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DRAFT FOR DISCUSSION



Stoney Creek Regional Facility Environmental Assessment

Supporting Document #3: Surface Water Existing Conditions Report



terrapure

1195 Stellar Drive, Unit #1 Newmarket Ontario L3Y 7B8 Canada
11102771 | Report No 5 | June 21, 2016



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1. Introduction

Terrapure Environmental (Terrapure), owner and operator of the Stoney Creek Regional Facility (SCRF; Facility), has initiated an Individual Environmental Assessment (EA) under the Ontario *EA Act* seeking approval to provide an additional 3,680,000 cubic meters (m³) of disposal capacity to their SCRF through a reconfiguration of the site back to its original Ministry of the Environment and Climate Change-approved footprint. This reconfiguration would allow Terrapure to utilize the existing space more efficiently while retaining the same overall geographic size of the site.

Terrapure's SCRF has been an important part of the local community since it was approved by the Ministry of the Environment and Climate Change in 1996. The existing SCRF is only permitted to accept solid, non-hazardous residual materials from commercial, industrial and institutional sources. These are truly "end of life" materials that have exhausted all recycling options. Putrescible waste (i.e., municipal solid waste, organic material) disposal is not permitted at the SCRF. The total approved capacity under the Environmental Protection Act approvals at the existing SCRF is 6,320,000 m³ with an approved maximum annual volume of 750,000 tonnes of solid, non-hazardous industrial residual materials. The proposed changes would not change the type or annual volume of materials currently accepted at the facility, nor the maximum number of vehicles to the site per day.

The SCRF is expected to reach capacity in the next 16 to 22 years, accepting a combination of residual material and industrial soils or "fill," which is required to bring the site to final grade. By changing the configuration of the site and accepting more residual materials than industrial soils, it is expected that the SCRF may be able to close sooner than currently anticipated (within 13-20 years) because the market for residuals is much stronger and more consistent than that for soils.

The *EA Act* requires that proponents describe the environment that may potentially be affected or may reasonably be expected to be affected, directly or indirectly, by the alternatives and the undertaking proposed as part of an EA. As such, this report characterizes the surface water existing conditions presently found at the SCRF.

2. Study Areas

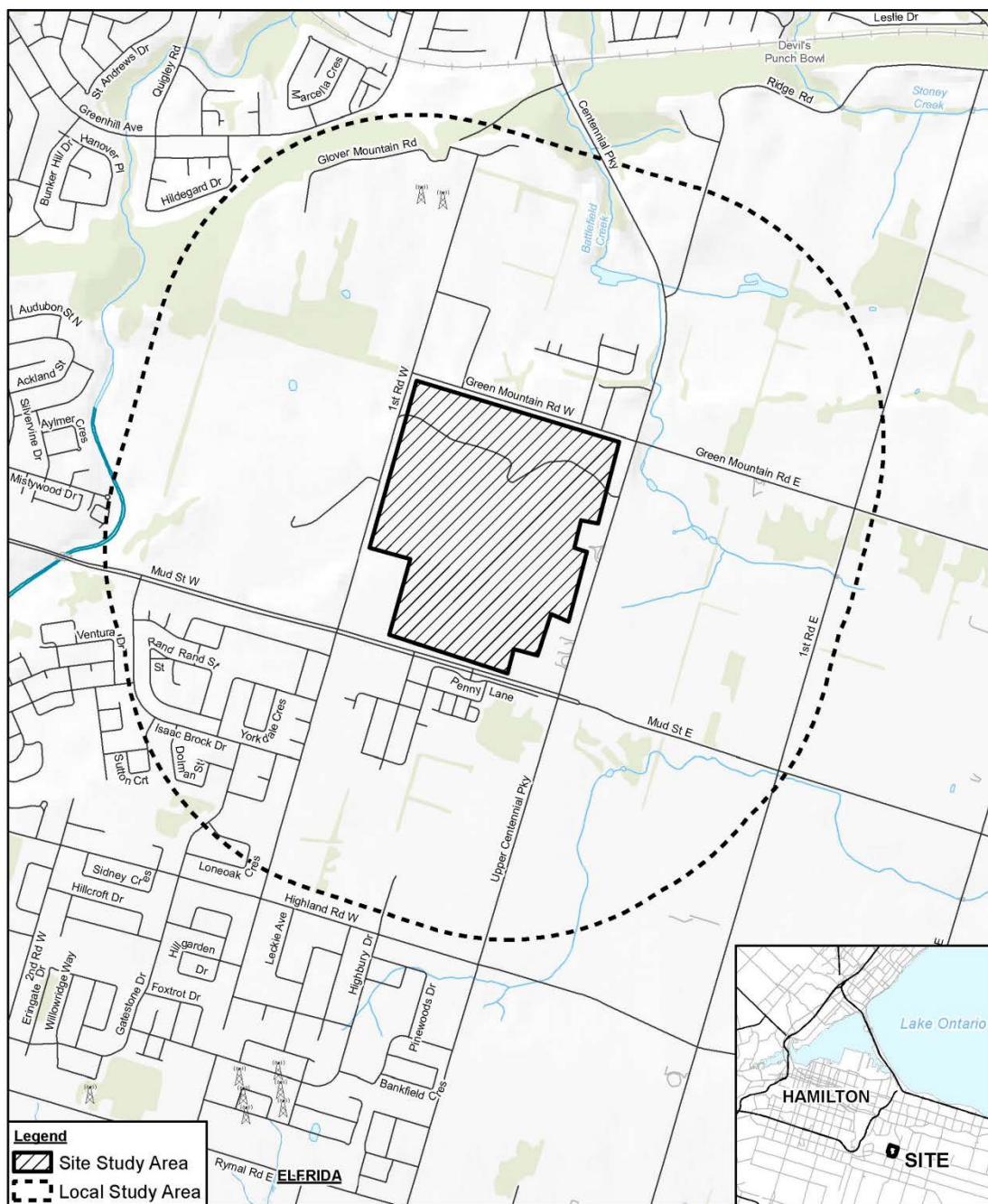
From a surface water environment perspective, the characterization of existing conditions within the following study areas are appropriate to this EA:

- **Site Study Area**, including all lands within the existing, approved boundaries of the SCRF, as defined by Environmental Compliance Approval (ECA) No. A181008, as amended.
- **Local Study Area**, includes the roadside swale that starts at First Road West and Green Mountain Road West and conveys stormwater runoff north along the west side of First Road West, eventually discharging into Davis Creek.

These study areas will also be used by GHD to assess the effects of the proposed changes to the on-Site stormwater conveyance and management features and the downstream receivers within the Local Study Area.

The surface water study areas are illustrated on **Figure 2.1**.

Figure 2.1 Surface Water Study Areas



0 150 300 450
Meters
Coordinate System:
NAD 1983 UTM Zone 17N



**TERRAPURE
STONEY CREEK REGIONAL FACILITY EA
65 GREEN MOUNTAIN ROAD WEST**
**SURFACE WATER
STUDY AREAS**

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Jun 9, 2016

FIGURE 2.1

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3. Methodology

Available secondary sources of information were collected and reviewed to characterize surface water existing conditions within the study areas. The following sources of secondary information were collected and reviewed:

- Closed Hamilton (Stoney Creek) Landfill, ECA Annual Report – 2015
- Hamilton (Stoney Creek) Landfill, Provisional Certificate of Approval Annual Report – 2015
- Newalta Stoney Creek Landfill Footprint Reconfiguration Supporting Document, October 2013
- Considerations for Reduction of Newalta Stoney Creek Landfill Footprint Memo, October 9, 2012
- Amended ECA, No. A181008, Stoney Creek Landfill, March 1, 2016
- Certificate of Approval – Industrial Sewage Works, Newalta Stoney Creek Landfill, May 1, 2008

4. Characterization of the Existing Environment

The existing surface water conveyance and treatment system for the Site Study Area (See **Appendix A**) consists of a set of swales, sumps and forcemains that convey stormwater runoff to a stormwater management pond in the northwest corner of the property for water quality treatment and runoff peak flow control. The drainage swales along the south and west sides of the site are in their final location. All other drainage swales and forcemains are temporary and will be moved as site construction progresses. Under currently approved final closure conditions, the swales will wrap around the perimeter of the landfill area, as well as the remaining area on the northern portion of the site and convey stormwater runoff from the landfill cap to the stormwater management pond. The stormwater management pond will provide quantity and quality control for site runoff. The outlet for the stormwater management pond is near the southeast corner of First Road West and Green Mountain Drive. The outlet structure discharges into a catch basin/manhole southeast in the intersection of First Road West and Green Mountain Road, then through a sewer into a roadside swale on the west side of First Road West. The outlet structure is equipped with a sluice gate that can be closed in the event of a trigger parameter failing during regular testing. If a trigger parameter fails twice in a row, the gate will be closed and the stormwater management pond will accumulate water until it overflows into the neighbouring leachate collection pond via the emergency overflow weir.

The leachate collection pond is a detention pond located in the northwest corner of the Site, sandwiched between the forebay and main cell of the current stormwater management pond. The detention pond receives water fed from groundwater pumping well M4 of the groundwater collection system and runoff from the truck wash pad. The water in the detention pond is periodically pumped to the leachate equalization pond, west of the SCRF. Any precipitation that falls within an active working area is collected by the leachate collection system and pumped to the equalization pond. The equalization pond flows via a gravity sewer west of the site to a City of Hamilton sanitary sewer on Mistywood Drive, north of Mud Street. In the future, the collection pond will be removed and the stormwater management pond will be reconfigured to have two forebays to capture inflows from the south/west and east/north perimeter swales. Discharge is currently to the catch basin/manhole that



in turn discharges into a swale along the west side of First Road West, however in the future it will discharge directly into City of Hamilton storm sewers that are to be installed once the road is upgraded and the neighbouring lands developed.

Perimeter berms along the edges of the property direct stormwater runoff away from the working area towards roadside swales surrounding the property. Stormwater runoff from the landfill cap will not come into contact with "clean" stormwater runoff from the edges of the site or off site.

The downstream receivers of stormwater runoff from the stormwater management pond comprise the Local Study Area. The roadside ditch along the west side of First Road West flows north to Ridgeview Drive, where it turns west towards the Niagara Escarpment. The flow is conveyed over some falls along the escarpment and into storm sewers associated with a residential subdivision. The flow is eventually conveyed through the subdivision and discharged to Davis Creek.

Annual surface water quality monitoring is completed in accordance with the requirements of the Amended ECA and Certificate of Approval for Industrial Sewage Works. The monitoring program has been historically performed by Jackman Geoscience Inc., and involves monitoring for both the closed west landfill (located on the west side of First Road West) and the SCRF. For the purposes of this report, only monitoring relevant to the SCRF will be discussed. The purpose of the surface water monitoring program is to:

1. Assess whether the SCRF is in compliance with the surface water quality policies of the MOECC.
2. Evaluate the effectiveness of on-site sediment control measures.

Surface water monitoring related to the SCRF occurs at three locations within the Site Study Area and seven locations in the Local Study Area. The exact monitoring program description is contained within Schedule D of ECA A181008 and section 5 of C of A number 5400-7DSSHU.

Since the completion of construction for the existing stormwater management pond, sampling has indicated that concentrations of phosphorus have periodically exceeded the associated trigger level in the C of A. As a result, the stormwater management pond has been operated with the sluice gate closed and on occasion, the pond has not discharged stormwater into the roadside ditch along First Road West. Instead, the stormwater has been diverted into the leachate collection pond, which eventually ends up in the City sanitary sewer. Sampling at other surface water monitoring locations periodically showed water quality results that were elevated in comparison to the Provincial Water Quality Objectives (PWQO) or trigger levels, however that would not have been a result of impacts from surface water generated on Site as all runoff would have been diverted to the retention pond, and eventually to City sanitary sewers. Aluminum and Zinc was detected at concentrations above PWQO's at off Site sampling locations, for a majority of the sampling events. Sampling completed at the leachate collection pond, or other locations along the leachate conveyance system, also had concentrations of various parameters that were above PWQO's, however the water from those ponds are discharged into the sanitary sewer system.

Given that the stormwater management pond has been operating with its outlet closed since its inception, any off site detection of any parameter at concentrations above PWQO's or other trigger levels is not a result of the discharge of impacted stormwater as no stormwater has been discharged from the site since the pond was built.



5. References

Aecom, *Considerations for Reduction of Newalta Stoney Creek Landfill Footprint* Memo, to Mike Jovanovic and Lorenzo Alfano, from Mark Sungaila, cc to Brian Dermody, October 9, 2012.

Aecom, *Newalta Stoney Creek Landfill Footprint Reconfiguration Supporting Document*, October 2013.

Aecom, *Stormwater Contingency and Remedial Action Plan, Stage 1 Stormwater Management Facility, Newalta Stoney Creek Landfill*, May 2013.

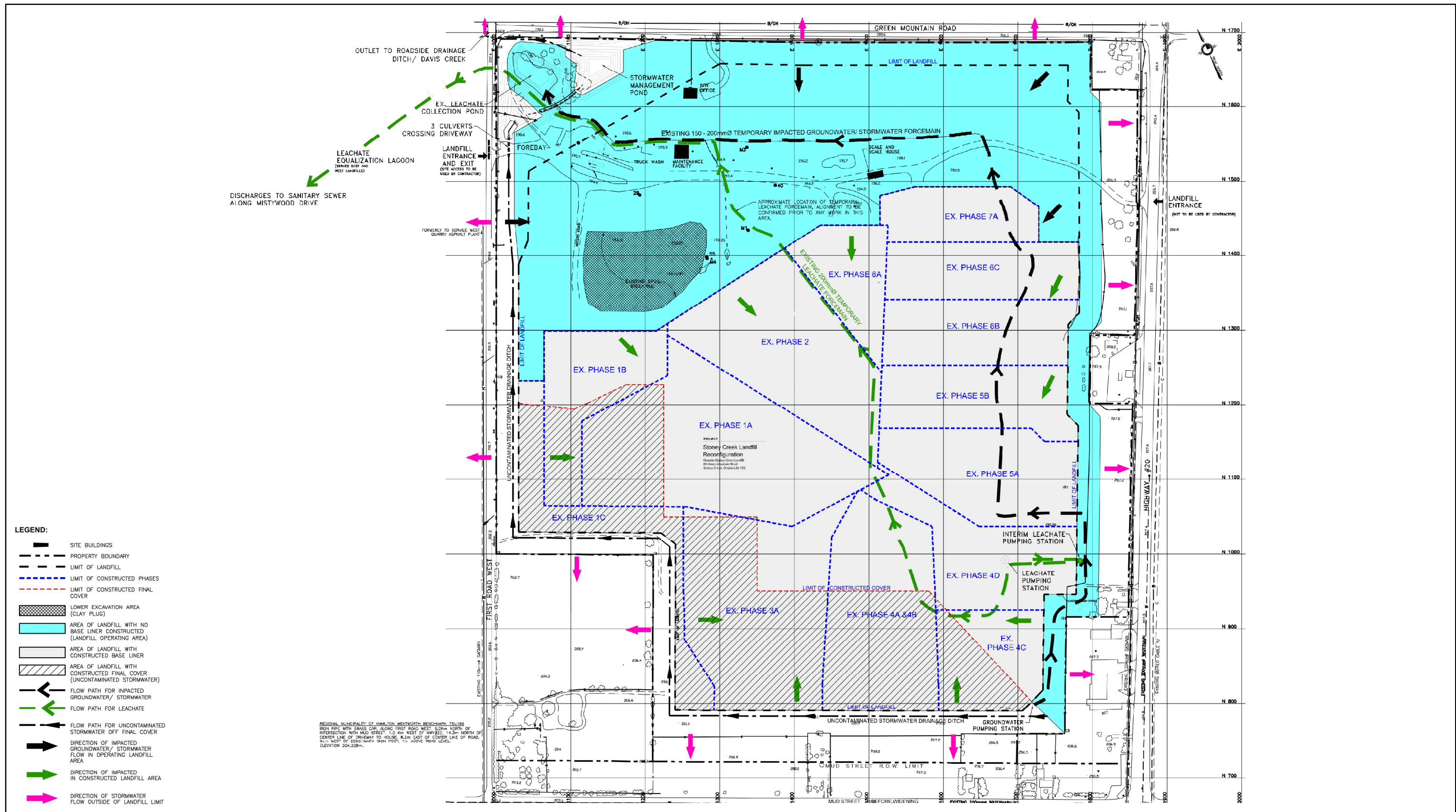
Jackman Geoscience Inc., *Closed Hamilton (Stoney Creek) Landfill, Environmental Compliance Approval No. A130404, Annual Report 2014*. June 30, 2015.

Jackman Geoscience Inc., *Hamilton (Stoney Creek) Landfill, Provisional Certificate of Approval No. A181008, Annual Report 2014*. June 30, 2015.

Ministry of the Environment and Climate Change, *Amended Environmental Compliance Approval, Number A181008*, March 1, 2016.

Ministry of the Environment and Climate Change, *Certificate of Approval – Industrial Sewage Works, Number 5400-7DSSHU*, May 1, 2008.

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0 50 100 150
Meters



TERRAPURE
STONEY CREEK REGIONAL FACILITY EA
65 GREEN MOUNTAIN ROAD WEST

SURFACE WATER INFRASTRUCTURE

11102771-03
Jun 14, 2016

FIGURE 4.1