

MEMO

DATE May 8th, 2026 **PROJECT NO.** 1808-7701

RE Chloride Impact Assessment
Bisgould Lands
2699 Victoria Street North, Township of Woolwich

TO Township of Woolwich
24 Church Street West
Elmira, ON N3B 2Z6

FROM Trevor Fraser, P.Eng.
C.F. Crozier & Associates Inc.

CC

1.0 Introduction

C.F. Crozier & Associates Inc. (Crozier) was retained by Thomasfield Homes Limited, to prepare a Chloride Impact Assessment in support of the Official Plan Amendment (OPA)/ Zoning By-Law Amendment (ZBA) application for the site located at 2699 Victoria Street N, in the Township of Woolwich. The subject lands cover an area of approximately 44 ha and currently consist primarily of agricultural fields, open space, a tributary of Hopewell creek, and a wetland. The Subject Lands are bounded by Kramp Road south, a cemetery to the east, Greenhouse Road to the west and Victoria St N to the north.

The proposed Concept Plan (GSP Group, July 2023) features a mix of single-detached, townhouse residential, and mixed-use units. It also includes designated blocks for a Stormwater Management Facility and a park, along with 23 m and 18 m wide Right-of-Way allowances. The proposed unit distribution has been included below:

- 174 Mixed-Use Apartment Units
- 52 Stacked Townhouse Units
- 88 Back-to-back Townhouse Units
- 10.40 ha of Low-Density Residential Area

This plan has been prepared to review the site design, considering the impact of road salt application on the local environment. This plan suggests practical methods of winter maintenance that will help limit sodium and chloride concentrations in the water supply. Please refer to the attached Figure 1 for details.

2.0 Source Water Protection

The site is located within the Hopewell Creek watershed and is within the Regulation Limits of the Grand River Conservation Authority (GRCA). A review of the Ministry of Environment Conservation and Parks (MECP) Source Protection Information Atlas revealed that the property is located within a Wellhead Protection Area D (WHPA-D) with a vulnerability score of 2. Furthermore, the site is in a Wellhead Protection Area with Groundwater Under Direct Influence (WHPA-E).

Given the source protection triggers noted above, the proposed development will be subject to Source Water Protection policies if activities include any prescribed drinking water threats under the Clean Water Act that would be considered a significant drinking water threat. The following items fall under prescribed drinking water threats:

- Handling, storage, and application of Dense Non-Aqueous Phase Liquids (DNAPLs).
- Handling, storage, and application of commercial grade fertilizers.
- Handling, storage, and application of agricultural (ASM) and non-agricultural source material (NASM) (e.g., manure, imported soils).
- Handling, storage, and application of pesticides.
- Handling and storage of solvents.
- The handling and storage of large quantities of fuels.
- The storage of snow and the handling, storage, and application of road salt.

The proposed development is residential; therefore, it is not anticipated that DNAPLs, commercial grade fertilizers, pesticides, organic solvents, or fuels will be handled or stored on the site. However, snow storage and salt application will be proposed for the development. Therefore, the following sections describe the proposed winter maintenance practices to minimize potential groundwater impacts and adhere to source water protection policies.

3.0 Identification of Traffic Areas and Sensitive Features

The proposed development consists of residential units, right-of-way allowances, a park, a stormwater management facility, and natural heritage areas. Surface parking is proposed for the mixed-use blocks located in the northern and western portions of the subject property. The site is accessed by four entrances: one entrance from Victoria St N and one from Kramp Rd for the eastern portion of the Subject Lands; and two entrances from Greenhouse Road for the western portion of the Subject Lands. The internal roadways are proposed to be paved surfaces with adequate storm drainage infrastructure, directing drainage to the stormwater management facility in the central portion of the lands. There is a natural heritage area in the

central portion of the lands, where consists of a wetland and tributary of Hopewell Creek. All sidewalks and entrances to the site are anticipated to experience pedestrian and vehicle usage. Please refer to the attached Figure 1 for details.

Existing and proposed fire hydrants located within the site should remain free of obstructions (i.e. snow) for a minimum of a 1-meter radius. The owner shall ensure snowfall from the entrances and sidewalks does not accumulate around the existing and proposed fire hydrants and snow is removed around the hydrants on an as-needed basis.

Special snow removal considerations will be applied to the sensitive areas described above to ensure that snow removal and salt management are completed in accordance with this plan. Please refer to the attached Winter Maintenance Plan (Figure 1) for the proposed site layout.

4.0 Identification of Snow-Storage/Disposal Areas

Based on the development concept plan GSP Group (dated October 17, 2025), most of the site is covered by residential and environmental protection area. The snow management operations proposed for the site allow for snow to be stored on the landscaped and paved areas during minor snowfall events and removed off-site during major snowfall events. The location for snow storage is located on the Winter Maintenance Plan (Figure 1). Snow storage will primarily be located along the landscaped areas and paved parking spaces where meltwater can be directed towards the internal storm sewer system, ultimately discharging to the stormwater management facility in the central portion of the subject property. The areas designated for snow storage removal are anticipated to have sufficient space to store minor snow events. Snow storage areas are not intended to provide snow storage for external areas.

5.0 Use of Alternative Products

Numerous ice control/winter maintenance products are currently available as alternatives to road salts. These do not utilize chloride dissolution to melt ice and therefore, minimize the potential release of sodium and chloride in meltwater. These alternative products are manufactured from bio-degradable sources and use ionization principles to inhibit ice and snow bonding to asphalt. However, since these technologies are relatively new, they are more expensive than rock salt. It is also difficult to compare product performance since some of these products have not been used consistently for long periods of time.

A winter maintenance contractor that is "Smart about Salt" certified could help compare and assess the effectiveness of each alternative product available. This individual would be familiar with the various options as well as the maintenance measures required for each of them. The Owner will be able to decide if the use of an alternative product is feasible within the project budget. Recommendations for a maintenance contractor will be made available to the Owner upon request.

6.0 Engineered Measures

Site grading has been designed to ensure that all runoff from the site is directed towards the area catchments and captured in the internal storm sewer system. Effective drainage will reduce ice formation and subsequent salt application. All area catchments shall be inspected and maintained regularly to ensure that runoff is captured.

Roof runoff will drain through connected roof leaders to the internal storm sewer system prior to discharging to the existing municipal storm sewer. Building downspouts will not outlet to sidewalks, pedestrian areas, or towards vehicular traffic. Ice formation and subsequent salt application is expected to be reduced with the direction of rooftop runoff towards the internal stormwater system.

7.0 Operational Measures

Snow Removal/Disposal

As indicated on the Winter Maintenance Plan (Figure 1), there are designated areas on site for snow storage during a minor snowfall event. The primary snow control method to be implemented is the timely removal of snow and ice from the internal roadway and pedestrian walkways. This snow is to be stored at the identified locations during minor snowfall events and trucked off-site during major snowfall events. All entrances to the site and the pedestrian access will be permitted for road salt use to ensure safe vehicle and pedestrian access, respectively. Entrances to the site and the pedestrian access in the western portion of the lands will be permitted for road salt use to ensure safe vehicle and pedestrian access, respectively. It is imperative that the snow be removed from the site in a timely manner to prevent uncontrolled snow melt from occurring and reducing the opportunity for emergency salt application. Timing for snow removal should be discussed with the certified salt maintenance contractor prior to implementation.

De-icing Agents

Private site developments are significant sources of increased chloride levels in runoff during winter and spring due to overuse of road salts. Road salt, or sodium chloride, has an effective temperature range for melting ice between +4°C and -1°C. Application of road salt outside this temperature range should be avoided. Salt application rates usually range from 15 to 39 grams per square meter. This application rate will not be exceeded in areas that require salting. Proper road salt application machinery will be required and calibrated to apply the ice control products at a specified, controlled application rate. Application tracking worksheets should be used to track the overall de-icing agent usage on site particularly for those products that may release sodium and chloride.

Road salt will be limited on the site's internal roadways and sidewalks except for the roadway entrances and pedestrian access located off Victoria Street N. Salt alternatives are the suggested methods for ice control within the internal roadway, parking areas, and walkways on site. It is recommended to hire a winter maintenance contractor who is familiar with various application methods, rates, and salt management reduction practices. Contractors should be aware of the appropriate guidelines and the potential impacts of excessive salt application.

Monitoring Program

Implementing a winter operation monitoring program is essential to ensure the effectiveness of this Salt Management Plan. It is recommended that both the Owner and maintenance contractor review winter operations annually to maintain efforts to reduce salt application on site and demonstrate adherence to the operations plan. The Owner and maintenance contractor should also monitor and evaluate the usage of road salt and alternative products during the winter season. Monitoring results should be reviewed after each season to identify

deficiencies with current operations and opportunities to make improvements for more effective winter operations.

8.0 Summary

The proposed Chloride Impact Assessment aims to reduce the use of road salt on the property to minimize infiltration of the salt into the subsurface. The site has been designed to drain all runoff, including snow melt, into the internal storm sewer system and outlet to the storm sewers located within the surrounding road network. Snow removal/disposal methods shall be implemented accordingly. De-icing agents should be used at appropriate application rates and tracked on a regular basis during the winter season. Although this plan is an attempt to limit the application of road salt, it should be noted that pedestrian safety takes priority. During extreme weather events, the winter maintenance contractor should use their best judgement to ensure that sufficient ice/snow control is provided for the safety of all individuals at the site.

The Owner and maintenance contractor should be aware of this report and of the various salt management practices for winter maintenance. The implementation of this plan will help prevent the environmental impacts of excessive salt application and identify opportunities for more effective winter maintenance to ensure long term chlorine reduction for this site.

Sincerely,

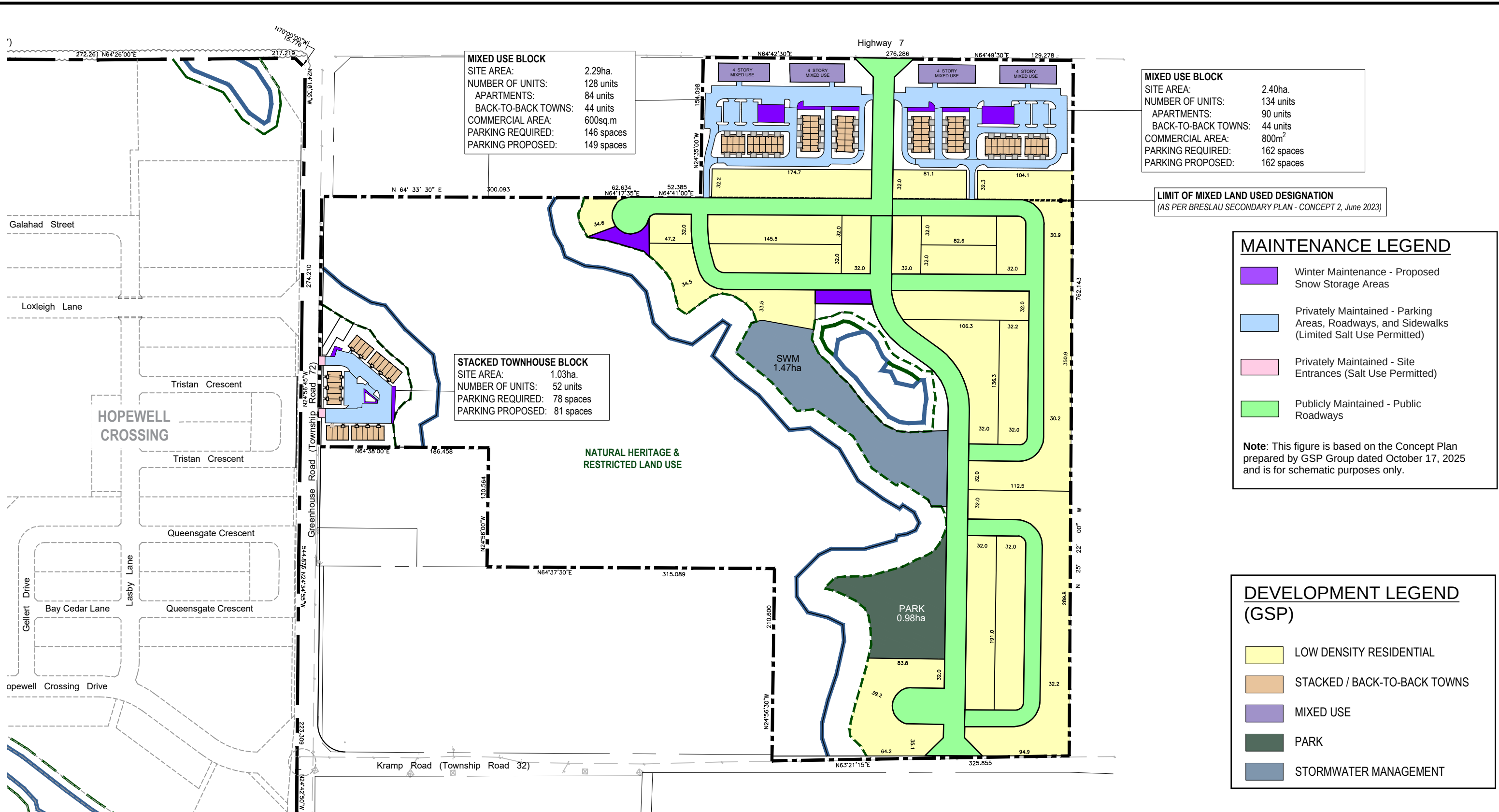
C.F. CROZIER & ASSOCIATES INC.



Trevor Fraser, P.Eng.
Project Manager, Land Development

Encl. Winter Maintenance Plan (Figure 1)

jc



MIXED USE BLOCK
 SITE AREA: 2.29ha.
 NUMBER OF UNITS: 128 units
 APARTMENTS: 84 units
 BACK-TO-BACK TOWNS: 44 units
 COMMERCIAL AREA: 600sq.m
 PARKING REQUIRED: 146 spaces
 PARKING PROPOSED: 149 spaces

STACKED TOWNHOUSE BLOCK
 SITE AREA: 1.03ha.
 NUMBER OF UNITS: 52 units
 PARKING REQUIRED: 78 spaces
 PARKING PROPOSED: 81 spaces

MIXED USE BLOCK
 SITE AREA: 2.40ha.
 NUMBER OF UNITS: 134 units
 APARTMENTS: 90 units
 BACK-TO-BACK TOWNS: 44 units
 COMMERCIAL AREA: 800m²
 PARKING REQUIRED: 162 spaces
 PARKING PROPOSED: 162 spaces

LIMIT OF MIXED LAND USED DESIGNATION
 (AS PER BRESLAU SECONDARY PLAN - CONCEPT 2, June 2023)

MAINTENANCE LEGEND

- Winter Maintenance - Proposed Snow Storage Areas
- Privately Maintained - Parking Areas, Roadways, and Sidewalks (Limited Salt Use Permitted)
- Privately Maintained - Site Entrances (Salt Use Permitted)
- Publicly Maintained - Public Roadways

Note: This figure is based on the Concept Plan prepared by GSP Group dated October 17, 2025 and is for schematic purposes only.

DEVELOPMENT LEGEND (GSP)

- LOW DENSITY RESIDENTIAL
- STACKED / BACK-TO-BACK TOWNS
- MIXED USE
- PARK
- STORMWATER MANAGEMENT

DEVELOPMENT CONCEPT - Prepared by GSP (October, 2025)

Thomasfield Homes

Bisgould Land, Breslau, Township of Woolwich

0 20 40 60 100 200

NOTE: This concept should be considered as a preliminary demonstration model that illustrates an 'order of magnitude' development scenario for the site. The number of units, floor area and parking supply are approximate and subject to more detailed design as well as municipal planning approvals.

Scale 1:4,000 | July 14, 2023 | Project No. 23158 | Drawn By: MN

