A' to LOS 'F'. LOS 'A' represents the conditions with the lowest travel-time delay to drivers and LOS 'F' represents the conditions with the highest delays. The LOS and the corresponding delay, as defined by HCM, for stop-controlled intersections are shown in **Table 1**.

Volume-to-capacity ratio (v/c) compares the traffic volumes of each intersection movement at intersections with the upset capacity of the intersection to handle those movements.

The HCM methodology uses the critical stop-controlled approach as an indicator of overall intersection operations for two-way stop-controlled intersections.

Table 1 Level of Service Criteria and Descriptions for Stop-Controlled Intersections

Level of Service	Average Control Delay (Sec/Veh)	Description
A	≤ 10	Free Flow
B	> 10 and ≤ 15	Stable Flow (slight delays)
C	> 15 and ≤ 25	Stable Flow (acceptable delays)
D	> 25 and ≤ 35	Approaching Unstable Flow (tolerable delay)
E	> 35 and ≤ 50	Unstable Flow (intolerable delay)
F	> 50	Forced Flow (congested and queues fail to clear)

For the purposes of this TIS report, critical operations at an intersection will be assumed to be present when an LOS 'E' or a v/c ratio exceeding 0.85 is expected for any given movement, or for the intersection as a whole.

The results of the 2025 existing traffic operations analysis for the study area intersection are summarized in **Table 2** for the AM and PM peak hours. The table includes the overall intersection performance as well as the results for key movements, defined as the intersection movements with the highest v/c ratio. Detailed Synchro output reports are provided in **Appendix B**.

Table 2 Existing Conditions Traffic Operations

Intersection	Overall Intersection		Key Movements			
	LOS	Delay (s)	Movement	V/C	LOS	Delay (s)
AM Peak Hour						
Bethune Street and County Road 2	A	1.8	WBLR	0.01	A	8.7
PM Peak Hour						
Bethune Street and County Road 2	A	1.8	WBLR	0.03	A	9.1

As shown in **Table 2**, the existing conditions capacity analysis indicates that no critical operations are experienced at Bethune Street and County Road 2 for either peak hour conditions.

3. Future Conditions

3.1 Traffic Volumes (2027 and 2032)

To estimate traffic levels for different horizon scenarios, a layered approach was taken starting with the existing “baseline” (2025) traffic volumes as the base layer. Then a combination of “background” and/or “site-generated” traffic layers were added to the base layer to estimate traffic levels for each scenario.

- **Baseline traffic approximations** – the 2025 traffic counts
- **Background traffic growth estimates** – This refers to the traffic volume growth on the general road network resulting from changes in the broader region that happen over time, without the proposed development. This could be in the form of growth (or decline) in general traffic levels for a variety of reasons such as population and employment changes, regional network changes, etc. For the purposes of this study, background traffic growth was estimated to be 2% per year.
- **Site generated traffic estimates** – This refers to the estimated traffic volumes that will be produced from the proposed development itself.

3.1.1 Trip Generation, Distribution, and Assignment

Trip generation rates from the ITE *Trip Generation Manual, 12th Edition* were utilized to estimate the number of trips generated by the proposed development. Specifically, the rates for “Single-Family Attached Housing” (ITE Land Use Code 215) and “Multifamily housing (Mid-Rise)” (ITE Land Use Code 221) were used to estimate the trips expected to be generated by the proposed development. **Table 3** presents the vehicle trip generation estimates for both peak hours for the proposed development.

Table 3 Vehicle Trips Generated by the Proposed Development

Land Use Description	Number of units	Inbound Vehicle Trips %	Outbound Vehicle Trips %	Inbound Vehicle Trips	Outbound Vehicle Trips	Total Vehicle Trips
AM Peak Hour						
Single-Family Attached Housing (LUC 215)	44	25%	75%	6	16	22
Multifamily Housing Mid-rise (LUC 221)	72	25%	75%	3	8	11
Total	112	-	-	9	24	33
PM Peak Hour						
Single-Family Attached Housing (LUC 215)	80	64%	36%	19	14	33
Multifamily Housing Mid-rise (LUC 221)	32	57%	43%	12	7	19
Total	112	-	-	31	21	52

A total of 33 trips (split into 9 inbound and 24 outbound trips) are generated during the AM peak hour. During the PM peak hour, a total of 52 new trips (split into 31 inbound and 21 outbound trips) are generated.

The trips generated by the proposed development have been distributed to the road network by following existing travel patterns. The assumed directional distribution data is provided in **Table 4**. Upon trip distribution and assignment of the site-generated trips, traffic volumes generated by the proposed development were assigned to the network, as illustrated in **Figure 3**.

Table 4 Trips Distribution for Proposed Development

Direction (To/From)		AM Peak Hour		PM Peak Hour	
		Inbound	Outbound	Inbound	Outbound
North	County Road 2	45%	52%	41%	45%
East	Bethune Street	3%	0%	0%	2%
	Cairn View Road/Old Montreal Road	10%	11%	12%	17%
West	County Road 2	42%	37%	47%	36%

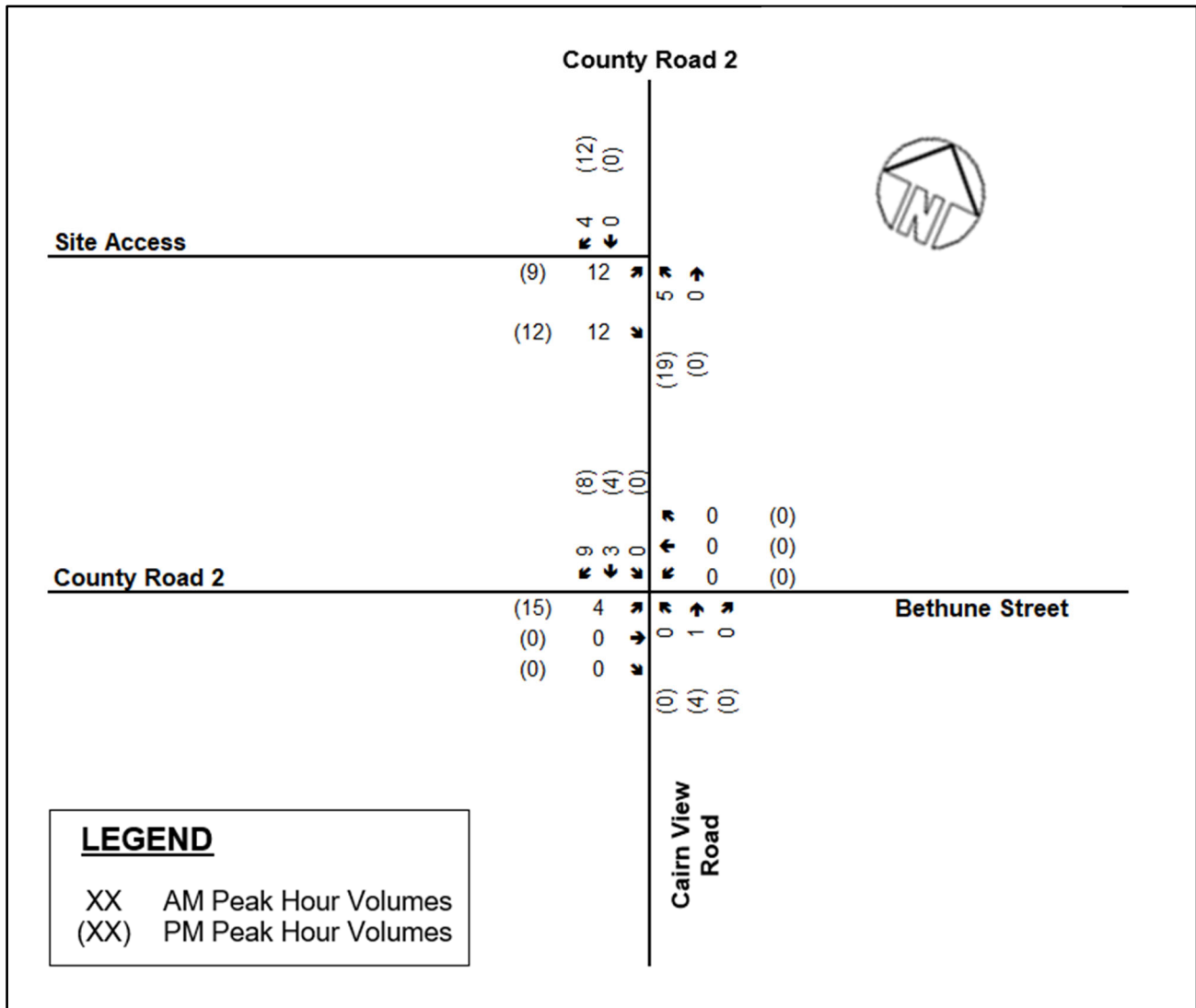


Figure 3 Site-Generated Trips

3.2 Intersection Capacity Analysis

The intersection capacity analysis for each of the three future conditions scenarios was conducted using the same methodology used for existing conditions analysis. The results of the traffic operations analysis for the 2027 future background conditions, as well as both the 2027 and 2032 future total conditions are presented.

3.2.1 2027 Future Background Conditions

The traffic volumes for the 2027 future background scenario are shown in **Figure 4**. A summary of the resulting traffic operations is presented in **Table 5**. Detailed Synchro output reports are provided in **Appendix B**.

Figure 4 2027 Future Background Volumes

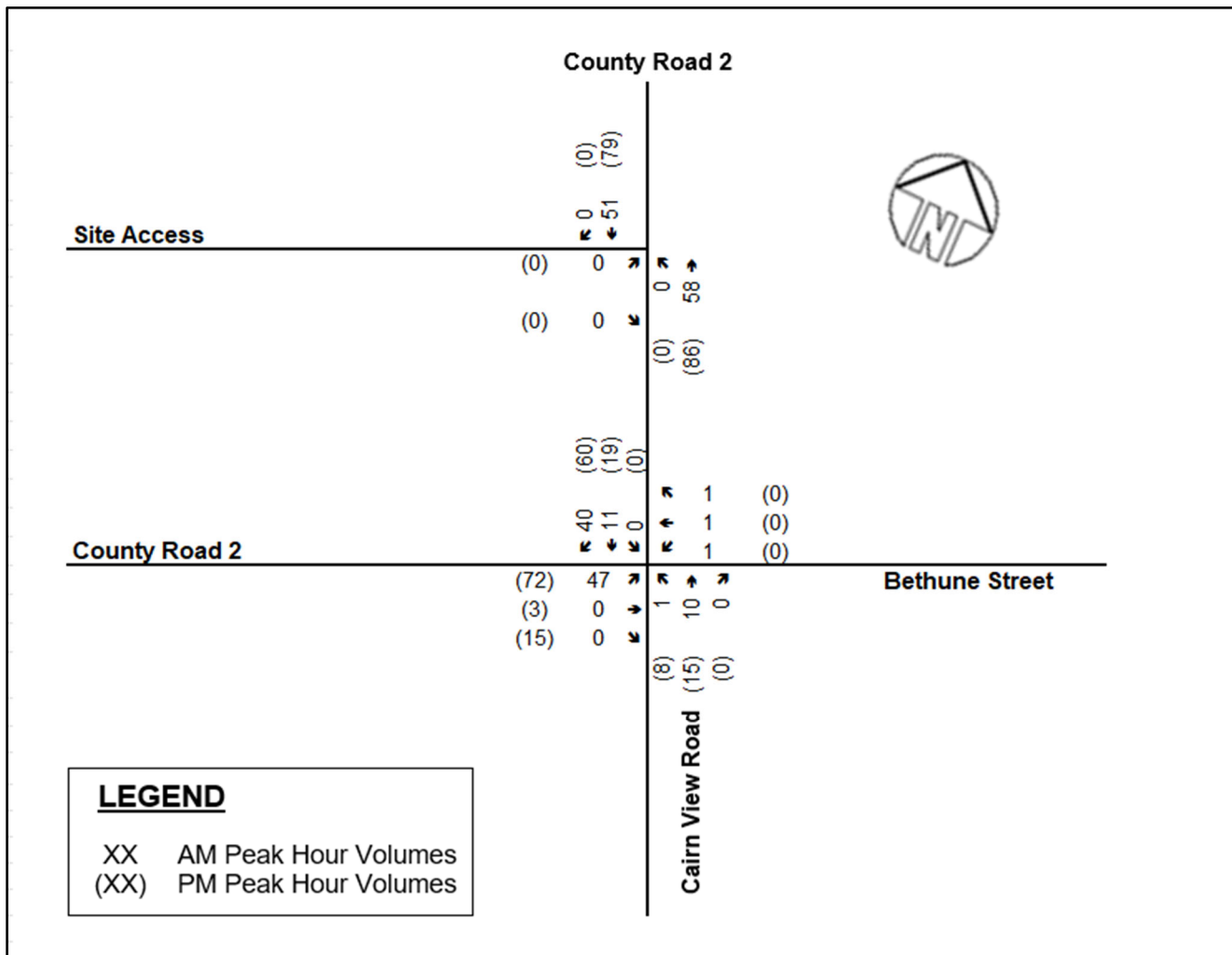


Table 5 2027 Future Background Conditions Traffic Operations

Intersection	Overall Intersection		Key Movements			
	LOS	Delay (s)	Movement	V/C	LOS	Delay (s)
AM Peak Hour						
Bethune Street and County Road 2	A	1.8	WBLR	0.01	A	8.7
PM Peak Hour						
Bethune Street and County Road 2	A	1.8	WBLR	0.03	A	9.1

The capacity analysis for the 2027 future background scenario indicates that no critical operations are expected at Bethune Street and County Road 2 for this horizon year for either peak hour conditions.

3.2.2 2027 Future Total Conditions

After adding the proposed development traffic volumes shown in **Figure 3** to the 2027 future background development volumes from **Figure 4**, the 2027 future total conditions traffic volumes are shown in **Figure 5**. A summary of the resulting traffic operations is presented in Table 6. Detailed Synchro output reports are provided in **Appendix B**.

Figure 5 2027 Future Total Volumes

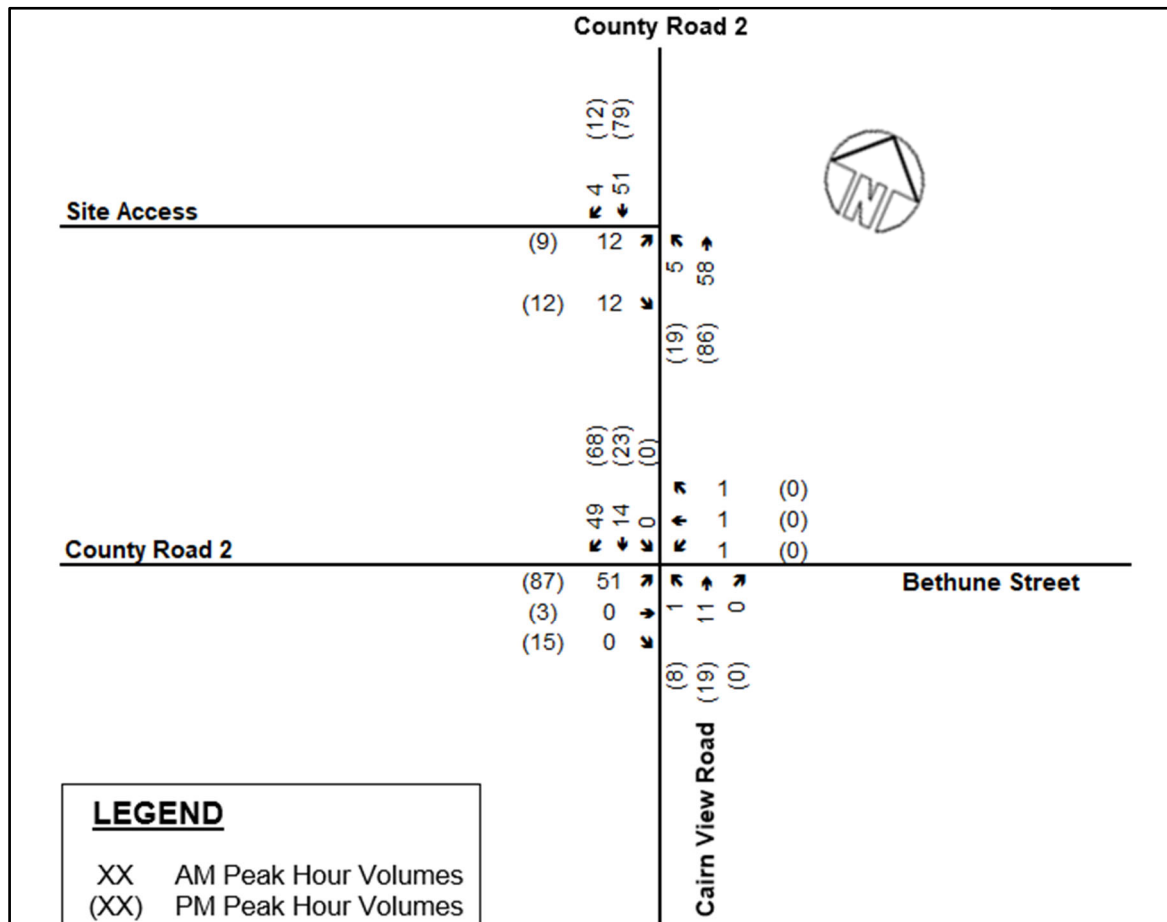


Table 6 2027 Future Total Conditions Traffic Operations

Intersection	Overall Intersection		Key Movements			
	LOS	Delay (s)	Movement	V/C	LOS	Delay (s)
AM Peak Hour						
Bethune Street and County Road 2	A	1.7	WBLR	0.02	A	8.7
Site Access and County Road 2	A	1.8	EBLR	0.03	A	9.0
PM Peak Hour						
Bethune Street and County Road 2	A	1.9	WBLR	0.03	A	9.2
Site Access and County Road 2	A	1.5	EBLR	0.03	A	9.3

The 2027 future total conditions capacity analysis indicates that no critical operations are expected at the study area intersections for this horizon year for either peak hour conditions.

3.2.3 2032 Future Total Conditions

After growing the 2025 existing conditions volumes to 2032 using the yearly 2% growth rate, the traffic volumes from the proposed development were added to the network to estimate the 2032 future total conditions traffic volumes. The 2032 future total conditions volumes are shown in **Figure 6**. A summary of the resulting traffic operations is presented in **Table 7**. Detailed Synchro output reports are provided in **Appendix B**.

Figure 6 2032 Future Total Volumes

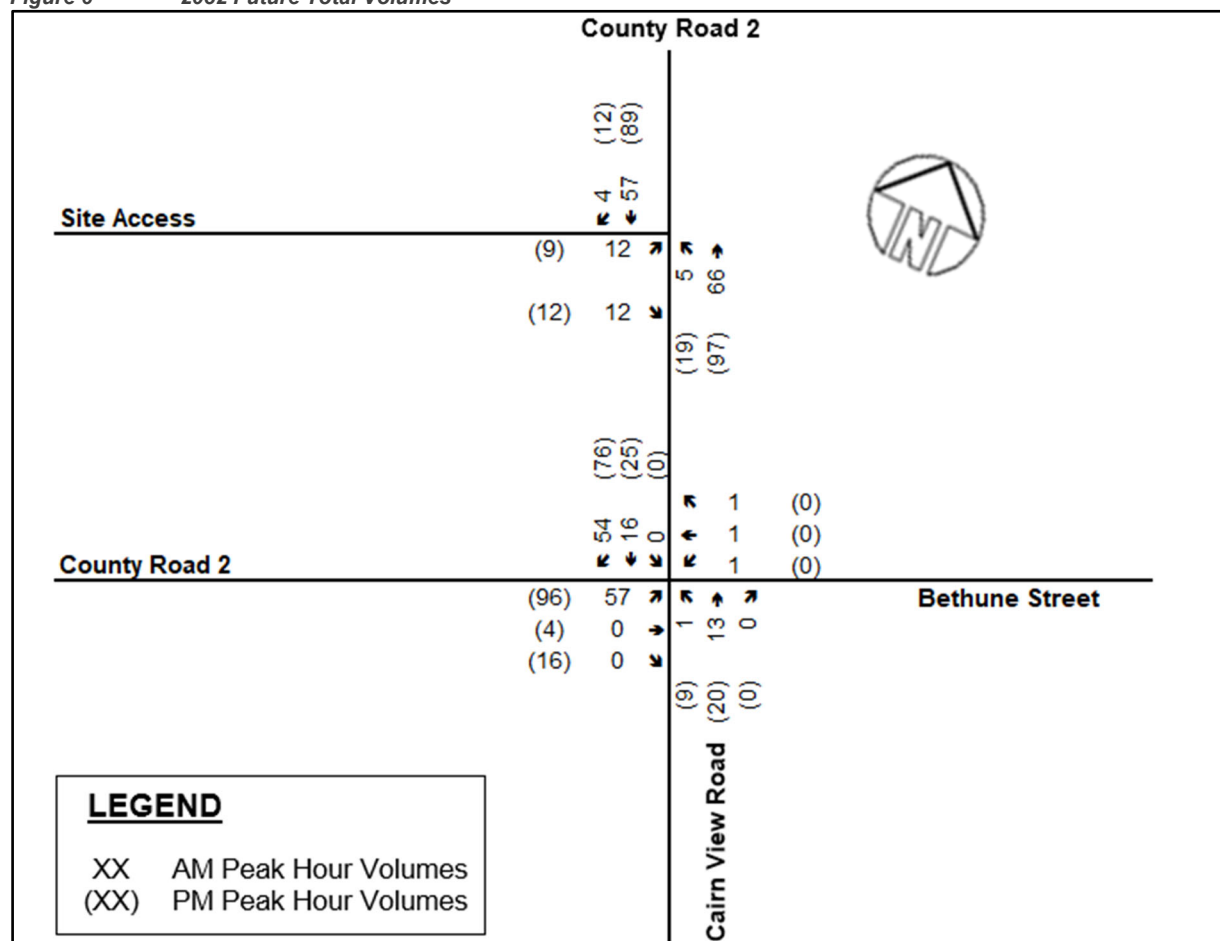


Table 7 2032 Future Total Conditions Traffic Operations

Intersection	Overall Intersection		Key movements			
	LOS	Delay (s)	Movement	V/C	LOS	Delay (s)
AM Peak hour						
Bethune Street and County Road 2	A	1.8	WBLR	0.02	A	8.8
Site Access and County Road 2	A	1.8	EBLR	0.03	A	9.1
PM Peak Hour						
Bethune Street and County Road 2	A	1.9	WBLR	0.04	A	9.4
Site Access and County Road 2	A	1.5	EBLR	0.03	A	9.4

The 2032 future total conditions capacity analysis indicates that no critical operations are expected at the study area intersections for this horizon year for either peak hour conditions.

4. Sightlines Analysis

A sight distance analysis was conducted at the intersection of Bethune Street and County Road 2. This intersection is located on a horizontal curve, which can present visibility and safety concerns for vehicles approaching and departing. The purpose of this review was to ensure that the expected traffic growth would not worsen any potential safety risks related to sightlines.

A driver stopped on the minor roadway requires adequate departure sight distance to safely execute a turning or crossing manoeuvre. Sight distances were measured on November 6, 2025, under clear conditions. The Transportation Association of Canada – Geometric Design Guide for Canadian Roads (June 2017) was used to determine the required sight distances for Bethune Street and Cairn View Road, both of which are stop-controlled intersections. Departure sight distance varies depending on whether the manoeuvre is a left turn, right turn, or crossing, and is influenced by the design speed of the major roadway.

County Road 2 has a posted speed of 60 km/h south of Church Street (before the curve) and 50 km/h north of Church Street, with an advisory sign recommending 50 km/h through the curve. For this analysis, a design speed of 50 km/h was applied to reflect the curve condition.

Measurements show that a driver facing west at the stop bar on Bethune Street/Cairn View Road has a sight line of 105 metres for left turns and 350 metres for right turns. These measurements meet the TAC Guide requirements for departure sight distance at the design speed of 50 km/h, confirming that sightlines are adequate and the anticipated increase in traffic is not expected to create additional safety concerns.

We recommend extending the 50 km/h speed limit through the curve to improve safety through the curve for all road users. This speed is consistent with the advisory signage already in place and reflects the geometric constraints of the horizontal curve, which can limit sightlines for drivers approaching and departing the intersection. Using a speed limit of 50 km/h will help ensure that available sight distances remain adequate for turning manoeuvres. Lower speeds reduce the likelihood and severity of collisions, particularly in areas where visibility is restricted, and support compliance with best practices outlined in the TAC Geometric Design Guide. The measured sight distances compared to the required sight distances are shown in **Table 8**.

Table 8 Sight distances assessment for a design speed of 50 km/h

Leg	Sight distance type	Criteria	Measured distance	Meets requirement
East Leg Bethune Street/Cairn View Road	Left-turn sight distance	105 m	105 m	Yes
	Right-turn sight distance	110 m	350 m	Yes

5. Conclusions and Recommendations

In summary, the Traffic Impact Study demonstrates that the proposed Impala Developments subdivision at 20361 County Road 2, Lancaster, Ontario, will not adversely affect traffic operations or safety at key intersections in the study area. Analyses for existing and future scenarios, including projected growth through to 2032, indicate that all intersections will continue to operate at a high level of service, with no critical delays or capacity concerns during peak periods. Sightline assessments suggests that a speed limit of 50 km/h should be maintained through the curve to support safe manoeuvres for all road users. Overall, the findings suggest that the development can proceed without requiring additional traffic mitigation measures.

Regards,

A handwritten signature in black ink, appearing to read 'Vanessa Skelton', with a stylized flourish at the end.

Vanessa Skelton, P. Eng.

Project Manager

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Appendices

Appendix A

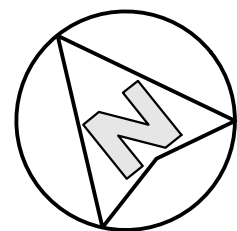
Concept Plan

M:\2025\25001 - Impala Developments\1. Lancaster Subdivision\1.1 Design\3. Concept\25001_CD1_C3.3.dwg Mar 26, 2025 10:02am BY (Thomas Harrison)



2025/03/14	2	ISSUED FOR REVIEW
2025/02/28	1	ISSUED FOR REVIEW
DATE	No.	REVISION

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PROJECT:

IMPALA DEVELOPMENTS
LANCASTER SUBDIVISION

TITLE:

CONCEPT PLAN
(OPTION No.3)

SCALE: 1:400	JOB NO: 25001
DESIGNED BY: T.H.	DATE: 2025/02/28
DRAWN BY: K.B.W./T.H.	DRAWING NO.
CHECKED BY: K.M.	C01.3

Appendix B

Synchro Outputs

Intersection

Intersection Delay, s/veh	6.8
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	11	1	2	11	0
Future Vol, veh/h	0	11	1	2	11	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	12	1	2	12	0
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	6.4	7.1	7.2
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	100%	0%	33%
Vol Thru, %	0%	0%	67%
Vol Right, %	0%	100%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	11	11	3
LT Vol	11	0	1
Through Vol	0	0	2
RT Vol	0	11	0
Lane Flow Rate	12	12	3
Geometry Grp	1	1	1
Degree of Util (X)	0.014	0.011	0.004
Departure Headway (Hd)	4.161	3.358	4.032
Convergence, Y/N	Yes	Yes	Yes
Cap	865	1070	892
Service Time	2.163	1.365	2.038
HCM Lane V/C Ratio	0.014	0.011	0.003
HCM Control Delay	7.2	6.4	7.1
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0	0	0

Intersection						
Int Delay, s/veh	1.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	11	45	0	11	38
Future Vol, veh/h	2	11	45	0	11	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	12	49	0	12	41
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	114	49	0	0	49	0
Stage 1	49	-	-	-	-	-
Stage 2	65	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	882	1020	-	-	1558	-
Stage 1	973	-	-	-	-	-
Stage 2	958	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	875	1020	-	-	1558	-
Mov Cap-2 Maneuver	875	-	-	-	-	-
Stage 1	973	-	-	-	-	-
Stage 2	950	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	8.7	0		1.6		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	995	1558	-	
HCM Lane V/C Ratio	-	-	0.014	0.008	-	
HCM Control Delay (s)	-	-	8.7	7.3	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0	0	-	

Intersection

Intersection Delay, s/veh	6.9
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	3	35	0	0	22	0
Future Vol, veh/h	3	35	0	0	22	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	38	0	0	24	0
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	6.6	0	7.3
HCM LOS	A	-	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	100%	0%	0%
Vol Thru, %	0%	8%	100%
Vol Right, %	0%	92%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	22	38	0
LT Vol	22	0	0
Through Vol	0	3	0
RT Vol	0	35	0
Lane Flow Rate	24	41	0
Geometry Grp	1	1	1
Degree of Util (X)	0.028	0.039	0
Departure Headway (Hd)	4.207	3.422	4.007
Convergence, Y/N	Yes	Yes	Yes
Cap	855	1048	0
Service Time	2.211	1.436	2.022
HCM Lane V/C Ratio	0.028	0.039	0
HCM Control Delay	7.3	6.6	7
HCM Lane LOS	A	A	N
HCM 95th-tile Q	0.1	0.1	0

Intersection						
Int Delay, s/veh	1.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	14	69	17	18	58
Future Vol, veh/h	8	14	69	17	18	58
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	15	75	18	20	63
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	187	84	0	0	93	0
Stage 1	84	-	-	-	-	-
Stage 2	103	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	802	975	-	-	1501	-
Stage 1	939	-	-	-	-	-
Stage 2	921	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	791	975	-	-	1501	-
Mov Cap-2 Maneuver	791	-	-	-	-	-
Stage 1	939	-	-	-	-	-
Stage 2	908	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	9.1	0		1.8		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-		899	1501	
HCM Lane V/C Ratio	-	-		0.027	0.013	
HCM Control Delay (s)	-	-		9.1	7.4	
HCM Lane LOS	-	-		A	A	
HCM 95th %tile Q(veh)	-	-		0.1	0	

Intersection

Intersection Delay, s/veh	6.8
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	11	1	2	11	0
Future Vol, veh/h	0	11	1	2	11	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	12	1	2	12	0
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	6.4	7.1	7.2
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	100%	0%	33%
Vol Thru, %	0%	0%	67%
Vol Right, %	0%	100%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	11	11	3
LT Vol	11	0	1
Through Vol	0	0	2
RT Vol	0	11	0
Lane Flow Rate	12	12	3
Geometry Grp	1	1	1
Degree of Util (X)	0.014	0.011	0.004
Departure Headway (Hd)	4.161	3.358	4.032
Convergence, Y/N	Yes	Yes	Yes
Cap	865	1070	892
Service Time	2.163	1.365	2.038
HCM Lane V/C Ratio	0.014	0.011	0.003
HCM Control Delay	7.2	6.4	7.1
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0	0	0

HCM 6th TWSC

4: Site Access & CR2

12-10-2025

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	58	51	0
Future Vol, veh/h	0	0	0	58	51	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	63	55	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	118	55	55	0	-	0
Stage 1	55	-	-	-	-	-
Stage 2	63	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	878	1012	1550	-	-	-
Stage 1	968	-	-	-	-	-
Stage 2	960	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	878	1012	1550	-	-	-
Mov Cap-2 Maneuver	878	-	-	-	-	-
Stage 1	968	-	-	-	-	-
Stage 2	960	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1550	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	0	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	-	-	-	

Intersection

Int Delay, s/veh 1.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	11	47	0	11	40
Future Vol, veh/h	2	11	47	0	11	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	12	51	0	12	43

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	118	51	0
Stage 1	51	-	-
Stage 2	67	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	878	1017	1555
Stage 1	971	-	-
Stage 2	956	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	871	1017	1555
Mov Cap-2 Maneuver	871	-	-
Stage 1	971	-	-
Stage 2	948	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	1.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	991	1555
HCM Lane V/C Ratio	-	-	0.014	0.008
HCM Control Delay (s)	-	-	8.7	7.3
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

Intersection

Intersection Delay, s/veh	6.9
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	3	34	0	0	23	0
Future Vol, veh/h	3	34	0	0	23	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	37	0	0	25	0
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	6.6	0	7.3
HCM LOS	A	-	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	100%	0%	0%
Vol Thru, %	0%	8%	100%
Vol Right, %	0%	92%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	23	37	0
LT Vol	23	0	0
Through Vol	0	3	0
RT Vol	0	34	0
Lane Flow Rate	25	40	0
Geometry Grp	1	1	1
Degree of Util (X)	0.029	0.038	0
Departure Headway (Hd)	4.205	3.426	4.008
Convergence, Y/N	Yes	Yes	Yes
Cap	856	1047	0
Service Time	2.209	1.439	2.023
HCM Lane V/C Ratio	0.029	0.038	0
HCM Control Delay	7.3	6.6	7
HCM Lane LOS	A	A	N
HCM 95th-tile Q	0.1	0.1	0

HCM 6th TWSC

4: Site Access & CR2

12-10-2025

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	86	79	0
Future Vol, veh/h	0	0	0	86	79	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	93	86	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	179	86	86	0	-	0
Stage 1	86	-	-	-	-	-
Stage 2	93	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	811	973	1510	-	-	-
Stage 1	937	-	-	-	-	-
Stage 2	931	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	811	973	1510	-	-	-
Mov Cap-2 Maneuver	811	-	-	-	-	-
Stage 1	937	-	-	-	-	-
Stage 2	931	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1510	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	0	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	-	-	-	

Intersection						
Int Delay, s/veh	1.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	15	72	18	19	60
Future Vol, veh/h	8	15	72	18	19	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	16	78	20	21	65
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	195	88	0	0	98	0
Stage 1	88	-	-	-	-	-
Stage 2	107	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	794	970	-	-	1495	-
Stage 1	935	-	-	-	-	-
Stage 2	917	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	782	970	-	-	1495	-
Mov Cap-2 Maneuver	782	-	-	-	-	-
Stage 1	935	-	-	-	-	-
Stage 2	903	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	9.1	0		1.8		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-		895	1495	
HCM Lane V/C Ratio	-	-		0.028	0.014	
HCM Control Delay (s)	-	-		9.1	7.4	
HCM Lane LOS	-	-		A	A	
HCM 95th %tile Q(veh)	-	-		0.1	0	

Intersection

Intersection Delay, s/veh	6.8
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	14	1	2	12	0
Future Vol, veh/h	0	14	1	2	12	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	15	1	2	13	0
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	6.4	7.1	7.2
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	100%	0%	33%
Vol Thru, %	0%	0%	67%
Vol Right, %	0%	100%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	12	14	3
LT Vol	12	0	1
Through Vol	0	0	2
RT Vol	0	14	0
Lane Flow Rate	13	15	3
Geometry Grp	1	1	1
Degree of Util (X)	0.015	0.014	0.004
Departure Headway (Hd)	4.167	3.36	4.036
Convergence, Y/N	Yes	Yes	Yes
Cap	864	1069	891
Service Time	2.169	1.367	2.042
HCM Lane V/C Ratio	0.015	0.014	0.003
HCM Control Delay	7.2	6.4	7.1
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0	0	0

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Intersection						
Int Delay, s/veh	1.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	12	12	5	58	54	4
Future Vol, veh/h	12	12	5	58	54	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	13	5	63	59	4
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	134	61	63	0	-	0
Stage 1	61	-	-	-	-	-
Stage 2	73	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	860	1004	1540	-	-	-
Stage 1	962	-	-	-	-	-
Stage 2	950	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	857	1004	1540	-	-	-
Mov Cap-2 Maneuver	857	-	-	-	-	-
Stage 1	959	-	-	-	-	-
Stage 2	950	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9	0.6		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1540	-	925	-	-	
HCM Lane V/C Ratio	0.004	-	0.028	-	-	
HCM Control Delay (s)	7.3	0	9	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

Intersection						
Int Delay, s/veh	1.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	12	51	0	14	49
Future Vol, veh/h	2	12	51	0	14	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	13	55	0	15	53
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	138	55	0	0	55	0
Stage 1	55	-	-	-	-	-
Stage 2	83	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	855	1012	-	-	1550	-
Stage 1	968	-	-	-	-	-
Stage 2	940	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	846	1012	-	-	1550	-
Mov Cap-2 Maneuver	846	-	-	-	-	-
Stage 1	968	-	-	-	-	-
Stage 2	931	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	8.7	0		1.6		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	- 984		1550	-	
HCM Lane V/C Ratio	-	- 0.015		0.01	-	
HCM Control Delay (s)	-	- 8.7		7.3	0	
HCM Lane LOS	-	- A		A	A	
HCM 95th %tile Q(veh)	-	- 0		0	-	

Intersection

Intersection Delay, s/veh 6.9

Intersection LOS A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	3	38	0	0	27	0
Future Vol, veh/h	3	38	0	0	27	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	41	0	0	29	0
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	6.6	0	7.4
HCM LOS	A	-	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	100%	0%	0%
Vol Thru, %	0%	7%	100%
Vol Right, %	0%	93%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	27	41	0
LT Vol	27	0	0
Through Vol	0	3	0
RT Vol	0	38	0
Lane Flow Rate	29	45	0
Geometry Grp	1	1	1
Degree of Util (X)	0.034	0.042	0
Departure Headway (Hd)	4.213	3.429	4.019
Convergence, Y/N	Yes	Yes	Yes
Cap	854	1046	0
Service Time	2.217	1.444	2.037
HCM Lane V/C Ratio	0.034	0.043	0
HCM Control Delay	7.4	6.6	7
HCM Lane LOS	A	A	N
HCM 95th-tile Q	0.1	0.1	0

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Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	12	19	86	79	12
Future Vol, veh/h	9	12	19	86	79	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	13	21	93	86	13
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	228	93	99	0	-	0
Stage 1	93	-	-	-	-	-
Stage 2	135	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	760	964	1494	-	-	-
Stage 1	931	-	-	-	-	-
Stage 2	891	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	749	964	1494	-	-	-
Mov Cap-2 Maneuver	749	-	-	-	-	-
Stage 1	917	-	-	-	-	-
Stage 2	891	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.3	1.3		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1494	-	858	-	-	
HCM Lane V/C Ratio	0.014	-	0.027	-	-	
HCM Control Delay (s)	7.4	0	9.3	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

Intersection						
Int Delay, s/veh	1.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	19	87	18	23	68
Future Vol, veh/h	8	19	87	18	23	68
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	21	95	20	25	74
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	229	105	0	0	115	0
Stage 1	105	-	-	-	-	-
Stage 2	124	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	759	949	-	-	1474	-
Stage 1	919	-	-	-	-	-
Stage 2	902	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	745	949	-	-	1474	-
Mov Cap-2 Maneuver	745	-	-	-	-	-
Stage 1	919	-	-	-	-	-
Stage 2	886	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	9.2	0		1.9		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-		878	1474	
HCM Lane V/C Ratio	-	-		0.033	0.017	
HCM Control Delay (s)	-	-		9.2	7.5	
HCM Lane LOS	-	-		A	A	
HCM 95th %tile Q(veh)	-	-		0.1	0.1	

Intersection

Intersection Delay, s/veh

7

Intersection LOS

A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	16	13	1	2	14	0
Future Vol, veh/h	16	13	1	2	14	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	14	1	2	15	0
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	6.8	7.1	7.3
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	100%	0%	33%
Vol Thru, %	0%	55%	67%
Vol Right, %	0%	45%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	14	29	3
LT Vol	14	0	1
Through Vol	0	16	2
RT Vol	0	13	0
Lane Flow Rate	15	32	3
Geometry Grp	1	1	1
Degree of Util (X)	0.018	0.032	0.004
Departure Headway (Hd)	4.195	3.695	4.052
Convergence, Y/N	Yes	Yes	Yes
Cap	857	972	886
Service Time	2.204	1.704	2.063
HCM Lane V/C Ratio	0.018	0.033	0.003
HCM Control Delay	7.3	6.8	7.1
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.1	0

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Intersection						
Int Delay, s/veh	1.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	12	12	5	66	57	4
Future Vol, veh/h	12	12	5	66	57	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	13	5	72	62	4
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	146	64	66	0	-	0
Stage 1	64	-	-	-	-	-
Stage 2	82	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	846	1000	1536	-	-	-
Stage 1	959	-	-	-	-	-
Stage 2	941	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	843	1000	1536	-	-	-
Mov Cap-2 Maneuver	843	-	-	-	-	-
Stage 1	956	-	-	-	-	-
Stage 2	941	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.1	0.5		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1536	-	915	-	-	
HCM Lane V/C Ratio	0.004	-	0.029	-	-	
HCM Control Delay (s)	7.4	0	9.1	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

Intersection						
Int Delay, s/veh	1.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	14	57	0	16	54
Future Vol, veh/h	2	14	57	0	16	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	15	62	0	17	59
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	155	62	0	0	62	0
Stage 1	62	-	-	-	-	-
Stage 2	93	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	836	1003	-	-	1541	-
Stage 1	961	-	-	-	-	-
Stage 2	931	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	827	1003	-	-	1541	-
Mov Cap-2 Maneuver	827	-	-	-	-	-
Stage 1	961	-	-	-	-	-
Stage 2	921	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	8.8	0		1.7		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	977	1541	-	
HCM Lane V/C Ratio	-	-	0.018	0.011	-	
HCM Control Delay (s)	-	-	8.8	7.4	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

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Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	12	19	97	89	12
Future Vol, veh/h	9	12	19	97	89	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	13	21	105	97	13
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	251	104	110	0	-	0
Stage 1	104	-	-	-	-	-
Stage 2	147	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	738	951	1480	-	-	-
Stage 1	920	-	-	-	-	-
Stage 2	880	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	727	951	1480	-	-	-
Mov Cap-2 Maneuver	727	-	-	-	-	-
Stage 1	906	-	-	-	-	-
Stage 2	880	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.4	1.2		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1480	-	840	-	-	
HCM Lane V/C Ratio	0.014	-	0.027	-	-	
HCM Control Delay (s)	7.5	0	9.4	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

Intersection						
Int Delay, s/veh	1.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	20	96	20	25	76
Future Vol, veh/h	9	20	96	20	25	76
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	22	104	22	27	83
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	252	115	0	0	126	0
Stage 1	115	-	-	-	-	-
Stage 2	137	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	737	937	-	-	1460	-
Stage 1	910	-	-	-	-	-
Stage 2	890	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	723	937	-	-	1460	-
Mov Cap-2 Maneuver	723	-	-	-	-	-
Stage 1	910	-	-	-	-	-
Stage 2	873	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	9.4	0		1.9		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	858	1460	-	
HCM Lane V/C Ratio	-	-	0.037	0.019	-	
HCM Control Delay (s)	-	-	9.4	7.5	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-	



Phase II Environmental Site Assessment

20361 County Road 2
Township of South Glengarry, Ontario

Prepared for:

Frecon Construction Limited

1235 S. Russell Road
Russell, ON K4R 1E5

Attn: Mr. Douglas Drevniok

May 17, 2019

Pinchin File: 236269.001



Phase II Environmental Site Assessment

20361 County Road 2, Township of South Glengarry, Ontario
Frecon Construction Limited

May 17, 2019

Pinchin File: 236269.001

Issued To: Frecon Construction Limited
Contact: Mr. Douglas Drevniok
Issued On: May 17, 2019
Pinchin File: 236269.001
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EXECUTIVE SUMMARY

Pinchin Ltd. (Pinchin) was retained through an Authorization to Proceed, Limit of Liability and Terms of Engagement signed by Mr. Douglas Drevniok of Frecon Construction Limited (Client) to conduct a Phase II Environmental Site Assessment (ESA) of the property located at 20361 County Road 2 in the Township of South Glengarry, Ontario (hereafter referred to as the Site).

The Site is vacant and undeveloped; however, a shed is located on the east-central portion of the Site.

The purpose of this Phase II ESA was to address potential issues of environmental concern in relation to the potential acquisition and subsequent redevelopment of the Site.

The results of the Phase I ESA completed by Pinchin identified the following potential issues of environmental concern:

- An automotive repair/servicing facility is located at 20359 County Road 2. In addition, the Technical Standards & Safety Authority Expired Facilities database indicated that two fuel tanks and associated piping were expired at the retail fuel outlet at this property in 2001. It should be noted that the database did not indicate whether the fuel was stored in aboveground storage tanks or underground storage tanks (USTs); however, it is inferred that the fuel was stored in USTs. This property is located approximately 15 metres east of the Site and is situated hydraulically upgradient of the Site relative to the inferred groundwater flow direction. Based on the nature of operations, the close proximity of this property to the Site and the inferred groundwater flow direction, it is Pinchin's opinion that this property could result in potential subsurface impacts at the Site.

Based on the above-mentioned findings, Pinchin recommended that a Phase II ESA be conducted at the Site in order to assess for the presence of environmental impacts.

The Phase II ESA was completed at the Site by Pinchin between April 29, 2019 and May 1, 2019 and consisted of the advancement of two boreholes, both of which were completed as groundwater monitoring wells.

Select "worst case" soil samples collected during the borehole drilling program were submitted for laboratory analysis of petroleum hydrocarbons (PHCs) (F1-F4), volatile organic compounds (VOCs) and polycyclic aromatic hydrocarbons (PAHs). Groundwater samples collected from the newly installed monitoring wells and were submitted for laboratory analysis of PHCs (F1-F4), VOCs and PAHs.



Based on Site-specific information, the soil and groundwater quality was assessed based on the Ontario Ministry of the Environment, Conservation and Parks *Table 2 Standards* for industrial/commercial/community land use and medium/fine-textured soil.

Reported concentrations in the soil and groundwater samples submitted for analysis of PHCs (F1-F4), VOCs and PAHs satisfied the *Table 3 Standards*.

Based on the findings of this Phase II ESA, it is Pinchin's opinion that no further subsurface investigation is required for the Site at this time in relation to the findings of the Phase I ESA.

This Executive Summary is subject to the same standard limitations as contained in the report and must be read in conjunction with the entire report.



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1.0 INTRODUCTION

Pinchin Ltd. (Pinchin) was retained through an Authorization to Proceed, Limit of Liability and Terms of Engagement signed by Mr. Douglas Drevniok of Frecon Construction Limited (Client) to conduct a Phase II Environmental Site Assessment (ESA) of the property located at 20361 County Road 2 in the Township of South Glengarry, Ontario (hereafter referred to as the Site).

The Site is vacant and undeveloped; however, a shed is located on the east-central portion of the Site.

The purpose of this Phase II ESA was to address potential issues of environmental concern in relation to the potential acquisition and subsequent redevelopment of the Site.

This Phase II ESA was completed in general accordance with the Canadian Standards Association document entitled "*Phase II Environmental Site Assessment, CSA Standard Z769-00 (R2018)*", dated 2000 and reaffirmed in 2018.

1.1 Background

Pinchin completed a Phase I ESA of the Site for the Client, the findings of which were provided in the report entitled "*Phase I Environmental Site Assessment, 20361 County Road 2. Township of South Glengarry, Ontario*", dated February 22, 2019. The results of the Phase I ESA completed by Pinchin identified the following area of potential environmental concern (APEC) that could give rise to potential subsurface impacts in connection with the Site:

- An automotive repair/servicing facility is located at 20359 County Road 2. In addition, the Technical Standards & Safety Authority Expired Facilities database indicated that two fuel tanks and associated pipping were expired at the retail fuel outlet at this property in 2001. It should be noted that the database did not indicate whether the fuel was stored in aboveground storage tanks or underground storage tanks (USTs); however, it is inferred that the fuel was stored in USTs. This property is located approximately 15 metres east of the Site and is situated hydraulically upgradient of the Site relative to the inferred groundwater flow direction. Based on the nature of operations, the close proximity of this property to the Site and the inferred groundwater flow direction, it is Pinchin's opinion that this property could result in potential subsurface impacts at the Site.

Based on the above-mentioned findings, it was Pinchin's recommendation that a Phase II ESA be conducted at the Site in order to assess the above-noted APEC for the presence of environmental impacts.



1.2 Scope of Work

The scope of work completed by Pinchin, as outlined in the Pinchin proposal entitled *"Proposal for Phase II Environmental Site Assessment, 203611 County Road 2, Township of South Glengarry, Ontario"* submitted to the Client on February 27, 2019, included the following:

- Advancement of two boreholes following the clearance of underground services, both of which were instrumented with a groundwater monitoring well;
- Submission of select "worst case" soil samples for laboratory analysis of petroleum hydrocarbons (PHCs) in the F1 to F4 fraction ranges (F1-F4), volatile organic compounds (VOCs) and polycyclic aromatic hydrocarbons (PAHs);
- Collection of groundwater samples from each of the newly installed monitoring wells, following well development and purging, for laboratory analysis of PHCs (F1-F4), VOCs and PAHs;
- Comparison of the soil and groundwater laboratory analytical results to the applicable regulatory criteria; and
- Preparation of a factual report detailing the findings of the Phase II ESA and recommendations.

2.0 METHODOLOGY

The investigation methodology was conducted in general accordance with the Ontario Ministry of the Environment, Conservation and Parks (MECP) document entitled *"Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario"* dated December 1996 (*MECP Sampling Guideline*), the Association of Professional Geoscientists of Ontario document entitled *"Guidance for Environmental Site Assessments under Ontario Regulation 153/04 (as amended)"*, dated April 2011 (*APGO Guideline*) and Pinchin's standard operating procedures (SOPs).

2.1 Borehole Investigation

Pinchin retained Strata Drilling Group (Strata) to complete the borehole drilling program at the Site on April 29, 2019, following the clearance of underground services in the vicinity of the work area by public utility locators and a private utility locator retained by Pinchin. Strata is licensed by the MECP in accordance with Ontario Regulation 903 (as amended) to undertake borehole drilling/well installation activities.

The boreholes were advanced to a maximum depth of 4.6 mbgs using a Geomachine GM 100 direct push drill rig. Soil samples were collected at continuous intervals using 3.8 centimetre (cm) inner diameter (ID) direct push soil samplers with dedicated single-use sample liners. Discrete soil samples were collected from the single-use liners and containerized in laboratory-supplied glass sampling jars.

Subsurface soil conditions were logged on-Site by Pinchin personnel at the time of drilling. Soil samples were examined for visual and olfactory evidence of impacts and a portion of each sample was analyzed in the field for petroleum-derived vapour concentrations in soil headspace using a photoionization detector (PID).

The locations of the boreholes are shown on Figure 2 and a description of the subsurface stratigraphy encountered during the drilling program is documented in the borehole logs included in Appendix II.

2.2 Monitoring Well Installation

Groundwater monitoring wells were installed in boreholes MW-1 and MW-2 to enable groundwater monitoring and sampling. The monitoring wells were constructed with 3.8 cm inner diameter (ID) flush-threaded Schedule 40 polyvinyl chloride (PVC) risers, followed by a length of 3.8 cm ID No. 10 slot PVC screen that intersected the water table.

Each well screen was sealed at the bottom using a threaded cap and each riser was sealed at the top with a lockable J-plug cap. Silica sand was placed around and above the screened interval to form a filter pack around the well screen. A layer of bentonite was placed above the silica sand and was extended to just below the ground surface. A 5.1 cm ID Schedule 40 PVC outer casing, approximately 15 cm in length, was installed in each well around the top of the riser and into the top of the bentonite seal. A bentonite seal was then placed between the riser and outer casing. A protective aboveground monument casing was installed at the ground surface over each riser pipe and outer casing and cemented in place.

The locations of the monitoring wells are shown on Figure 2. The monitoring well construction details are shown on the borehole logs included in Appendix II.

2.3 Groundwater Monitoring Data

The water levels within the monitoring wells (MW-1 and MW-2) were measured on April 30, 2019 and May 1, 2019 using an interface probe. The presence/absence of non-aqueous phase liquid (NAPL) was also assessed during groundwater monitoring using the interface probe. The water level information obtained during groundwater monitoring is presented in Table 3 and on the borehole logs in Appendix II.

2.4 Sampling and Laboratory Analysis

2.4.1 Soil

One most apparent “worst case” soil sample, based on vapour concentrations as well as visual and/or olfactory considerations recovered from each borehole was submitted for laboratory analysis of PHCs (F1-F4), VOCs and PAHs.

In addition, representative soil samples were submitted for pH analysis and grain size distribution analysis to confirm the Site Condition Standards applicable to the Site as provided in the MECP document entitled “*Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*”, dated April 15, 2011 (*MECP Standards*).

The borehole locations are shown on Figure 2. Table 1 provides a summary of the soil samples submitted for laboratory analysis.

2.4.2 Groundwater

On April 30, 2019 newly installed groundwater monitoring wells MW-1 and MW-2 were developed by removing three to five well casing volumes, or were purged until dry, in accordance with Pinchin's SOPs.

On May 1, 2019 the newly installed groundwater monitoring wells were purged and sampled using Pinchin's SOPs. The groundwater samples collected from these monitoring wells were submitted for laboratory analysis of PHCs (F1-F4), VOCs and PAHs.

All monitoring well development activities were conducted using dedicated inertial pumps comprised of Waterra polyethylene tubing and foot valves. Following pre-sampling purging with dedicated inertial pumps, sampling for PHCs (F2-F4) was conducted using a peristaltic pump and dedicated polyethylene tubing. Sampling for VOCs, and PHCs (F1) was then conducted using dedicated inertial pumps.

The monitoring well locations are shown on Figure 2. Table 1 provides a summary of the groundwater samples submitted for laboratory analysis.

2.4.3 Analytical Laboratory

Selected soil and groundwater samples were delivered to Maxxam Analytics Inc. (Maxxam) in Ottawa, Ontario for analysis. Maxxam is an independent laboratory accredited by the Standards Council of Canada and the Canadian Association for Laboratory Accreditation. Formal chain of custody records of the sample submissions were maintained between Pinchin and the staff at Maxxam.

2.5 QA/QC Protocols

Various quality assurance/quality control (QA/QC) protocols were followed during the Phase II ESA to ensure that representative samples were obtained and that representative analytical data were reported by the laboratory.

Field QA/QC protocols that were employed by Pinchin included the following:

- Soil samples were extracted from the interior of the sampling device (where possible), rather than from areas in contact with the sampler walls to minimize the potential for cross-contamination;
- Soil and groundwater samples were placed in laboratory-supplied glass sample jars;
- The monitoring wells were developed following installation and were purged to remove stagnant water prior to sample collection so that representative groundwater samples could be obtained. Dedicated purging and sampling equipment was used for monitoring well development, purging and sampling to minimize the potential for cross-contamination;
- Soil and groundwater samples were placed in coolers on ice immediately upon collection, with appropriate sample temperatures maintained prior to submission to the laboratory;
- Dedicated and disposable nitrile gloves were used for sample handling;
- Non-dedicated monitoring and sampling equipment was cleaned before initial use and between uses to minimize the potential for cross-contamination by washing with an Alconox™/potable water mixture followed by a deionized water rinse; and
- Sample collection and handling procedures were performed in general accordance with the *MECP Sampling Guideline*, the *APGO Guideline* and Pinchin's SOPs for Phase II ESAs.

Maxxam's internal laboratory QA/QC consisted of the analysis of laboratory duplicate, method blank, matrix spike and spiked blank samples, an evaluation of relative percent difference (RPD) calculations for laboratory duplicate samples, and an evaluation of surrogate recoveries.

2.6 Ontario Water Well Records

Ontario Regulation 903 (as amended) requires that all wells installed to depths greater than 3.0 mbgs have a water well record completed by a licensed well technician. The owner of the monitoring well must keep the water well record on file for a period of two years and the monitoring wells must be decommissioned as per Ontario Regulation 903 (as amended) if monitoring wells are no longer in use.

Strata is a licensed well driller under Ontario Regulation 903 (as amended), and submitted a water well record to the MECP and the Client to fulfill the requirements of Ontario Regulation 903 (as amended).

2.7 Site Condition Standards

The Site is vacant and undeveloped, free of any permanent structures and/or buildings located within the Township of South Glengarry, Ontario. It is Pinchin's understanding that potable water for the Site and surrounding area is supplied by a privately-owned supply well.

Ontario Regulation 153/04 (as amended) states that a Site is classified as an "environmentally sensitive area" if the pH of the surface soil (less than 1.5 mbgs) is less than 5 or greater than 9, the pH of the subsurface soil (greater than 1.5 mbgs) is less than 5 or greater than 11, or if the Site is an area of natural significance or is adjacent to or contains land within 30 metres of an area of natural significance. Two representative soil samples collected from the boreholes advanced at the Site were submitted for pH analysis. The pH values measured in the submitted soil samples were within the limits for non-sensitive sites. The Site is also not an area of natural significance and it is not adjacent to, nor does it contain land within 30 metres of, an area of natural significance. As such, the Site is not an environmentally sensitive area.

One representative soil sample collected from the boreholes advanced at the Site was submitted for 75 micron single-sieve grain size analysis. Based on the results of this analysis, the soil at the Site is interpreted to be medium/fine-textured for the purpose of selecting the appropriate *MECP Standards*.

The pH and grain size analytical results are summarized in Table 3.

Based on the above, the appropriate Site Condition Standards for the Site are:

- "Table 2: Full Depth Generic Site Condition Standards for Use in a Potable Ground Water Condition", provided in the *MECP Standards (Table 2 Standards)* for:
 - Medium/fine-textured soils; and
 - Industrial/commercial/community property use.

As such, the analytical results have been compared to these *Table 2 Standards*.

3.0 RESULTS

3.1 Site Geology and Hydrogeology

Based on the soil samples recovered during the borehole drilling program, the soil stratigraphy at the drilling locations below the grassed surface generally consists of sandy silt to a maximum depth of 1.5

mbgs, underlain by silty clay to a maximum borehole depth of 4.6 mbgs at MW-1. Moist to wet soil conditions were observed at or below 0.5 mbgs.

A detailed description of the subsurface stratigraphy encountered during borehole advancement is documented in the borehole logs located in Appendix II.

The water level information obtained during groundwater monitoring is presented in Table 3 and on the borehole logs in Appendix II. The depth to groundwater measured within the newly installed monitoring wells ranged from 0.57 mbgs at MW-1 to 0.65 mbgs at MW-2 on May 1, 2019.

The Raisin River is located approximately 100 m west of the Site. The Raisin River flows south and discharges into the St. Lawrence River, located approximately 375 m south of the Site. Groundwater flow at the Site is inferred to be towards the west-southwest based topography and the nearest body of water.

3.2 Soil Headspace Vapour Concentrations

Vapour concentrations measured in the headspace of soil samples collected during the drilling investigation are presented on the borehole logs in Appendix II and ranged from 0.1 parts per million by volume (ppm_v) to a maximum of 0.2 ppm_v.

3.3 Field Observations

No odours or staining were observed in the soil samples collected during the borehole drilling program, and no odours or evidence of NAPL were observed during groundwater monitoring and sampling.

3.4 Analytical

3.4.1 Soil

As indicated in Tables 4 through 6, reported concentrations of PHCs (F1-F4), VOCs and PAHs in the soil samples submitted for analysis met the *Table 2 Standards*.

The laboratory Certificate of Analysis for the soil samples is provided in Appendix IV.

3.4.2 Groundwater

As indicated in Tables 7 through 9, reported concentrations in the groundwater samples submitted for analysis of PHCs (F1-F4), VOCs and PAHs in the groundwater samples submitted for analysis met the *Table 2 Standards*.

The laboratory Certificate of Analysis for the groundwater samples is provided in Appendix IV.

4.0 FINDINGS AND CONCLUSIONS

Based on the work completed, the following is a summary of the activities and findings of this Phase II ESA:

- Pinchin retained Strata to advance two boreholes at the Site on April 29, 2019. The boreholes were advanced to a maximum depth of 4.6 mbgs using a Geomachine GM 100 direct push drill rig. Both boreholes were instrumented with monitoring wells to enable groundwater monitoring and sampling;
- The soil stratigraphy at the drilling locations below the gravel-graded surface generally consists of sandy silt to a maximum depth of 1.5 mbgs, underlain by silty clay to a maximum borehole depth of 4.6 mbgs at MW-1. Moist to wet soil conditions were observed at or below 0.5 mbgs;
- Groundwater levels at the Site measured on May 1, 2019 ranged between 0.57 mbgs at MW-1 to 0.65 mbgs at MW-2. Inferred groundwater flow is expected to be west-southwest based on the proximity of the Raisin River;
- Based on Site-specific information, the soil and groundwater quality was assessed based on the *Table 2 Standards* for industrial/commercial/community property use and medium-fine-textured soil;
- A total of two “worst case” soil samples based on the results of field screening were submitted for laboratory analysis of PHCs (F1-F4), VOCs and PAHs;
- Groundwater samples were collected from the newly installed monitoring wells (MW-1 and MW-2) by Pinchin on May 1, 2019, and were submitted for laboratory analysis of PHCs (F1-F4), VOCs and PAHs; and
- Reported concentrations in the soil and groundwater samples submitted for analysis of PHCs (F1-F4), VOCs and PAHs satisfied the *Table 2 Standards*.

Based on the findings of this Phase II ESA, it is Pinchin’s opinion that no further subsurface investigation is required for the Site at this time in relation to the findings of the Phase I ESA.

5.0 TERMS AND LIMITATIONS

This Phase II ESA was performed for Frecon Construction Limited (Client) in order to investigate potential environmental impacts at 20361 County Road 2 in the Township of South Glengarry, Ontario (Site). The term recognized environmental condition means the presence or likely presence of any hazardous substance on a property under conditions that indicate an existing release, past release, or a material threat of a release of a hazardous substance into structures on the property or into the ground,



groundwater, or surface water of the property. This Phase II ESA does not quantify the extent of the current and/or recognized environmental condition or the cost of any remediation.

Conclusions derived are specific to the immediate area of study and cannot be extrapolated extensively away from sample locations. Samples have been analyzed for a limited number of contaminants that are expected to be present at the Site, and the absence of information relating to a specific contaminant does not indicate that it is not present.

No environmental site assessment can wholly eliminate uncertainty regarding the potential for recognized environmental conditions on a property. Performance of this Phase II ESA to the standards established by Pinchin is intended to reduce, but not eliminate, uncertainty regarding the potential for recognized environmental conditions on the Site, and recognizes reasonable limits on time and cost.

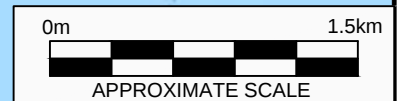
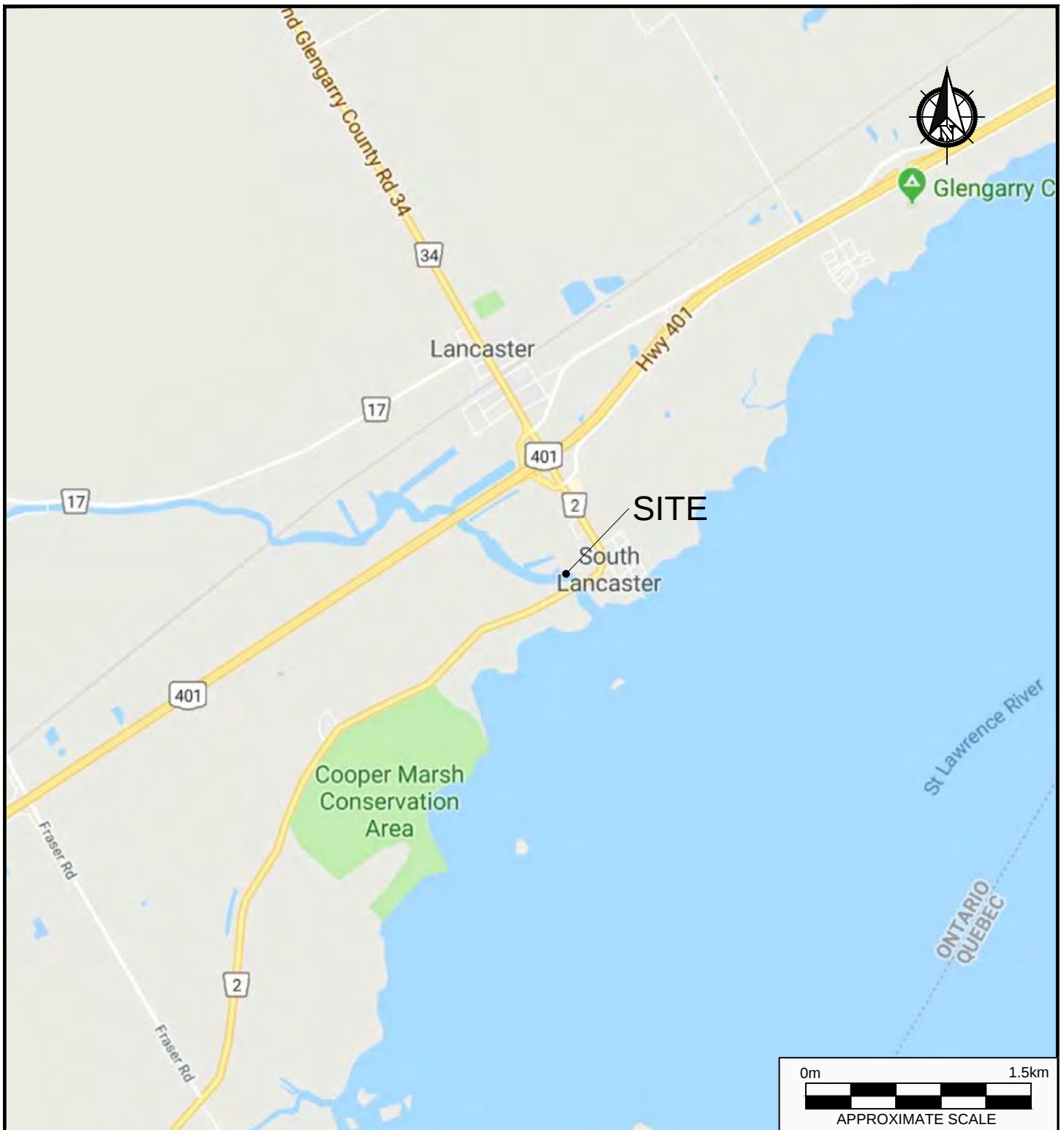
This Phase II ESA was performed in general compliance with currently acceptable practices for environmental site investigations, and specific Client requests, as applicable to this Site. The scope of work completed by Pinchin, as part of this Phase II ESA, is not sufficient (in and of itself) to meet the requirements for the submission of a Record of Site Condition (RSC) in accordance with Ontario Regulation 153/04 (as amended). If an RSC is an intended end product of work conducted at the Site, further consultation and/or work will be required.

This report was prepared for the exclusive use of the Client, subject to the terms, conditions and limitations contained within the duly authorized proposal for this project. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, is the sole responsibility of such third parties. Pinchin accepts no responsibility for damages suffered by any third party as a result of decisions made or actions conducted.

If additional parties require reliance on this report, written authorization from Pinchin will be required. Pinchin disclaims responsibility of consequential financial effects on transactions or property values, or requirements for follow-up actions and costs. No other warranties are implied or expressed. Furthermore, this report should not be construed as legal advice. Pinchin will not provide results or information to any party unless disclosure by Pinchin is required by law.

Pinchin makes no other representations whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in this report, including, but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and these interpretations may change over time.

APPENDIX I
Figures



PROJECT NAME			
PHASE II ENVIRONMENTAL SITE ASSESSMENT			
CLIENT NAME			
FRECON CONSTRUCTION LIMITED			
PROJECT LOCATION			
20361 COUNTY ROAD 2, TOWNSHIP OF SOUTH GLENGARRY, ONTARIO			
FIGURE NAME			FIGURE NO.
KEY MAP			
APPROXIMATE SCALE	PROJECT NO.	DATE	
AS SHOWN	236269.001	MAY 2019	1



PROJECT NAME			
PHASE II ENVIRONMENTAL SITE ASSESSMENT			
CLIENT NAME			
FRECON CONSTRUCTION LIMITED			
PROJECT LOCATION			
20361 COUNTY ROAD 2, TOWNSHIP OF SOUTH GLENGARRY, ONTARIO			
FIGURE NAME			FIGURE NO.
MONITORING WELL LOCATION PLAN			
APPROXIMATE SCALE	PROJECT NO.	DATE	
AS SHOWN	236269.001	MAY 2019	2

APPENDIX II
Borehole Logs



Log of Borehole: MW-1

Project #: 236269.001

Logged By: MK

Project: Phase II Environmental Site Assessment

Client: Frecon Construction Limited

Location: 20361 County Road 2, Township of South Glengarry, Ontario

Drill Date: April 29, 2019

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Recovery (%)	Sample ID	Soil Vapour Concentration* (ppm) PID	Laboratory Analysis
0		Ground Surface	0.00					
0		Grass	0.15					
1		Sandy Silt				SS-1	0.2	
2		Brown, with organics, damp to wet.						
3					60	SS-2	0.1	pH
4								
5			1.52					
6		Silty Clay				SS-3	0.1	
7		Brown, some sand, wet.						
8					100	SS-4	0.1	
9								
10								
11						SS-5	0.1	
12								
13					100	SS-6	0.1	PHC, VOC, PAH, GrainSize
14								
15			4.57					
16		End of Borehole						
17								
18								
19								
20								

Contractor: Strata Drilling Group Inc.

Drilling Method: Direct Push

Well Casing Size: 3.8 cm

Note:

* Soil vapour concentrations measured using a photoionization detector (PID).

Grade Elevation: NM

Top of Casing Elevation: NM

Sheet: 1 of 1



Log of Borehole: MW-2

Project #: 236269.001

Logged By: MK

Project: Phase II Environmental Site Assessment

Client: Frecon Construction Limited

Location: 20361 County Road 2, Township of South Glengarry, Ontario

Drill Date: April 29, 2019

SUBSURFACE PROFILE					SAMPLE			
Depth	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Recovery (%)	Sample ID	Soil Vapour Concentration* (ppm) PID	Laboratory Analysis
0 ft 0 m		Ground Surface	0.00					
0.15		Grass	0.15					
1		Sandy Silt Brown, damp.				SS-1	0.1	
2								
3						SS-2	0.1	
4								
5		Groundwater seam at 1.52 mbgs.	1.52					
6		Silty Clay Brown, wet.				SS-3	0.1	PHC, VOC, PAH, pH
7								
8								
9						SS-4	0.1	
10			3.05					
11		End of Borehole						
12								
13								
14								
15								
16								
17								
18								
19								
20								

Contractor: Strata Drilling Group Inc.

Drilling Method: Direct Push

Well Casing Size: 3.8 cm

Note:

* Soil vapour concentrations measured using a photoionization detector (PID).

Grade Elevation: NM

Top of Casing Elevation: NM

Sheet: 1 of 1

APPENDIX III
Summary Tables

TABLE 1
SAMPLES SUBMITTED FOR LABORATORY ANALYSIS
Frecon Construction Limited
20361 County Road 2, Township of South Glengarry, Ontario

Samples		Parameters										Rationale/Notes			
Borehole / Monitoring Well ID	Sample ID	SOIL SAMPLES	PHCs (F1-F4) & BTEX	VOCs	PAHs	pH	Grain Size Analysis	GROUNDWATER SAMPLES	PHCs (F1-F4)	PHCs (F1-F4) & BTEX	VOCs		PAHs		
MW-1	SS-2						●								Shallow pH to confirm applicable MECP standards.
	SS-6		●	●	●				●						Assess soil and groundwater quality in relation to off-Site automotive garage/Confirm applicable MECP standards.
	MW-1									●	●	●	●		
MW-2	SS-3		●	●	●	●									Assess soil and groundwater quality in relation to off-Site automotive garage/Confirm applicable MECP standards.
	MW-2									●	●	●	●		

Notes:

PHCs (F1-F4) Petroleum Hydrocarbons (Fraction 1 to Fraction 4)
 BTEX Benzene, Toluene, Ethylbenzene, and Xylenes
 VOCs Volatile Organic Compounds
 PAHs Polycyclic Aromatic Hydrocarbons
 mbgs Metres Below Ground Surface
 MECP Ontario Ministry of the Environment, Conservation and Parks

TABLE 2
pH AND GRAIN SIZE ANALYSIS FOR SOIL
Frecon Construction Limited
20361 County Road 2, Township of South Glengarry, Ontario

<i>Parameter</i>	<i>Units</i>	<i>MECP Site Condition Standard Selection Criteria</i>	<i>Sample Designation</i>		
			<i>Sample Collection Date (dd/mm/yyyy)</i>		
			<i>Sample Depth (mbgs)</i>		
			<i>MW-1 SS-2</i>	<i>MW-2 SS-3</i>	<i>MW-1 SS-6</i>
			<i>29/04/2019</i>	<i>29/04/2019</i>	<i>29/04/2019</i>
			<i>0.8 - 1.5</i>	<i>1.5 - 2.3</i>	<i>3.8 - 4.6</i>
			<i>Surface</i>	<i>Sub-Surface</i>	<i>NA</i>
pH		Surface: 5 < pH < 9 Subsurface: 5 < pH < 11	6.85	7.00	NA
Sieve #200 <0.075 mm	%	50%	NA	NA	100
Sieve #200 >0.075 mm	%	50%	NA	NA	<1
Grain Size Classification			NA	NA	MEDIUM/FINE

Notes:

BOLD	Environmentally Sensitive Area (Based Upon pH of Surface Soil)
BOLD	Environmentally Sensitive Area (Based Upon pH of Sub-Surface Soil)
NA	Not Analysed
mbgs	Metres Below Ground Surface

TABLE 3
GROUNDWATER ELEVATION DATA
Frecon Construction Limited
20361 County Road 2, Township of South Glengarry, Ontario

<i>Well Number</i>	<i>Date (dd/mm/yyyy)</i>	<i>NAPL Level Measurement from TOC (m)</i>	<i>Water Level Measurement from TOC (m)</i>	<i>Water Level Measurement from Ground (mbgs)</i>	<i>Product Thickness (m)</i>	<i>Calculated Water Level Elevation (mREL)</i>
MW-1	01/05/2019	ND	1.38	0.57	ND	NM
MW-2	01/05/2019	ND	1.45	0.65	ND	NM

Notes:

mREL Indicates Groundwater Elevation (metres) Relative To Site Benchmark with Assumed Elevation of 100.00 Metres
NAPL Non-Aqueous Phase Liquid
ND Not Detected
TOC Indicates Top of Casing
m Metres
mbgs Metres Below Ground Surface

TABLE 4
PETROLEUM HYDROCARBON ANALYSIS FOR SOIL
Frecon Construction Limited
20361 County Road 2, Township of South Glengarry, Ontario

<i>Parameter</i>	<i>MECP Table 2 Standards*</i>	<i>Sample Designation</i>	
		<i>Sample Collection Date (dd/mm/yyyy)</i>	
		<i>Sample Depth (mbgs)</i>	
		<i>MW-1 SS-6</i>	<i>MW-2 SS-3</i>
		29/04/2019	29/04/2019
		3.8 - 4.6	1.5 - 2.3
Petroleum Hydrocarbons F1 (C ₆ - C ₁₀)	55	<10	<10
Petroleum Hydrocarbons F2 (>C ₁₀ - C ₁₆)	230	30	<10
Petroleum Hydrocarbons F3 (>C ₁₆ - C ₃₄)	1700	<50	<50
Petroleum Hydrocarbons F4 (>C ₃₄ - C ₅₀)	3300	<50	<50

Notes:

MECP Table 2 Standards* Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011, Table 2 Standards, Medium/Fine-Textured Soils, Potable Groundwater Condition, for Industrial/Commercial/Community Property Use.

BOLD	Exceeds Site Condition Standard
BOLD	Reportable Detection Limit Exceeds Site Condition Standard
Units	All Units in µg/g
mbgs	Metres Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes

TABLE 5
VOLATILE ORGANIC COMPOUND ANALYSIS FOR SOIL
Frecon Construction Limited
20361 County Road 2, Township of South Glengarry, Ontario

Parameter	MECP Table 2 Standards*	Sample Designation	
		Sample Collection Date (dd/mm/yyyy)	
		Sample Depth (mbgs)	
		MW-1 SS-6	MW-2 SS-3
		29/04/2019	29/04/2019
		3.8 - 4.6	1.5 - 2.3
Acetone	16	<0.50	<0.50
Benzene	0.32	<0.020	<0.020
Bromodichloromethane	1.5	<0.050	<0.050
Bromoform	0.61	<0.050	<0.050
Bromomethane	0.05	<0.050	<0.050
Carbon Tetrachloride	0.21	<0.050	<0.050
Chlorobenzene	2.4	<0.050	<0.050
Chloroform	0.47	<0.050	<0.050
Dibromochloromethane	2.3	<0.050	<0.050
1,2-Dichlorobenzene	1.2	<0.050	<0.050
1,3-Dichlorobenzene	9.6	<0.050	<0.050
1,4-Dichlorobenzene	0.2	<0.050	<0.050
1,1-Dichloroethane	0.47	<0.050	<0.050
1,2-Dichloroethane	0.05	<0.050	<0.050
1,1-Dichloroethylene	0.064	<0.050	<0.050
Cis-1,2-Dichloroethylene	1.9	<0.050	<0.050
Trans-1,2-Dichloroethylene	1.3	<0.050	<0.050
1,2-Dichloropropane	0.16	<0.050	<0.050
Cis-1,3-Dichloropropylene	NV	<0.030	<0.030
Trans-1,3-Dichloropropylene	NV	<0.040	<0.040
Ethylbenzene	1.1	<0.020	<0.020
Ethylene Dibromide	0.05	<0.050	<0.050
Methyl Ethyl Ketone	70	<0.50	<0.50
Methylene Chloride	1.6	<0.050	<0.050
Methyl Isobutyl Ketone	31	<0.50	<0.50
Methyl-t-Butyl Ether	1.6	<0.050	<0.050
Styrene	34	<0.050	<0.050
1,1,1,2-Tetrachloroethane	0.087	<0.050	<0.050
1,1,2,2-Tetrachloroethane	0.05	<0.050	<0.050
Toluene	6.4	0.044	0.029
Tetrachloroethylene	1.9	<0.050	<0.050
1,1,1-Trichloroethane	6.1	<0.050	<0.050
1,1,2-Trichloroethane	0.05	<0.050	<0.050
Trichloroethylene	0.55	<0.050	<0.050
Vinyl Chloride	0.032	<0.020	<0.020
m-Xylene & p-Xylene	NV	<0.020	<0.020
o-Xylene	NV	<0.020	<0.020
Total Xylenes	26	<0.020	<0.020
Dichlorodifluoromethane	16	<0.050	<0.050
Hexane(n)	46	<0.050	<0.050
Trichlorofluoromethane	4	<0.050	<0.050
1,3-Dichloropropene (cis + trans)	0.059	<0.050	<0.050

Notes:

MECP Table 2 Standards*

Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011, Table 2 Standards, Medium/Fine-Textured Soils, Potable Groundwater Condition, for Industrial/Commercial/Community Property Use.

BOLD
BOLD

Exceeds Site Condition Standard
Reportable Detection Limit Exceeds Site Condition Standard

Units
mbgs

All Units in µg/g
Metres Below Ground Surface

TABLE 6
POLYCYCLIC AROMATIC HYDROCARBON ANALYSIS FOR SOIL
Frecon Construction Limited
20361 County Road 2, Township of South Glengarry, Ontario

<i>Parameter</i>	<i>MECP Table 2 Standards*</i>	<i>Sample Designation</i>	
		<i>Sample Collection Date (dd/mm/yyyy)</i>	
		<i>Sample Depth (mbgs)</i>	
		<i>MW-1 SS-5</i>	<i>MW-2 SS-4</i>
		<i>11/04/2019</i>	<i>11/04/2019</i>
		<i>3.1 - 3.8</i>	<i>2.3 - 3.1</i>
Acenaphthene	21	<0.0050	<0.0050
Acenaphthylene	0.15	<0.0050	<0.0050
Anthracene	0.67	<0.0050	<0.0050
Benzo(a)anthracene	0.96	<0.0050	<0.0050
Benzo(a)pyrene	0.3	<0.0050	<0.0050
Benzo(b)fluoranthene	0.96	<0.0050	<0.0050
Benzo(ghi)perylene	9.6	<0.0050	<0.0050
Benzo(k)fluoranthene	0.96	<0.0050	<0.0050
Chrysene	9.6	<0.0050	<0.0050
Dibenzo(a,h)anthracene	0.1	<0.0050	<0.0050
Fluoranthene	9.6	<0.0050	<0.0050
Fluorene	62	<0.0050	<0.0050
Indeno(1,2,3-cd)pyrene	0.76	<0.0050	<0.0050
Methylnaphthalene 2-(1-)	30	<0.0050	<0.0050
Naphthalene	9.6	<0.0050	<0.0050
Phenanthrene	12	<0.0050	<0.0050
Pyrene	96	<0.0050	<0.0050

Notes:

MECP Table 2 Standards*

Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011, Table 2 Standards, Medium/Fine-Textured Soils, Potable Groundwater Condition, for Industrial/Commercial/Community Property Use.

BOLD
BOLD

Units
mbgs

Exceeds Site Condition Standard
Reportable Detection Limit Exceeds Site Condition Standard
All Units in µg/g
Metres Below Ground Surface

TABLE 7
PETROLEUM HYDROCARBON ANALYSIS FOR GROUNDWATER
Frecon Construction Limited
20361 County Road 2, Township of South Glengarry, Ontario

<i>Parameter</i>	<i>MECP Table 2 Standards*</i>	<i>Sample Designation</i>	
		<i>Sample Collection Date (dd/mm/yyyy)</i>	
		<i>MW-1</i>	<i>MW-2</i>
		<i>01/05/2019</i>	<i>01/05/2019</i>
Petroleum Hydrocarbons F1 (C ₆ - C ₁₀)	750	<25	<25
Petroleum Hydrocarbons F2 (>C ₁₀ - C ₁₆)	150	<100	<100
Petroleum Hydrocarbons F3 (>C ₁₆ - C ₃₄)	500	<200	<200
Petroleum Hydrocarbons F4 (>C ₃₄ - C ₅₀)	500	<200	<200

Notes:

MECP Table 2 Standards*

Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011, Table 2 Standards, Medium/Fine-Textured Soils, Potable Groundwater Condition, for All Types of Property Use.

BOLD
BOLD

Units

BTEX

Exceeds Site Condition Standard

Reportable Detection Limit Exceeds Site Condition Standard

All Units in µg/L

Benzene, Toluene, Ethylbenzene and Xylenes

TABLE 8
VOLATILE ORGANIC COMPOUND ANALYSIS FOR GROUNDWATER
Frecon Construction Limited
20361 County Road 2, Township of South Glengarry, Ontario

<i>Parameter</i>	<i>MECP Table 2 Standards*</i>	<i>Sample Designation</i>	
		<i>Sample Collection Date (dd/mm/yyyy)</i>	
		<i>MW-1</i>	<i>MW-2</i>
		<i>01/05/2019</i>	<i>01/05/2019</i>
Acetone	2700	<10	<10
Benzene	5	<0.20	<0.20
Bromodichloromethane	16	<0.50	<0.50
Bromoform	25	<1.0	<1.0
Bromomethane	0.89	<0.50	<0.50
Carbon Tetrachloride	0.79	<0.20	<0.20
Chlorobenzene	30	<0.20	<0.20
Chloroform	2.4	<0.20	<0.20
Dibromochloromethane	25	<0.50	<0.50
1,2-Dichlorobenzene	3	<0.50	<0.50
1,3-Dichlorobenzene	59	<0.50	<0.50
1,4-Dichlorobenzene	1	<0.50	<0.50
1,1-Dichloroethane	5	<0.20	<0.20
1,2-Dichloroethane	1.6	<0.50	<0.50
1,1-Dichloroethylene	1.6	<0.20	<0.20
Cis-1,2-Dichloroethylene	1.6	<0.50	<0.50
Trans-1,2-Dichloroethylene	1.6	<0.50	<0.50
1,2-Dichloropropane	5	<0.20	<0.20
Cis-1,3-Dichloropropylene	NV	<0.30	<0.30
Trans-1,3-Dichloropropylene	NV	<0.40	<0.40
Ethylbenzene	2.4	<0.20	<0.20
Ethylene Dibromide	0.2	<0.20	<0.20
Methyl Ethyl Ketone	1800	<10	<10
Methylene Chloride	50	<2.0	<2.0
Methyl Isobutyl Ketone	640	<5.0	<5.0
Methyl-t-Butyl Ether	15	<0.50	<0.50
Styrene	5.4	<0.50	<0.50
1,1,1,2-Tetrachloroethane	1.1	<0.50	<0.50
1,1,2,2-Tetrachloroethane	1	<0.50	<0.50
Toluene	24	<0.20	<0.20
Tetrachloroethylene	1.6	<0.20	<0.20
1,1,1-Trichloroethane	200	<0.20	<0.20
1,1,2-Trichloroethane	4.7	<0.50	<0.50
Trichloroethylene	1.6	<0.20	<0.20
Vinyl Chloride	0.5	<0.20	<0.20
m-Xylene & p-Xylene	NV	<0.20	<0.20
o-Xylene	NV	<0.20	<0.20
Total Xylenes	300	<0.20	<0.20
Dichlorodifluoromethane	590	<1.0	<1.0
Dioxane, 1,4-	50	-	-
Hexane(n)	51	<1.0	<1.0
Trichlorofluoromethane	150	<0.50	<0.50
1,3-Dichloropropene (cis + trans)	0.5	<0.50	<0.50

Notes:

MECP Table 2 Standards*

Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011, Table 2 Standards, Medium/Fine-Textured Soils, Potable Groundwater Condition, for All Types of Property Use.

BOLD
BOLD

Units

Exceeds Site Condition Standard

Reportable Detection Limit Exceeds Site Condition Standard

All Units in µg/L

TABLE 9
POLYCYCLIC AROMATIC HYDROCARBON ANALYSIS FOR GROUNDWATER
Frecon Construction Limited
20361 County Road 2, Township of South Glengarry, Ontario

<i>Parameter</i>	<i>MECP Table 2 Standards*</i>	<i>Sample Designation</i>	
		<i>Sample Collection Date (dd/mm/yyyy)</i>	
		<i>MW-1</i>	<i>MW-2</i>
		<i>01/05/2019</i>	<i>01/05/2019</i>
Acenaphthene	4.1	<0.050	<0.050
Acenaphthylene	1	<0.050	<0.050
Anthracene	2.4	<0.050	<0.050
Benzo(a)anthracene	1	<0.050	<0.050
Benzo(a)pyrene	0.01	<0.010	<0.010
Benzo(b)fluoranthene	0.1	<0.050	<0.050
Benzo(ghi)perylene	0.2	<0.050	<0.050
Benzo(k)fluoranthene	0.1	<0.050	<0.050
Chrysene	0.1	<0.050	<0.050
Dibenzo(a,h)anthracene	0.2	<0.050	<0.050
Fluoranthene	0.41	<0.050	<0.050
Fluorene	120	<0.050	<0.050
Indeno(1,2,3-cd)pyrene	0.2	<0.050	<0.050
Methylnaphthalene 2-(1-)	3.2	<0.050	<0.050
Naphthalene	11	<0.050	<0.050
Phenanthrene	1	<0.030	<0.030
Pyrene	4.1	<0.050	<0.050

Notes:

MECP Table 2 Standards*

Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011, Table 2 Standards, Medium/Fine-Textured Soils, Potable Groundwater Condition, for All Types of Property Use.

BOLD
BOLD
Units

Exceeds Site Condition Standard
Reportable Detection Limit Exceeds Site Condition Standard
All Units in µg/L

APPENDIX IV
Laboratory Certificates of Analysis

Your Project #: 236269.001
Your C.O.C. #: 102916

Attention: Mike Kosiw

Pinchin Ltd
Ottawa
1 Hines Road
Suite 200
Kanata, ON
CANADA K2K 3C7

Report Date: 2019/05/09
Report #: R5703832
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9B5591

Received: 2019/05/01, 15:35

Sample Matrix: Soil
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Methylnaphthalene Sum (1)	2	N/A	2019/05/07	CAM SOP-00301	EPA 8270D m
1,3-Dichloropropene Sum	2	N/A	2019/05/07	OTT SOP-00002	EPA 8260C m
Petroleum Hydrocarbons F2-F4 in Soil (2)	2	2019/05/02	2019/05/07	OTT SOP-00001	CCME CWS
Moisture	2	N/A	2019/05/07	CAM SOP-00445	McKeague 2nd ed 1978
PAH Compounds in Soil by GC/MS (SIM) (1)	2	2019/05/06	2019/05/06	CAM SOP-00318	EPA 8270D m
pH CaCl2 EXTRACT (1)	2	2019/05/06	2019/05/06	CAM SOP-00413	EPA 9045 D m
Sieve, 75um (1)	1	N/A	2019/05/07	CAM SOP-00467	Carter 2nd ed m
Volatile Organic Compounds and F1 PHCs	2	N/A	2019/05/07	OTT SOP-00002	EPA 8260C m

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Methylnaphthalene Sum (1)	2	N/A	2019/05/07	CAM SOP-00301	EPA 8270D m
1,3-Dichloropropene Sum	2	N/A	2019/05/07	OTT SOP-00002	EPA 8260C m
Petroleum Hydrocarbons F2-F4 in Water (2)	2	2019/05/02	2019/05/08	OTT SOP-00001	CCME Hydrocarbons
PAH Compounds in Water by GC/MS (SIM) (1)	2	2019/05/03	2019/05/03	CAM SOP-00318	EPA 8270D m
Volatile Organic Compounds and F1 PHCs	2	N/A	2019/05/07	OTT SOP-00002	EPA 8260C m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing. Maxxam is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their

Your Project #: 236269.001
Your C.O.C. #: 102916

Attention: Mike Kosiw

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1 Hines Road
Suite 200
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CANADA K2K 3C7

Report Date: 2019/05/09
Report #: R5703832
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9B5591

Received: 2019/05/01, 15:35
agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Maxxam Analytics Mississauga

(2) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Alisha Williamson, Project Manager

Email: AWilliamson@maxxam.ca

Phone# (613) 274-0573

=====

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

O.REG 153 PAHS (SOIL)

Maxxam ID		JPF438		JPF439		
Sampling Date		2019/04/29		2019/04/29		
COC Number		102916		102916		
	UNITS	MW-1 SS-6	RDL	MW-2 SS-3	RDL	QC Batch
Calculated Parameters						
Methylnaphthalene, 2-(1-)	ug/g	<0.014	0.014	<0.0071	0.0071	6099587
Polyaromatic Hydrocarbons						
Acenaphthene	ug/g	<0.010	0.010	<0.0050	0.0050	6105617
Acenaphthylene	ug/g	<0.010	0.010	<0.0050	0.0050	6105617
Anthracene	ug/g	<0.010	0.010	<0.0050	0.0050	6105617
Benzo(a)anthracene	ug/g	<0.010	0.010	<0.0050	0.0050	6105617
Benzo(a)pyrene	ug/g	<0.010	0.010	<0.0050	0.0050	6105617
Benzo(b,j)fluoranthene	ug/g	<0.010	0.010	<0.0050	0.0050	6105617
Benzo(g,h,i)perylene	ug/g	<0.010	0.010	<0.0050	0.0050	6105617
Benzo(k)fluoranthene	ug/g	<0.010	0.010	<0.0050	0.0050	6105617
Chrysene	ug/g	<0.010	0.010	<0.0050	0.0050	6105617
Dibenz(a,h)anthracene	ug/g	<0.010	0.010	<0.0050	0.0050	6105617
Fluoranthene	ug/g	<0.010	0.010	<0.0050	0.0050	6105617
Fluorene	ug/g	<0.010	0.010	<0.0050	0.0050	6105617
Indeno(1,2,3-cd)pyrene	ug/g	<0.010	0.010	<0.0050	0.0050	6105617
1-Methylnaphthalene	ug/g	<0.010	0.010	<0.0050	0.0050	6105617
2-Methylnaphthalene	ug/g	<0.010	0.010	<0.0050	0.0050	6105617
Naphthalene	ug/g	<0.010	0.010	<0.0050	0.0050	6105617
Phenanthrene	ug/g	<0.010	0.010	<0.0050	0.0050	6105617
Pyrene	ug/g	<0.010	0.010	<0.0050	0.0050	6105617
Surrogate Recovery (%)						
D10-Anthracene	%	116		118		6105617
D14-Terphenyl (FS)	%	113		113		6105617
D8-Acenaphthylene	%	112		100		6105617
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						

O.REG 153 VOCs BY HS & F1-F4 (SOIL)

Maxxam ID		JPF438			JPF438			JPF439		
Sampling Date		2019/04/29			2019/04/29			2019/04/29		
COC Number		102916			102916			102916		
	UNITS	MW-1 SS-6	RDL	QC Batch	MW-1 SS-6 Lab-Dup	RDL	QC Batch	MW-2 SS-3	RDL	QC Batch
Inorganics										
Moisture	%	37	0.2	6106276	38	0.2	6106276	25	0.2	6106276
Calculated Parameters										
1,3-Dichloropropene (cis+trans)	ug/g	<0.050	0.050	6099979				<0.050	0.050	6099979
Volatile Organics										
Acetone (2-Propanone)	ug/g	<0.50	0.50	6105049				<0.50	0.50	6105049
Benzene	ug/g	<0.020	0.020	6105049				<0.020	0.020	6105049
Bromodichloromethane	ug/g	<0.050	0.050	6105049				<0.050	0.050	6105049
Bromoform	ug/g	<0.050	0.050	6105049				<0.050	0.050	6105049
Bromomethane	ug/g	<0.050	0.050	6105049				<0.050	0.050	6105049
Carbon Tetrachloride	ug/g	<0.050	0.050	6105049				<0.050	0.050	6105049
Chlorobenzene	ug/g	<0.050	0.050	6105049				<0.050	0.050	6105049
Chloroform	ug/g	<0.050	0.050	6105049				<0.050	0.050	6105049
Dibromochloromethane	ug/g	<0.050	0.050	6105049				<0.050	0.050	6105049
1,2-Dichlorobenzene	ug/g	<0.050	0.050	6105049				<0.050	0.050	6105049
1,3-Dichlorobenzene	ug/g	<0.050	0.050	6105049				<0.050	0.050	6105049
1,4-Dichlorobenzene	ug/g	<0.050	0.050	6105049				<0.050	0.050	6105049
Dichlorodifluoromethane (FREON 12)	ug/g	<0.050	0.050	6105049				<0.050	0.050	6105049
1,1-Dichloroethane	ug/g	<0.050	0.050	6105049				<0.050	0.050	6105049
1,2-Dichloroethane	ug/g	<0.050	0.050	6105049				<0.050	0.050	6105049
1,1-Dichloroethylene	ug/g	<0.050	0.050	6105049				<0.050	0.050	6105049
cis-1,2-Dichloroethylene	ug/g	<0.050	0.050	6105049				<0.050	0.050	6105049
trans-1,2-Dichloroethylene	ug/g	<0.050	0.050	6105049				<0.050	0.050	6105049
1,2-Dichloropropane	ug/g	<0.050	0.050	6105049				<0.050	0.050	6105049
cis-1,3-Dichloropropene	ug/g	<0.030	0.030	6105049				<0.030	0.030	6105049
trans-1,3-Dichloropropene	ug/g	<0.040	0.040	6105049				<0.040	0.040	6105049
Ethylbenzene	ug/g	<0.020	0.020	6105049				<0.020	0.020	6105049
Ethylene Dibromide	ug/g	<0.050	0.050	6105049				<0.050	0.050	6105049
Hexane	ug/g	<0.050	0.050	6105049				<0.050	0.050	6105049
Methylene Chloride(Dichloromethane)	ug/g	<0.050	0.050	6105049				<0.050	0.050	6105049
Methyl Ethyl Ketone (2-Butanone)	ug/g	<0.50	0.50	6105049				<0.50	0.50	6105049
Methyl Isobutyl Ketone	ug/g	<0.50	0.50	6105049				<0.50	0.50	6105049
Methyl t-butyl ether (MTBE)	ug/g	<0.050	0.050	6105049				<0.050	0.050	6105049
Styrene	ug/g	<0.050	0.050	6105049				<0.050	0.050	6105049
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate										

O.REG 153 VOCS BY HS & F1-F4 (SOIL)

Maxxam ID		JPF438			JPF438			JPF439		
Sampling Date		2019/04/29			2019/04/29			2019/04/29		
COC Number		102916			102916			102916		
	UNITS	MW-1 SS-6	RDL	QC Batch	MW-1 SS-6 Lab-Dup	RDL	QC Batch	MW-2 SS-3	RDL	QC Batch
1,1,1,2-Tetrachloroethane	ug/g	<0.050	0.050	6105049				<0.050	0.050	6105049
1,1,2,2-Tetrachloroethane	ug/g	<0.050	0.050	6105049				<0.050	0.050	6105049
Tetrachloroethylene	ug/g	<0.050	0.050	6105049				<0.050	0.050	6105049
Toluene	ug/g	0.044	0.020	6105049				0.029	0.020	6105049
1,1,1-Trichloroethane	ug/g	<0.050	0.050	6105049				<0.050	0.050	6105049
1,1,2-Trichloroethane	ug/g	<0.050	0.050	6105049				<0.050	0.050	6105049
Trichloroethylene	ug/g	<0.050	0.050	6105049				<0.050	0.050	6105049
Trichlorofluoromethane (FREON 11)	ug/g	<0.050	0.050	6105049				<0.050	0.050	6105049
Vinyl Chloride	ug/g	<0.020	0.020	6105049				<0.020	0.020	6105049
p+m-Xylene	ug/g	<0.020	0.020	6105049				<0.020	0.020	6105049
o-Xylene	ug/g	<0.020	0.020	6105049				<0.020	0.020	6105049
Total Xylenes	ug/g	<0.020	0.020	6105049				<0.020	0.020	6105049
F1 (C6-C10)	ug/g	<10	10	6105049				<10	10	6105049
F1 (C6-C10) - BTEX	ug/g	<10	10	6105049				<10	10	6105049
F2-F4 Hydrocarbons										
F2 (C10-C16 Hydrocarbons)	ug/g	30	10	6107133				<10	10	6107133
F3 (C16-C34 Hydrocarbons)	ug/g	<50	50	6107133				<50	50	6107133
F4 (C34-C50 Hydrocarbons)	ug/g	<50	50	6107133				<50	50	6107133
Reached Baseline at C50	ug/g	Yes		6107133				Yes		6107133
Surrogate Recovery (%)										
o-Terphenyl	%	91		6107133				93		6107133
4-Bromofluorobenzene	%	98		6105049				99		6105049
D10-o-Xylene	%	107		6105049				124		6105049
D4-1,2-Dichloroethane	%	89		6105049				91		6105049
D8-Toluene	%	101		6105049				103		6105049
RDL = Reportable Detection Limit										
QC Batch = Quality Control Batch										
Lab-Dup = Laboratory Initiated Duplicate										

RESULTS OF ANALYSES OF SOIL

Maxxam ID		JPF437		JPF438			JPF439	
Sampling Date		2019/04/29		2019/04/29			2019/04/29	
COC Number		102916		102916			102916	
	UNITS	MW-1 SS-2	QC Batch	MW-1 SS-6	RDL	QC Batch	MW-2 SS-3	QC Batch
Inorganics								
Available (CaCl ₂) pH	pH	6.85	6105184				7.00	6105184
Miscellaneous Parameters								
Grain Size	%			FINE	N/A	6104965		
Sieve - #200 (<0.075mm)	%			100	1	6104965		
Sieve - #200 (>0.075mm)	%			<1	1	6104965		
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable								

O.REG 153 PAHS (WATER)

Maxxam ID		JPF440	JPF441		
Sampling Date		2019/05/01	2019/05/01		
COC Number		102916	102916		
	UNITS	MW-1	MW-2	RDL	QC Batch
Calculated Parameters					
Methylnaphthalene, 2-(1-)	ug/L	<0.071	<0.071	0.071	6099607
Polyaromatic Hydrocarbons					
Acenaphthene	ug/L	<0.050	<0.050	0.050	6102359
Acenaphthylene	ug/L	<0.050	<0.050	0.050	6102359
Anthracene	ug/L	<0.050	<0.050	0.050	6102359
Benzo(a)anthracene	ug/L	<0.050	<0.050	0.050	6102359
Benzo(a)pyrene	ug/L	<0.010	<0.010	0.010	6102359
Benzo(b,j)fluoranthene	ug/L	<0.050	<0.050	0.050	6102359
Benzo(g,h,i)perylene	ug/L	<0.050	<0.050	0.050	6102359
Benzo(k)fluoranthene	ug/L	<0.050	<0.050	0.050	6102359
Chrysene	ug/L	<0.050	<0.050	0.050	6102359
Dibenz(a,h)anthracene	ug/L	<0.050	<0.050	0.050	6102359
Fluoranthene	ug/L	<0.050	<0.050	0.050	6102359
Fluorene	ug/L	<0.050	<0.050	0.050	6102359
Indeno(1,2,3-cd)pyrene	ug/L	<0.050	<0.050	0.050	6102359
1-Methylnaphthalene	ug/L	<0.050	<0.050	0.050	6102359
2-Methylnaphthalene	ug/L	<0.050	<0.050	0.050	6102359
Naphthalene	ug/L	<0.050	<0.050	0.050	6102359
Phenanthrene	ug/L	<0.030	<0.030	0.030	6102359
Pyrene	ug/L	<0.050	<0.050	0.050	6102359
Surrogate Recovery (%)					
D10-Anthracene	%	113	100		6102359
D14-Terphenyl (FS)	%	100	78		6102359
D8-Acenaphthylene	%	98	102		6102359
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					

O.REG 153 VOCs BY HS & F1-F4 (WATER)

Maxxam ID		JPF440	JPF441		
Sampling Date		2019/05/01	2019/05/01		
COC Number		102916	102916		
	UNITS	MW-1	MW-2	RDL	QC Batch
Calculated Parameters					
1,3-Dichloropropene (cis+trans)	ug/L	<0.50	<0.50	0.50	6099980
Volatile Organics					
Acetone (2-Propanone)	ug/L	<10	<10	10	6105053
Benzene	ug/L	<0.20	<0.20	0.20	6105053
Bromodichloromethane	ug/L	<0.50	<0.50	0.50	6105053
Bromoform	ug/L	<1.0	<1.0	1.0	6105053
Bromomethane	ug/L	<0.50	<0.50	0.50	6105053
Carbon Tetrachloride	ug/L	<0.20	<0.20	0.20	6105053
Chlorobenzene	ug/L	<0.20	<0.20	0.20	6105053
Chloroform	ug/L	<0.20	<0.20	0.20	6105053
Dibromochloromethane	ug/L	<0.50	<0.50	0.50	6105053
1,2-Dichlorobenzene	ug/L	<0.50	<0.50	0.50	6105053
1,3-Dichlorobenzene	ug/L	<0.50	<0.50	0.50	6105053
1,4-Dichlorobenzene	ug/L	<0.50	<0.50	0.50	6105053
Dichlorodifluoromethane (FREON 12)	ug/L	<1.0	<1.0	1.0	6105053
1,1-Dichloroethane	ug/L	<0.20	<0.20	0.20	6105053
1,2-Dichloroethane	ug/L	<0.50	<0.50	0.50	6105053
1,1-Dichloroethylene	ug/L	<0.20	<0.20	0.20	6105053
cis-1,2-Dichloroethylene	ug/L	<0.50	<0.50	0.50	6105053
trans-1,2-Dichloroethylene	ug/L	<0.50	<0.50	0.50	6105053
1,2-Dichloropropane	ug/L	<0.20	<0.20	0.20	6105053
cis-1,3-Dichloropropene	ug/L	<0.30	<0.30	0.30	6105053
trans-1,3-Dichloropropene	ug/L	<0.40	<0.40	0.40	6105053
Ethylbenzene	ug/L	<0.20	<0.20	0.20	6105053
Ethylene Dibromide	ug/L	<0.20	<0.20	0.20	6105053
Hexane	ug/L	<1.0	<1.0	1.0	6105053
Methylene Chloride(Dichloromethane)	ug/L	<2.0	<2.0	2.0	6105053
Methyl Ethyl Ketone (2-Butanone)	ug/L	<10	<10	10	6105053
Methyl Isobutyl Ketone	ug/L	<5.0	<5.0	5.0	6105053
Methyl t-butyl ether (MTBE)	ug/L	<0.50	<0.50	0.50	6105053
Styrene	ug/L	<0.50	<0.50	0.50	6105053
1,1,1,2-Tetrachloroethane	ug/L	<0.50	<0.50	0.50	6105053
1,1,2,2-Tetrachloroethane	ug/L	<0.50	<0.50	0.50	6105053
Tetrachloroethylene	ug/L	<0.20	<0.20	0.20	6105053
Toluene	ug/L	<0.20	<0.20	0.20	6105053
1,1,1-Trichloroethane	ug/L	<0.20	<0.20	0.20	6105053
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					

O.REG 153 VOCs BY HS & F1-F4 (WATER)

Maxxam ID		JPF440	JPF441		
Sampling Date		2019/05/01	2019/05/01		
COC Number		102916	102916		
	UNITS	MW-1	MW-2	RDL	QC Batch
1,1,2-Trichloroethane	ug/L	<0.50	<0.50	0.50	6105053
Trichloroethylene	ug/L	<0.20	<0.20	0.20	6105053
Trichlorofluoromethane (FREON 11)	ug/L	<0.50	<0.50	0.50	6105053
Vinyl Chloride	ug/L	<0.20	<0.20	0.20	6105053
p+m-Xylene	ug/L	<0.20	<0.20	0.20	6105053
o-Xylene	ug/L	<0.20	<0.20	0.20	6105053
Total Xylenes	ug/L	<0.20	<0.20	0.20	6105053
F1 (C6-C10)	ug/L	<25	<25	25	6105053
F1 (C6-C10) - BTEX	ug/L	<25	<25	25	6105053
F2-F4 Hydrocarbons					
F2 (C10-C16 Hydrocarbons)	ug/L	<100	<100	100	6100703
F3 (C16-C34 Hydrocarbons)	ug/L	<200	<200	200	6100703
F4 (C34-C50 Hydrocarbons)	ug/L	<200	<200	200	6100703
Reached Baseline at C50	ug/L	Yes	Yes		6100703
Surrogate Recovery (%)					
o-Terphenyl	%	110	113		6100703
4-Bromofluorobenzene	%	94	97		6105053
D4-1,2-Dichloroethane	%	100	103		6105053
D8-Toluene	%	94	96		6105053
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					

TEST SUMMARY

Maxxam ID: JPF437
Sample ID: MW-1 SS-2
Matrix: Soil

Collected: 2019/04/29
Shipped:
Received: 2019/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
pH CaCl2 EXTRACT	AT	6105184	2019/05/06	2019/05/06	Gnana Thomas

Maxxam ID: JPF438
Sample ID: MW-1 SS-6
Matrix: Soil

Collected: 2019/04/29
Shipped:
Received: 2019/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	6099587	N/A	2019/05/07	Automated Statchk
1,3-Dichloropropene Sum	CALC	6099979	N/A	2019/05/07	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	6107133	2019/05/02	2019/05/07	Mariana Vascan
Moisture	BAL	6106276	N/A	2019/05/07	Fatemeh Habibagahi
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	6105617	2019/05/06	2019/05/06	Jett Wu
Sieve, 75um	SIEV	6104965	N/A	2019/05/07	Min Yang
Volatile Organic Compounds and F1 PHCs	GC/MSFD	6105049	N/A	2019/05/07	Liliana Gaburici

Maxxam ID: JPF438 Dup
Sample ID: MW-1 SS-6
Matrix: Soil

Collected: 2019/04/29
Shipped:
Received: 2019/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	6106276	N/A	2019/05/07	Fatemeh Habibagahi

Maxxam ID: JPF439
Sample ID: MW-2 SS-3
Matrix: Soil

Collected: 2019/04/29
Shipped:
Received: 2019/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	6099587	N/A	2019/05/07	Automated Statchk
1,3-Dichloropropene Sum	CALC	6099979	N/A	2019/05/07	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	6107133	2019/05/02	2019/05/07	Mariana Vascan
Moisture	BAL	6106276	N/A	2019/05/07	Fatemeh Habibagahi
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	6105617	2019/05/06	2019/05/06	Jett Wu
pH CaCl2 EXTRACT	AT	6105184	2019/05/06	2019/05/06	Gnana Thomas
Volatile Organic Compounds and F1 PHCs	GC/MSFD	6105049	N/A	2019/05/07	Liliana Gaburici

Maxxam ID: JPF440
Sample ID: MW-1
Matrix: Water

Collected: 2019/05/01
Shipped:
Received: 2019/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	6099607	N/A	2019/05/07	Automated Statchk
1,3-Dichloropropene Sum	CALC	6099980	N/A	2019/05/07	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	6100703	2019/05/02	2019/05/08	Mariana Vascan
PAH Compounds in Water by GC/MS (SIM)	GC/MS	6102359	2019/05/03	2019/05/03	Mitesh Raj
Volatile Organic Compounds and F1 PHCs	GC/MSFD	6105053	N/A	2019/05/07	Liliana Gaburici

TEST SUMMARY

Maxxam ID: JPF441
Sample ID: MW-2
Matrix: Water

Collected: 2019/05/01
Shipped:
Received: 2019/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	6099607	N/A	2019/05/07	Automated Statchk
1,3-Dichloropropene Sum	CALC	6099980	N/A	2019/05/07	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	6100703	2019/05/02	2019/05/08	Mariana Vasan
PAH Compounds in Water by GC/MS (SIM)	GC/MS	6102359	2019/05/03	2019/05/03	Mitesh Raj
Volatile Organic Compounds and F1 PHCs	GC/MSFD	6105053	N/A	2019/05/07	Liliana Gaburici

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	7.0°C
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Sample JPF438 [MW-1 SS-6] : PAH analysis: Detection limits were adjusted for high moisture content.

Results relate only to the items tested.

QUALITY ASSURANCE REPORT

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6100703	MVA	Matrix Spike		o-Terphenyl	2019/05/09		111	%	30 - 130
				F2 (C10-C16 Hydrocarbons)	2019/05/09		102	%	50 - 130
				F3 (C16-C34 Hydrocarbons)	2019/05/09		102	%	50 - 130
				F4 (C34-C50 Hydrocarbons)	2019/05/09		102	%	50 - 130
6100703	MVA	Spiked Blank		o-Terphenyl	2019/05/09		113	%	30 - 130
				F2 (C10-C16 Hydrocarbons)	2019/05/09		101	%	80 - 120
				F3 (C16-C34 Hydrocarbons)	2019/05/09		101	%	80 - 120
				F4 (C34-C50 Hydrocarbons)	2019/05/09		101	%	80 - 120
6100703	MVA	Method Blank		o-Terphenyl	2019/05/08		113	%	30 - 130
				F2 (C10-C16 Hydrocarbons)	2019/05/08	<100		ug/L	
				F3 (C16-C34 Hydrocarbons)	2019/05/08	<200		ug/L	
				F4 (C34-C50 Hydrocarbons)	2019/05/08	<200		ug/L	
6100703	MVA	RPD		F2 (C10-C16 Hydrocarbons)	2019/05/08	NC		%	50
				F3 (C16-C34 Hydrocarbons)	2019/05/08	16		%	50
				F4 (C34-C50 Hydrocarbons)	2019/05/08	7.5		%	50
6102359	RAJ	Matrix Spike		D10-Anthracene	2019/05/03		111	%	50 - 130
				D14-Terphenyl (FS)	2019/05/03		101	%	50 - 130
				D8-Acenaphthylene	2019/05/03		98	%	50 - 130
				Acenaphthene	2019/05/03		102	%	50 - 130
				Acenaphthylene	2019/05/03		100	%	50 - 130
				Anthracene	2019/05/03		102	%	50 - 130
				Benzo(a)anthracene	2019/05/03		104	%	50 - 130
				Benzo(a)pyrene	2019/05/03		98	%	50 - 130
				Benzo(b/j)fluoranthene	2019/05/03		100	%	50 - 130
				Benzo(g,h,i)perylene	2019/05/03		95	%	50 - 130
				Benzo(k)fluoranthene	2019/05/03		89	%	50 - 130
				Chrysene	2019/05/03		84	%	50 - 130
				Dibenz(a,h)anthracene	2019/05/03		81	%	50 - 130
				Fluoranthene	2019/05/03		112	%	50 - 130
				Fluorene	2019/05/03		99	%	50 - 130
				Indeno(1,2,3-cd)pyrene	2019/05/03		102	%	50 - 130
				1-Methylnaphthalene	2019/05/03		116	%	50 - 130
				2-Methylnaphthalene	2019/05/03		102	%	50 - 130
				Naphthalene	2019/05/03		95	%	50 - 130
				Phenanthrene	2019/05/03		102	%	50 - 130
6102359	RAJ	Spiked Blank		Pyrene	2019/05/03		110	%	50 - 130
				D10-Anthracene	2019/05/03		111	%	50 - 130
				D14-Terphenyl (FS)	2019/05/03		106	%	50 - 130
				D8-Acenaphthylene	2019/05/03		98	%	50 - 130
				Acenaphthene	2019/05/03		99	%	50 - 130
				Acenaphthylene	2019/05/03		96	%	50 - 130
				Anthracene	2019/05/03		99	%	50 - 130
				Benzo(a)anthracene	2019/05/03		102	%	50 - 130
				Benzo(a)pyrene	2019/05/03		95	%	50 - 130
				Benzo(b/j)fluoranthene	2019/05/03		97	%	50 - 130
				Benzo(g,h,i)perylene	2019/05/03		93	%	50 - 130
				Benzo(k)fluoranthene	2019/05/03		85	%	50 - 130
				Chrysene	2019/05/03		82	%	50 - 130
				Dibenz(a,h)anthracene	2019/05/03		81	%	50 - 130
				Fluoranthene	2019/05/03		109	%	50 - 130
				Fluorene	2019/05/03		96	%	50 - 130
				Indeno(1,2,3-cd)pyrene	2019/05/03		100	%	50 - 130
				1-Methylnaphthalene	2019/05/03		113	%	50 - 130
				2-Methylnaphthalene	2019/05/03		98	%	50 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6102359	RAJ	Method Blank	Naphthalene	2019/05/03		92	%	50 - 130
			Phenanthrene	2019/05/03		100	%	50 - 130
			Pyrene	2019/05/03		108	%	50 - 130
			D10-Anthracene	2019/05/03		113	%	50 - 130
			D14-Terphenyl (FS)	2019/05/03		110	%	50 - 130
			D8-Acenaphthylene	2019/05/03		99	%	50 - 130
			Acenaphthene	2019/05/03	<0.050		ug/L	
			Acenaphthylene	2019/05/03	<0.050		ug/L	
			Anthracene	2019/05/03	<0.050		ug/L	
			Benzo(a)anthracene	2019/05/03	<0.050		ug/L	
			Benzo(a)pyrene	2019/05/03	<0.010		ug/L	
			Benzo(b/j)fluoranthene	2019/05/03	<0.050		ug/L	
			Benzo(g,h,i)perylene	2019/05/03	<0.050		ug/L	
			Benzo(k)fluoranthene	2019/05/03	<0.050		ug/L	
			Chrysene	2019/05/03	<0.050		ug/L	
			Dibenz(a,h)anthracene	2019/05/03	<0.050		ug/L	
			Fluoranthene	2019/05/03	<0.050		ug/L	
			Fluorene	2019/05/03	<0.050		ug/L	
			Indeno(1,2,3-cd)pyrene	2019/05/03	<0.050		ug/L	
			1-Methylnaphthalene	2019/05/03	<0.050		ug/L	
			2-Methylnaphthalene	2019/05/03	<0.050		ug/L	
			Naphthalene	2019/05/03	<0.050		ug/L	
			Phenanthrene	2019/05/03	<0.030		ug/L	
			Pyrene	2019/05/03	<0.050		ug/L	
6102359	RAJ	RPD	Acenaphthene	2019/05/03	5.9		%	30
			Acenaphthylene	2019/05/03	NC		%	30
			Anthracene	2019/05/03	6.4		%	30
			Benzo(a)anthracene	2019/05/03	NC		%	30
			Benzo(a)pyrene	2019/05/03	NC		%	30
			Benzo(b/j)fluoranthene	2019/05/03	NC		%	30
			Benzo(g,h,i)perylene	2019/05/03	NC		%	30
			Benzo(k)fluoranthene	2019/05/03	NC		%	30
			Chrysene	2019/05/03	NC		%	30
			Dibenz(a,h)anthracene	2019/05/03	NC		%	30
			Fluoranthene	2019/05/03	NC		%	30
			Fluorene	2019/05/03	5.1		%	30
			Indeno(1,2,3-cd)pyrene	2019/05/03	NC		%	30
			1-Methylnaphthalene	2019/05/03	NC		%	30
			2-Methylnaphthalene	2019/05/03	18		%	30
			Naphthalene	2019/05/03	0		%	30
			Phenanthrene	2019/05/03	1.3		%	30
			Pyrene	2019/05/03	NC		%	30
6104965	GYA	QC Standard	Sieve - #200 (<0.075mm)	2019/05/07		55	%	53 - 58
			Sieve - #200 (>0.075mm)	2019/05/07		45	%	42 - 47
6104965	GYA	RPD	Sieve - #200 (<0.075mm)	2019/05/07	0.30		%	20
			Sieve - #200 (>0.075mm)	2019/05/07	3.7		%	20
6105049	LGA	Matrix Spike	4-Bromofluorobenzene	2019/05/07		98	%	60 - 140
			D10-o-Xylene	2019/05/07		108	%	60 - 130
			D4-1,2-Dichloroethane	2019/05/07		99	%	60 - 140
			D8-Toluene	2019/05/07		107	%	60 - 140
			Acetone (2-Propanone)	2019/05/07		82	%	60 - 140
			Benzene	2019/05/07		92	%	60 - 140
			Bromodichloromethane	2019/05/07		87	%	60 - 140
			Bromoform	2019/05/07		93	%	60 - 140

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6105049	LGA	Spiked Blank	Bromomethane	2019/05/07		87	%	60 - 140
			Carbon Tetrachloride	2019/05/07		86	%	60 - 140
			Chlorobenzene	2019/05/07		93	%	60 - 140
			Chloroform	2019/05/07		85	%	60 - 140
			Dibromochloromethane	2019/05/07		93	%	60 - 140
			1,2-Dichlorobenzene	2019/05/07		86	%	60 - 140
			1,3-Dichlorobenzene	2019/05/07		87	%	60 - 140
			1,4-Dichlorobenzene	2019/05/07		87	%	60 - 140
			Dichlorodifluoromethane (FREON 12)	2019/05/07		104	%	60 - 140
			1,1-Dichloroethane	2019/05/07		88	%	60 - 140
			1,2-Dichloroethane	2019/05/07		79	%	60 - 140
			1,1-Dichloroethylene	2019/05/07		86	%	60 - 140
			cis-1,2-Dichloroethylene	2019/05/07		81	%	60 - 140
			trans-1,2-Dichloroethylene	2019/05/07		79	%	60 - 140
			1,2-Dichloropropane	2019/05/07		78	%	60 - 140
			cis-1,3-Dichloropropene	2019/05/07		69	%	60 - 140
			trans-1,3-Dichloropropene	2019/05/07		78	%	60 - 140
			Ethylbenzene	2019/05/07		89	%	60 - 140
			Ethylene Dibromide	2019/05/07		92	%	60 - 140
			Hexane	2019/05/07		104	%	60 - 140
			Methylene Chloride(Dichloromethane)	2019/05/07		86	%	60 - 140
			Methyl Ethyl Ketone (2-Butanone)	2019/05/07		88	%	60 - 140
			Methyl Isobutyl Ketone	2019/05/07		87	%	60 - 140
			Methyl t-butyl ether (MTBE)	2019/05/07		84	%	60 - 140
			Styrene	2019/05/07		87	%	60 - 140
			1,1,1,2-Tetrachloroethane	2019/05/07		97	%	60 - 140
			1,1,2,2-Tetrachloroethane	2019/05/07		91	%	60 - 140
			Tetrachloroethylene	2019/05/07		87	%	60 - 140
			Toluene	2019/05/07		91	%	60 - 140
			1,1,1-Trichloroethane	2019/05/07		92	%	60 - 140
			1,1,2-Trichloroethane	2019/05/07		86	%	60 - 140
			Trichloroethylene	2019/05/07		87	%	60 - 140
			Trichlorofluoromethane (FREON 11)	2019/05/07		99	%	60 - 140
			Vinyl Chloride	2019/05/07		97	%	60 - 140
			p+m-Xylene	2019/05/07		94	%	60 - 140
			o-Xylene	2019/05/07		93	%	60 - 140
			F1 (C6-C10)	2019/05/07		99	%	60 - 140
			4-Bromofluorobenzene	2019/05/07		103	%	60 - 140
			D10-o-Xylene	2019/05/07		122	%	60 - 130
			D4-1,2-Dichloroethane	2019/05/07		102	%	60 - 140
			D8-Toluene	2019/05/07		107	%	60 - 140
			Acetone (2-Propanone)	2019/05/07		92	%	60 - 140
			Benzene	2019/05/07		97	%	60 - 130
			Bromodichloromethane	2019/05/07		92	%	60 - 130
			Bromoform	2019/05/07		99	%	60 - 130
			Bromomethane	2019/05/07		93	%	60 - 140
			Carbon Tetrachloride	2019/05/07		89	%	60 - 130
			Chlorobenzene	2019/05/07		96	%	60 - 130
			Chloroform	2019/05/07		87	%	60 - 130
			Dibromochloromethane	2019/05/07		99	%	60 - 130
			1,2-Dichlorobenzene	2019/05/07		90	%	60 - 130
			1,3-Dichlorobenzene	2019/05/07		88	%	60 - 130
			1,4-Dichlorobenzene	2019/05/07		89	%	60 - 130
			Dichlorodifluoromethane (FREON 12)	2019/05/07		107	%	60 - 140

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6105049	LGA	Method Blank	1,1-Dichloroethane	2019/05/07		93	%	60 - 130
			1,2-Dichloroethane	2019/05/07		84	%	60 - 130
			1,1-Dichloroethylene	2019/05/07		90	%	60 - 130
			cis-1,2-Dichloroethylene	2019/05/07		86	%	60 - 130
			trans-1,2-Dichloroethylene	2019/05/07		85	%	60 - 130
			1,2-Dichloropropane	2019/05/07		81	%	60 - 130
			cis-1,3-Dichloropropene	2019/05/07		85	%	60 - 130
			trans-1,3-Dichloropropene	2019/05/07		81	%	60 - 130
			Ethylbenzene	2019/05/07		94	%	60 - 130
			Ethylene Dibromide	2019/05/07		97	%	60 - 130
			Hexane	2019/05/07		105	%	60 - 130
			Methylene Chloride(Dichloromethane)	2019/05/07		90	%	60 - 130
			Methyl Ethyl Ketone (2-Butanone)	2019/05/07		98	%	60 - 140
			Methyl Isobutyl Ketone	2019/05/07		95	%	60 - 130
			Methyl t-butyl ether (MTBE)	2019/05/07		88	%	60 - 130
			Styrene	2019/05/07		91	%	60 - 130
			1,1,1,2-Tetrachloroethane	2019/05/07		101	%	60 - 130
			1,1,1,2-Tetrachloroethane	2019/05/07		98	%	60 - 130
			Tetrachloroethylene	2019/05/07		91	%	60 - 130
			Toluene	2019/05/07		92	%	60 - 130
			1,1,1-Trichloroethane	2019/05/07		95	%	60 - 130
			1,1,2-Trichloroethane	2019/05/07		91	%	60 - 130
			Trichloroethylene	2019/05/07		92	%	60 - 130
			Trichlorofluoromethane (FREON 11)	2019/05/07		101	%	60 - 130
			Vinyl Chloride	2019/05/07		104	%	60 - 130
			p+m-Xylene	2019/05/07		97	%	60 - 130
			o-Xylene	2019/05/07		96	%	60 - 130
			F1 (C6-C10)	2019/05/07		95	%	80 - 120
			4-Bromofluorobenzene	2019/05/07		100	%	60 - 140
			D10-o-Xylene	2019/05/07		103	%	60 - 130
			D4-1,2-Dichloroethane	2019/05/07		112	%	60 - 140
			D8-Toluene	2019/05/07		94	%	60 - 140
			Acetone (2-Propanone)	2019/05/07	<0.50		ug/g	
			Benzene	2019/05/07	<0.020		ug/g	
			Bromodichloromethane	2019/05/07	<0.050		ug/g	
			Bromoform	2019/05/07	<0.050		ug/g	
			Bromomethane	2019/05/07	<0.050		ug/g	
			Carbon Tetrachloride	2019/05/07	<0.050		ug/g	
			Chlorobenzene	2019/05/07	<0.050		ug/g	
			Chloroform	2019/05/07	<0.050		ug/g	
			Dibromochloromethane	2019/05/07	<0.050		ug/g	
			1,2-Dichlorobenzene	2019/05/07	<0.050		ug/g	
			1,3-Dichlorobenzene	2019/05/07	<0.050		ug/g	
			1,4-Dichlorobenzene	2019/05/07	<0.050		ug/g	
			Dichlorodifluoromethane (FREON 12)	2019/05/07	<0.050		ug/g	
			1,1-Dichloroethane	2019/05/07	<0.050		ug/g	
			1,2-Dichloroethane	2019/05/07	<0.050		ug/g	
			1,1-Dichloroethylene	2019/05/07	<0.050		ug/g	
			cis-1,2-Dichloroethylene	2019/05/07	<0.050		ug/g	
			trans-1,2-Dichloroethylene	2019/05/07	<0.050		ug/g	
			1,2-Dichloropropane	2019/05/07	<0.050		ug/g	
			cis-1,3-Dichloropropene	2019/05/07	<0.030		ug/g	
			trans-1,3-Dichloropropene	2019/05/07	<0.040		ug/g	
			Ethylbenzene	2019/05/07	<0.020		ug/g	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6105049	LGA	RPD	Ethylene Dibromide	2019/05/07	<0.050		ug/g	
			Hexane	2019/05/07	<0.050		ug/g	
			Methylene Chloride(Dichloromethane)	2019/05/07	<0.050		ug/g	
			Methyl Ethyl Ketone (2-Butanone)	2019/05/07	<0.50		ug/g	
			Methyl Isobutyl Ketone	2019/05/07	<0.50		ug/g	
			Methyl t-butyl ether (MTBE)	2019/05/07	<0.050		ug/g	
			Styrene	2019/05/07	<0.050		ug/g	
			1,1,1,2-Tetrachloroethane	2019/05/07	<0.050		ug/g	
			1,1,2,2-Tetrachloroethane	2019/05/07	<0.050		ug/g	
			Tetrachloroethylene	2019/05/07	<0.050		ug/g	
			Toluene	2019/05/07	<0.020		ug/g	
			1,1,1-Trichloroethane	2019/05/07	<0.050		ug/g	
			1,1,2-Trichloroethane	2019/05/07	<0.050		ug/g	
			Trichloroethylene	2019/05/07	<0.050		ug/g	
			Trichlorofluoromethane (FREON 11)	2019/05/07	<0.050		ug/g	
			Vinyl Chloride	2019/05/07	<0.020		ug/g	
			p+m-Xylene	2019/05/07	<0.020		ug/g	
			o-Xylene	2019/05/07	<0.020		ug/g	
			Total Xylenes	2019/05/07	<0.020		ug/g	
			F1 (C6-C10)	2019/05/07	<10		ug/g	
			F1 (C6-C10) - BTEX	2019/05/07	<10		ug/g	
			Acetone (2-Propanone)	2019/05/07	NC		%	50
			Benzene	2019/05/07	NC		%	50
			Bromodichloromethane	2019/05/07	NC		%	50
			Bromoform	2019/05/07	NC		%	50
			Bromomethane	2019/05/07	NC		%	50
			Carbon Tetrachloride	2019/05/07	NC		%	50
			Chlorobenzene	2019/05/07	NC		%	50
			Chloroform	2019/05/07	NC		%	50
			Dibromochloromethane	2019/05/07	NC		%	50
			1,2-Dichlorobenzene	2019/05/07	NC		%	50
			1,3-Dichlorobenzene	2019/05/07	NC		%	50
			1,4-Dichlorobenzene	2019/05/07	NC		%	50
			Dichlorodifluoromethane (FREON 12)	2019/05/07	NC		%	50
			1,1-Dichloroethane	2019/05/07	NC		%	50
			1,2-Dichloroethane	2019/05/07	NC		%	50
			1,1-Dichloroethylene	2019/05/07	NC		%	50
			cis-1,2-Dichloroethylene	2019/05/07	NC		%	50
			trans-1,2-Dichloroethylene	2019/05/07	NC		%	50
			1,2-Dichloropropane	2019/05/07	NC		%	50
			cis-1,3-Dichloropropene	2019/05/07	NC		%	50
			trans-1,3-Dichloropropene	2019/05/07	NC		%	50
			Ethylbenzene	2019/05/07	NC		%	50
			Ethylene Dibromide	2019/05/07	NC		%	50
			Hexane	2019/05/07	NC		%	50
			Methylene Chloride(Dichloromethane)	2019/05/07	NC		%	50
			Methyl Ethyl Ketone (2-Butanone)	2019/05/07	NC		%	50
			Methyl Isobutyl Ketone	2019/05/07	NC		%	50
			Methyl t-butyl ether (MTBE)	2019/05/07	NC		%	50
			Styrene	2019/05/07	NC		%	50
			1,1,1,2-Tetrachloroethane	2019/05/07	NC		%	50
			1,1,2,2-Tetrachloroethane	2019/05/07	NC		%	50
			Tetrachloroethylene	2019/05/07	NC		%	50
			Toluene	2019/05/07	NC		%	50

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6105053	LGA	Matrix Spike	1,1,1-Trichloroethane	2019/05/07	NC		%	50
			1,1,2-Trichloroethane	2019/05/07	NC		%	50
			Trichloroethylene	2019/05/07	NC		%	50
			Trichlorofluoromethane (FREON 11)	2019/05/07	NC		%	50
			Vinyl Chloride	2019/05/07	NC		%	50
			p+m-Xylene	2019/05/07	NC		%	50
			o-Xylene	2019/05/07	NC		%	50
			Total Xylenes	2019/05/07	NC		%	50
			F1 (C6-C10)	2019/05/07	NC		%	30
			F1 (C6-C10) - BTEX	2019/05/07	NC		%	30
			4-Bromofluorobenzene	2019/05/06		102	%	70 - 130
			D4-1,2-Dichloroethane	2019/05/06		112	%	70 - 130
			D8-Toluene	2019/05/06		99	%	70 - 130
			Acetone (2-Propanone)	2019/05/06		109	%	60 - 140
			Benzene	2019/05/06		96	%	70 - 130
			Bromodichloromethane	2019/05/06		94	%	70 - 130
			Bromoform	2019/05/06		104	%	70 - 130
			Bromomethane	2019/05/06		91	%	60 - 140
			Carbon Tetrachloride	2019/05/06		93	%	70 - 130
			Chlorobenzene	2019/05/06		94	%	70 - 130
			Chloroform	2019/05/06		84	%	70 - 130
			Dibromochloromethane	2019/05/06		100	%	70 - 130
			1,2-Dichlorobenzene	2019/05/06		88	%	70 - 130
			1,3-Dichlorobenzene	2019/05/06		87	%	70 - 130
			1,4-Dichlorobenzene	2019/05/06		92	%	70 - 130
			Dichlorodifluoromethane (FREON 12)	2019/05/06		95	%	60 - 140
			1,1-Dichloroethane	2019/05/06		89	%	70 - 130
			1,2-Dichloroethane	2019/05/06		91	%	70 - 130
			1,1-Dichloroethylene	2019/05/06		84	%	70 - 130
			cis-1,2-Dichloroethylene	2019/05/06		86	%	70 - 130
			trans-1,2-Dichloroethylene	2019/05/06		84	%	70 - 130
			1,2-Dichloropropane	2019/05/06		87	%	70 - 130
			cis-1,3-Dichloropropene	2019/05/06		93	%	70 - 130
			trans-1,3-Dichloropropene	2019/05/06		111	%	70 - 130
			Ethylbenzene	2019/05/06		88	%	70 - 130
			Ethylene Dibromide	2019/05/06		105	%	70 - 130
			Hexane	2019/05/06		94	%	70 - 130
			Methylene Chloride(Dichloromethane)	2019/05/06		93	%	70 - 130
			Methyl Ethyl Ketone (2-Butanone)	2019/05/06		101	%	60 - 140
			Methyl Isobutyl Ketone	2019/05/06		120	%	70 - 130
			Methyl t-butyl ether (MTBE)	2019/05/06		94	%	70 - 130
			Styrene	2019/05/06		90	%	70 - 130
			1,1,1,2-Tetrachloroethane	2019/05/06		94	%	70 - 130
			1,1,2,2-Tetrachloroethane	2019/05/06		106	%	70 - 130
			Tetrachloroethylene	2019/05/06		80	%	70 - 130
			Toluene	2019/05/06		88	%	70 - 130
			1,1,1-Trichloroethane	2019/05/06		86	%	70 - 130
			1,1,2-Trichloroethane	2019/05/06		94	%	70 - 130
			Trichloroethylene	2019/05/06		88	%	70 - 130
			Trichlorofluoromethane (FREON 11)	2019/05/06		89	%	70 - 130
			Vinyl Chloride	2019/05/06		97	%	70 - 130
			p+m-Xylene	2019/05/06		92	%	70 - 130
			o-Xylene	2019/05/06		90	%	70 - 130
			F1 (C6-C10)	2019/05/06		96	%	60 - 140

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6105053	LGA	Spiked Blank		4-Bromofluorobenzene	2019/05/06		101	%	70 - 130
				D4-1,2-Dichloroethane	2019/05/06		99	%	70 - 130
				D8-Toluene	2019/05/06		102	%	70 - 130
				Acetone (2-Propanone)	2019/05/06		85	%	60 - 140
				Benzene	2019/05/06		96	%	70 - 130
				Bromodichloromethane	2019/05/06		89	%	70 - 130
				Bromoform	2019/05/06		93	%	70 - 130
				Bromomethane	2019/05/06		93	%	60 - 140
				Carbon Tetrachloride	2019/05/06		85	%	70 - 130
				Chlorobenzene	2019/05/06		95	%	70 - 130
				Chloroform	2019/05/06		86	%	70 - 130
				Dibromochloromethane	2019/05/06		92	%	70 - 130
				1,2-Dichlorobenzene	2019/05/06		89	%	70 - 130
				1,3-Dichlorobenzene	2019/05/06		93	%	70 - 130
				1,4-Dichlorobenzene	2019/05/06		96	%	70 - 130
				Dichlorodifluoromethane (FREON 12)	2019/05/06		105	%	60 - 140
				1,1-Dichloroethane	2019/05/06		89	%	70 - 130
				1,2-Dichloroethane	2019/05/06		81	%	70 - 130
				1,1-Dichloroethylene	2019/05/06		89	%	70 - 130
				cis-1,2-Dichloroethylene	2019/05/06		84	%	70 - 130
				trans-1,2-Dichloroethylene	2019/05/06		88	%	70 - 130
				1,2-Dichloropropane	2019/05/06		80	%	70 - 130
				cis-1,3-Dichloropropene	2019/05/06		84	%	70 - 130
				trans-1,3-Dichloropropene	2019/05/06		96	%	70 - 130
				Ethylbenzene	2019/05/06		92	%	70 - 130
				Ethylene Dibromide	2019/05/06		95	%	70 - 130
				Hexane	2019/05/06		107	%	70 - 130
				Methylene Chloride(Dichloromethane)	2019/05/06		89	%	70 - 130
				Methyl Ethyl Ketone (2-Butanone)	2019/05/06		95	%	60 - 140
				Methyl Isobutyl Ketone	2019/05/06		95	%	70 - 130
				Methyl t-butyl ether (MTBE)	2019/05/06		88	%	70 - 130
				Styrene	2019/05/06		91	%	70 - 130
				1,1,1,2-Tetrachloroethane	2019/05/06		94	%	70 - 130
				1,1,2,2-Tetrachloroethane	2019/05/06		93	%	70 - 130
				Tetrachloroethylene	2019/05/06		89	%	70 - 130
				Toluene	2019/05/06		90	%	70 - 130
				1,1,1-Trichloroethane	2019/05/06		91	%	70 - 130
				1,1,2-Trichloroethane	2019/05/06		88	%	70 - 130
				Trichloroethylene	2019/05/06		92	%	70 - 130
				Trichlorofluoromethane (FREON 11)	2019/05/06		97	%	70 - 130
				Vinyl Chloride	2019/05/06		106	%	70 - 130
				p+m-Xylene	2019/05/06		98	%	70 - 130
				o-Xylene	2019/05/06		93	%	70 - 130
				F1 (C6-C10)	2019/05/06		98	%	60 - 140
6105053	LGA	Method Blank		4-Bromofluorobenzene	2019/05/06		101	%	70 - 130
				D4-1,2-Dichloroethane	2019/05/06		100	%	70 - 130
				D8-Toluene	2019/05/06		97	%	70 - 130
				Acetone (2-Propanone)	2019/05/06	<10		ug/L	
				Benzene	2019/05/06	<0.20		ug/L	
				Bromodichloromethane	2019/05/06	<0.50		ug/L	
				Bromoform	2019/05/06	<1.0		ug/L	
				Bromomethane	2019/05/06	<0.50		ug/L	
				Carbon Tetrachloride	2019/05/06	<0.20		ug/L	
				Chlorobenzene	2019/05/06	<0.20		ug/L	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6105053	LGA	RPD	Chloroform	2019/05/06	<0.20		ug/L	
			Dibromochloromethane	2019/05/06	<0.50		ug/L	
			1,2-Dichlorobenzene	2019/05/06	<0.50		ug/L	
			1,3-Dichlorobenzene	2019/05/06	<0.50		ug/L	
			1,4-Dichlorobenzene	2019/05/06	<0.50		ug/L	
			Dichlorodifluoromethane (FREON 12)	2019/05/06	<1.0		ug/L	
			1,1-Dichloroethane	2019/05/06	<0.20		ug/L	
			1,2-Dichloroethane	2019/05/06	<0.50		ug/L	
			1,1-Dichloroethylene	2019/05/06	<0.20		ug/L	
			cis-1,2-Dichloroethylene	2019/05/06	<0.50		ug/L	
			trans-1,2-Dichloroethylene	2019/05/06	<0.50		ug/L	
			1,2-Dichloropropane	2019/05/06	<0.20		ug/L	
			cis-1,3-Dichloropropene	2019/05/06	<0.30		ug/L	
			trans-1,3-Dichloropropene	2019/05/06	<0.40		ug/L	
			Ethylbenzene	2019/05/06	<0.20		ug/L	
			Ethylene Dibromide	2019/05/06	<0.20		ug/L	
			Hexane	2019/05/06	<1.0		ug/L	
			Methylene Chloride(Dichloromethane)	2019/05/06	<2.0		ug/L	
			Methyl Ethyl Ketone (2-Butanone)	2019/05/06	<10		ug/L	
			Methyl Isobutyl Ketone	2019/05/06	<5.0		ug/L	
			Methyl t-butyl ether (MTBE)	2019/05/06	<0.50		ug/L	
			Styrene	2019/05/06	<0.50		ug/L	
			1,1,1,2-Tetrachloroethane	2019/05/06	<0.50		ug/L	
			1,1,2,2-Tetrachloroethane	2019/05/06	<0.50		ug/L	
			Tetrachloroethylene	2019/05/06	<0.20		ug/L	
			Toluene	2019/05/06	<0.20		ug/L	
			1,1,1-Trichloroethane	2019/05/06	<0.20		ug/L	
			1,1,2-Trichloroethane	2019/05/06	<0.50		ug/L	
			Trichloroethylene	2019/05/06	<0.20		ug/L	
			Trichlorofluoromethane (FREON 11)	2019/05/06	<0.50		ug/L	
			Vinyl Chloride	2019/05/06	<0.20		ug/L	
			p+m-Xylene	2019/05/06	<0.20		ug/L	
			o-Xylene	2019/05/06	<0.20		ug/L	
			Total Xylenes	2019/05/06	<0.20		ug/L	
			F1 (C6-C10)	2019/05/06	<25		ug/L	
			F1 (C6-C10) - BTEX	2019/05/06	<25		ug/L	
			Acetone (2-Propanone)	2019/05/06	NC		%	30
			Benzene	2019/05/06	NC		%	30
			Bromodichloromethane	2019/05/06	NC		%	30
			Bromoform	2019/05/06	NC		%	30
			Bromomethane	2019/05/06	NC		%	30
			Carbon Tetrachloride	2019/05/06	NC		%	30
			Chlorobenzene	2019/05/06	NC		%	30
			Chloroform	2019/05/06	NC		%	30
			Dibromochloromethane	2019/05/06	NC		%	30
			1,2-Dichlorobenzene	2019/05/06	NC		%	30
			1,3-Dichlorobenzene	2019/05/06	NC		%	30
			1,4-Dichlorobenzene	2019/05/06	NC		%	30
			Dichlorodifluoromethane (FREON 12)	2019/05/06	NC		%	30
			1,1-Dichloroethane	2019/05/06	6.4		%	30
			1,2-Dichloroethane	2019/05/06	NC		%	30
			1,1-Dichloroethylene	2019/05/06	NC		%	30
			cis-1,2-Dichloroethylene	2019/05/06	NC		%	30
			trans-1,2-Dichloroethylene	2019/05/06	NC		%	30

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,2-Dichloropropane	2019/05/06	NC		%	30
			cis-1,3-Dichloropropene	2019/05/06	NC		%	30
			trans-1,3-Dichloropropene	2019/05/06	NC		%	30
			Ethylbenzene	2019/05/06	NC		%	30
			Ethylene Dibromide	2019/05/06	NC		%	30
			Hexane	2019/05/06	NC		%	30
			Methylene Chloride(Dichloromethane)	2019/05/06	NC		%	30
			Methyl Ethyl Ketone (2-Butanone)	2019/05/06	NC		%	30
			Methyl Isobutyl Ketone	2019/05/06	NC		%	30
			Methyl t-butyl ether (MTBE)	2019/05/06	NC		%	30
			Styrene	2019/05/06	NC		%	30
			1,1,1,2-Tetrachloroethane	2019/05/06	NC		%	30
			1,1,2,2-Tetrachloroethane	2019/05/06	NC		%	30
			Tetrachloroethylene	2019/05/06	NC		%	30
			Toluene	2019/05/06	NC		%	30
			1,1,1-Trichloroethane	2019/05/06	11		%	30
			1,1,2-Trichloroethane	2019/05/06	NC		%	30
			Trichloroethylene	2019/05/06	3.9		%	30
			Trichlorofluoromethane (FREON 11)	2019/05/06	NC		%	30
			Vinyl Chloride	2019/05/06	NC		%	30
			p+m-Xylene	2019/05/06	NC		%	30
			o-Xylene	2019/05/06	NC		%	30
			Total Xylenes	2019/05/06	NC		%	30
			F1 (C6-C10)	2019/05/06	NC		%	30
			F1 (C6-C10) - BTEX	2019/05/06	NC		%	30
6105184	GTO	Spiked Blank	Available (CaCl2) pH	2019/05/06		100	%	97 - 103
6105184	GTO	RPD	Available (CaCl2) pH	2019/05/06	0.48		%	N/A
6105617	JET	Matrix Spike	D10-Anthracene	2019/05/06		115	%	50 - 130
			D14-Terphenyl (FS)	2019/05/06		126	%	50 - 130
			D8-Acenaphthylene	2019/05/06		97	%	50 - 130
			Acenaphthene	2019/05/06		86	%	50 - 130
			Acenaphthylene	2019/05/06		96	%	50 - 130
			Anthracene	2019/05/06		105	%	50 - 130
			Benzo(a)anthracene	2019/05/06		121	%	50 - 130
			Benzo(a)pyrene	2019/05/06		98	%	50 - 130
			Benzo(b,j)fluoranthene	2019/05/06		92	%	50 - 130
			Benzo(g,h,i)perylene	2019/05/06		99	%	50 - 130
			Benzo(k)fluoranthene	2019/05/06		80	%	50 - 130
			Chrysene	2019/05/06		81	%	50 - 130
			Dibenz(a,h)anthracene	2019/05/06		101	%	50 - 130
			Fluoranthene	2019/05/06		131 (1)	%	50 - 130
			Fluorene	2019/05/06		83	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2019/05/06		109	%	50 - 130
			1-Methylnaphthalene	2019/05/06		116	%	50 - 130
			2-Methylnaphthalene	2019/05/06		105	%	50 - 130
			Naphthalene	2019/05/06		91	%	50 - 130
			Phenanthrene	2019/05/06		91	%	50 - 130
			Pyrene	2019/05/06		128	%	50 - 130
6105617	JET	Spiked Blank	D10-Anthracene	2019/05/06		117	%	50 - 130
			D14-Terphenyl (FS)	2019/05/06		115	%	50 - 130
			D8-Acenaphthylene	2019/05/06		114	%	50 - 130
			Acenaphthene	2019/05/06		95	%	50 - 130
			Acenaphthylene	2019/05/06		105	%	50 - 130
			Anthracene	2019/05/06		101	%	50 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6105617	JET	Method Blank		Benzo(a)anthracene	2019/05/06		115	%	50 - 130
				Benzo(a)pyrene	2019/05/06		95	%	50 - 130
				Benzo(b/j)fluoranthene	2019/05/06		90	%	50 - 130
				Benzo(g,h,i)perylene	2019/05/06		97	%	50 - 130
				Benzo(k)fluoranthene	2019/05/06		78	%	50 - 130
				Chrysene	2019/05/06		79	%	50 - 130
				Dibenz(a,h)anthracene	2019/05/06		99	%	50 - 130
				Fluoranthene	2019/05/06		113	%	50 - 130
				Fluorene	2019/05/06		90	%	50 - 130
				Indeno(1,2,3-cd)pyrene	2019/05/06		107	%	50 - 130
				1-Methylnaphthalene	2019/05/06		114	%	50 - 130
				2-Methylnaphthalene	2019/05/06		103	%	50 - 130
				Naphthalene	2019/05/06		90	%	50 - 130
				Phenanthrene	2019/05/06		89	%	50 - 130
				Pyrene	2019/05/06		112	%	50 - 130
				D10-Anthracene	2019/05/06		118	%	50 - 130
				D14-Terphenyl (FS)	2019/05/06		115	%	50 - 130
				D8-Acenaphthylene	2019/05/06		113	%	50 - 130
				Acenaphthene	2019/05/06	<0.0050		ug/g	
				Acenaphthylene	2019/05/06	<0.0050		ug/g	
				Anthracene	2019/05/06	<0.0050		ug/g	
				Benzo(a)anthracene	2019/05/06	<0.0050		ug/g	
				Benzo(a)pyrene	2019/05/06	<0.0050		ug/g	
				Benzo(b/j)fluoranthene	2019/05/06	<0.0050		ug/g	
				Benzo(g,h,i)perylene	2019/05/06	<0.0050		ug/g	
				Benzo(k)fluoranthene	2019/05/06	<0.0050		ug/g	
				Chrysene	2019/05/06	<0.0050		ug/g	
				Dibenz(a,h)anthracene	2019/05/06	<0.0050		ug/g	
				Fluoranthene	2019/05/06	<0.0050		ug/g	
				Fluorene	2019/05/06	<0.0050		ug/g	
				Indeno(1,2,3-cd)pyrene	2019/05/06	<0.0050		ug/g	
				1-Methylnaphthalene	2019/05/06	<0.0050		ug/g	
				2-Methylnaphthalene	2019/05/06	<0.0050		ug/g	
				Naphthalene	2019/05/06	<0.0050		ug/g	
				Phenanthrene	2019/05/06	<0.0050		ug/g	
				Pyrene	2019/05/06	<0.0050		ug/g	
6105617	JET	RPD		Acenaphthene	2019/05/06	NC		%	40
				Acenaphthylene	2019/05/06	NC		%	40
				Anthracene	2019/05/06	NC		%	40
				Benzo(a)anthracene	2019/05/06	NC		%	40
				Benzo(a)pyrene	2019/05/06	NC		%	40
				Benzo(b/j)fluoranthene	2019/05/06	NC		%	40
				Benzo(g,h,i)perylene	2019/05/06	NC		%	40
				Benzo(k)fluoranthene	2019/05/06	NC		%	40
				Chrysene	2019/05/06	NC		%	40
				Dibenz(a,h)anthracene	2019/05/06	NC		%	40
				Fluoranthene	2019/05/06	NC		%	40
				Fluorene	2019/05/06	NC		%	40
				Indeno(1,2,3-cd)pyrene	2019/05/06	NC		%	40
				1-Methylnaphthalene	2019/05/06	NC		%	40
				2-Methylnaphthalene	2019/05/06	NC		%	40
				Naphthalene	2019/05/06	NC		%	40
				Phenanthrene	2019/05/06	NC		%	40
				Pyrene	2019/05/06	NC		%	40

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6106276	FHB	RPD [JPF438-01]	Moisture	2019/05/07	2.7		%	50
6107133	MVA	Matrix Spike	o-Terphenyl	2019/05/07		99	%	30 - 130
			F2 (C10-C16 Hydrocarbons)	2019/05/07		100	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2019/05/07		100	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2019/05/07		100	%	50 - 130
6107133	MVA	Spiked Blank	o-Terphenyl	2019/05/07		97	%	30 - 130
			F2 (C10-C16 Hydrocarbons)	2019/05/07		98	%	80 - 120
			F3 (C16-C34 Hydrocarbons)	2019/05/07		98	%	80 - 120
			F4 (C34-C50 Hydrocarbons)	2019/05/07		98	%	80 - 120
6107133	MVA	Method Blank	o-Terphenyl	2019/05/07		93	%	30 - 130
			F2 (C10-C16 Hydrocarbons)	2019/05/07	<10		ug/g	
			F3 (C16-C34 Hydrocarbons)	2019/05/07	<50		ug/g	
			F4 (C34-C50 Hydrocarbons)	2019/05/07	<50		ug/g	
6107133	MVA	RPD	F2 (C10-C16 Hydrocarbons)	2019/05/07	NC		%	50
			F3 (C16-C34 Hydrocarbons)	2019/05/07	NC		%	50
			F4 (C34-C50 Hydrocarbons)	2019/05/07	NC		%	50

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference $\leq 2 \times \text{RDL}$).

(1) The recovery was above the upper control limit. This may represent a high bias in some results for this specific analyte. For results that were not detected (ND), this potential bias has no impact.

VALIDATION SIGNATURE PAGE

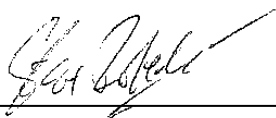
The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Anastassia Hamanov, Scientific Specialist



Liliana Gaburici, VOC Lab



Steve Roberts, Ottawa Lab Manager

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

CHAIN OF CUSTODY RECORD

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Invoice Information		Report Information (if differs from invoice)		Project Information (where applicable)		Turnaround Time (TAT) Required										
Company Name: <u>Pinchuk Ltd</u>	Company Name:	Quotation #:	☒ Regular TAT (5-7 days) Most analyses													
Contact Name: <u>Mike Kosin</u>	Contact Name:	P.O. #/ AFE#:	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS													
Address: <u>Matt Ryan</u>	Address: <u>SAME</u>	Project #: <u>236 269-001</u>	Rush TAT (Surcharges will be applied)													
Phone: <u>Hines Ed Krasat</u>	Phone:	Site Location:	☐ 1 Day ☐ 2 Days ☐ 3-4 Days													
Email: <u>Hines Ed Krasat</u>	Email:	Site #:	Date Required:													
Sampled By:		Rush Confirmation #:														
MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY																
Regulation 153 ☐ Table 1 ☐ Res/Park ☒ Med/ Fine ☐ Table 2 ☒ Ind/Comm ☐ Coarse ☒ Table 3 ☐ Agri/ Other ☐ Table _____ FOR RSC (PLEASE CIRCLE) Y / N		Other Regulations ☐ CCME ☐ Sanitary Sewer Bylaw ☐ MISA ☐ Storm Sewer Bylaw ☐ PWQO ☐ Region ☐ Other (Specify) _____ ☐ REG 558 (MIN. 3 DAY TAT REQUIRED)		Analysis Requested FIELD FILTERED (CIRCLE) Metals / Hg / CrVI BTEX/ PHC F1 PHCs F2 - F4 VOCs REG 153 METALS & INORGANICS REG 153 ICPMS METALS REG 153 METALS (Hg, CrVI, ICPMS Metals, HWS - B) DAHS PH Texture (5um)				LABORATORY USE ONLY CUSTODY SEAL Y / N Present Intact COOLER TEMPERATURES 8.2.6 COOLING MEDIA PRESENT: Y / N COMMENTS								
Include Criteria on Certificate of Analysis: Y / N SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM																
SAMPLE IDENTIFICATION	DATE SAMPLED (YYYY/MM/DD)	TIME SAMPLED (HH:MM)	MATRIX	# OF CONTAINERS SUBMITTED	FIELD FILTERED (CIRCLE) Metals / Hg / CrVI	BTEX/ PHC F1	PHCs F2 - F4	VOCs	REG 153 METALS & INORGANICS	REG 153 ICPMS METALS	REG 153 METALS (Hg, CrVI, ICPMS Metals, HWS - B)	DAHS	PH	Texture (5um)	HOLD-DO NOT ANALYZE	COMMENTS
1 Mw-1 SS-2	April 29 2019	AM 8:16	1	1								X				
2 Mw-1 SS-4	2019	L	2	2		X	X	X				X		X		
3 Mw-2 SS-3	L	PM	2	2		X	X	X				X		X		
4																
5 Mw-1	MAY 1 2019	AM 6:15	5	5												
6 Mw-2	2019	L	5	5												
7																
8																
9																
10																
RELINQUISHED BY: (Signature/Print)		DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)		DATE: (YYYY/MM/DD)	TIME: (HH:MM)	MAXXAM JOB #								
<u>Mike Kosin</u>		MAY 1 2019	12:30 PM	<u>Kenn J...</u>		MAY 1 2019	1:35 PM									

Unless otherwise agreed to in writing, work submitted on this Chain of Custody is subject to Maxxam's standard Terms and Conditions. Signing of this Chain of Custody document is acknowledgment and acceptance of our terms which are available for viewing at www.maxxam.ca/terms. Sample container, preservation, hold time and packages information can be viewed at <http://www.maxxam.ca/wp-content/uploads/Ontario-COC.pdf>.

CHAIN OF CUSTODY RECORD

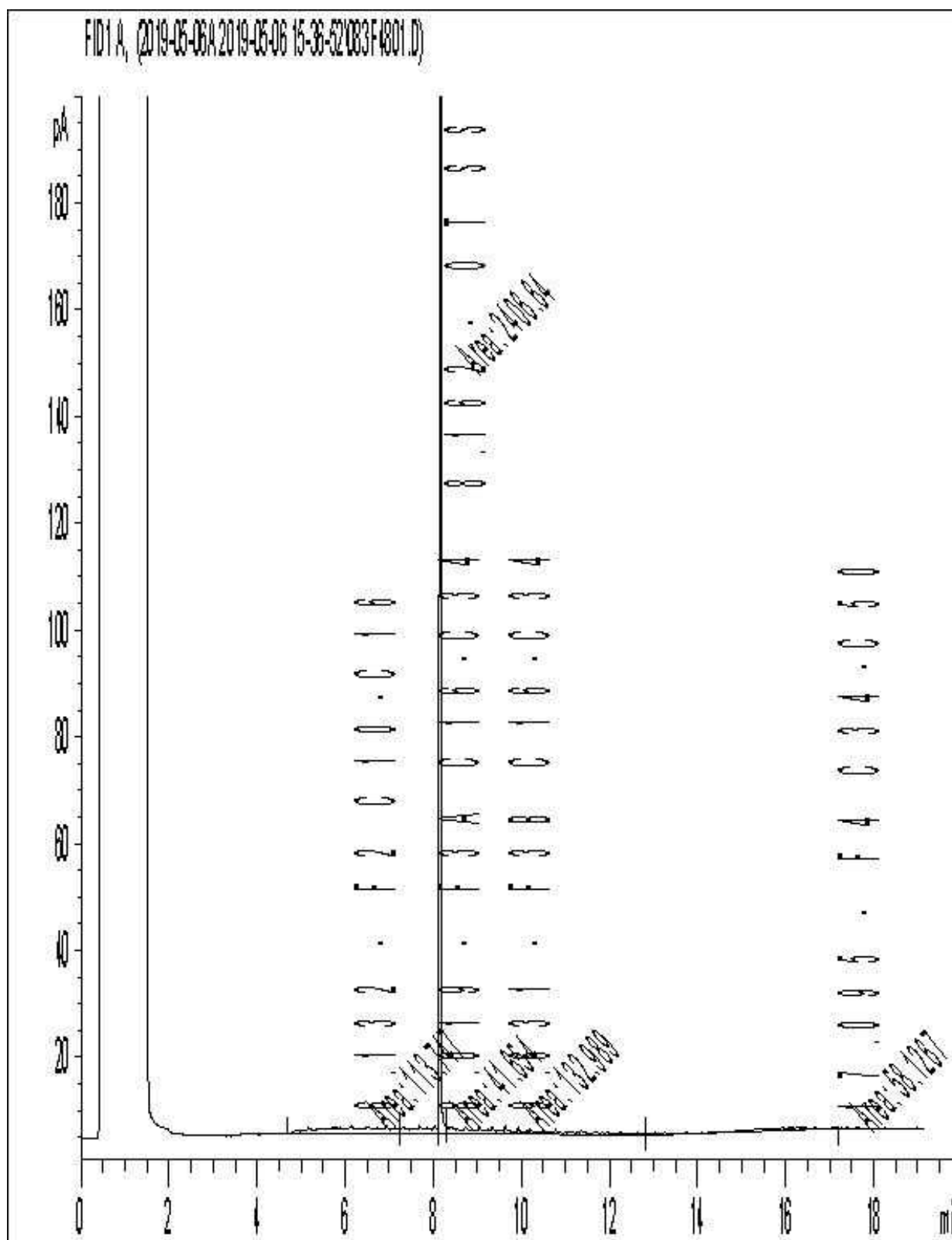
102916 Page 1 of 1

Invoice Information		Report Information (if differs from invoice)		Project Information (where applicable)		Turnaround Time (TAT) Required	
Company Name: <u>Pinehill Ltd</u>		Company Name:		Quotation #:		☒ Regular TAT (5-7 days) Most analyses	
Contact Name: <u>Mike Kosin</u>		Contact Name:		P.O. #/ A/E/R:		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS	
Address: <u>Matt Ryan</u>		Address: <u>SAME</u>		Project #: <u>236269.001</u>		Rush TAT (Surcharges will be applied)	
Phone:		Phone:		Site Location:		☐ 1 Day ☐ 2 Days ☐ 3-4 Days	
Email: <u>Hilary De Kromat</u>		Email:		Site #:		Date Required:	
Fax:		Fax:		Sampled By:		Rush Confirmation #:	
MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY							
Regulation 153		Other Regulations		Analysis Requested		LABORATORY USE ONLY	
☐ Table 1 ☐ Res/Park ☒ Med/ Fine ☐ Table 2 ☒ Ind/Comm ☐ Coarse ☒ Table 3 ☐ Agri/ Other ☐ Table 4		☐ CCME ☐ Sanitary Sewer Bylaw ☐ MISA ☐ Storm Sewer Bylaw ☐ PWQO ☐ Region ☐ Other (Specify) ☐ REG 558 (MIN. 3 DAY TAT REQUIRED)		# OF CONTAINERS SUBMITTED FIELD FILTERED (CIRCLE) Metals / ng / CVI HTEX/ PHC 11 PHC 12 14 VOCs REG 153 METALS & INORGANICS REG 153 METALS (Hg, Cr VI, ICMS Metals, HWS - Bi) PAHs PH Testure (TSA)		CUSTODY SEAL Y / N Present Intact 8.2.6 5/2/3 COOLING MEDIA PRESENT: ☐ Y ☐ N COMMENTS	
Include Criteria on Certificate of Analysis: Y / N							
SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM							
SAMPLE IDENTIFICATION		DATE SAMPLED (YYYY/MM/DD)	TIME SAMPLED (HH:MM)	MATRIX			
1 MW-1 SS-2		April 29	AM	8L	1		
2 MW-1 SS-4		2019	L		2 XXXX		
3 MW-2 SS-3		L	PM		2 XXXX		
4							
5 MW-1		MAY 1	AM	6L	5		
6 MW-2		2019	L		5		
7							
8							
9							
10							
RELINQUISHED BY: (Signature/Print)		DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)		DATE: (YYYY/MM/DD)	TIME: (HH:MM)
<u>Mike Kosin</u>		MAY 1	12:30	<u>Karen Tanya</u>		2019/05/01	15:35
		2019	PM	<u>Alisha Williamson</u>		2019/05/03	08:00

01-May-19 15:35
Alisha Williamson
B9B5591

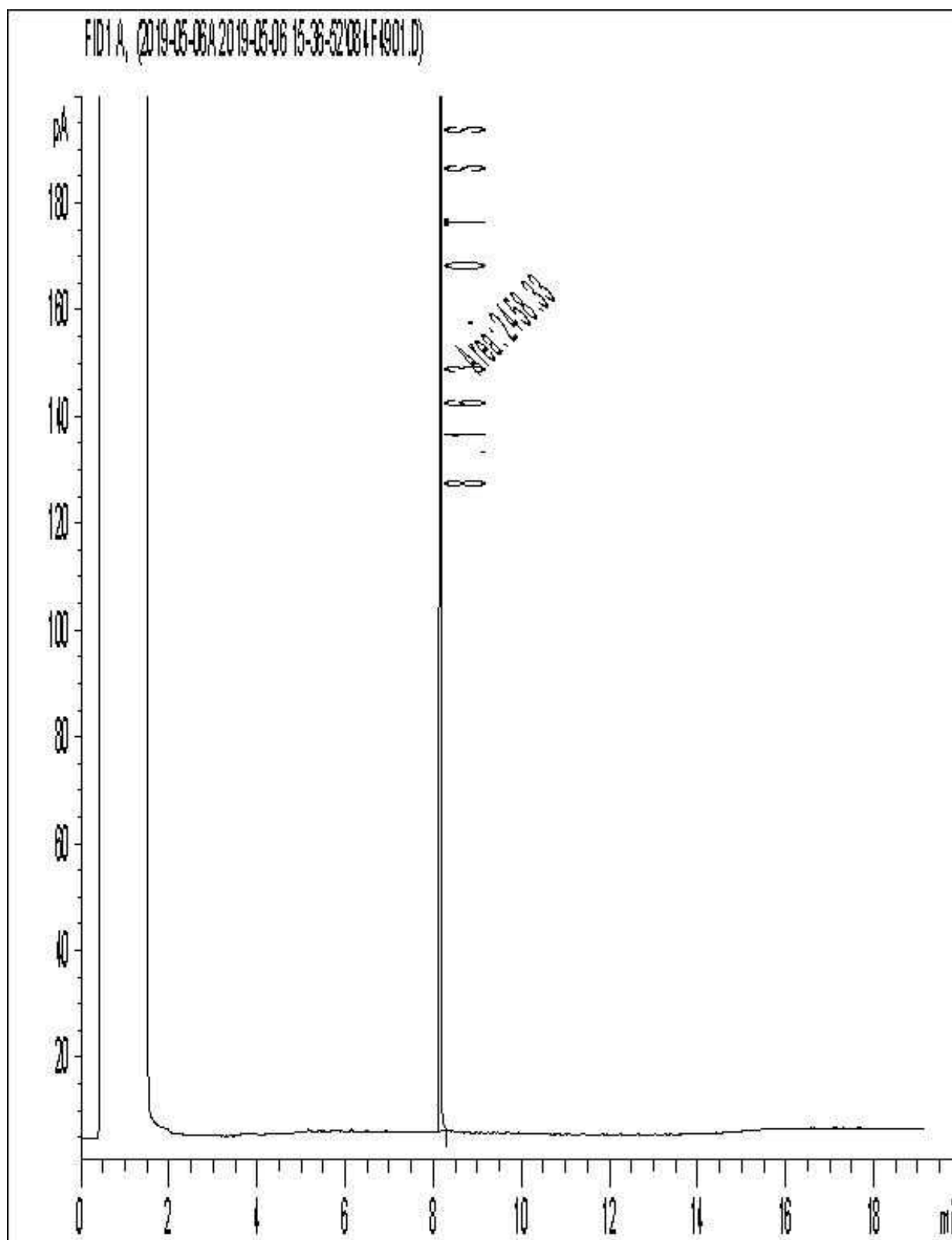
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Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



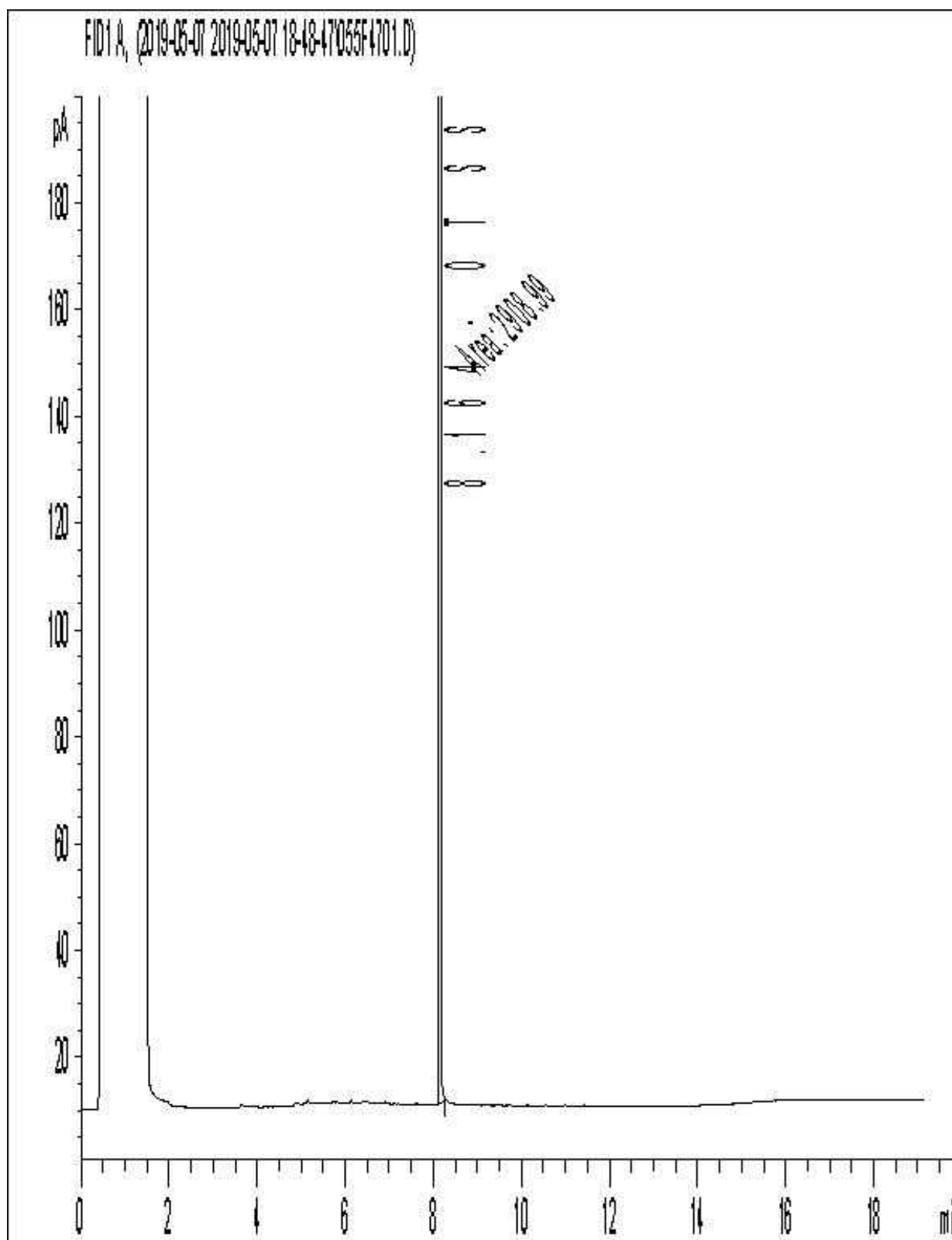
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



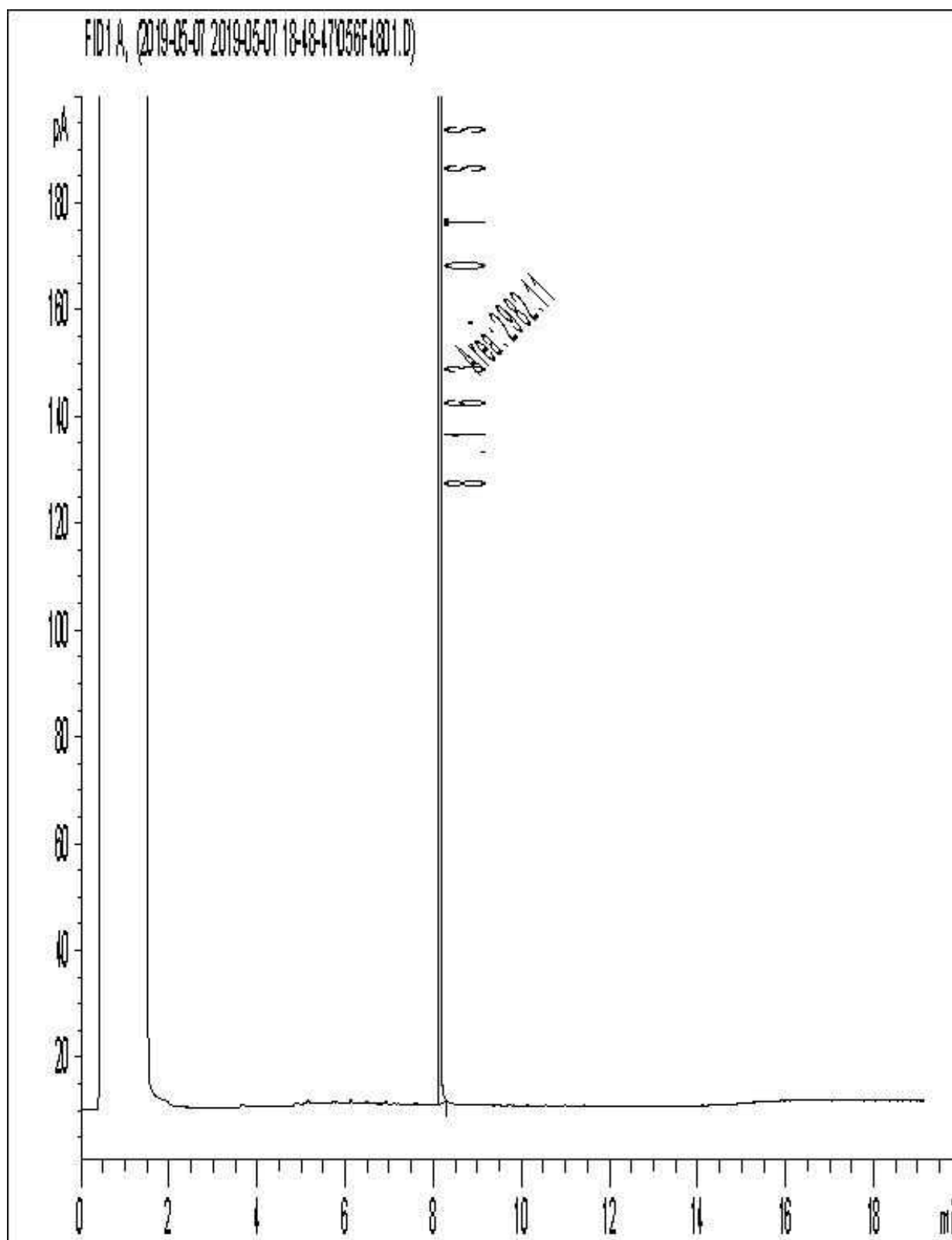
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.