CITY OF VAUGHAN

EXTRACT FROM COUNCIL MEETING MINUTES OF DECEMBER 15, 2015

Item 13, Report No. 44, of the Committee of the Whole, which was adopted without amendment by the Council of the City of Vaughan on December 15, 2015.

13 KIPLING TRAIL FEASIBILITY STUDY
WARD 2

The Committee of the Whole recommends approval of the recommendation contained in the following report of the Deputy City Manager, Planning & Growth Management and the Director of Parks Development, dated December 1, 2015:

Recommendation

The Deputy City Manager, Planning & Growth Management and the Director of Parks Development recommend:

1. That the Kipling Trail Feasibility Study Final Report dated October 28, 2015 be received for information.

Contribution to Sustainability

This report is consistent with the priorities previously set by Council in the Green Directions Vaughan, Community Sustainability Environmental Master Plan, Goal 2, Objective 2.2:

- To develop Vaughan as a City with maximum green space and an urban form that supports our expected population growth.

Economic Impact

There are no economic impacts associated with the recommendations of this report.

Communications Plan

Not applicable.

Purpose

The purpose of this report is to provide the results of the Kipling Trail Feasibility Study that was completed to review the possibility of constructing future trails in the valley open space located south west of Kipling Avenue and Highway 7 (location map appended as Attachment 1).

Background - Analysis and Options

In 2009 Council directed staff to undertake a feasibility study to determine the cost of developing a pathway from the east side of the Rainbow Creek valley open space at Angelina Avenue/Sara Street to connect to the Vaughan Grove Sports Park and the Holy Cross Academy. This recommendation was made to determine the possibility of providing a pedestrian connection through the open space as an alternative to pedestrians using Highway 7 to walk or bike to the park and/or school.

At the time, the City's Engineering staff met with York Region on improving safety for pedestrians along Highway 7, however a suggestion was made during this review to consider the construction of a pedestrian walkway or trail as a potential long-term solution. Trail connections through valley open spaces are supported by OPA 240 and OPA 700 and identified in the City's Pedestrian and Bicycle Masterplan, including a proposed north/south trail along this portion of Rainbow Creek.

…/2

The issue of a potential trail connection also arose as part of the consideration of a land use change for 77 Woodstream Avenue which was ultimately approved by the City and Region. At the time, the proponent and staff agreed to examine the trail connection through the valley open space as part of any future redevelopment of the area.

Although not specifically identified in the Pedestrian and Bicycle Master Plan, the proposed pedestrian trail across Rainbow Creek from the intersection of Angelina Avenue and Sara Street would make an important connection between the residential community on the east side of the creek with the park and school located on the west side. The proposed connection would also significantly reduce the walking distance of using the sidewalk system along Highway 7.

However, due to the significant topography of the open space valley (steep slopes, limited crossing areas), unknown geotechnical and hydrogeological conditions, TRCA restrictions and land ownership issues, construction of a trail crossing in this area may not be feasible, and accordingly a study was commissioned. In September 2012 Stantec Consulting Ltd. (Stantec) was retained to complete the feasibility study.

The purpose of the feasibility study was intended to help determine:

a. If the proposed trail connection is physically and financially viable;
b. Design options for a trail system that would have minimal environmental & cultural impact, while maintaining pedestrian safety and accessibility;
c. The optimal position for a pedestrian bridge;
d. The options and the most feasible routing of the trail connection;
e. The approximate preliminary costs associated with implementation of the proposed trail connection; and
f. To identify other development related requirements (access easements, environmental assessments, TRCA, MNR, Department of Fisheries and Oceans requirements, etc.).

Based on the above, the consultant's scope of work included review of the proposed trail alignment and design (including alignment options and cost estimates), geo-technical investigation, meander belt study, archaeology study and flora and fauna study. A public open house was also undertaken at the end of the review process to gauge community support and interest for the identified trail connection. The consulting team included a host of professionals including Landscape Architects, Ecologists, Archaeologists, Geotechnical Engineers, and Hydrologists.

Three options were identified as follows:

1) **Option 1. Trail connection on the west side of Rainbow Creek as per the conceptual Pedestrian and Bicycle Master Plan**. This option was not considered feasible due to the steepness of the valley wall. This option would require multiple bridge crossings to connect the community to the east and along the north/south trail alignment to traverse the steep slopes. Additionally this option would not significantly improve pedestrian access to the park compared to use of the existing sidewalk network.

2) **Option 2. Trail connection on the east side of Rainbow Creek.** This option was not considered feasible as there were too many complications with ecologically sensitive areas including flooding limits adjacent to the water channel. There were also concerns over the steep slopes. This option would require an extensive permitting and approvals process with the MNR and specifically included potential for disturbance of endangered species due to presence of Butternut trees and potential habitat of Red Side Dace.

3) **Option 3. Trail connections along a portion of the east side of Rainbow Creek and use of the open space south of Angelina Court.** This option is the only potential option for trail development and creek crossing due to the valley slopes and other restrictions. This option allows for the most stable creek crossing according to the Meander Belt Study and allows connections to existing trails on both sides of the creek. This option still includes very significant challenges with the design and permits requirements from the TRCA and MNR and also requires an agreement with the Province to obtain access onto crown lands.

Significant design and construction considerations were identified through the course of this study and although not insurmountable, the existing steep slopes, issues related to the highly variable and poor shale ground conditions, a mid-channel bar in Rainbow Creek that is experiencing much change through dynamic channel erosion, environmentally sensitive areas that include vegetation types and/or species habitat and endangered species, etc. would require significant resources and time in order to move this project to move forward.

Upon completion of the study phase of this project, the most feasible option (Option 3.) was used as a basis for engaging local residents about the Feasibility Study and identified trail connections. On September 15, 2015 a community open house meeting was held at the Ontario Soccer Centre to provide residents an opportunity to review the plans and to discuss the project with staff and the consultant. Approximately 15 residents attended the open house meeting and each person was offered a hard copy comment sheet. The study presentation boards and comment sheets were also posted on the City Website for those who could not attend the meeting. Verbal comments were received by staff and the consultant at the meeting and a total of six (6) written comment sheets were provided following the meeting. Details of the open house meeting can be found on Page 35 and Appendix A –VII of the attached consultant's report (Attachment 2).

Two (2) residents indicated their support for the identified trail connection and provided support for additional future trail connections through the Rainbow Creek open space to the south.

The remaining comments, which represent the majority of comments received about this project, did not support the identified trail connection. The following concerns were raised:

- Safety concerns for pedestrians accessing a remote valley location
- Limited to seasonal use because gravel trails cannot be winter maintained
- Environmental damage and impacts to the existing natural areas and wildlife
- Significant cost of the project (estimated to cost in excess of $1.25M)
- Increase in cars parking on local streets to access the valley and trails and traffic concerns
- Reduced sense of privacy and uniqueness to their community
- Increase in youth hanging out along the trails and in the valley
- Concerns over dangers of the river when it floods
- Maintenance concerns and potential for dumping and garbage

Based on the above analysis which identified significant physical and environmental challenges associated with this project as well as the lack of local community support for a trail connection at this location, staff recommend that the Kipling Trail Feasibility Study be received for information at this time. In addition, implementation of the preferred option (Option 3.) would require a land lease agreement with the Province since the area is located outside the limits of the current lease. Future consideration for trail development in this area can be reviewed at the time when future development applications are proposed on Woodstream Avenue or on lands in the Kipling Avenue area.

Relationship to Term of Council Service Excellence Strategy Map (2014-2018)

This report is consistent with the priorities established in the updated Term of Council Service Excellence Strategy Map, specifically:

- Continue to develop transit, cycling and pedestrian options to get around the City;
- Continue to ensure the safety and well-being of citizens; and
- Continue to cultivate an environmentally sustainable City.

Regional Implications

There are no regional implications.

Conclusion

In 2012 a consultant study was initiated to review the feasibility of providing a trail connection between the residential community located on the east side of Rainbow Creek, south of Kipling Avenue/Highway 7 to the Vaughan Grove Sports Park and Holy Cross Academy. The study identified many physical and environmental challenges associated with a proposed trail through this valley system. The study concluded that a pedestrian trail connection is potentially feasible but would require significant capital and time investment as well as an agreement with the Province for access to crown lands. The study also included a public consultation component and based on the results of a community open house meeting held in September 2015 there currently is not sufficient community support community for this project at this time.

Attachments

1. Location Map
2. Kipling Trail Feasibility Study Final Report Dated October 28, 2015

Report prepared by

Melanie Morris, Manager, Parks Development & Construction, Ext. 8058
Mike Kari, Project Landscape Architect, Ext. 8113

(A copy of the attachments referred to in the foregoing have been forwarded to each Member of Council and a copy thereof is also on file in the office of the City Clerk.)

COMMITTEE OF THE WHOLE **DECEMBER 1, 2015**

KIPLING TRAIL FEASIBILITY STUDY
WARD 2

Recommendation

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Report prepared by

Melanie Morris, Manager, Parks Development & Construction, Ext. 8058
Mike Kari, Project Landscape Architect, Ext. 8113

Respectfully submitted,

John MacKenzie,
Deputy City Manager
Planning & Growth Management

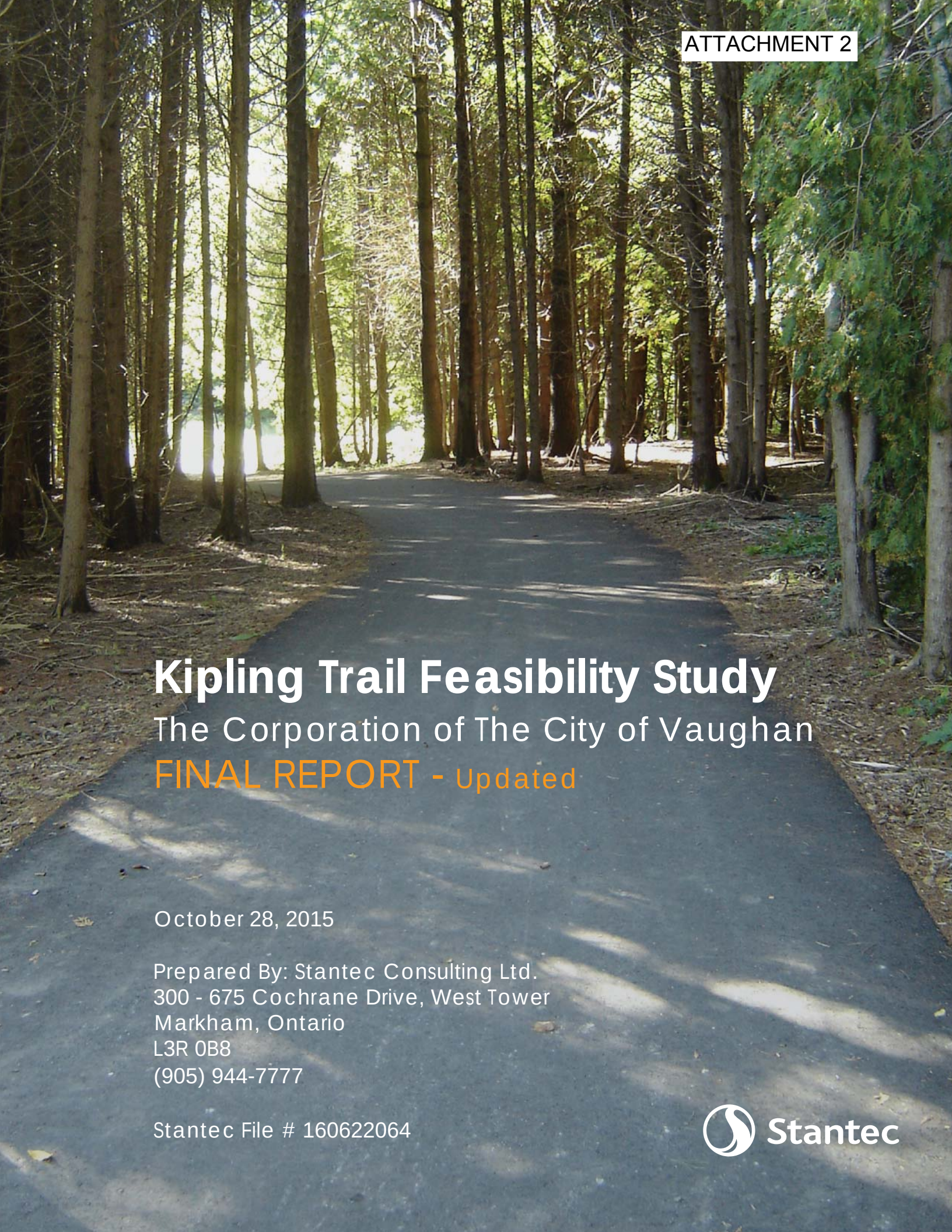
Jamie Bronsema,
Director of Parks Development

ATTACHMENT 1

Kipling Feasibility Study Area

0 70 140 280 420 560 M

ATTACHMENT 2



Kipling Trail Feasibility Study

The Corporation of The City of Vaughan

FINAL REPORT - Updated

October 28, 2015

Prepared By: Stantec Consulting Ltd.
300 - 675 Cochrane Drive, West Tower
Markham, Ontario
L3R 0B8
(905) 944-7777

Stantec File # 160622064

Stantec

1.0 EXECUTIVE SUMMARY

The Corporation of the City of Vaughan (herein referred to as the 'City') retained Stantec Consulting Ltd. (herein referred to as 'Stantec') to prepare a study to assess the feasibility of connecting the residential neighbourhood south of Highway 7, east of Rainbow Creek to the recreational facilities, school and park to the west of the Creek. The objective of the study is to analyze the archaeological, habitat and ecological, hydrological and general physical conditions of the study area and recommend design options for a trail system that will have minimal environmental & cultural impact, while maintaining pedestrian safety and accessibility. This report will aid the public agencies in the decision making process for any future trail development of the area by providing preliminary construction cost estimates as well as outlining the potential permits and required approvals.

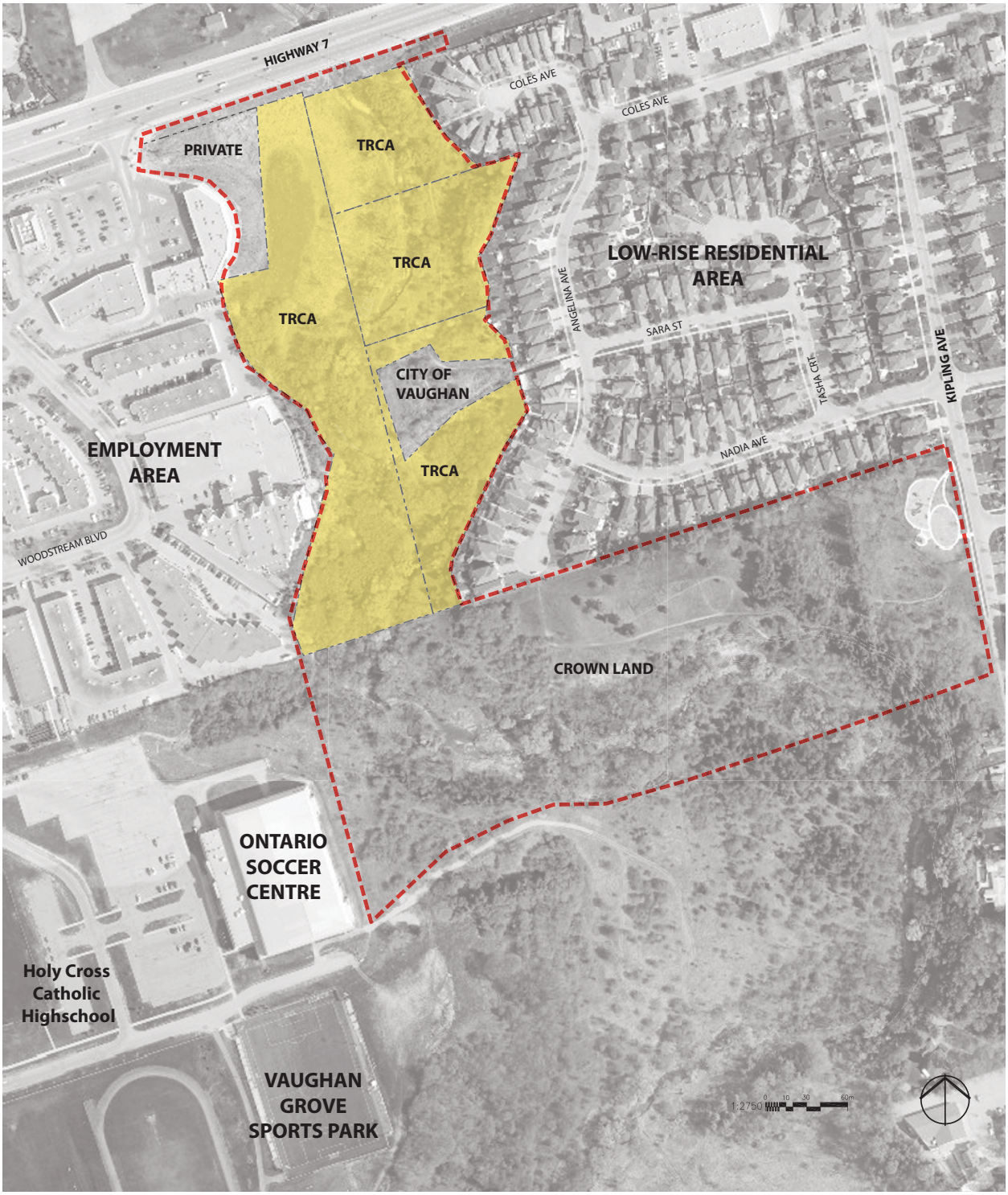
The most feasible route will connect the neighbourhood to the east of the site, to the Vaughan Grove Sports Park and sports fields, as well as the neighbouring school (Holy Cross Catholic High School) and successfully achieve all the design objectives and programming requirements outlined in this report. A proposed 3 metre wide multi-use trail for pedestrian and bike use along with a prefabricated metal bridge will allow for a safe trail connection within TRCA and Crown-Owned Land. If the trail project were to move forward the City would be required to secure access from the Crown.

This Feasibility Study includes high-level studies, that have been referenced throughout the report and included in the Appendix Section. The most feasible trail route has been based on the findings from these studies, aiming to satisfy the objective of providing a trail link and selecting a route which has the least impact on the environment. The most feasible trail route aims to minimize erosion and the disturbance to natural habitats. The alignment of the proposed trail and bridge would be setback from areas susceptible to erosion, from endangered vegetation and the vernal pool area, where possible.

Through the evaluation of the studies and site observations, the most feasible trail route would result in a 4,740 m (4.7km) trail with preliminary estimated costs of$1,246,312.50 ($867,687.50 for Phase 1 and $378,625 for Phase 2). The estimate includes the cost of the trail, compensation planting, signage, furniture as well as a bridge crossing and likely board walk across the wetland area. Phase I achieves the immediate objectives for the trail construction, connecting the east residential areas with the west parks, and Phase II provides a north-south connection that aligns with regional objectives for the trail systems in the City of Vaughan and York Region.

Given the complexity of this study area, based on the study of the sensitive habitats (namely the Redside Dace species and the Butternut tree grove) and other environmental considerations regarding the protection of the water body and erosion issues, the trail would require further evaluation from the Ministry of Natural Resources (MNR) and the Toronto and Region Conservation Authority (TRCA). To date, the City has submitted a Concept Development Application to the TRCA on November 14, 2012. A permit would be required under section 17(2)(c) of the Endangered Species Act 2007, however, this would only be confirmed upon submission of the proposal to the MNR for review. Feedback received from local residents that attended the September 15, 2015 PIC showed they were not in favour of the proposed trail.

It is our opinion that this trail is supportive to the regional and community connections planned in the City of Vaughan and York Region Masterplans for pedestrian and trail connections. The trail is feasible and can be completed in phases to minimize habitat impact and allow for regeneration periods, however due to the complexity of variables included, further studies would be required outside the study area to verify the final bridge crossing location. **Final construction costs, time frames for approvals and permits would vary based upon detailed design, construction scheduling and market conditions.**



Study Area
Contour Lines (1m Intervals)

FIGURE-1 PROJECT STUDY AREA, OWNERSHIP & ADJACENT LAND USES

2.0 PROJECT SCOPE

2.1 Study Area

The study area, is located on Lots 4 and 5, Concession 8 in the City of Vaughan, Ontario. It is a Natural Area that includes the tributary Rainbow Creek and is identified as part of the Parkway Belt West Lands (See Section 3.1). It is located south of Highway 7, near its intersection with Kipling Avenue and is adjacent to a low-rise neighbourhood to the east and a commercial area, a school and Vaughan Grove Sports Park as well as other sports facilities to the west.

The study area ownership varies between the City of Vaughan, TRCA and Crown Land, as identified in **Figure-1 Project Study Area, Ownership & Adjacent Land Uses**.

2.2 Methodology and Approach

Stantec was retained by the City through a Request for Quotation (RFQ) process in June 2012, to assess the feasibility of a trail within the identified study area, linking the neighbourhoods to the east to the sports fields adjacent to Vaughan Grove Park to the west. The individual supporting studies, as requested in the RFQ include an Archaeological Study Stage I, Natural Environment Constraint Study and a Meander Belt Study, which were all prepared by Stantec. They can be found in the **APPENDICES** section of this study.

Throughout the process, a number of site visits were conducted by the involved individual research teams to aid in the completion of the studies.

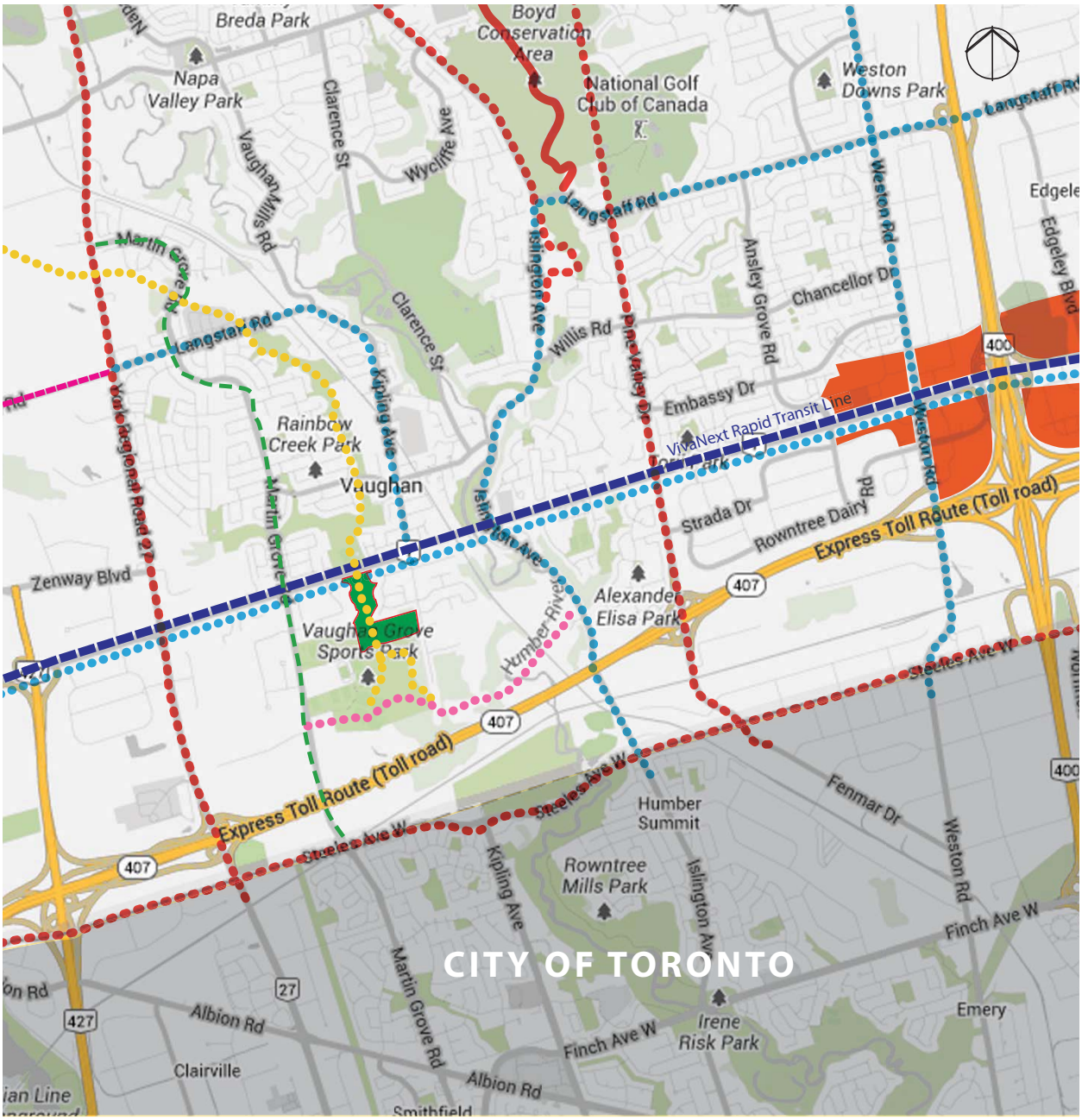
The Public Agencies involved in the process include:

- The Corporation of the City of Vaughan
- Toronto and Region Conservation Authority (TRCA)

As individual reports were compiled, their findings were then overlaid with the observed physical site conditions to produce the Opportunities and Constraints Map (**Figure-8 Opportunities and Constraints Map)**, which indicated potential trail routes that incorporated the research findings. Design objectives were set for the trail to act as form of evaluation method for any proposed trail alternatives.

Based on the research findings, trail alternatives were explored and evaluated and the most feasible trail location was shared with the City. A matrix of the design merits and demerits was compiled, which aids in the evaluation of the design in achieving the objectives and requirements for the trail. A preliminary cost estimate was created based upon the most feasible design.

The TRCA was contacted during the feasibility study. At that time, TRCA did not commit to providing formal comments unless a Development Concept Application was submitted. Review fees for standard projects are $2,500 and $5,500 for major projects. The TRCA did provide a list of submission requirements for Pedestrian Crossing Permits (refer to Appendix A-VI). Several of these requirements have been addressed in this feasibility report while others would need to be completed during the detailed design phase should this project proceed.



Scope Area
VivaNext Highway 7 Rapid Transit Line
York Region Proposed Cycling Network *
York Region Existing Multi-trail Use *
York Region Proposed Multi-trail Use *
York Region Proposed Paved Shoulder *
Regional Centre
City of Vaughan Proposed Neighbourhood Multi-use Recreational Pathway**
City of Vaughan Proposed Community Multi-use Recreational Pathway**
City of Vaughan Proposed Neighbourhood/Community Bike Lane**

** As per Figure A5-h Proposed Cycling Network for York Region - April 2008*

*** As per Proposed Facility Nework Plan for the Pedestrian and Bicycle Master Plan - 2007*

FIGURE-2 REGIONAL CONTEXT, COMMUNITY CONNECTIONS & OPEN SPACE NETWORK

Reference documents provided by the City and other reference material consulted in the study process include:

- Legal description of the subject lands,
- City of Vaughan "Active Together Master Plan for Parks, Recreation, Culture and Libraries" dated November 2008
- City of Vaughan Pedestrian and Bicycle Master Plan and the City of Vaughan CPTED Guidelines
- City Of Vaughan Natural Heritage In The City – April 2010 & Vaughan Vision 2020
- TRCA Humber River Watershed Plan: Pathways to a Healthy Humber-June 2008
- York Region Pedestrian & Cycling Master Plan Study – April 2010
- Pedestrian and Cycling Master Plan Planning and Design Guidelines Version 1.3 by MMM Group - 2008.
- Guidelines and best Practices for the Design, Construction and Maintenance of Sustainable Trails for All Ontarians by Trail for All Ontarians Collaborative - 2006.
- Pedestrian Bridge Crossing Permit Requirements, TRCA, August 2008.
- MNR Guidance for Development Activities in Redside Dace Protected Habitat, MNR, February 2011.
- Parkway Belt West Plan, Ministry of Municipal Affairs and Housing, 1978.
- Integrated Accessibility Standards Regulation Guidelines, Access Ontario, April 2014.

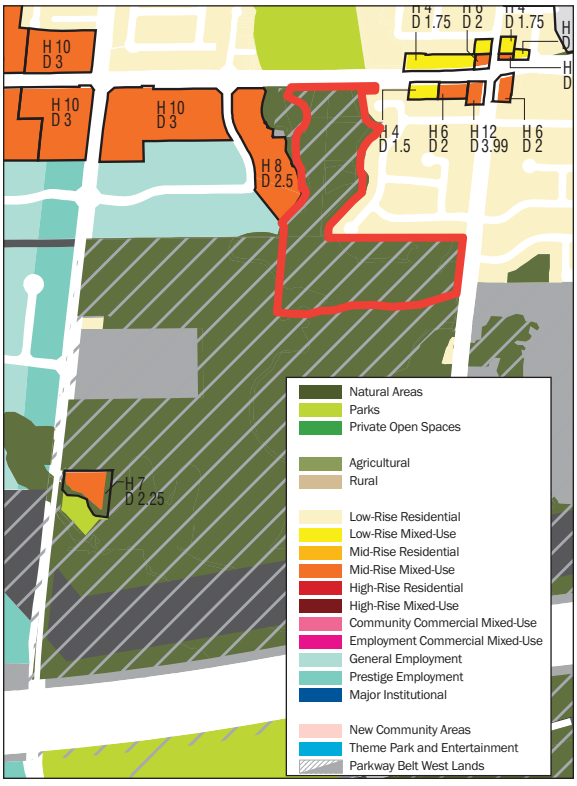


FIGURE-3 CITY OF VAUGHAN - LAND-USE MAP
Source: York Region Maps

3.0 INVENTORY AND ANALYSIS

3.1 Regional Context

From a regional perspective, the study area is part of several regional networks within Ontario as illustrated in **Figure-2 Regional Context, Community Connections & Open Space Network**

Within the regional transportation network of Ontario, it is located along the regional Highway 7 and is within approximately 5 km of the intersection of two major highways, 407 and 400. Development Plans for Highway 7 include the Viva Next Bus Rapidway Project, which entails a dedicated bus line along the centre of the highway to be completed by 2018.

This will be complemented by a network of bicycle and pedestrian paths and trails, as proposed in the York Region Pedestrian and Cycling Master Plan Study dated April 2010. This includes a cycling network along Highway 7 which will connect to the Vaughan Metropolitan Centre at the intersection of Highways 400 and 407.

Potential exists for linkages to existing trails at Thackeray Conservation Lands and Toronto's Humber Recreation Trail located south of Highway 407.

FIGURE-4 APPROXIMATE LOCATION OF CROWN LANDS TO BE SECURED

From an open space and conservation area perspective, the area is part of the West Humber River Sub-Watershed and is therefore monitored by the TRCA. Since the City does not own all the land of the subject study area, an alteration to the leasing agreement with the Crown Corporation may be required if this trail project should proceed.

Figure 4 identifies the approximate location of Crown Lands that would need to be secured between the City of Vaughan and the Crown Corporation if this project should proceed.

Parkway Belt West Plan

As defined by **Figure-3 City of Vaughan - Land-Use Map**, the study area is a *Natural Area*, and is identified as part of the Parkway Belt West Lands. The Parkway Belt West Plan (PBWP) was implemented in 1978 to aid in the creation of a multi-purpose utility corridor, urban separator and linked open space system. The PBWP was a culmination of regional planning, greenbelt and greenway planning and has a major function as an open space and recreation facilities link across the Region of York and the Province of Ontario.

The proposed trail supports the Parkway Belt West Plan (PBWP) goals and objectives. One of the PBWP's goals is to "provide a system of open space and recreational facilities linked with each other, nearby communities and other recreational areas". Objectives identified in the PBWP are supported by the proposed trail. These objectives include: "Set out major public and private open space that will provide opportunities for recreational activities that are accessible to the system of urban areas" and "Link existing and proposed public open-space and recreation areas into a network extending through the Parkway Belt and connecting to areas beyond".

Accessibility

Access Ontario's Integrated Accessibility Standards Regulation Guidelines (April 2014) were reviewed and the preferred trail design meets the accessibility guidelines. Relevant excerpts from the guidelines have been included below.

Consultations for Recreational Trails

Before constructing a recreational trail or redeveloping an existing trail, obligated organizations must consult with the public, including people with disabilities. Municipalities with an Accessibility Advisory Committee, established in accordance with subsection 29 (1) or (2) of the Accessibility for Ontarians with Disabilities Act, must also consult with the committee.

Consultations must address the following design elements that may be part of the trail:

- The slope of the trail (e.g. the appropriate cross slope, running slope or both)
- Need for, and location of, ramps on the trail
- Need for, location and design of:
    i. rest areas
    ii. passing areas
    iii. viewing areas
    iv. amenities on the trail
    v. any other accessibility feature.

Technical Requirements for Recreational Trails - Requirements as Stated in the Regulation

- A recreational trail must have a minimum clear width of 1,000 mm
- A recreational trail must have a clear height that provides a minimum head room clearance of 2,100 mm above the trail
- The surface of a recreational trail must be firm and stable
- Where a recreational trail is constructed adjacent to water or a drop-off, the trail must have edge protection that meets the following requirements:
    i. The edge protection must constitute an elevated barrier that runs along the edge of the recreational trail in order to prevent users of the trail from slipping over the edge.
    ii. The top of the edge protection must be at least 50 mm above the trail surface.
    iii. The edge protection must be designed so as not to impede the drainage of the trail surface.
- Despite the above paragraph, where there is a protective barrier that runs along the edge of a recreational trail that is adjacent to water or a drop-off, edge protection does not have to be provided.
- The entrance to a recreational trail must provide a clear opening of between 850 mm and 1,000 mm, whether the entrance includes a gate, bollard or other entrance design.
- A recreational trail must have at each trail head signage that provides the following information:
    i. The length of the trail.
    ii. The type of surface of which the trail is constructed.
    iii. The average and the minimum trail width.
    iv. The average and maximum running slope and cross slope.
    v. The location of amenities, where provided.
- The signage referred to above must have text that,
    i. has high tonal contrast with its background in order to assist with visual recognition; and
    ii. includes characters that use a sans serif font.
- Where other media, such as park websites or brochures, are used by the obligated organization to provide information about the recreational trail, beyond advertising, notice or promotion, the media must provide the same information as listed in paragraph 8 of subsection (1).

Technical Requirements Common to Recreational Trails

Ramps

Where a recreational trail or beach access route is equipped with a ramp, the ramp must meet the following requirements:

1. The ramp must have a minimum clear width of 900 mm.

2. The ramp must have a clear height that provides a minimum headroom clearance of 2,100 mm above the ramp.
3. The surface of the ramp must be firm and stable.
4. The ramp must have a maximum running slope of no more than 1:10.
5. The ramp must be provided with landings that meet the following requirements:
    i. Landings must be provided,
        a. at the top and bottom of the ramp,
        b. where there is an abrupt change in the direction of the ramp, and
        c. at horizontal intervals not greater than nine metres apart.
    ii. Landings must be a minimum of 1,670 mm by 1,670 mm at the top and bottom of the ramp and where there is an abrupt change in direction of the ramp.
    ii. Landings must be a minimum of 1,670 mm in length and at least the same width of the ramp for an in-line ramp.
    iv. Landings must have a cross slope that is not steeper that 1:50.
6. The ramp must not have any openings in the surface that allow the passage of an object that has a diameter of more than 20 mm.
7. The ramp must be equipped with handrails on both sides of the ramp and the handrails must,
    i. be continuously graspable along their entire length and have circular cross-section with an outside diameter not less than 30 mm and not more than 40 mm, or any non-circular shape with a graspable portion that has a perimeter not less than 100 mm and not more than 155 mm and whose largest cross-sectional dimension is not more than 57 mm,
    ii. be not less than 865 mm and not more than 965 mm high, measured vertically from the surface of the ramp, except that handrails not meeting these requirements are permitted if they are installed in addition to the required handrail,
    iii. terminate in a manner that will not obstruct pedestrian travel or create a hazard,
    iv. extend horizontally not less than 300 mm beyond the top and bottom of the ramp, and
    v. be provided with a clearance of not less than 50 mm between the handrail and any wall to which it is attached.
8. Where a ramp is more than 2,200 mm in width,
    i. one or more intermediate handrails which are continuous between landings must be provided and located so that there is no more than 1,650 mm between handrails, and
    ii. the handrails must meet the requirements set out in paragraph 7.
9. The ramp must have a wall or guard on both sides and where a guard is provided, it must,
    i. be not less than 1,070 mm measured vertically to the top of the guard from the ramp surface, and
    ii. be designed so that no member, attachment or opening located between 140 mm and 900 mm above the ramp surface being protected by the guard will facilitate climbing.

10. The ramp must have edge protection that is provided,
    i. with a curb at least 50 mm high on any side of the ramp where no solid enclosure or solid guard is provided, or
    ii. with railings or other barriers that extend to within 50 mm of the finished ramp surface.

3.2 Visual Assessment and Analysis of Existing Conditions

The study area contains the tributary Rainbow Creek, and is characterized by a combination of steep slopes (over 30%) with various flatter open areas, as illustrated in **Figure-5 Slope Study & Photo Key Plan**.

There are four identifiable pedestrian access points to the east edge of the study area and one on the west edge of the study area. Access points are not marked with signs. The site includes good view vista areas overlooking the natural areas. Generally, there are pedestrian access points into the site area from the east and west edges, but limited access points from the south or north edges.

The flora varies between primarily heavily forested areas, and smaller succession and meadow-like areas. There is a wetland at the north edge of the study area near the edge by Highway 7. This along with the fauna of the area is further discussed in Section **A - III. Natural Environment Constraints Study.**

Rainbow Creek, a tributary to the Humber River, runs through the study area and is further discussed in the Meander Belt Study (**A - IV. Meander Belt Study**).

Some observations from the site visits include:

- There are some areas with steep slopes that have issues with erosion. These areas would limit the development of trails in their vicinity.
- Steep slopes, in some cases are inaccessible and exceed 30% (1:3) rise to run ratio and limit access.

VIEW 1 - STEEP SLOPES WITHIN THE STUDY AREA

VIEW 2 - VERNAL POOL AREA

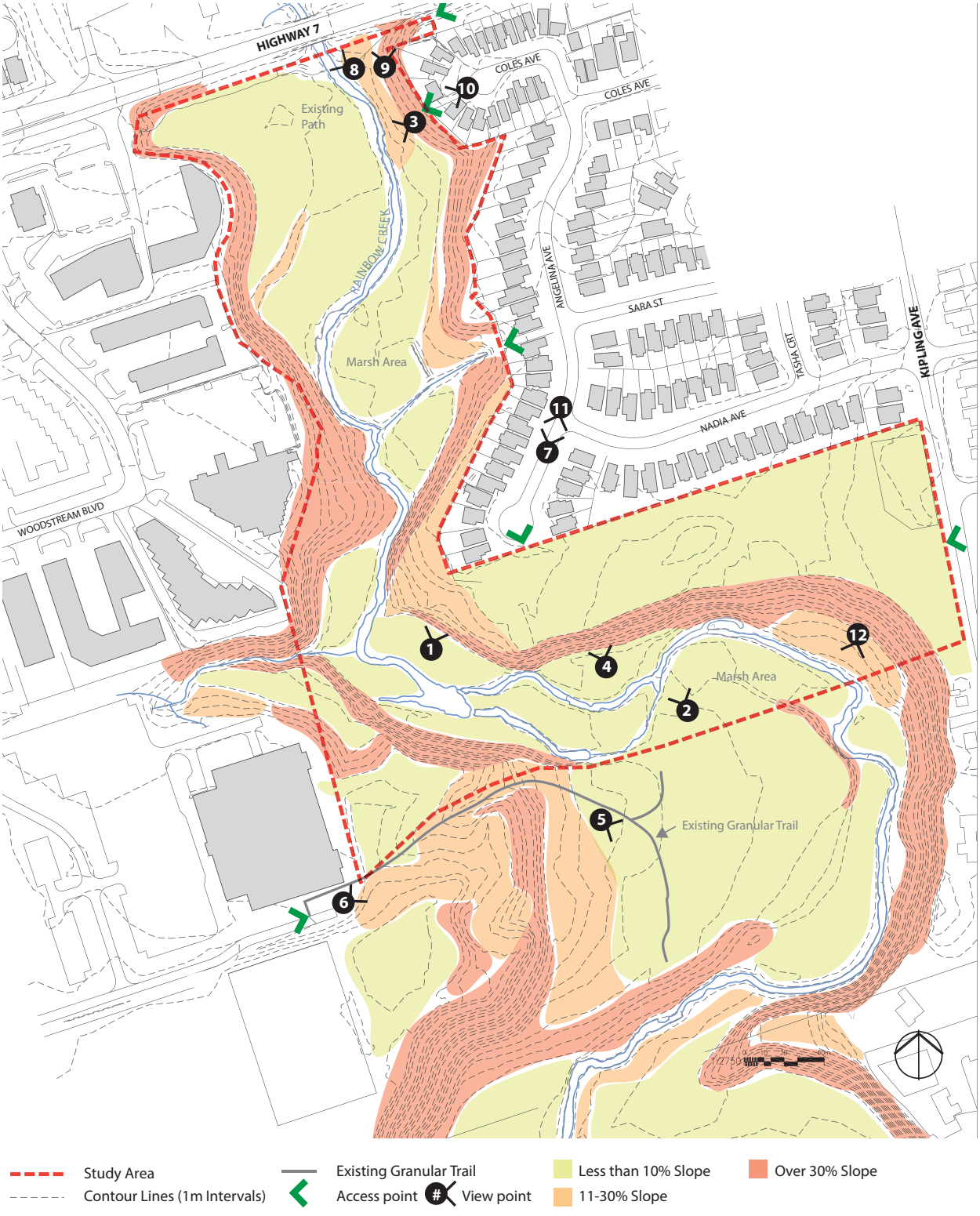


FIGURE-5 SLOPE STUDY & PHOTO KEY PLAN

VIEW 3 - TRAIL ACCESS POINT ON EAST EDGE

VIEW 4 - STEEP SLOPES AND EROSION ISSUES.

VIEW 5 - EXISTING GRANULAR PATH

VIEW 6 - ENTRY POINT NEAR SOCCER CENTRE

VIEW 7 - LOOKING NORTH ALONG ANGELINA AVE AT TERMINUS OF EXISTING SIDEWALK.

VIEW 8 - LOOKING NORTH AT THE HIGHWAY 7 UNDERPASS

- Several access points on the East side into the study area exist via Coles Avenue cul-de-sac, Sara Street, Angelina Avenue cul-de-sac and Kipling Avenue near it's intersection with Veneto Drive. These points are not marked and do not indicate if the area is accessible or not. The access point from the west edge near the soccer centre is outside the study area and is currently fenced from public access.
- Natural features within the site include an area to the north east with Butternut trees (Juglans cinerea), a vernal pool area to the south west of the creek and a seep area to the south east. These features are identified in Figure 6 and discussed further in section 3.3.2 below.
- A stormwater pond exists in the north east area of the site with a concrete weir.
- A parkette exists in the east edge of the site on Kipling Avenue.
- An open field tableland exists on the western edge of the site just south of the houses on Nadia Avenue with view vistas potential.

VIEW 9 - LOOKING WEST ALONG HIGHWAY 7 ON NORTH EDGE OF STUDY AREA - POTENTIAL LINK.

VIEW 10 - CONDITION OF EXISTING CONCRETE SIDEWALK WITHIN RESIDENTIAL NEIGHBOURHOOD.

VIEW 11 - LOOKING SOUTH AT TERMINUS OF EXISTING SIDEWALK.

VIEW 12 - POTENTIAL CREEK CROSSING LOCATION.

- Existing sidewalks within the residential neighbourhood along Angelina Avenue end just south of Nadia Avenue.
- Access via the underpass under Highway 7 does not have enough vertical height to allow safe pedestrian access, however north-south connections for community trails may be accommodated within the Highway 7 Right-of-way by use of existing sidewalks crossing at signalized intersections in order to connect to Rainbow Creek Park.

Refer to **Figure-8 Opportunities and Constraints Map,** which identifies the location of the above listed items.t

3.3 Summary of Supplementary Studies and Reports

As part of the feasibility study, various reports were prepared. These reports include: a detailed Archaeological Stage I Study, Natural Environment Constraints Study, Meander Belt study and a Geotechnical Assessment Report. These reports have been appended to this study. The following is a summary of their relevant findings and conclusions.

3.3.1 Archaeological Study STAGE I

As described in the study in section **A - II. Archaeological Study Stage I,** Archaeological potential is established by determining the likelihood that archaeological resources may be present on a subject property. Stantec applied archaeological potential criteria commonly used by the Ontario Ministry of Tourism, Culture and Sport (Government of Ontario 2011) to determine areas of archaeological potential within the region under study. These variables include proximity to previously identified archaeological sites by the TRCA, distance to various types of water sources, soil texture and drainage, glacial geomorphology, elevated topography and the general topographic variability of the area.

The area also has soils suitable for pre-contact Aboriginal agriculture and 11 archaeological sites are registered within a one kilometre vicinity of the study area. Specific to this study area, a Stage 1 and 2 archaeological assessment was completed by the TRCA in the northwest corner. No archaeological resources were recovered during the assessment (TRCA 2013). As such, the pre-contact Aboriginal archaeological potential of the study area is judged to be moderate to high. Given the location of the study area in close proximity to a body of water, the post-contact Aboriginal archaeological potential of the study area is judged to be moderate to high. Considering the study area's proximity to early Euro-Canadian settlement roads and domestic sites, the historic Euro-Canadian archaeological potential of the study area was judged to be moderate to high.

In summary, following Section 1.3.1 of the Standards and Guidelines for Consultant Archaeologists (Government of Ontario 2011), the study area retains archaeological potential except for that area already assessed by TRCA.

Based on the Stage 1 background research, it is recommended that a Stage 2 archaeological assessment would need to be undertaken in the area not previously assessed by the Toronto and Region Conservation Authority, as part of the detailed design phase.

3.3.2 Natural Environment Constraints Study

The study (**A - III. Natural Environment Constraints Study)** assessed the terrestrial features which include: designated features, vegetation communities, vascular plant species and wildlife including amphibians, reptiles, mammals and bird species. This was a combined method referencing the TRCA, conducting a background study and field investigations. The assessment highlights are as follows:

- There are no known natural features such as significant wetlands, woodlands or Areas of Natural and Scientific Interest (ANSI). Identified natural features within the study area include a marsh area identified as a vernal pool area, which has the potential for amphibian breeding grounds and a Seep area in the southeast corner of the study area as identified in **Figure-6 Natural Features And Habitats**.

- Vegetation: The majority of the study area is wooded, with bluff communities associated with valleyland walls and small community pockets of marsh and cultural meadow. An area with Butternut Trees (*Juglans cinerea*) was identified in the north east portion of the study area, which is considered an endangered species. Additionally, some Black Walnut trees (*Juglans nigra*) were identified, which are rare locally. The report recommended ensuring the trail minimized the disturbance of wetland areas, specifically the FOD7-3 (fresh-moist willow lowland deciduous forest community) areas identified in the Natural Heritage Reference Manual (MNR 2010), from which Figure 6 was derived.

- Birds: All species observed were ranked common and widespread or uncommon but not rare, with the exception of the Chimney Swift, which is provincially ranked as Threatened. It was concluded that although this species was observed in the study area, it likely does not nest therein, since it prefers breeding around chimneys, walls or other man-built structures for roosting and breeding.

- Aquatic Species: Rainbow Creek is identified as a Redside Dace Habitat, which is classified as *Endangered* under the MNR Endangered Species Act. Mitigation measures for this species is discussed in the report, specifically pertaining to the creek crossing. (refer to item 5.1 in Appendix A-111)

- Asphalt trails are typically prohibited in areas where there is Redside Dace. Should this project proceed to detailed design, a consultation meeting with MNR is recommended to discuss the project. The MNR will determine whether or not the project warrants a permit process for the Endangered Species Act or if a letter of advice would suffice. The permit process requires approximately eight months for approvals and is to be signed by the Minister of Natural Resources.

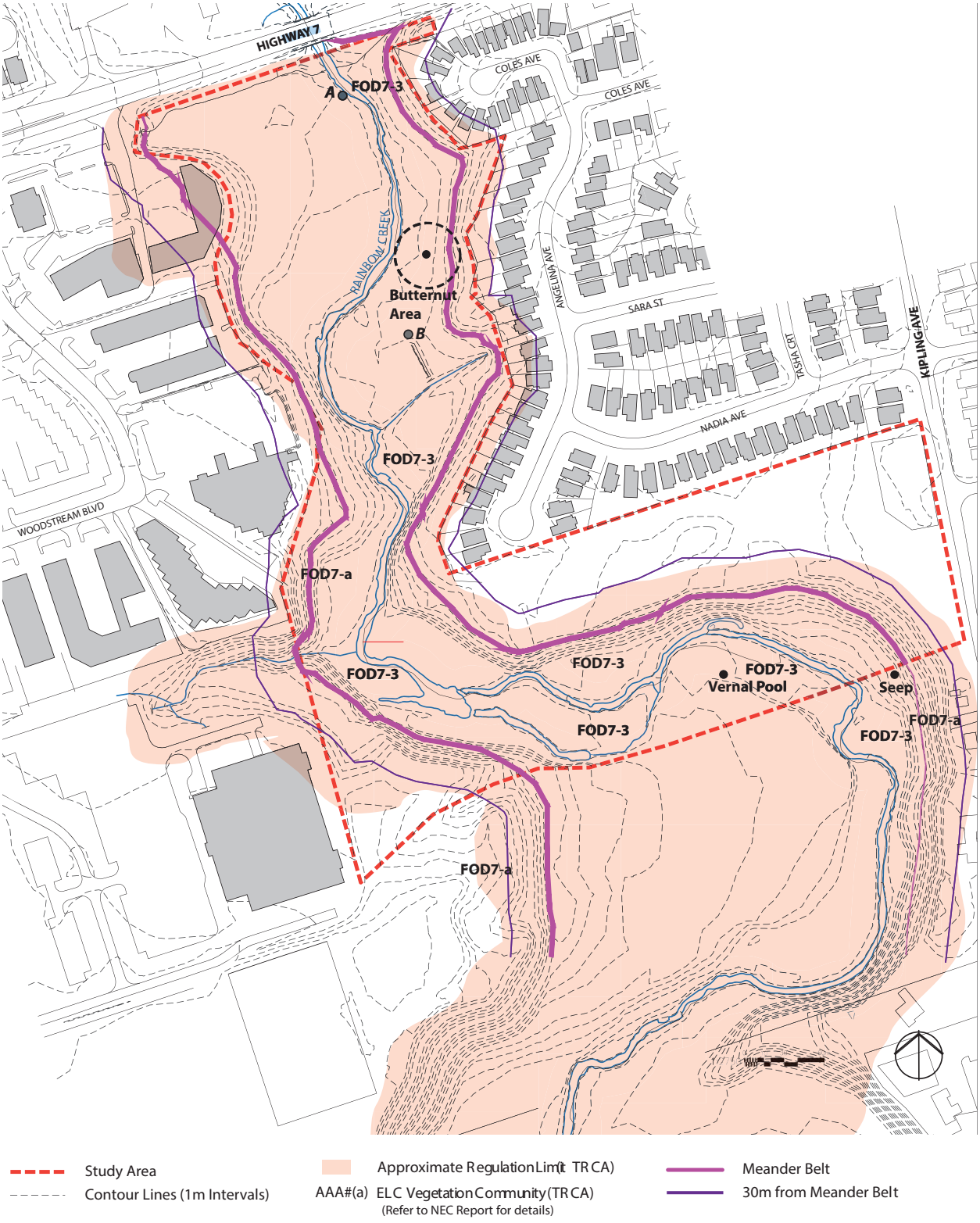


FIGURE-6 NATURAL FEATURES AND HABITATS

Recommendations were as follows:

- Design a path to avoid wetlands where possible and, where necessary, elevate crossing through the use of boardwalks to facilitate water movement.
- In order to minimize impact on the vegetation, designated access points will be established for access to the trail. Boardwalks, if required, should maintain the function of wetland/habitat features. Additionally, trails may be designed to offer some opportunity for education to the general public through naturalist information signage;
- Avoid the encroachment, or removal of any feature that is considered to hold water during the spring and early summer period (i.e. vernal pools, seeps, wetland/marsh communities).
- A protective 25m radius buffer around Butternut Tree area is suggested to prevent damage to the roots. However, a trail may be aligned within or near the 25m radius, provided the trees have a Butternut Health Assessment conducted and if retainable, MNR mitigation and compensation measures would be placed on the trail design.

Bridge Design recommendations are as follows:

- As part of the Red-side Dace habitat protection area, the MNR recommends that the crossing width be minimized, the bridge be located on an area of the stream where there is less likelihood for erosion of the banks, crossings in areas that have already been disturbed and avoid disturbing new areas and that bridges should be high enough to allow light penetrations into the watercourse.

A permit would be required upon the assessment of the proposed trail location and creek crossing location and bridge construction with respect to habitat disturbance and protection measures, specifically relating to the Endangered Species Act Permit and the Fisheries Act review and requirements.

3.3.3 Meander Belt Study

Rainbow Creek was assessed from Highway 7 (Upstream) to a point approximately 1km downstream of Highway 7 in its direction of flow from north to south. In the historic assessment of the Channel Planform within Rainbow Creek, it was concluded that the Mid-Channel bar (MCB) shows significant evolution between 2002 and 2012. The upstream planform in 2002 is very similar to that of 2012, however, the downstream planform at the east bend is significantly different in 2012 when compared to 2002. The length of the MCB had decreased by half and a shift in the channel has occurred.

The rate of erosion in the upstream reach at the 100-year rate is estimated to be 28m and 44m at the downstream reach. The zone around the MCB in the downstream reach has experienced a high rate of erosion, approximately 35m in 10 years in addition to a significant planform shift and is therefore considered unstable refer to **Figure-7 Meander Belt And Stable Slope Edge.** The meanders are largely or partially confined within a relatively narrow valley, therefore limited potential for substantial planform shifts. Sinuosity in 2002 was 1.17 and 1.20 in 2012. Details can be found in Section **A - IV. Meander Belt Study.**

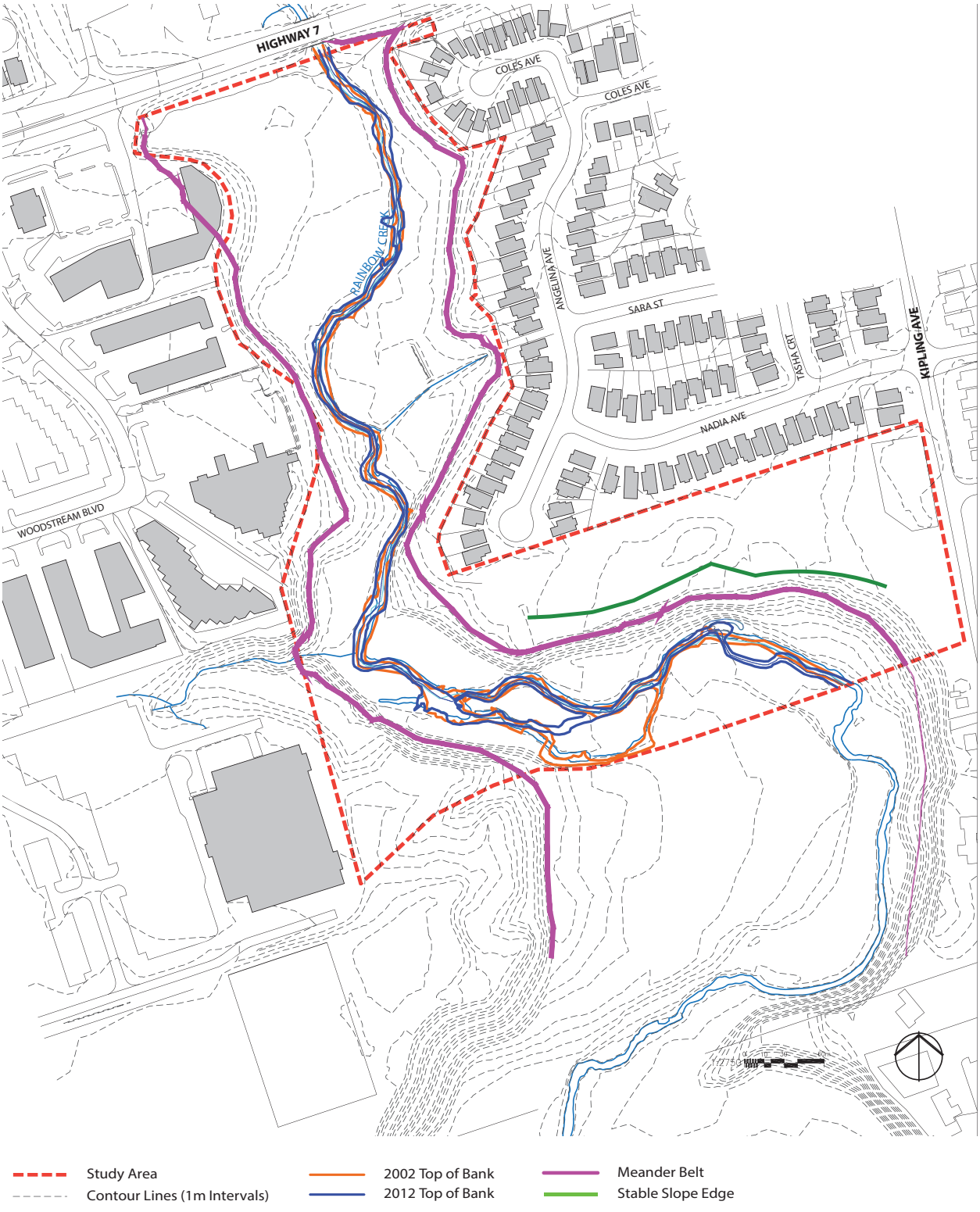


FIGURE-7 MEANDER BELT AND STABLE SLOPE EDGE

The location of the proposed creek crossing was chosen based on the stability potential. Further studies would be required outside the delineated scope of work, however, to determine the stability of the creek within 30 metres south of the study area to verify the stability of the chosen location of the creek crossing.

3.3.4 Geotechnical Assessment

While the majority of the banks are well vegetated, there appears to be active surface or toe erosion and previous slope failures at several locations within the site, based on visual assessment.

The soil is predominantly silt and silty clay soils, with some isolated coarse and fine-textured glaciolacustrine deposit patches and shale bedrock at the toe of the slope and within the flood plain of the creek. The shallow static groundwater level is expected to range from approximately 3.0 to 5.4 metres.

The creek is more than 15 metres away from the eastern boundary of the bank except at the eastern section near Kipling Avenue where it approaches approximately 8 metres at three locations. That said, the bank along the east property boundary is considered to be stable, based on a preliminary slope stability analysis. However, rill erosion was observed at the crest of the valley wall, likely caused by surface runoff and it is recommended that surface vegetation be maintained and possibly increased if signs of degradation are observed. The suggested stable slope allowance is 30% (or 1 vertical : 3 horizontal). Additionally, a stable slope edge line was identified in **Figure-7 Meander Belt And Stable Slope Edge**. It is recommended that this line be the minimum setback from the slope to the trail.

As for the shale bedrock conditions, it is characterized as “highly variable and of very poor quality” therefore indicating that the bridge foundations utilizing the weathered shale bedrock may be designed using an assumed factored Ultimate Limit States (ULS) resistance of 0.8 Mpa. This would require a dimension of 2.0 metres for the spread footings, where the upper footing must be founded below an imaginary 10:7 (Horizontal: Vertical) line drawn from the base of the lower footing (details available in section **A - V. Geotechnical Assessment**).

3.4 Summary of Findings

Upon analyzing the study area, various opportunities and constraints are evident. Opportunities include: existing accessible connection points from the neighbourhood to the east and sports park to the west as seen in **Figure-8 Opportunities and Constraints Map**, as well as adjacency to the planned regional trail along Highway 7. Additionally, key look-out points could be incorporated in the trail to elevate its community value and use. Proximity to the school can also be an opportunity to utilize the trail for educational purposes, based on the significant habitat ecosystems that exist in the study area.

Constraints include the crossing of Rainbow Creek, which will require a bridge intervention and satisfying requirements pertaining to the existing Redside Dace Habitat. Steep slopes also create a constraint for the potential trail locations since issues such as accessibility and slope stabilization will impact the trail design, including maintaining the necessary setbacks from endangered species habitats. Furthermore, access points on the west edge of the study area need to be improved and made public, as currently the access point is gated. The trail would not be safe if it continued under Highway 7 due to flooding potential. However, there are options to provide the

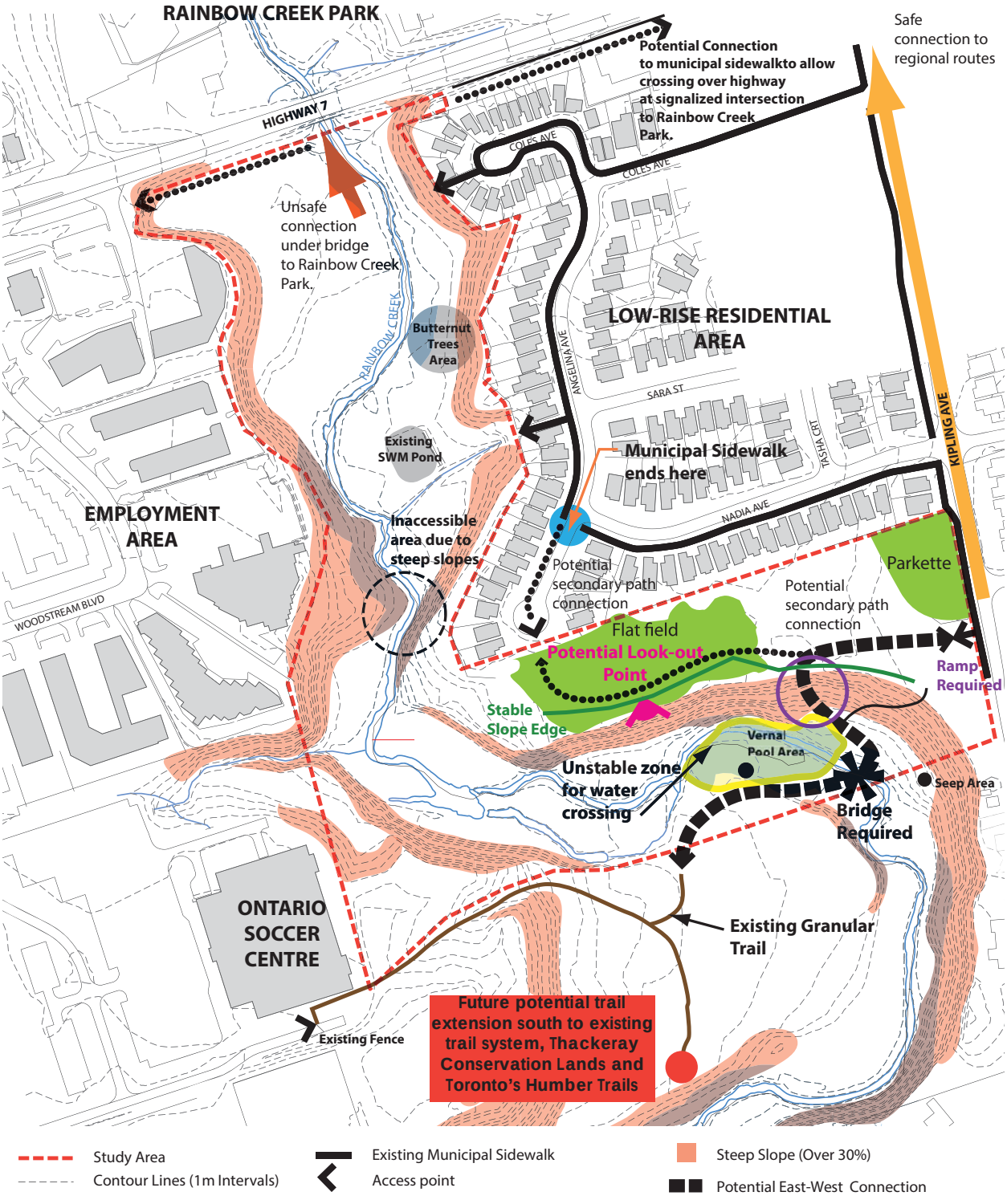


FIGURE-8 OPPORTUNITIES AND CONSTRAINTS MAP

north-south link to Rainbow Creek park by utilizing sidewalk and signalized intersections along Highway 7. Another option would include construction of a pedestrian bridge over Highway 7; However, this would require additional studies and significant costs.

Ramps and switchbacks would be required to provide access from the eastern tableland area down towards the proposed trail and bridge. An alternative to ramps would be the use of stairs. There would be less disturbance to the existing grades and vegetation with stairs; however it would make the trail inaccessible to many users.

Objectives and Key Issues for Trail Path Layout

- CONNECTIVITY & USES: Improve on the existing trail system in the City of Vaughan as well as with the regional connections and encourage community access to adjacent sports facilities and schools, that accommodate pedestrian and bicycle uses by connecting the east and west edges of the study area via a bridge and north and south edges with existing regional trail systems.
- ACCESSIBILITY: Create a trail system that is as sustainable and universally accessible as can possibly be accommodated, (Trails for all Ontarians Collaborative - 2006) especially with the steep slopes observed on the site.
- SAFETY: Ensure trail users safety by incorporating some of the Crime Prevention through Environmental Design Guidelines, where applicable and locating the trail away from steep or unstable slopes. Bridges and switchbacks would need to be included to ensure pedestrian accessibility where slopes are steep or where crossing the creek is needed.
- SUSTAINABILITY & SENSITIVITY: Protect and enhance the Rainbow Creek watershed and its thriving ecosystem by ensuring minimal habitat disturbance and maintaining protection of endangered species such as Butternut Trees and the Red Side Dace fish, specifically where water-crossings or boardwalks are proposed.
- COMMUNITY INVOLVEMENT & ENJOYMENT: Create opportunities for community members to maintain and enhance the trail and establish a sense of community ownership towards the trail by providing look out areas and educations signs to promote community involvement.

Conceptual image of educational signs

4.0 PROPOSED TRAIL ALIGNMENT AND DESIGN OPTIONS

4.1 Programming and Trail Requirements

The Kipling Trail option to connect the east and west side of the naturalized study area; allowing access from the neighbourhood to the east and to the sports park to the west. A summary of the programming requirements for the trail, that achieve the trail objectives, include the following:

Conceptual image of 3 metre wide trail

Conceptual image of 3 metre wide switchback

Conceptual image of stairs in trails

CONNECTIVITY & USES

- Trail is to be a multi-use (Pedestrian and Bike) off-road route path through a naturalized area connecting the eastern neighbourhoods with the sports facilities to the west of the study area. Steep slopes on the east side of the creek may not allow access for emergency and maintenance vehicle uses, which can be better accommodated from the west edge. Trail width and materials can be refined during the detailed design phase. It is recommended that trail width, materials and base materials allow for maintenance vehicles; taking into account turning radii. The recommended trail to accommodate multi-uses is a 3 metres wide path.

ACCESSIBILITY

- For accessibility and pedestrian safety concerns, steep slopes (over 30%) are to be avoided in the selection of the trail alignment. Erosion control measures would be required for public safety where slopes are steep alongside the trail. Any section of the trail along the areas within the 11 to 29% range should ensure erosion control measures are in place and sustainable. Preferred slope range for pedestrian and bike access should be between 2% to 8%. Use of switchbacks allows for accessible pedestrian access to the bottom of the slope. Stairs would also allow access and

require less disturbance; however stairs are not universally accessible. Utilize wayfinding signage that is clear so that users of all age ranges can easily navigate the system. Additionally, access from the Soccer Centre cannot be gated or fenced.

SAFETY

- Allow unimpeded sightlines and avoid blind spots along the path, where possible.
- Set clear active destination paths for the trail and avoid the use of pedestrian underpasses and narrow passageways, if unsafe.
- Erosion control to be implemented along any grading work with steep slopes to ensure continued safety and accessibility, such as at switchbacks. Guard rails would be required along ramps and steep slopes. These are especially important along any switch-backs on the trail that would be required for accessibility.
- Provide Access Control (*ie.* P-Gates)to control use and to slow down cyclists.
- Trail markers and directional signage to be considered for orientation and information purposes.
- Use of guard rails to restrict access to sensitive or hazardous areas.

SUSTAINABILITY AND SENSITIVITY

- Minimize disruption to the existing ecosystems and environments. This includes sensitive habitats along and within the creek and ensure that any disruptions do not occur during multiplying seasons as determined in the Natural Environment Constraints Study.
- Trail alignment to avoid vernal pool area if possible. Boardwalk to be considered if trail is proposed through these areas.

Conceptual image of p-gates

Conceptual image of directional signs

Conceptual image of guard rails

Conceptual image of boardwalk

Conceptual image of a Shade-structure.

Conceptual image of a bridge-structure.

- Trail is to be setback from surface water ways where possible, with minimized impact where it is necessary to cross these surface waterways. Location of bridge crossing to be outside the erodable area and to consider the meander belt movement. Bridge materials and components are to be carefully considered.

- Habitat Protection: Ensure a 30 metre buffer on either side of the Meander Belt as a protection measure for the Ministry of Natural Resources Red-side Dace habitat protection area. Butternut trees marked areas within the site are to have a 25 metre protection radius.

COMMUNITY INVOLVEMENT AND ENJOYMENT

- Support facilities such as benches along the route at scenic look-out areas as well as bicycle parking near the trail heads should be provided. Additional features could include waste receptacles, signage, interpretive signs and P-gates. Key scenic look-out areas should consider use of shade structures.

- Opportunities for educational signs and wild life observation areas can be provided.

- Allow stewardship as a means to maintain the trail and provide the community a sense of ownership of Kipling Trail, through the involvement of local community members and groups.

4.2 Trail Conceptual Alignment & Approach Assessment

Due to the limited locations where a bridge crossing could be placed based on habitat disturbance, accessibility and erosion issues, steep slopes and sensitive flora and fauna, trail layout options were limited.

A summary of the options that were explored include:

a. Do nothing. This option would not achieve the objectives of providing a recreational trail, providing safe trails to avoid potential degradation of sensitive areas, and providing key linkages between the residential neighbourhood east of the valley to the facilities west of the valley. (Note that the majority of the feedback received from local residents that attended the PIC on September 15, 2015 were not in favour of adding a trail.)

b. Provide a continuous off-road trail to Rainbow Creek Park north of Highway 7. This option required passing underneath Highway 7 and was found to be unsafe due to the proximity to the creek. Providing a pedestrian bridge over Highway 7 would be safe; however it would require further time and studies, approvals and significant costs.

c. Providing a continuous off-road trail within the naturalized valley area to link the north limit at Highway 7 to the residential neighbourhood east of the valley and Vaughan Grove Sports Park west of the valley. On account of the steep inaccessible grades within part of the valley (west of the residential area between the south limit of the neighbourhood and Sara Street) a continuous accessible trail is not possible. The use of stairs could be considered in these steep slope areas, allowing continuity of the trail within the valley. This approach would limit the users of the trail. Altering the grades to allow an accessible trail within the valley area would require significant disturbance to the valley landform and vegetation. This option is not feasible due to the disturbance to the environment, high costs and the improbability of securing agency approvals.

d. The most feasible option, as shown on Figure 9 and described in section 4.3, achieves an efficient and accessible connection between the west and east side of the valley with limited disturbance to the environment. A continuous valley trail is not achieved due to steep grades; however, through the utilization of existing municipal sidewalks, a continuous pedestrian link is possible.

Further studies and permits would be required. Refer to TRCA Pedestrian Bridge Permit Requirements in **A - VI. TRCA Bridge Design Requirements - August 2008.** The most feasible trail layout, highlighted in **Figure-9 Conceptual Trail Layout,** was explored and evaluated based on nine criteria which cover requirements for the trail as well as the objectives previously outlined. The trail can be divided into two phases (PH I & PH II), the first achieving the primary goal and connecting the east and west edges of the study area. The second phase focuses on the north/ south connections and integrating the trail into the planned regional trail systems.

FIGURE-9 CONCEPTUAL TRAIL LAYOUT

A summary of the analysis can be seen in the following **Table 1** showing the recommended route and its compliance with the established requirements for the trail, followed by an analysis of the criteria.

TABLE 1: MATRIX OF PROPOSED TRAIL OPTION CONFORMITY TO REQUIREMENTS

	Criteria	Evaluation	Details
1.	Trail Length (Ph I +Ph II))	4,740 metres	Connects with existing path locations and minimizes amount of existing trail preparation to be added.
2.	Archaeological Disturbance	●	No archaeological disturbance based on Stage I study.
3.	Natural Habitat Disturbance	◑	Trail will aim to minimize impact on sensitive habitat areas.
4.	Accessibility (Slopes %) & Erosion Issues	○	Trail will require a ramp at steep slopes and may not be universally accessible.
5.	Intervention & Plant Restoration Scale	◑	Connects with existing paths and minimizes amount of habitat disturbance areas.
6.	Safety	◑	Pedestrian safety measures and information signage.
7.	Geotechnical Intervention Level	◑	Considers the stable slope edge and minimizes erosion concerns.
8.	Connections (Regional + Local)	●	Allows connection from Kipling Avenue to Martin Grove Road and Vaughan Grove Sports Park. Rainbow Creek Park can be linked utilizing Highway 7 ROW.
9.	Enjoyment Factor	◑	Phase I employs the look-out area south of the residential neighbourhood. Trail caters for the enjoyment of the natural environment and passive recreation.

○ Low/Negative

● High/Positive

Through the analysis of the various studies and the visual evaluation of the site, only one area was identified suitable to accommodate the bridge water crossing. This was the area directly south west of the parkette along Kipling Avenue.

As for accessibility, the steep slopes that characterize the area make it difficult to select a route that does not involve significant grading to allow pedestrian access form the tableland to the valley. The recommended trail alignment would achieve the least amount of slope stabilization requirements, although a switch-back with retaining walls and guardrails along the steep incline would be required to achieve the accessible path slope.

With respect to the length of the trail, the most feasible trail alignment utilizes existing formal and informal paths and access points in the study area. It is the shortest route to get from the east to the west side across the study area, and therefore creates the least amount of habitat disturbance.

The most feasible trail alignment does not have any impact on any archaeological areas based on the Stage I Assessment and has limited impact on natural habitat areas. A Stage II Archaeological assessment would be required once the construction impact areas have been narrowed down and defined.

Based on the potential view vistas, this alignment allows desirable view vistas in both phases of the trail, as indicated in **Figure-9 Conceptual Trail Layout**.

4.3 Preferred Trail Design Components & Guidelines

Trail Dimensions and Materials

The off-road multi-use recreational pathways (MRP) recommends a minimum 3.0 metre width according to the Vaughan Pedestrian and Bicycle Master Plan. This allows for traffic flow in both directions. **Figure-10 An example of a typical minimum cross-section for a Class 1 Multi-Use Recreational Pathway- Source: The City of Vaughan Pedestrian and Bicycle Master Plan** illustrates a cross-section for a typical MRP.

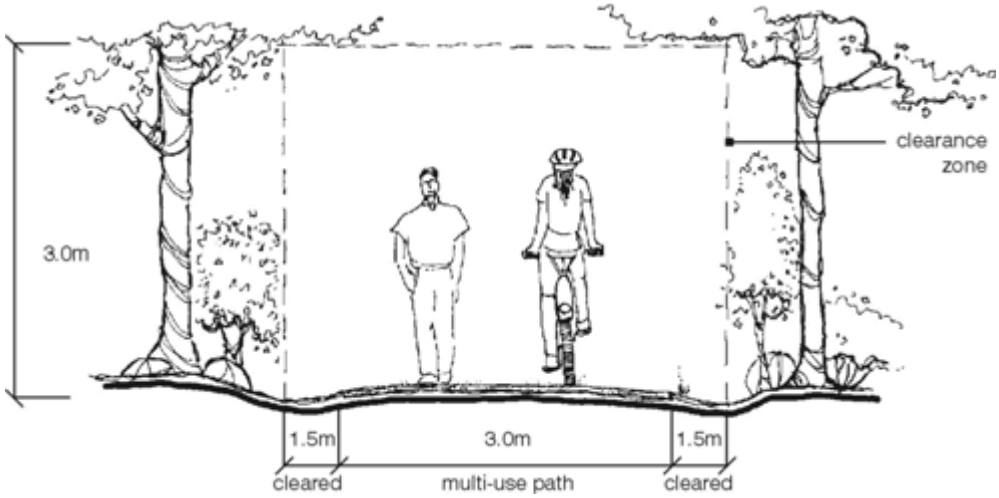


FIGURE-10 AN EXAMPLE OF A TYPICAL MINIMUM CROSS-SECTION FOR A CLASS 1 MULTI-USE RECREATIONAL PATHWAY- SOURCE: THE CITY OF VAUGHAN PEDESTRIAN AND BICYCLE MASTER PLAN

The master plan also recommends asphalt or granular surfaces such as stone-dust or gravel for MRPs. It recommends that stone-dust or gravel surfaces be used for MRPs in environmentally sensitive areas, especially those proposed in the rural areas of the City and environmentally sensitive areas in valley lands. Other alternatives to asphalt include limestone screenings with enviro-bond, but this would be dependent on the agreement of TRCA and MNR.

Asphalt surfaces are preferred for MRP's that provide key connections within urban areas, and are anticipated to receive high use, especially for utilitarian cyclists or pedestrians. Asphalt is also preferred to gravel and limestone screenings since screening can potentially cause environmental damage due to displacement of material outside the designated path. However, based on the City of Vaughan's previous experience with MNR permit approvals, asphalt is not a preferred surface treatment.

Dimensions and Materials Guidelines

- **Table 2** illustrates minimum and optimum dimensions as per the City of Vaughan Pedestrian and Bicycle Master Plan:

TABLE 2: TRAIL DIMENSION REQUIREMENTS

Element	Design (Optimum)	Design (Minimum)
Width	3 metres with two 1.5 metres soft shoulders	2.5 metres minimum and no shoulders if lack of right of way
Cross Slope	3%, draining towards waterway	
Incline	5%	8.33% for short distance, with intermittent rest areas at 100 metre intervals

Source: Pedestrian and Cycling Master Plan-Planning and Design Guidelines-2006 Version 1.3

- All off-road pedestrian and cycling routes (with the exception of footpaths and hiking trails) should be designed in such a way that they are accessible to cyclists, pedestrians, and those using mobility devices.
- Grades greater than 5% should normally be avoided. It is desirable for grades to be less than 3%, especially long uphill grades. On long steep grades, introduce flat rest areas approximately every 100 metres of horizontal distance.
- Uphill slopes for cyclists require wider operating areas to allow for side-to-side movement that often occurs when going uphill.
- Ramps should be provided along routes where steep grades cannot be avoided. Steps are less damaging to the natural environment, however, they are unsafe with water conditions and cold temperatures and inaccessible to trail users and should therefore be avoided.
- See City of Vaughan details in the Appendix for Limestone Screening and Asphalt Paving as well as trail dimensions.

Trail Safety

Way-finding signage is to be utilized at trail heads and forks. Ensure visibility and clear sight distance along winding paths where possible and mark inaccessible slopes (over 8%) to ensure pedestrian safety. Erosion and soil stability measures are to be considered in detailed design interventions, as well as anti-slip surfaces and railings where applicable. Signage & Pavement Markings and Trail Rating as per the Ontario Trails Council are to be included to identify where the trail is accessible and if it is easy, moderate or extreme.

Safety Guidelines

Safety Measures as per the Government of Ontario's Integrated Accessibility Standards Regulation Guidelines (Accessibility for Ontarians with Disabilities Act, 2005), and the section dealing with the Design of Public Spaces Standards (Accessibility Standards For The Built Environment) specify the following guidelines to consider for accessibility, where possible:

- Minimum turning radius is 1.5m at trail heads;
- Minimum 1.5m wide paths;
- Ramp slopes of a maximum of 1:12 (8%) and requires handrails;
- Signage height should be mounted at a consistent height of 1525 mm (5').

Bridge

The bridge width should not be less than 3 metres wide. Load requirements are to allow for maintenance and emergency vehicles. Specific load requirements to be determined in consultation with City of Vaughan during the detailed design stage.

A prefabricated bridge with concrete footings with a length of between 20-25 metres would be required at the proposed location. Concrete abutments are to be setback from banks and be located on stable edges of the creek with no erosion concerns.

The pedestrian bridge will require a permit from the TRCA as per the TRCA Watercourse Crossing Guidelines for major stream crossings dated 2008 to fully assess the proposed span and crossing location. The permit application requirements are referenced in Section **A - VI. TRCA Bridge Design Requirements - August 2008.** Details regarding bridge foundations can be found in the Geotechnical Assessment in Appendix **A - V. Geotechnical Assessment** (page 4&5) for recommended footing design. It is recommended that a prefabricated metal bridge be used for this crossing. All stream crossings are to follow Best Management Practice for Redside Dace habitat areas (see Appendix) **A - III. Natural Environment Constraints Study.**

Conceptual image of a metal bridge structure.

Other Components

Other trail design components that are to be considered are:

- Sustainability & Water Management -Culvert & Stormwater Managment Drawings & Erosion Controls
- Furniture & Details: Furniture Details, Signage, Benches, look-out areas, waste -receptacles, signage, and painted lines along neighbourhood streets.
- Construction Issues & Restoration and Compensation including planting restoration along length of trail and removal of plant material procedures (On-site or off site).

4.4 Construction, Phasing and Implementation

4.4.1 Preliminary Construction Cost Estimates & Phasing

Table 3 is a preliminary cost estimate for Phases I and II. Permit fees, additional detailed studies and consulting fees have been included in each Phase of the costing estimates.

4.4.2 Operations, Maintenance & Potential Future Connections

Maintenance could be supported through the City's Park Ambassador Program (http://www.vaughan.ca/events/Pages/Park-Ambassador-Launch.aspx), which was launched in 2013, to foster a community stewardship approach to the parks in the City of Vaughan. Ambassadors could monitor the trail and assist Parks Staff and Patrol by conducting site visits and performing visual checks. They report damage and undesirable activities to the appropriate City staff and/or department. They also inform park users about City services, events and initiatives, if there is community interest.

Additionally, city budget would be required for the maintenance of this trail.

At the time of the submission for this report, a Concept Development Application was submitted to the TRCA on November 14, 2012 for purposes of receiving input only.

Phase II addresses future connections to the north that would utilize municipal sidewalks along Highway 7 as well as connections through the neighbourhood along Angelina Avenue. It is not an immediate requirement to achieve the primary objectives of this trail. These are achieved in Phase One and connect the east and west edges of the naturalised area south of Highway 7 surrounding Rainbow Creek.

TABLE 3: PRELIMINARY COST ESTIMATE FOR TRAIL WORKS

Stantec File: 1606 22064
16-Oct-15

OPINION OF PROBABLE COST - LANDSCAPE WORKS

Kipling Trail Feasibility Study
Vaughan, ON

Notes: Taxes are not included

Item	Description	Unit	Estimated Quantity	Unit Price	Total Price
	PHASE ONE				
1.0	**Site Preparation**				
1.1	Siltation Control Fencing (double)	LM	800	$ 48.00	$ 38,400.00
1.2	Metal Security Fence	LM	300	$ 15.00	$ 4,500.00
1.3	Temporary project construction signage	ea	1	$ 900.00	$ 900.00
1.4	Erosion control items (i.e. mud-mats), complete with remediation upon completion of work.	L.Sum	1	$ 10,000.00	$ 10,000.00
1.5	Tree Pruning, clearing, removal and disposal of existing plant material.	L.Sum	1	$ 30,000.00	$ 30,000.00
1.6	Earth Works	L.Sum	1	$ 50,000.00	$ 50,000.00
2.0	**Trail Construction**				
2.1	Trail Paving (3m wide trail limestone screenings)	m^2	2,650	$ 40.00	$ 106,000.00
2.2	Resurfacing of existing Granular Trail (3m wide trail)	m^2	990	$ 25.00	$ 24,750.00
2.3	Envirobond stabilizing product (or approved equal) on trails with gradient over 5%	L.Sum	1	$ 10,000.00	$ 10,000.00
2.4	Armour Stone Retaining Walls	lm	150	$ 400.00	$ 60,000.00
2.5	Guard/Hand Rails along switchback	lm	150	$ 250.00	$ 37,500.00
2.6	Guard rails along trail	lm	100	$ 250.00	$ 25,000.00
2.7	Culverts	L. Sum	1	$ 6,000.00	$ 6,000.00
3.0	**Bridge** (c/w concrete abutments)	L.Sum	1	$ 120,000.00	$ 120,000.00
4.0	**Boardwalk**	L.Sum	1	$ 40,000.00	$ 40,000.00
5.0	**Furniture & Signage**				
5.1	Bench	ea	4	$ 2,500.00	$ 10,000.00
5.2	Waste Receptacles / Recycling	ea	4	$ 1,500.00	$ 6,000.00
5.3	Signage (Entry/Way-Finding)	ea	3	$ 1,500.00	$ 4,500.00
5.4	Signage (Interpretive/Educational)	ea	2	$ 3,000.00	$ 6,000.00
5.5	P-Gates	ea	3	$ 2,000.00	$ 6,000.00

6.0	**Compensation Planting**						
6.1	Trees (native deciduous and coniferous trees of varying sizes)	ea	70	$	350.00	$	24,500.00
6.2	Shrubs	ea	600	$	35.00	$	21,000.00
6.3	Seeding (disturbed areas)	m²	3000	$	6.50	$	19,500.00
		TOTAL PHASE ONE CONSTRUCTION				**$**	**660,550.00**
					Phase One 15% Contigency:	$	99,082.50
					Phase One Consulting Fees (10%):	$	66,055.00
					Phase One Survey:	$	8,000.00
					Phase One Geotechnical Services:	$	10,000.00
					Phase One Archaeological (Phase 2) Study	$	10,000.00
					Arbouricultural Services	$	8,000.00
					Phase One Permits:	$	6,000.00
					Phase One Total Estimated Cost:	**$**	**867,687.50**
	Phase One Provisional Item: Shade Structure					*$*	*60,000.00*

	PHASE TWO				
7.0	**Site Preparation**				
7.1	Siltation Control Fencing (double)	LM	400	$ 48.00	$ 19,200.00
7.2	Metal Security Fence	LM	200	$ 15.00	$ 3,000.00
7.3	Temporary project construction signage	ea	1	$ 900.00	$ 900.00
7.4	Erosion control items (i.e. mud-mats), complete with remediation upon completion of work.	L.Sum	1	$ 10,000.00	$ 10,000.00
7.5	Tree Pruning, clearing, removal and disposal of existing path and plant material.	L.Sum	1	$ 22,000.00	$ 22,000.00
7.6	Earth Works	L.Sum	1	$ 40,000.00	$ 40,000.00
8.0	**Trail Construction**				$
8.1	Trail Paving (3m wide trail limestone screenings)	m^2	1,100	$ 40.00	$ 44,000.00
8.2	Envirobond stabilizing product (or approved equal) on trails with gradient over 5%	L.Sum	1	$ 5,000.00	$ 5,000.00
8.3	Concrete Sidewalk (repairs at existing access points)	m^2	120	$ 80.00	$ 9,600.00
8.4	Armour Stone Retaining Walls	lm	80	$ 400.00	$ 32,000.00
8.5	Guard/Hand Rails along top of wall	lm	80	$ 250.00	$ 20,000.00
8.6	Culverts	L. Sum	1	$ 5,000.00	$ 5,000.00
9.0	**Furniture & Signage**				
9.1	Bench	ea	2	$ 2,500.00	$ 5,000.00
9.2	Waste Receptacles / Recycling	ea	4	$ 1,500.00	$ 6,000.00
9.3	Signage (Entry/Way-Finding)	ea	3	$ 1,500.00	$ 4,500.00
9.4	Signage (Interpretive/Educational)	ea	1	$ 3,000.00	$ 3,000.00
9.5	P-Gates	ea	3	$ 2,000.00	$ 6,000.00
10.0	**Compensation Planting**				
10.1	Trees (native deciduous and coniferous trees of varying sizes)	ea	60	$ 350.00	$ 21,000.00
10.2	Shrubs	ea	300	$ 35.00	$ 10,500.00
10.3	Seeding (disturbed areas)	m^2	2000	$ 6.50	$ 13,000.00
		TOTAL PHASE TWO CONSTRUCTION			**$ 279,700.00**

Phase Two 15% Contigency:	$ 41,955.00
Phase Two Consulting Fees (10%):	$ 27,970.00
Phase Two Survey:	$ 8,000.00
Phase Two Geotechnical Services:	$ 8,000.00
Arbouricultural Services	$ 8,000.00
Phase Two Permits:	$ 5,000.00
Phase Two Total Estimated Cost:	**$ 378,625.00**
TOTAL ESTIMATED COST:	**$ 1,246,312.50**

4.5 Summary of Public Information Centre (PIC)

4.5.1 Summary Comments

On Tuesday September 15th from 7:00 p.m. to 8:30 p.m. the City of Vaughan's Parks Development Department held a Public Open House at the Vaughan Soccer Centre (7401 Martin Grove Road), Canada Room, for the public to review the proposed Kipling Trail Feasibility Study prepared by Stantec Consulting Ltd. The area residents were notified about the Public Open House by the City of the Vaughan. 450 addressed invitations were sent to all residents living south of Hwy #7 and west of the CP railland. The Public Information Centre (PIC) exhibited a summary of the feasibility study on three (3) boards provided for the interested public to view (refer to Appendix A-VIII).

The Feasibility Study and Intent:

The study assesses the feasibility of connecting the residential neighbourhood south of Highway 7, east of Rainbow Creek to the recreational facilities, school and park to the west of the Creek. The objective of the study is to analyze the archaeological, habitat and ecological, hydrological and general physical conditions of the study area and recommend design options for a trail system that will have minimal environmental & cultural impact, while maintaining pedestrian safety and accessibility. The intent of the study was to assess the viability of trails in the valley, to aid the public agencies in the decision making process for the future trail development in the area, and to assess public interest and solicit feedback.

Purpose of the Public Open House:

The purpose of the Public Open House was to provide information and answer questions about the feasibility of the study with the area residents and businesses, as well as solicit input and feedback including concerns, issues or benefits of the study. The City was also soliciting input on the public's interest in a long term vision of connecting the trail system north to Rainbow Creek Park and beyond, and south along the river valley to the Thackeray Conservation Lands and eventually connecting to the City of Toronto trail system thereby providing Vaughan residents with a regional trail route.

The Public Open House:

The Open House was attended by approximately 15 people over the hour and a half session mostly from the residents immediately north east of the study area. In attendance to answer questions and provide information were three City of Vaughan staff, Ward 2 Councillor Tony Carella and one Stantec representative.

The responses by those attending varied from some positive feedback to no preference to a majority of those attending expressing concern over the proposed trails and east-west connection. Concerns and intense debate occurred with several residents over the east-west trail and bridge connection as the primary issue.

The residents voiced concerns such as:

- Increase in cars parking in their area to access the valley and trails;
- Increased traffic on the residential streets;
- Reduced sense of privacy;
- Increase in youth hanging out along the trails and in the valley;
- Safety of children and youth walking from the residential area on the east along the trail to the Vaughan Grove Sports Park, the Ontario Soccer Centre and the Holy Cross Catholic High School.

Some questions and interest were raised about:

- A possible continuous connection south along Kipling Avenue;
- A connection at the top of the valley from Angelina Avenue to the parkette on Kipling and south to the Veneto Tennis Club;
- A walking trail that circulates back to the residential area without connecting to the larger valley to the south.

Very little interest was expressed about connecting to the north of Highway 7.

5.0 CONCLUSION & NEXT STEPS

Based on our analysis, we believe that Kipling Trail is an important connection within the regional and community pedestrian corridors for the City of Vaughan and the community surrounding the study area. The objective of connecting the east residential neighbourhood to the west neighbourhood schools and park can be attained. The most feasible trail is not proposed continuously within the natural area due to physical site restrictions such as steep eroding slopes (refer to summary of ecplored options in Section 4.2).

In summary, creating a trail within the study area would provide benefits including:

- Linkages from east to west connecting the residential neighbourhoods with the schools and parks within the community.
- Trails marking pedestrian and cyclist uses reduces the creation of footpaths through potentially sensitive or unsafe areas.
- Provide safe water-course crossing.
- Provide passive recreation and interesting look-out area over a natural habitat.
- Provide potential educational benefits for neighbouring schools.
- Promote community involvement and appreciation.

Some of the potential challenges associated with the creation of the trail, that will need to be considered further include:

- Disturbance to vegetation and natural habitats within the study area.
- Grading and erosion measure during construction.
- Water-course crossing within Redside Dace area and issues with silt-control and permits.
- Popularity of the trail may attract more users to the area which may potentially impact wild-life.
- Construction noise and removals (outside breeding period) and their impact on wild-life.
- Feedback received from local residents that attended the September 15, 2015 PIC were not in favour of the proposed trail.
- Trail would require securing access over Crown Land.

We believe that it is feasible to develop a trail system within the study area through a detailed design that would need to carefully consider all the complex habitat and topographical conditions where the path is proposed. However, the City of Vaughan should take into consideration the opinions provided by local residents during the PIC.

NEXT STEPS

Should this project proceed, the following steps are the envisioned process for the construction of Kipling Trail:

- The City would need to secure access over Crown Land.
- The City would need to commit to process and approve budget required for approvals and implementation.
- Further consultation with MNR and TRCA to confirm approval in principle and determine permit costs and timing.
- Identify any required detailed studies to satisfy agencies (MNR and TRCA) and list all required approvals based on the preferred design, we believe that detailed mitigation strategies can be developed during the detailed design phase to reach a solution that will satisfy the reviewing agencies.
- Timing estimates and schedules to be prepared with respect to: approvals, design, construction and monitoring.
- Retain consultant for detailed trail design and construction administration.
- Obtain all permits.
- Retain contractor to construct the trail.
- Post-construction monitoring as per agency requirements.

PERMITS

Permits that would be required for the construction of the trail include:

- Bridge Crossing permit: requires further study of Fluvial geomorphological conditions, erosion control plans and design flows and velocity
- TRCA permit for Bridge and vegetation removals
- MNR Endangered Species Act Permit and the Fisheries Act review

ADDITIONAL STUDIES

Additional studies that will be required for the construction of the trail include:

- Archaeological Stage 2 Study
- Boreholes Report and soil assessment (Geotechnical)
- Survey
- Arborist Report

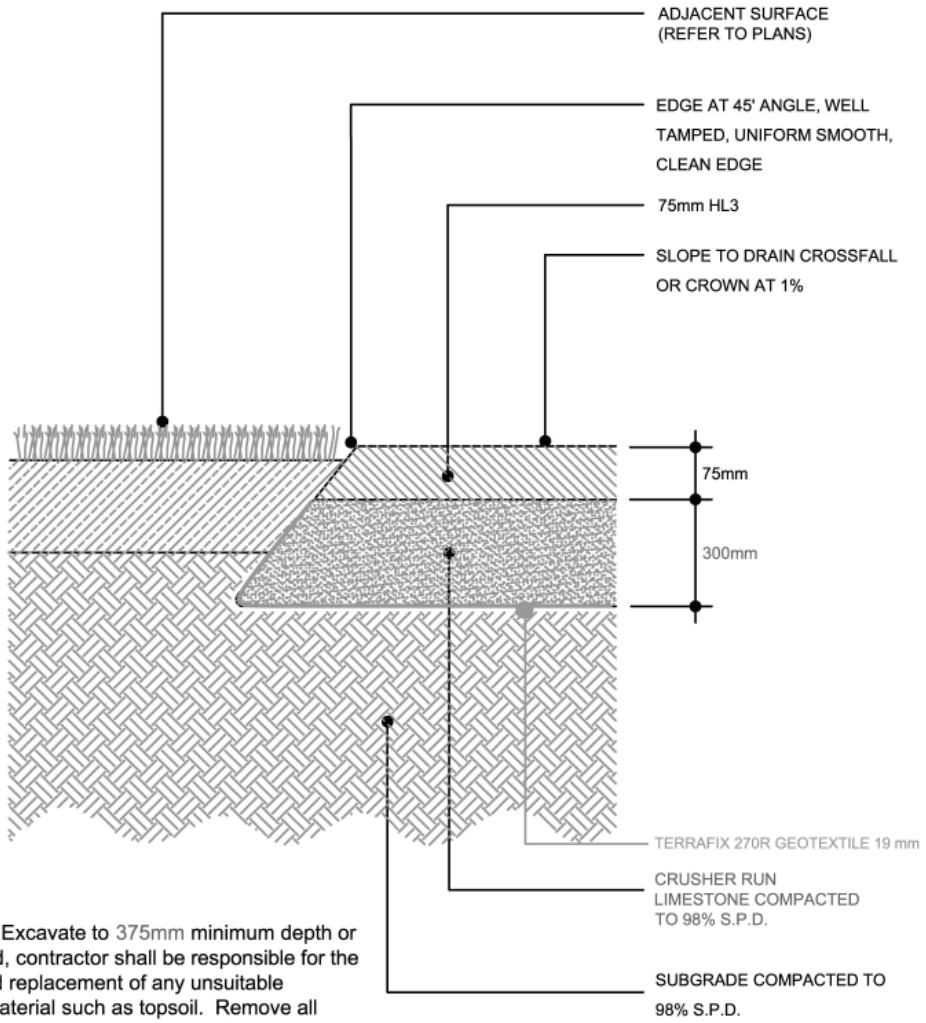
In conclusion, the study area's natural environment includes a variety of complex natural conditions, which include endangered species (Redside Dace and Butternut Trees), steep slopes which limit access and require grading of slopes to provide access, and a vernal pool.

The key objective of providing a trail link that connects the east residential neighbourhood to the parks and school in the west would be beneficial to the community and achieve the regional and community pedestrian and bike masterplan goals for a comprehensive trail system. It encourages walking, cycling and passive recreation and appreciation of nature. It also provide opportunities for education and learning and a non direct link to Rainbow Creek Park tot he north.

A phased approach to this trail construction would allow the immediate objective of connecting the east and west edges along this naturalized area to be connected in Phase I followed by the north-south connection required as part of the regional connectivity plan to be achieved in Phase II.

This feasibility study concludes that through the highlighted opportunities and constraints and the provided conceptual trail design that aims to minimize disturbance to the environment, the key objectives for the trail system can be achieved.APPENDICES

A - I. CITY OF VAUGHAN STANDARD DETAILS



Excavation: Excavate to 375mm minimum depth or as specifiied, contractor shall be responsible for the removal and replacement of any unsuitable subgrade material such as topsoil. Remove all excavated material and dispose of off site.

NOTES:

1. All dimensions in millimetres.
2. Asphalt and granular base dimensions shown are minimum after compaction.
3. Slope subgrade parallel to finished grade (min. 2% slope).
4. Width of path to be identified on landscape plans.

#	REVISIONS	APR'D	DATE
2.			
1.			

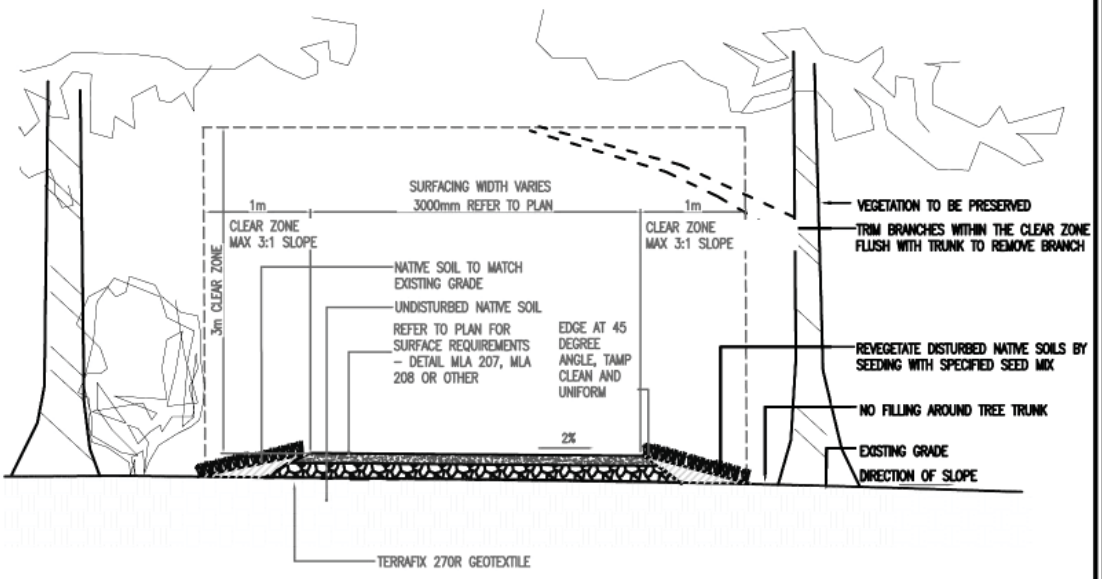
VAUGHAN

Department of *Parks Development*

ASPHALT PAVING DETAIL
LIGHT DUTY ASPHALT

DRAWN: PD APPROVED: P.G.
NOT TO SCALE DATE: 01/01/03

DRAWING NO.
MLA 208
(MODIFIED)



NOTES

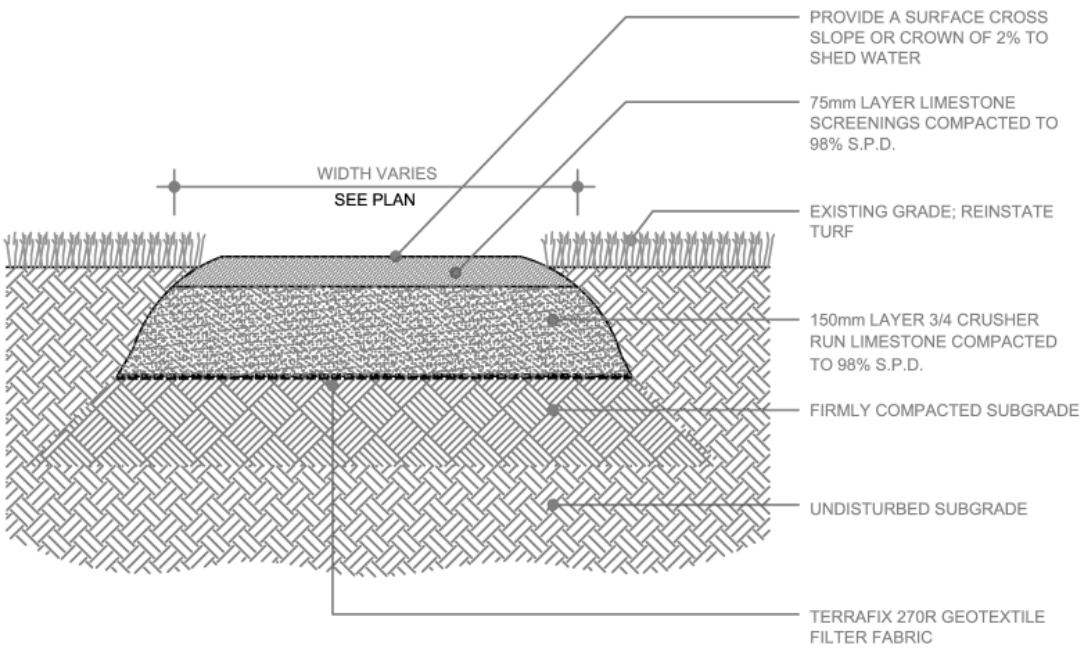
1. FINAL ALIGNMENT OF TRAIL TO BE STAKED AND APPROVED PRIOR TO CONSTRUCTION.
2. MAINTAIN EXISTING GRADES, DO NOT DISTURB EXISTING SOIL IN ROOT ZONES OF VEGETATION TO BE PRESERVED.
3. A CERTAIN DEGREE OF BRUSH CLEARING WILL BE REQUIRED IN SPECIFIC AREAS. IN AREAS THAT REQUIRE BRUSH CLEARING ENSURE THAT THE FOLLOWING ALLOWANCES ARE MAINTAINED;
   3.0m VERTICAL CLEARANCE FROM ALL OVERHEAD BRANCHES AND THE TRAIL SURFACE
   1.0m HORIZONTAL CLEARANCE FROM SIDE BRANCHES AND THE TRAIL EDGE.
4. CROSS SLOPE TRAIL SURFACE TO THE SIDE THAT DRAINS AWAY.
5. REMOVE LEAF LITTER AND OTHER ORGANIC MATTER AS REQUIRED.
6. ROOT PRUNE AND MITIGATE AS PER INTERNATIONAL SOCIETY OF ARBORICULTURE STANDARDS IF ROOTS ARE DAMAGED.
9. NOTIFY PROJECT MANAGER WHERE DESIRED SLOPES ARE NOT ACHIEVABLE PRIOR TO CONSTRUCTION.

#	REVISIONS	APR'D	DATE
2.			
1.			

VAUGHAN Department of *Parks Development*

MULTI USE PATH DETAIL ZONE OF CLEARANCE

DRAWN: MM APPROVED: –	DRAWING NO.
NOT TO SCALE DATE: 01/01/09	MLA MU–1



NOTES:

1. Restore all damage to existing sod. Sod laid at trail edge to be placed 25mm below the tread on level ground or on the downhill side of a cross slope. Sod laid on the uphill side of a cross slope to be level with the tread of the walkway to ensure positive drainage.
2. All dimensions in millimetres.
3. Refer to landscape plans for path width.

#	REVISIONS	APR'D	DATE
2.			
1.			

VAUGHAN

Department of *Parks Development*

LIMESTONE SCREENING WALKWAY DETAIL

DRAWN: PD APPROVED: P.G.

NOT TO SCALE DATE: 01/01/03

DRAWING NO. MLA 207 (MODIFIED)

A - II. ARCHAEOLOGICAL STUDY STAGE I

Stage 1 Archaeological Assessment

Proposed Kipling Trail
Lots 4 and 5, Concession 8
City of Vaughan, Regional Municipality of York, Ontario

Submitted to:

Michael Kari
The City of Vaughan
Vaughan City Hall
2141 Major Mackenzie Drive
Vaughan, ON L6A 1T1
Tel: (905) 832-8555 Ext. 8113 Fax: (905) 832-8522
Email: mike.kari@vaughan.ca

Licensee: Jim Wilson, MA
License Number: P001
PIF Numbers: P001-715-2013

ORIGINAL REPORT
December 6, 2013

Executive Summary

Stantec Consulting Ltd. (Stantec) was retained by the City of Vaughan to complete a Stage 1 archaeological assessment for a study area located on Lots 4 and 5, Concession 8, City of Vaughan, York County, Ontario. This Stage 1 Archaeological Assessment addresses the development of the proposed Kipling Trail connecting the eastern side of an open, green space with Vaughan Grove Park south of Highway 7 and east of Martin Grove Road. This assessment was conducted to meet the requirements of Section 2.6.2 of the *Provincial Policy Statement* (Government of Ontario 2005) related to the *Planning Act* (Government of Ontario 1990a), prior to the submission of site plan applications to the City of Vaughan and the Ministry of Tourism, Sport, and Culture.

The objectives of the Stage 1 assessment were to compile available information about the known and potential archaeological heritage resources within the study area and to provide specific direction for the protection, management and/or recovery of these resources. Due to the moderate to high level of archaeological potential as shown by background information and research, a site visit to assess archaeological potential was not undertaken at this time. A northwestern corner portion of the study area has been previously assessed by the Toronto and Region Conservation Authority and will require no further assessment. **Stage 1 background research resulted in the recommendation that a Stage 2 archaeological assessment of areas not previously assessed should be undertaken in the area not previously assessed by the Toronto and Region Conservation Authority**.

The Ontario Ministry of Tourism, Culture and Sport is asked to review the results presented and to accept this report into the Ontario Public Register of Archaeological Reports.

The Executive Summary highlights key points from the report only; for complete information and findings, the reader should examine the complete report.

Table of Contents

Project Personnel

Overall Project Manager	Mike Dartizio, OALA, CSLA
Task Manager	Jeffrey Muir, BA (R304)
Licensed Archaeologist:	Jim Wilson, MA (P001)
Licensed Field Directors:	Jeffrey Muir, BA (R304)
Report Writer:	Jennifer Schumacher, BA (R465)
Office Assistants:	Lorraine Spence-Claro
Senior Review:	Colin Varley, M.A., R.P.A., Associate, Senior Archaeologist (P002)

Acknowledgments

Proponent Contact:	Mike Kari, Landscape Architect, The City of Vaughan
Ministry of Tourism, Culture and Sport:	Robert von Bitter

1.0 Project Context

1.1 DEVELOPMENT CONTEXT

Stantec Consulting Ltd. (Stantec) was retained by the City of Vaughan to complete a Stage 1 Archaeological Assessment for a study area located on Lots 4 and 5, Concession 8, City of Vaughan, Ontario (Figure 1). This Stage 1 Archaeological Assessment addresses the development of the Proposed Kipling Trail connecting the eastern side of an open, green space within Vaughan Grove Park south of Highway 7 and east of Martin Grove Road. The study area is approximately 480 metres long by 560 metres wide. The area consists of bushlot, open green areas, and intersected by Rainbow Creek. This assessment was conducted to meet the requirements of Section 2.6.2 of the *Provincial Policy Statement* (Government of Ontario 2005) related to the *Planning Act* (Government of Ontario 1990a) prior to the submission of site plan applications to the City of Vaughan and the Ministry of Tourism, Culture and Sport (MTCS).

The objectives of the Stage 1 assessment were to compile available information about the known and potential archaeological heritage resources within the study area and to provide specific direction for the protection, management and/or recovery of these resources. In compliance with the provincial standards and guidelines set out in the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), the objectives of the Stage 1 Archaeological Overview/Background Study are as follows:

- To provide information about the study area's geography, history, previous archaeological fieldwork and current land conditions;
- To evaluate in detail the study area's archaeological potential which will support recommendations for Stage 2 survey for all or parts of the property; and
- To recommend appropriate strategies for Stage 2 survey.

To meet these objectives Stantec archaeologists employed the following research strategies:

- A review of relevant archaeological, historic and environmental literature pertaining to the study area;
- A review of the land use history, including pertinent historic maps;
- An examination of the Ontario Archaeological Sites Database (ASDB) to determine the presence of known archaeological sites in and around the project area;
- A review of the *City of Vaughan Official Plan: Archaeological and First Nations Policy Study* (Archaeological Services Inc. (ASI), 2010) to identify predetermined areas of high archaeological potential; and

- Contacting the Toronto and Region Conservation Authority (TRCA) regarding any previous work on the portion of the study area owned by TRCA.

Permission to enter the study area if necessary was provided by the City of Vaughan.

1.2 HISTORICAL CONTEXT

1.2.1 Post-contact Aboriginal Resources

The post-contact Aboriginal occupation of Southern Ontario was heavily influenced by the dispersal of various Iroquoian-speaking communities by the New York State Iroquois and the subsequent arrival of Algonkian speaking groups from northern Ontario at the end of the 17th century and the beginning of the 18th century (Konrad 1981; Schmalz 1991). By 1690, Algonkian speakers from the north appear to have begun to repopulate Bruce County (Rogers 1978:761). This is the period in which the Mississaugas are known to have moved into southern Ontario and the lower Great Lakes watersheds (Konrad 1981). In southwestern Ontario, however, members of the Three Fires Confederacy (Chippewa, Ottawa and Potawatomi) were immigrating from Ohio and Michigan in the late 1700s (Feest and Feest 1978:778-779).

The study area first enters the Euro-Canadian historic record when the Chippewa First Nations entered into Treaty Number 13 (Figure 2). Treaty Number 13 was entered into when

> *On the 23rd day of September, 1787, ... Sir John Johnson, representing the King and Wabukanyne, Neace and Paquan, Principal Chief and Warchiefs of the Mississa[auga] Nation at the Carrying Place, did execute an agreement for the purpose of conveying a tract of land to the King, but it has been ascertained that the Instrument was defective and imperfect, and nothing was done about carrying it out until the first day of August, 1805, an Indenture was made, at the River Credit at Lake Ontario, between William Claus, Esquire, Deputy Superintendent General and Deputy Inspector General of Indians and of their Affairs, for and in behalf of Our Sovereign Lord the King and the Principal Chiefs, Warriors and people of the Mississa[uga] Nation of Indians. This purchase ..., is known as the Toronto Purchase and described as follows: "Commencing at the east bank of the south outlet of the River Etobicoke; thence up the same following the several windings and turnings of the said river to a maple tree, blazed on 4 sides at a distance of three quarters in a straight line from the mouth of the said river; thence north twenty-two degrees west twenty-four miles and one quarter; thence north sixty-eight degrees east fourteen miles; thence south twenty-two degrees east twenty-eight miles more or less to Lake Ontario; then westerly along the water's edge of Lake Ontario, to the eastern bank of the south outlet of the River Etobicoke, being the place of beginning, together with all the woods and waters thereon." This last described parcel is only a small portion of the parcel, supposed to have been conveyed by the Indians, September 23rd, 1787, and the consideration demanded by*

the Indians was only ten shillings.

(Morris 1943:21-22)

The presence of the Humber River one kilometre to the east and Rainbow Creek that runs through the study area would supply enough potable water and other natural resources to serve as hunting grounds or areas for resource extraction for nearby First Nations groups. As there is a temporally indeterminate Aboriginal campsite within one kilometre of the study area, there is potential for post-contact Aboriginal archaeological resources.

1.2.2 Historic Euro-Canadian Archaeological Resources and Surveys

The study area is situated in Lots 4 and 5, Concession 8, Geographic Township of Vaughan, York County, Ontario. The study area currently consists of bushlot, open green areas, and is intersected by Rainbow Creek.

York County, named in honour of Yorkshire, England, was established in 1792. It was originally created to provide a territorial unit to act as an electoral division and for the militia. The original limits of the county were marked out by John Graves Simcoe, the first Lieutenant Governor of the province. Originally York County encompassed the area from Lake Simcoe to east of Lake Scugog but was later divided into Halton, Ontario, and Peel counties (Mitchell 1950).

Euro-Canadian settlement of York County began in 1798. The earliest immigrants were from the United States followed by a second wave of settlers from the British Isles. This second wave of settlers reached its pinnacle between 1820 and 1840 and as a result many of the villages in Vaughan Township were not founded until after 1820 (Reaman 1971:16). The Township of Vaughan contained mixed settlements of Anglicans, Lutherans, Methodists, Presbyterians, Mennonites, Quakers, and Dunkards (Reaman 1971:129). By 1840 the Township of Vaughan had 18 sawmills, 6 grist mills, 11 shops, and 257 taxable houses (Reaman 1971:62). The population grew from 2,141 to 4,187 people between 1832 and 1842 (Reaman 1971:61). Due to the increased number of settlers, one-third of the Township of Vaughan was cleared and inhabited or cultivated by the beginning of the 1840s (Reaman 1971).

Figure 3 shows a portion of the 1878 Historical Atlas map of the north portion of York Township. The study area crosses properties that belong to Jonathon Jeffry and Jonathon Williams. Three farm houses and historic roadways are all in close proximity to the study area (Miles & Co. 1878). Two farm houses are on the east boundary of the study area and represent an area of high archaeological potential.

The criteria used by the MTCS to determine potential for historic archaeological sites include the presence of: 1) particular, resource-specific features that would have attracted past subsistence or extractive uses; 2) areas of initial, non-Aboriginal settlement; 3) early historic transportation routes; and 4) properties designated under the Ontario Heritage Act (Government of Ontario

1990b). In addition, the *City of Vaughan Official Plan: Archaeological and First Nations Policy* (ASI 2010) states that any area within 100 metres of a historic mill, domestic site, or early settlement road qualifies as an area of historic archaeological potential (ASI 2010).

The study area is currently used as a municipal park area and as an open, undeveloped area. The land surveyed in this assessment is partially owned by the Toronto Regional Conservation Authority and partially owned by the City of Vaughan.

1.2.3 Recent Reports

Other than the existing historic documentation, the study area has been documented in three recent archaeological assessments. Two archaeological assessments have been carried out in the vicinity of the study area, both conducted by ASI. ASI produced a Stage 1 archaeological assessment entitled *Archaeological Assessment: Stage 1 Background Study and Property Inspection for Preferred Sewer Alignment, West Vaughan Sewage Servicing, Class Environmental Assessment Study, Former Township of Vaughan, York County, City of Vaughan, Regional Municipality of York, Ontario* (ASI 2013) and a Stage 2 archaeological assessment entitled *Stage 2 Property Assessment, VivaNext H2 Preliminary Engineering, Highway 7 Corridor Islington Avenue to Yonge Street Connection, Road Public Transit Improvements, Former Townships of York, Vaughan, and Markham, York County, Regional Municipality of York, Ontario* (ASI 2012). The third archaeological assessment was conducted within the study area itself by the TRCA and is entitled *Archaeological Assessment (Stage 1-2) in the City of Vaughan, York Region, Western Vaughan Sewage Servicing* (TRCA 2013). The report itself is still in preparation and has not yet been submitted to the MTCS.

1.3 ARCHAEOLOGICAL CONTEXT

The current property conditions of the study area include a paved walking trail, a waterway, woodlot and scrub brush.

1.3.1 The Natural Environment

The study area is situated within the “Peel Plain” physiographic region (Chapman and Putnam 1984: 174-176).

> *The Peel plain is a level-to-undulating tract of clay soils (Photo 70) covering 300 square miles across the central portions of the Regional Municipalities of York, Peel, and Halton. The general elevation is from 500 to 750 feet a.s.l. and there is a gradual and fairly uniform slope toward Lake Ontario. Across this plain the Credit, Humber, Don, and Rouge Rivers have cut deep valleys, as have other streams such as the Bronte, Oakville, and Etobicoke Creeks.*
>
> (Chapman and Putnam 1984:174)

The closest potable water source is Rainbow Creek which runs through the study area. The common soil type in the area is imperfectly drained Peel Clay accompanied by smaller pockets of variably drained Bottom Land and well drained Fox Sandy Loam, all suitable for pre-contact Aboriginal agricultural practices (Hoffman and Richards 1955:70-72).

1.3.2 Pre-contact Aboriginal Resources

It has been demonstrated that pre-contact Aboriginal people began occupying southern Ontario as the glaciers receded from the land, as early as 11,000 B.C. Table 1 provides a breakdown of the cultural and temporal history of the occupations in the City of Vaughan, based on Ellis and Ferris 1990.

Table 1: Cultural Chronology for City of Vaughan

Period	Characteristics	Time Period	Comments
Early Paleo-Indian	Fluted Projectiles	9000 - 8400 B.C.	spruce parkland/caribou hunters
Late Paleo-Indian	Hi-Lo Projectiles	8400 - 8000B.C.	smaller but more numerous sites
Early Archaic	Kirk and Bifurcate Base Points	8000 - 6000 B.C.	slow population growth
Middle Archaic	Brewerton-like points	6000 - 2500 B.C.	environment similar to present
Late Archaic	Lamoka (narrow points)	2000 - 1800 B.C.	increasing site size
	Broad Points	1800 - 1500 B.C.	large chipped lithic tools
	Small Points	1500 - 1100B.C.	introduction of bow hunting
Terminal Archaic	Hind Points	1100 - 950 B.C.	emergence of true cemeteries
Early Woodland	Meadowood Points	950 - 400 B.C.	introduction of pottery
Middle Woodland	Dentate/Pseudo-Scallop Pottery	400 B.C. - A.D.500	increased sedentism
	Princess Point	A.D. 550 - 900	introduction of corn
Late Woodland	Early Ontario Iroquoian	A.D. 900 - 1300	emergence of agricultural villages
	Middle Ontario Iroquoian	A.D. 1300 - 1400	long longhouses (100m +)
	Late Ontario Iroquoian	A.D. 1400 - 1650	tribal warfare and displacement
Contact Aboriginal	Various Algonkian Groups	A.D. 1700 - 1875	early written records and treaties

Period	Characteristics	Time Period	Comments
Late Historic	Euro-Canadian	A.D. 1796 - present	European settlement

1.3.3 Previously Identified Archaeological Sites and Surveys

In order that an inventory of archaeological resources could be compiled, the registered archaeological site records kept by the Ontario Ministry of Tourism, Culture and Sport were consulted. In Ontario, information concerning archaeological sites is stored in the ASDB maintained by the Ministry of Tourism, Culture and Sport. This database contains archaeological sites registered according to the Borden system. Under the Borden system, Canada is divided into grid blocks based on latitude and longitude. A Borden Block is approximately 13 kilometres east to west and approximately 18.5 kilometres north to south. Each Borden Block is referenced by a four-letter designator and sites within a block are numbered sequentially as they are found. The study area under review is within Borden Block AkGv.

Information concerning specific site locations is protected by provincial policy, and is not fully subject to the *Freedom of Information and Protection of Privacy Act*. The release of such information in the past has led to looting or various forms of illegally conducted site destruction. Confidentiality extends to all media capable of conveying location, including maps, drawings, or textual descriptions of a site location. The Ministry of Tourism, Culture and Sport will provide information concerning site location to the party or an agent of the party holding title to a property, or to a licensed archaeologist with relevant cultural resource management interests.

An examination of the ASDB has shown that 11 archaeological sites are registered within a one kilometre radius of the study area: eight Archaic, one Paleo-Indian, one pre-Iroquoian, and one undetermined. As mentioned previously, two archaeological studies have been undertaken within 50 metres of the study area (ASI 2012; ASI 2013) but no sites have been identified within 50 metres of the study area (personal communication, Robert von Bitter February 21, 2013; Government of Ontario n.d.).

Table 1: Sites Documented within One Kilometre of the Proposed Kipling Trail

Borden Number	Site Name	Cultural Affiliation	Site Type
AkGv-122	Kipling 1	early Archaic	undetermined
AkGv-113	Kipling 2	early Archaic	undetermined
AkGv-114	Kipling 3	late Archaic	campsite
AkGv-116		early Archaic	findspot
AkGv-117	Wild Turkey Surprise	early Archaic	campsite
AkGv-21	Johnson-Thain	Archaic	campsite

Borden Number	Site Name	Cultural Affiliation	Site Type
AkGv-27	Robert Johnson	undetermined	undetermined
AkGv-28		early Archaic	campsite
AkGv-90	Thornbush	pre-Iroquoian	campsite
AkGv-91	Ageing Maple	Paleo-Indian	campsite
AkGv-92	Dave's Dugout	late Archaic	findspot

Two archaeological assessments have been carried out in the vicinity of the study area. This work was conducted by ASI. ASI produced a Stage 1 archaeological assessment entitled *Archaeological Assessment: Stage 1 Background Study and Property Inspection for Preferred Sewer Alignment, West Vaughan Sewage Servicing, Class Environmental Assessment Study, Former Township of Vaughan, York County, City of Vaughan, Regional Municipality of York, Ontario* (ASI 2013) and a Stage 2 archaeological assessment entitled *Stage 2 Property Assessment, VivaNext H2 Preliminary Engineering, Highway 7 Corridor Islington Avenue to Yonge Street Connection, Road Public Transit Improvements, Former Townships of York, Vaughan, and Markham, York County, Regional Municipality of York, Ontario* (ASI 2012). Neither of these assessments identified sites or recommended further archaeological assessment.

One archaeological assessment has been carried out within the limits of the study area. A Stage 1 and 2 Archaeological Assessment was carried out by Toronto and Region Conservation Authority (TRCA) in 2012 concerning the northwest corner of the current study area. No cultural materials were recovered and no further work was recommended for their area of assessment (TRCA 2012) Figure 4 maps this area in relation to the present study area.

Vaughan's municipal archaeological management plan, entitled *City of Vaughan Official Plan: Archaeological and First Nations Policy Study* (ASI 2010) was also consulted. While no archaeological sites are shown within the study area, the study area is illustrated as an area of archaeological potential (Figure 5). This archaeological potential will be further investigated in Section 3.0 below.

2.0 Field Methods

The Stage 1 archaeological assessment compiled available information about the known and potential archaeological heritage resources within the study area including the use of the *City of Vaughan Official Plan: Archaeological and First Nations Policy Study* (ASI 2010). This Stage 1 archaeological assessment is under archaeological consulting license P001 issued to Jim Wilson, MA, of Stantec by the Ministry of Tourism, Culture and Sport. The study area is approximately 480 metres long by 560 metres wide. The area consists of bushlot, open green areas, and intersected by Rainbow Creek. As per the *Standards and Guidelines for Consultant Archaeologists* (Section 7.7.6, Standard 3; Government of Ontario 2011), Figure 4 illustrates that according to the *City of Vaughan Official Plan: Archaeological and First Nations Policy Study,* the study area meets the requirements for Stage 2 archaeological assessment (ASI 2010). No property inspection was conducted at this time and any areas that are deemed to be disturbed, wet, or retaining low archaeological potential otherwise would need to be documented during the Stage 2 archaeological assessment (Figure 4).

3.0 Analysis and Conclusions

Archaeological potential is established by determining the likelihood that archaeological resources may be present on a subject property. Stantec applied archaeological potential criteria commonly used by the Ontario Ministry of Tourism, Culture and Sport (Government of Ontario 2011) to determine areas of archaeological potential within the region under study. These variables include proximity to previously identified archaeological sites, distance to various types of water sources, soil texture and drainage, glacial geomorphology, elevated topography and the general topographic variability of the area.

Distance to modern or ancient water sources is generally accepted as the most important determinant of past human settlement patterns and, considered alone, may result in a determination of archaeological potential. However, any combination of two or more other criteria, such as well-drained soils or topographic variability, may also indicate archaeological potential. Finally, extensive land disturbance can eradicate archaeological potential (Wilson and Horne 1995).

Distance to water is an essential factor in archaeological potential modeling. When evaluating distance to water it is important to distinguish between water and shoreline, as well as natural and artificial water sources, as these features affect sites locations and types to varying degrees. According to the *City of Vaughan Official Plan: Archaeological and First Nations Policy Study*, any areas within 250 metres of a river or creek retain pre-contact Aboriginal potential (ASI 2010). The MTCS (Government of Ontario 2011) categorizes water sources in the following manner:

- Primary water sources: lakes, rivers, streams, creeks;
- Secondary water sources: intermittent streams and creeks, springs, marshes and swamps;
- Past water sources: glacial lake shorelines, relic river or stream channels, cobble beaches, shorelines of drained lakes or marshes; and
- Accessible or inaccessible shorelines: high bluffs, swamp or marshy lake edges, sandbars stretching into marsh.

The study area crosses directly over Rainbow Creek therefore meeting the MTCS' and *City of Vaughan Official Plan: Archaeological and First Nations Policy Study*'s defined characteristics for archaeological potential. The area also has soils suitable for pre-contact Aboriginal agriculture and 11 archaeological sites are registered within a one kilometre vicinity of the study area. Specific to this study area and as mentioned previously, a Stage 1 and 2 archaeological

assessment was completed by the TRCA in the northwest corner. No archaeological resources were recovered during the assessment (TRCA 2013). As such, the pre-contact Aboriginal archaeological potential of the study area is judged to be moderate to high. Given the location of the study area in close proximity to a body of water, the post-contact Aboriginal archaeological potential of the study area is judged to be moderate to high. Considering the study area's proximity to early Euro-Canadian settlement roads and domestic sites, the historic Euro-Canadian archaeological potential of the study area was judged to be moderate to high.

In summary, following Section 1.3.1 of the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), the study area retains archaeological potential except for that area already assessed by TRCA (Figure 4).

4.0 Recommendations

Stantec Consulting Ltd. (Stantec) was retained by the City of Vaughan to complete a Stage 1 archaeological assessment for a study area located on Lots 4 and 5, Concession 8, City of Vaughan, Ontario. This assessment was conducted to meet the requirements of Section 2.6.2 of the *Provincial Policy Statement* (Government of Ontario 2005) related to the *Planning Act* (Government of Ontario 1990a), prior to the submission of site plan applications to the City of Vaughan and the Ministry of Tourism, Culture and Sport. The archaeological potential of the study area was found to be moderate to high for pre-contact Aboriginal, post-contact Aboriginal and historic Euro-Canadian archaeological resources. Therefore, **Stage 1 background research resulted in the recommendation that Stage 2 archaeological assessment should be conducted in the area not previously assessed by TRCA**.

Stage 2 archaeological assessment of the study area would include test pit survey at five metre intervals as outlined in Section 2.1.2 of the 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), to be followed by the procedures outlined in Section 2.1.3 if any archaeological resources are recovered during the Stage 2 field work. Any areas of previous disturbance found during the course of the Stage 2 field work will also be documented as outlined in Section 2.1.8.

The Ontario Ministry of Tourism, Culture and Sport is asked to review the results presented and to accept this report into the Ontario Public Register of Archaeological Reports. Additional archaeological assessment is still required and so the archaeological sites recommended for further archaeological fieldwork remain subject to Section 48(1) of the *Ontario Heritage Act* and may not be altered, or have artifacts removed, except by a person holding an archaeological license.

5.0 Advice on Compliance with Legislation

This report is submitted to the Ontario Minister of Tourism, Culture and Sport as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c 0.18 (Government of Ontario 1990b). The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Tourism, Culture and Sport, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeology Reports referred to in Section 65.1 of the *Ontario Heritage Act*.

Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48(1) of the *Ontario Heritage Act*.

The *Cemeteries Act*, R.S.O. 1990 c. C.4 and the *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 (when proclaimed in force) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ontario Ministry of Consumer Services.

Archaeological sites recommended for further archaeological fieldwork or protection remain subject to Section 48(1) of the *Ontario Heritage Act* and may not be altered, or have artifacts removed from them, except by a person holding an archaeological license.

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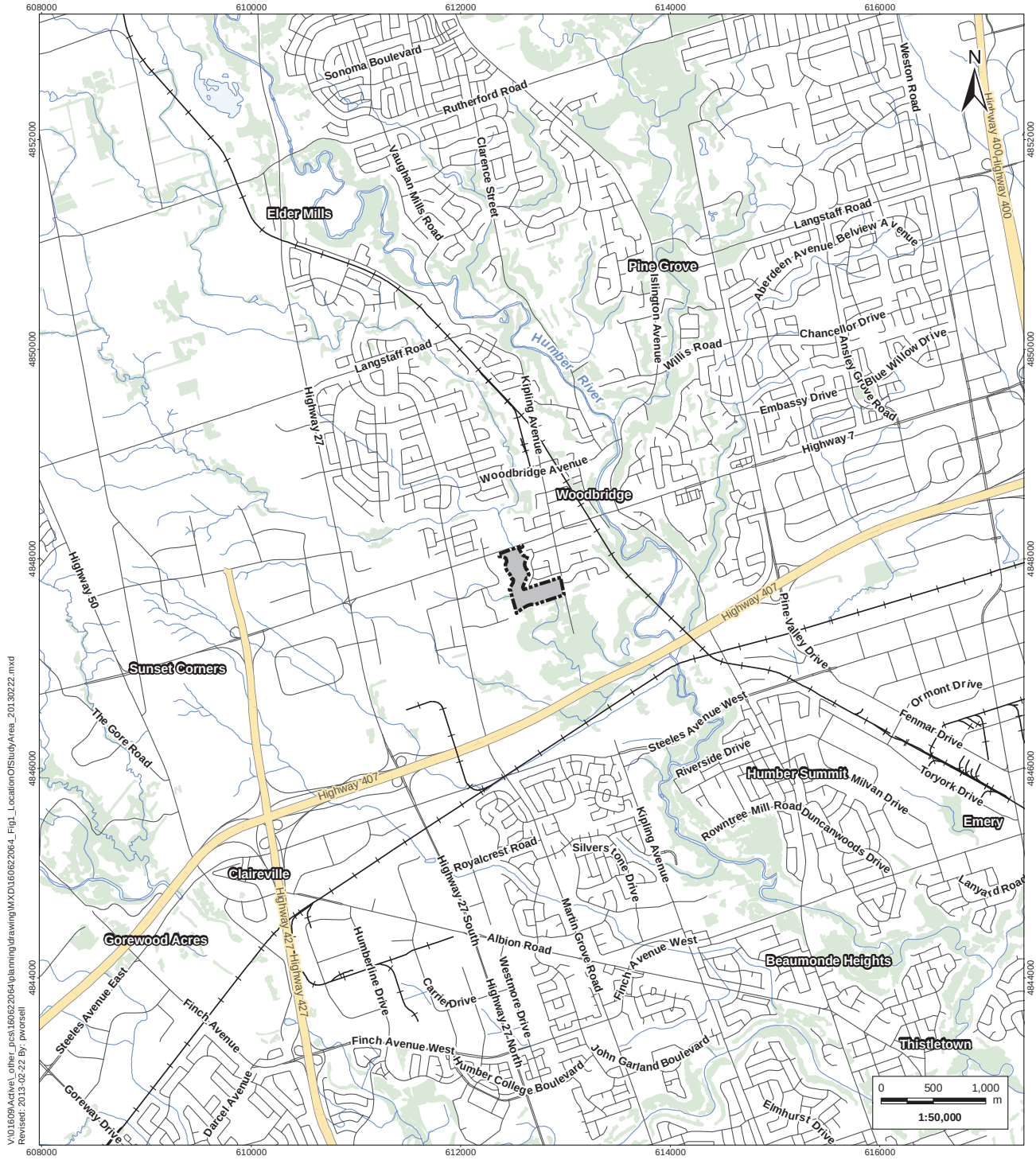
7.0 Maps

All maps will follow on succeeding pages.



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Revised: 2013-02-22 By: pworsell

February 2013
160622064

Stantec

Legend

- Study Area
- Highway
- Road
- Railway
- Watercourse
- Waterbody
- Wooded Area

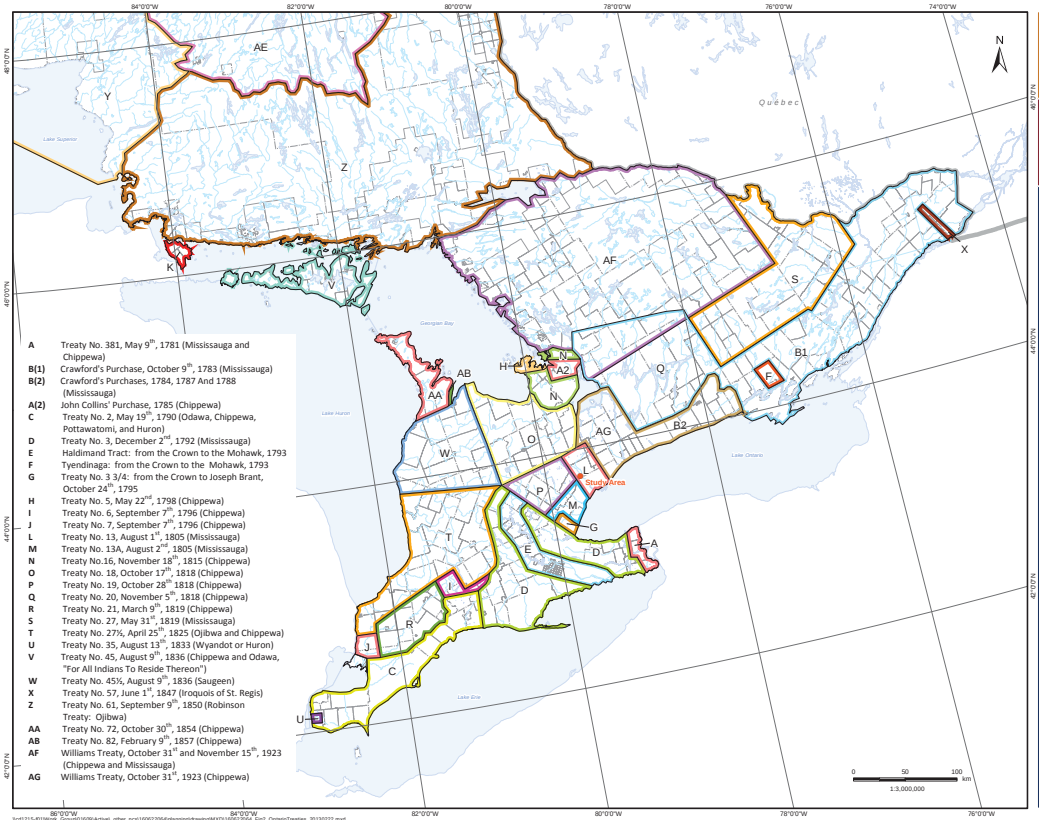
Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.

Client/Project
Client/Project

Figure No.
1

Title
Location of Study Area



A	Treaty No. 381, May 9th, 1781 (Mississauga and Chippewa)
B(1)	Crawford's Purchase, October 9th, 1783 (Mississauga)
B(2)	Crawford's Purchases, 1784, 1787 And 1788 (Mississauga)
A(2)	John Collins' Purchase, 1785 (Chippewa)
C	Treaty No. 2, May 19th, 1790 (Odawa, Chippewa, Pottawatomi, and Huron)
D	Treaty No. 3, December 2nd, 1792 (Mississauga)
E	Haldimand Tract: from the Crown to the Mohawk, 1793
F	Tyendinaga: from the Crown to the Mohawk, 1793
G	Treaty No. 3 3/4: from the Crown to Joseph Brant, October 24th, 1795
H	Treaty No. 5, May 22nd, 1798 (Chippewa)
I	Treaty No. 6, September 7th, 1796 (Chippewa)
J	Treaty No. 7, September 7th, 1796 (Chippewa)
L	Treaty No. 13, August 1st, 1805 (Mississauga)
M	Treaty No. 13A, August 2nd, 1805 (Mississauga)
N	Treaty No.16, November 18th, 1815 (Chippewa)
O	Treaty No. 18, October 17th, 1818 (Chippewa)
P	Treaty No. 19, October 28th 1818 (Chippewa)
Q	Treaty No. 20, November 5th, 1818 (Chippewa)
R	Treaty No. 21, March 9th, 1819 (Chippewa)
S	Treaty No. 27, May 31st, 1819 (Mississauga)
T	Treaty No. 27½, April 25th, 1825 (Ojibwa and Chippewa)
U	Treaty No. 35, August 13th, 1833 (Wyandot or Huron)
V	Treaty No. 45, August 9th, 1836 (Chippewa and Odawa, "For All Indians To Reside Thereon")
W	Treaty No. 45½, August 9th, 1836 (Saugeen)
X	Treaty No. 57, June 1st, 1847 (Iroquois of St. Regis)
Z	Treaty No. 61, September 9th, 1850 (Robinson Treaty: Ojibwa)
AA	Treaty No. 72, October 30th, 1854 (Chippewa)
AB	Treaty No. 82, February 9th, 1857 (Chippewa)
AF	Williams Treaty, October 31st and November 15th, 1923 (Chippewa and Mississauga)
AG	Williams Treaty, October 31st, 1923 (Chippewa)

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Revised: 2013-02-25 By: pvansell

Legend

- Study Area
- Municipal Boundary - Upper
- Municipal Boundary - Lower
- Watercourse
- Waterbody

Notes

1. Coordinate System: NAD 1983 Statistics Canada Lambert
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.
3. Treaty boundaries adapted from MNR July 1980, based on map compiled by J.L. Morris 2 March 1931. For cartographic representation only.

Stantec

February 2013
160622064

Client/Project
Client
Title
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Figure No.
2

Title
Treaties and Purchases (Adapted from Morris 1931)

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Revised: 2013-02-22 By: pworsell

February 2013
160622064

Stantec

Legend

- Study Area
- Highway
- Road
- Railway
- Watercourse
- Waterbody

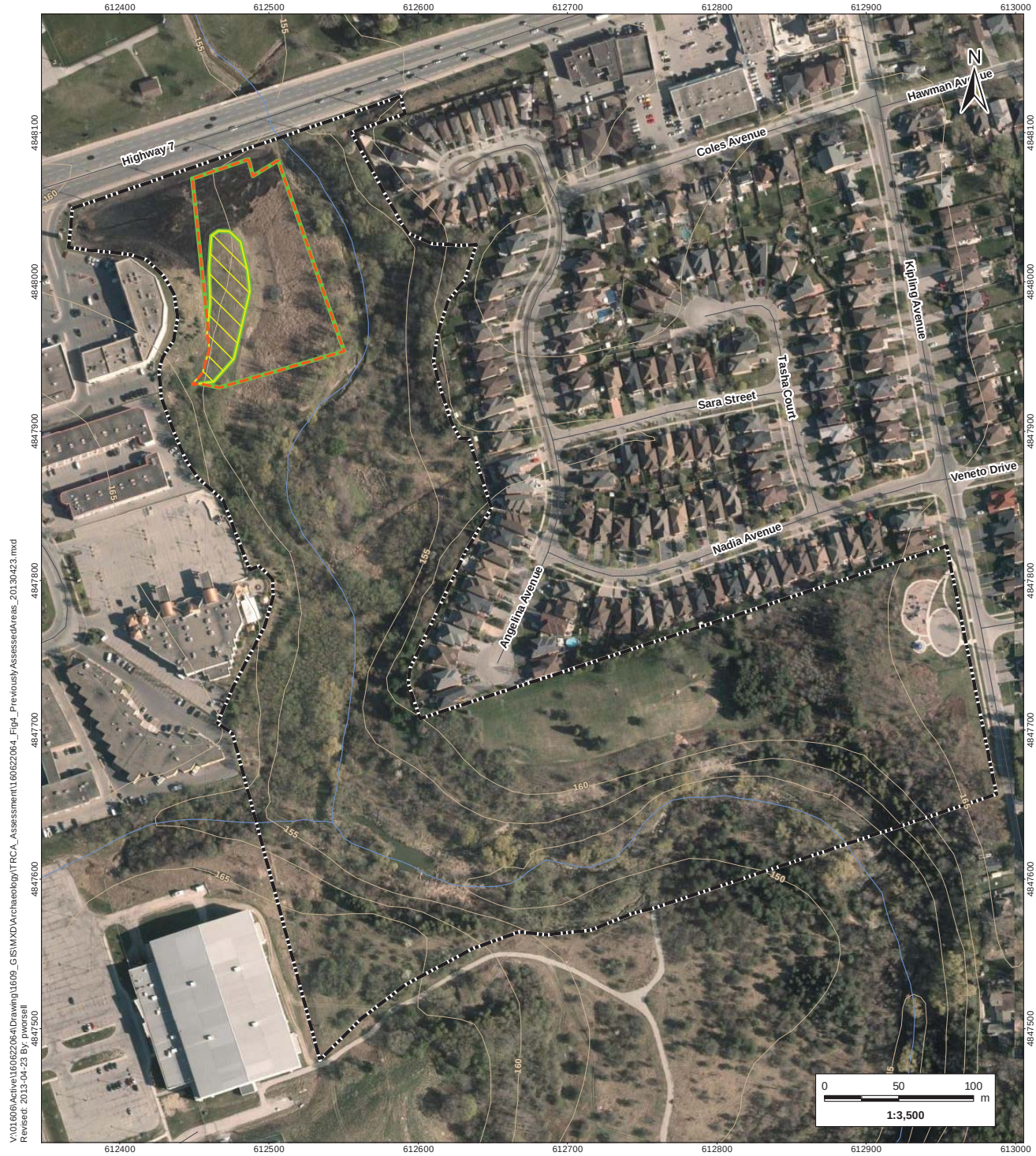
Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.

Client/Project
Client/Project

Figure No.
3

Title
Portion of Miles & Co. 1878 Map of Vaughan Township



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Revised: 2013-04-23 By: pworsell

April 2013
160622064

Stantec

Legend

- Study Area
- Previous Stage 2 Archaeological Assessment by TRCA (P338-045-2012)
- Previously Studied (P338-045-2012) - Wet Area, Not Assessed
- Previously Studied (P338-045-2012) – Test Pit Survey, Stage 2 Assessed
- Highway
- Road
- Railway
- Elevation Contour (metres ASL)
- Watercourse
- Waterbody

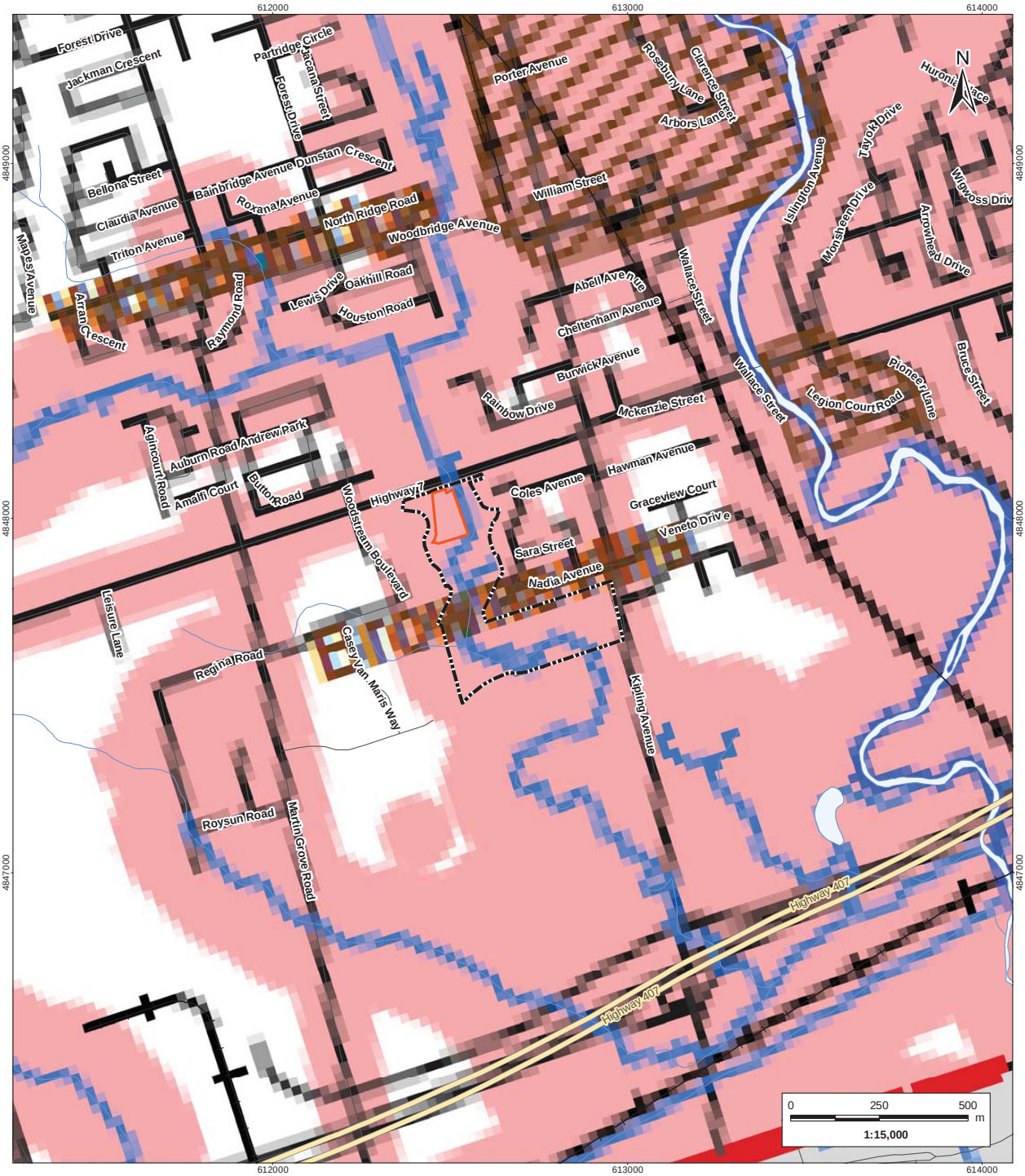
Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.
3. Orthographic imagery provided by © First Base Solutions, 2013. Imagery taken in 2012.

Client/Project
The City of Vaughan
Kipling Trail

Figure No.
4

Title
Previously Assessed Areas



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Revised: 2013-04-23 By: pworsell

April 2013
160622064

Stantec

Legend

- Study Area
- Previous Stage 2 Archaeological Assessment by TRCA (P338-045-2012)
- Highway
- Road
- Railway
- Watercourse
- Waterbody
- Composite Archaeological Potential

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
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Client/Project

The City of Vaughan
Kipling Trail

Figure No.

5

Title

City of Vaughan Official Plan: Archaeological and First Nations Policy Study's Map of Archaeological Potential (ASI 2010)

8.0 Closure

This report has been prepared for the sole benefit of the City of Vaughan and may not be used by any third party without the express written consent of Stantec Consulting Ltd. and the City of Vaughan. Any use which a third party makes of this report is the responsibility of such third party.

We trust this report meets your current requirements. Please do not hesitate to contact us should you require further information or have additional questions about any facet of this report.

Yours truly,

James A. Wilson, MA
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A - III. NATURAL ENVIRONMENT CONSTRAINTS STUDY

Natural Environment Constraint Report

Proposed Kipling Trail
Lots 4 and 5, Concession 8
City of Vaughan, Regional Municipality of
York, Ontario

December 13, 2013

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1.0 Introduction

1.1 REPORT OVERVIEW

Stantec Consulting Ltd. (Stantec) has been retained by the City of Vaughan to complete the natural environment assessment for the study area. This Natural Environment Report (NER) addresses the development of the Proposed Kipling Trail connecting the eastern side of an open, green space within Vaughan Grove Park south of Highway 7 and east of Martin Grove Road. The principal objective for this constraints report is the review and analysis of the natural features within the study area and the identification of any issues that may create significant constraints to trail development.

1.2 STUDY AREA

The Study Area is located on Lots 4 and 5, Concession 8, City of Vaughan, Ontario (**Figure 1, Appendix A**); it is approximately 480 m by 560 m in size. The majority of the study area is wooded and part of the Vaughan Grove Sports Park, associated with Rainbow Creek which runs north-south through the study area and connects to the Humber River to the southeast. Other portions included cultural meadow and small marsh communities.

1.3 GUIDING PRINCIPLES

In deciding how and where to site a trail, the ecology of the study area must be taken into consideration. The following principles serve to guide the decision-making process:

1. The ecological integrity of the valley should always be respected in any use or design-related decision;
2. Significant natural areas or sensitive areas should be avoided;
3. Pathways and trails should be located in the least sensitive areas. Vegetation, soils and slopes are the primary determinants;
4. Tree cutting or vegetative clearing should be avoided wherever possible. Where cutting or clearing cannot be avoided, it should be minimized;
5. Terrestrial habitat disruption should be minimized;
6. Disruption to valley walls and associated potential erosion should be minimized; and,
7. Aquatic habitat disruption should be minimized.

2.3.1 Vegetation Communities and Vascular Plants

Field investigations were conducted June 5, 2013 within the Study Area by a qualified Stantec botanist. These were conducted to confirm and assess the character of existing vegetation conditions. The work included Ecological Land Classification (ELC) of vegetation communities and a floristic survey of the key areas in the Study Area. Vegetation communities were delineated on aerial photographs and checked in the field; community characterizations were then based on the ELC system (Lee et al., 1998). Nomenclature largely follows Newmaster et al. (1998), with updates taken from published volumes of the Flora of North America Editorial Committee (1993+). Additional sources include Michigan Flora Online (2011), Tropicos, and Brouillet et al. (2010+). English colloquial names generally follow Newmaster et al. (1998).

2.3.2 Breeding Birds

A breeding bird survey was conducted on June 5, 2013 within the study area, recording all species of birds that were heard or seen. A conservative approach to determining breeding status was taken; all birds seen or heard in appropriate habitat during the breeding season were assumed to be breeding.

2.3.3 Amphibian Call Counts

Anuran call count surveys were undertaken May 31 and June 24, 2013 at 3 Stations. Guidelines provided by the Marsh Monitoring Program manual are applied to each station and survey (Environment Canada, 1996). A survey station area is a 100 m radius semicircle. The surveyor stands at the edge of the station and listens from left to right (see field sheets for a diagram). At each call count survey and station, all calling toads and frogs are identified and recorded over a three minute time period. Call levels are described using values of 1, 2, or 3. Level 1 indicates that individuals can be counted and calls are not simultaneous. Level 2 indicates that calls are distinguishable with some simultaneous calling. Level 3 indicates a full chorus where calls are continuous and overlapping (Environment Canada, 1996). Calling toad or frog species from outside of the survey station, or those heard off property, are also recorded.

2.4 ANALYSIS OF SIGNIFICANCE AND SENSITIVITY

Biological field data were evaluated to establish the significance of the observed natural heritage features. The provincial status of flora and fauna was provided by the Natural Heritage Information Centre (NHIC, 2010). Status rankings (SRANKs) for plants, vegetation communities and wildlife are based on the number of occurrences in Ontario and have the following meanings:

- S1: critically imperiled; often fewer than 5 occurrences;
- S2: imperiled; often fewer than 20 occurrences;
- S3: vulnerable; often fewer than 80 occurrences;
- S4: apparently secure ;

- S5: secure; and,
- S?: unranked, or, if following a ranking, rank uncertain (e.g. S3?).

The global, federal and provincial status of wildlife was determined by reviewing species accounts published by the Natural Heritage Information Centre (NHIC, 2007). Species At Risk (SAR) protected under the Endangered Species Act (ESA) include those listed on the current Species at Risk in Ontario (SARO) List, while the federal species include those listed on current Schedules issued under the Species at Risk Act (SARA).

Natural heritage information collected from the Study Area was evaluated to confirm potential significance. Provincial significance of vegetation communities was based on the draft rankings assigned by the Natural Heritage Information Centre (Bakowsky, 1996). The provincial status of all plant species is based on Newmaster et. al (1998), with updates from the database of the Natural Heritage Information Centre (NHIC, 2001). Identification of potentially sensitive plant species is based on assignment of a coefficient of conservatism value (CC) to each native species in southern Ontario (Oldham et al., 1995). The value of CC, ranging from 0 (low) to 10 (high), is based on a species' tolerance of disturbance and fidelity to a specific natural habitat. Species with a CC value of 9 or 10 generally exhibit a high degree of fidelity to a narrow range of habitat parameters.

3.0 Existing Natural Environment Features

Terrestrial features include designated features, vegetation communities, vascular plant species, and wildlife including amphibians, reptiles, mammals, and bird species.

3.1 PHYSIOGRAPHY AND LANDSCAPE ECOLOGY

The Study Area is located within the Peel Plain physiographic region (Chapman and Putnam, 1984). This is a tract of clay soils which covers 300 mi^2 across the central portions of Regional Municipalities of York, Peel and Halton with a level-to-undulating manner (*ibid*), sloping gradually and uniformly toward Lake Ontario. No large undrained depressions, swamps or bogs in the area are encountered as the plain is cut into deep valleys associated with the Credit, Humber, Don and Rouge Rivers, and the Bronte, Oakville and Etobicoke Creeks; drainage remains imperfect associated with the inter-stream areas (*ibid*). Till containing large amounts of shale and limestone comprise the underlying geological material, modified across much of the plain by a veneer of clay which (when deep enough) is varved (*ibid*).

Evidence indicates that the Peel plain was historically hardwood forest, with well-drained parts growing sugar maple, beech, white oak, hickory, basswood, some white pine (Chapman and Putnam, 1984). Areas with depressions carried elm, white ash and white cedar (*ibid*). Dominant soil is imperfectly-drained Peel clay, distinguished by a very dark brown, crumb-structured, stone-free, surface horizon, 5 to 6 inches thick; with a sub-surface layer of brownish grey, clay loam 4 to 5 inches thick; this is underlain by 9 to 12 inches of dull brown, blocky clay further underlain by dull brownish grey, calcareous clay till or stone-free clay (*ibid*). This soil is productive when surface drainage is established.

The study area falls within the Niagara Deciduous Forest Region (Rowe, 1972). Forest communities are dominated by broadleaved trees consisting primarily of beech and sugar maple, with basswood, red maple, red oak, white oak and bur oak. This area of Canada also contains the primary distribution of black walnut, sycamore, swamp white oak and shagbark hickory, with the more widely-distributed butternut, bitternut hickory, rock elm, silver maple and blue-beech (*ibid*). Scattered individual groups with sporadic occurrences in specialized sites are tulip-tree, black cherry, mockernut and pignut hickories, chinquapin oak, pin oak, black oak, black gum, blue ash, cucumber-tree, pawpaw, Kentucky coffee-tree, red mulberry and sassafras (*ibid*), with chestnut present historically prior to removal due to blight.

This Niagara Deciduous Forest Region is underlain by successive Palaeozoic formations: from west to east, Devonian, Siluarian and Orodovician; these limestones and shales are covered by glacial material and considerable depth, with some clay-and-sand deposits from glacial lakes Iroquois and Algonquin present on the northeast and southeast sides, respectively (Rowe, 1972). Soils are very fertile gray brown luvisols and humic gleysols, due to the favourable climate, broadleaved vegetation, and underlying calcareous bedrock (*ibid*).

3.2 DESIGNATED FEATURES

The York Region Official Plan (YROP) (2010) designates the study area as “Urban Area” per Map 3 - Environmentally Significant Areas and Areas of Natural and Scientific Interest. Within the study area, Map 5 – Woodlands notes the forested area as part of the region’s “woodland” tracts and “Conservation Area/Regional Forest”. Figure 3 – Greenlands Systems of the YROP notes the study area falls within part of the “Regional Greenlands System”.

The City of Vaughan Official Plan (CVOP) (2010) notes the study area overlaps with “Core Features” per Schedule 2 – Natural Heritage Network; Schedule 13 – Landuse designates the study area as falling with both “Natural Areas” and “Parkway Belt West Lands”.

Aside from the designations noted above, the study area otherwise does not contain any other known natural features such as significant wetlands, significant woodlands, Areas of Natural and Scientific Interest (ANSIs), etc.

3.3 VEGETATION COMMUNITIES

The vegetation communities, based on the ELC system for Southern Ontario, are shown on **Figure 1** (**Appendix A**). The majority of the study area is wooded, with bluff communities associated with valleyland walls, and small community pockets of marsh and cultural meadow.

The vegetation community types are described in **Table 1** below.

Table 3-1 Ecological Land Classification (ELC) Vegetation Types

ELC Type	Community Description
Forest (FO)	
Coniferous Forest (FOC)	
FOC4-1 (TRCA) Fresh-Moist White Cedar Coniferous Forest	The canopy of this mature coniferous forest was most abundant in eastern white cedar. The sub-canopy consisted of Manitoba maple and white ash. The understory comprised of alternate-leaf dogwood and thicket creeper with common buckthorn associates. Canada enchanter’s nightshade and bulblet bladder fern dominated the ground layer.
Mixed Forest (FOD)	
FOD7-a (TRCA) Fresh-Moist Lowland Deciduous Forest	Manitoba maple dominated the canopy of this young mixed forest with hybrid willow associates. The most abundant species in the sub-canopy was Manitoba maple, while common buckthorn dominated the understory. The ground layer was comprised mostly of garlic mustard, with smaller amounts of cleavers and yellow avens.
FOD7-3 (TRCA) Fresh-Moist Willow Lowland Deciduous Forest	West Floodplain The canopy of this young mixed forest was abundant in hybrid willow. The sub-canopy and understory layers were dominated by Manitoba maple with the understory having smaller amounts of common buckthorn. The ground layer was comprised mostly of garlic mustard, with smaller amounts of cleavers and yellow avens.

Table 3-1 Ecological Land Classification (ELC) Vegetation Types

ELC Type	Community Description
FOD7-3 Fresh-Moist Willow Lowland Deciduous Forest	East Floodplain The canopy of this mid-aged mixed forest in the east floodplain was dominated by weeping white willow, while the sub-canopy was dominated by Manitoba maple. The understory was made up of primarily common buckthorn, green ash and black cherry. Swamp red currant and dames rocket were the most abundant species in the ground layer with lesser amounts of cleavers.
Cultural (CU)	
Cultural Plantation (CUP)	
CUP3-3 (TRCA) Scotch Pine Coniferous Plantation	The canopy of this coniferous plantation was made up primarily of scots pine. The sub-canopy was comprised of paradise apple and common buckthorn. Common buckthorn, white ash and lesser amounts of tatarian honeysuckle comprised the understory. Virginia creeper and unidentified sterile sedge species dominated the ground layer with European swallow-wort and Canada goldenrod associates.
CUP3-3 (TRCA) pg. 11 of 11 ELC notes	The canopy of this coniferous plantation was made up primarily of scots pine and trembling aspen. The sub-canopy was comprised of American elm and trembling aspen. Common buckthorn and trembling aspen made up the understory layer, while Canada enchanter's nightshade, Virginia creeper and European swallow-wort comprised the ground layer.
Cultural Thicket (CUT)	
CUT1-b (TRCA) Mineral Cultural Thicket	Manitoba maple comprised the majority of the canopy in this young aged cultural thicket. Manitoba maple and riverbank grape made up the sub-canopy. The understory was dominated by common buckthorn, while the ground layer was comprised of dame's rocket with Canada goldenrod and Manitoba maple associates.
1-CUT (Stantec) Mineral Cultural Thicket	CUS1-b (TRCA) The canopy of this young aged cultural thicket was dominated by dotted hawthorn and common crab apple. The sub-canopy consisted of orchard grass and Kentucky bluegrass, with lesser amounts of Canada goldenrod. The understory was made up of black medick.
Cultural Woodland (CUW)	
CUW1-A3 (TRCA) Mineral Cultural Woodland	The canopy of the southern portion of this young aged cultural woodland was most abundant in black walnut. The sub-canopy consisted primarily of Manitoba maple, tatarian honeysuckle and riverbank grape. Orchard grass, smooth brome and wild red raspberry comprised the understory of this community. The ground layer was dominated by Canada enchanter's nightshade and avens species with cleavers associates. The canopy of the northern portion of this cultural woodland was primarily dominated by black walnut while Manitoba maple dominated the sub-canopy. The understory was most abundant in common buckthorn. Orchard grass and cleavers comprised the ground layer. This community contained the Butternut observed.

Table 3-1 Ecological Land Classification (ELC) Vegetation Types

ELC Type	Community Description
Cultural Savannah (CUS)	
CUS1-b (TRCA)	The canopy of this young aged community was dominated by paradise apple with dotted hawthorn and sedge species associates. The sub-canopy was most abundant in common buckthorn, while the understory was comprised of staghorn sumac, orchard grass and Kentucky bluegrass.

None of the vegetation communities listed above is considered rare in the province.

3.3.1 Vascular Plants

Seventy-four species of vascular plants were recorded from the Study Area during the site inventories. Of that number, 74 species or 63% were native and 44 species or 37% were exotic. A complete list of plants recorded is provided in **Appendix B**.

The majority of the native species are ranked S5 or S4 (Common to uncommon in Ontario). One locally (Regional Municipality of York) rare species was observed:

- Black Walnut (*Juglans nigra*) – ranked R.

None of the species observed had a CC of 9 or 10, and no nationally or provincially rare, threatened or endangered species were found aside from the Endangered Butternut (*Juglans cinerea)*, located at the northeastern portion of the study area within a cultural woodland, just northwest of Sara Street and associated with eastern side of Rainbow Creek (**Figure 1, Appendix A**).

3.4 BREEDING BIRDS

Breeding bird surveys were conducted within the study area on June 5, 2013 between 06:15 and 13:30. Weather conditions had a temperature range between 11^0C and 19^0C, with a Beaufort scale wind condition of 0 to 1, cloud cover ranged between 0% and 25%, with no precipitation. Habitat areas were identified during the breeding bird survey and were used to assist in recording the location of the breeding birds observed or heard along the road right of way and adjacent lands. Five habitats were identified:

1. Riparian forest and cultural community;
2. Slope forest and upland cultural community;
3. Cultural thicket;
4. Marsh; and,
5. Bluff.

A complete list of birds observed is appended (**Appendix C**). According to the Ontario Breeding Bird Atlas, approximately 92 species of birds are known to breed within the mapsquare (10 km by 10 km) in which the study area lies. During the June 5, 2013 breeding bird survey, a total of 27 species of birds were observed, most of which are likely to be breeding in or adjacent to the study area.

Almost all species observed during the June 2013 survey are ranked S5 (Secure; common and widespread), or S4 (Apparently secure; uncommon but not rare), except for one: Chimney Swift, which is provincially ranked as Threatened. Chimney Swift use chimneys for roosting and breeding, as well as walls, rafters, or gables of buildings and, less frequently, natural structures such as hollow trees, tree cavities and cracks in cliffs (Cadman et al., 2007). The main limiting factor contributing to the species' decline is the reduction of suitable breeding and roosting habitat through logging, removal of abandoned buildings and particularly the reduction in use of traditional chimneys; poor weather conditions during breeding season, pesticide use, chimney sweeping during breeding season and intolerance of some building owners are also contributing factors (COSEWIC, 2007). This species was observed within the study area but likely does not nest therein.

3.5 AMPHIBIANS

Amphibian call count surveys were conducted once monthly in May and June of 2013. Details from each survey are provided below in **Tables 3-2** and **3-3**. Written summaries and additional details of each station and survey are included below the Tables. There were three stations in total, which have been illustrated in Figure 1, Appendix A.

Table 3-2 Survey Timing and Weather Parameters

Survey	Date/Time	Weather				Surveyors
		Temp. °C	Wind (Beaufort Scale)	Cloud %	PPT / PPT last 24 hours	
1	May 31, 2013 20:10 – 21:30	27	0	100	None / ~2 mm	C. Korpijaakko
2	June 24, 2013 21:28 – 22:45	28	3	95	None / None	A. Corrigan

Table 3-3 Anuran Calling Activity Levels

Station	Date	Species						Notes
		AMTO	CHFR	GRTR	NLFR	SPPE	WOFR	
A	May							Additional calls were heard prior to starting survey
	June							
B	May		2					
	June							
C	May							
	June							

* denotes species heard outside of the 100 m station but within the subject lands.
** denotes species heard outside of the subject lands.
1* denotes species call code inside station, and species additionally heard outside of 100 m station but within the subject lands.

1. Station A contained MAS 2-1b and CUP1-C communities, and was close to the Rainbow Creek. Water was present during the survey, being located 0.5 feet from the river. No calls were heard from the station. Despite the MAS 2-1b community being large enough to support breeding amphibians, the noise from traffic along Highway 7 adjacent and north of the community and station likely impede frog calling success. A shopping plaza is also located immediately west and adjacent to this marsh and survey station;
2. Station B contained MAS 2-1b. Water was present during the survey, but measured less than 1 cm in depth. Two chorus frogs (CHFR) were heard calling from within the station on the May 31, 2013 survey; additional frogs were heard calling prior to starting the survey on that date. None were heard during the June 24, 2013 survey; and,
3. Station C contained a very small vernal pool within a FOD7-3 vegetation community. Water was present during the surveys, though no amphibians were visually observed. No calls were heard from the station either.

Overall, station A and station C had no calls, while station B had low amphibian breeding activity levels.

4.0 Constraints to Trail Development

Based on desktop review of aerial photography, review of background information, and results of the 2013 field investigations, the features that potentially present a constraint to siting of the trail are woodlands, wetlands, valleyland bluffs, and sensitive species.

4.1 WOODLANDS

Criteria suggested by the *Natural Heritage Reference Manual* (MNR 2010) for designating significant woodlands at a provincial level include woodland size, ecological function (interior, proximity to other woodlands or habitat, linkages, water protection and species diversity), uncommon characteristics, and economic and social values. It is the local planning authority's responsibility to designate significant woodlands.

The woodland throughout the study area has been identified by the MNR through its LIO mapping data. The City and Region's OP mapping does not indicate that any of the woodlands located within the study area are designated as significant. Development of the trail within the woodland is feasible as it is comprised largely of common species, as well as a number of exotic species (44 of the total species observed). Sensitive forest vegetation communities should be avoided, specifically the FOD7-3; his community type is wetland in nature and impervious trail should not be sited within any of the FOD7-3 communities within the study area.

4.2 WETLANDS

Various wetland communities are found within the study area (Section 3.3)(Figure 1, Appendix A). These include the MAS2-1 communities (cattail mineral shallow marshes), one of which is fairly large and located at the north end of the study area, adjacent and south of Highway 7. The second is located west of Sara Street and appears to have grown as a result of exposed tile drainage, likely servicing stormwater outfall from the adjacent residential community to the east (exposed concrete bed was observed bordering the small community). Given the sensitive nature of wetlands, the trail should be sited so as to not encroach on such communities. An MAM2-2 (reed-canary grass mineral meadow marsh) community is located in the southwestern portion of the study area, east of the Vaughan Grove Sports Park and just north of the existing paved pathway. However, this community is located away from any new proposed trail development and is not a concern.

The FOD7-3 (fresh-moist willow lowland deciduous forest community is also considered to exhibit wetland characteristics and should be avoided to the extent particular or subject to conditional trail design determined in consultation with the TRCA. A vernal pool was identified within the FOD7-3 community in the southeastern portion of the study area. It was observed to be limited in size and although no breeding frogs were observed calling during May and June surveys in 2013, it may provide amphibian breeding habitat for other species or early breeding frog species. The trail should be aligned to avoid this area.

A seep was observed during breeding bird and vegetation surveys in June 2013, located in the far southeastern corner of the study area within the FOC4-1 vegetation community (fresh – moist white cedar coniferous forest), situated within a fairly steep portion of the eastern valley wall. The trail should avoid this area and trail design to maintain any outfall surface flow expressed from the seep area to Rainbow Creek.

4.3 VALLEYLANDS

As per the Geotechnical Report (Stantec, 2013), valleyland exists towards the centre of the study area along the east bank and floodplain. The vegetation community is characterized as BLS1 – mineral shrub bluff vegetation community. Bluff communities and valley walls are sensitive features given their proneness for erosion and slope failures; in fact, vegetation along such areas is crucial in erosion control. Such features pose a hazard risk, are difficult to maintain if disturbed or lose vegetation cover, and are not suitable areas for siting a trail. Further information concerning slope is provide in the geotechnical slope stability memorandum prepared under separate cover (Stantec 2013)

4.4 THREATENED OR ENDANGERED SPECIES

4.4.1 Terrestrial Species

Two rare species were encountered: Butternut (Endangered) and Chimney Swift (Threatened). The Chimney Swift is unlikely to be using habitats available within the study area for breeding/nesting, though it may forage therein. The trail is not expected to impact the foraging opportunities for this species given the proposed extent of the development and the passive nature of the undertaking.

The Butternut was located in the northeastern portion of the study area and should be avoided in development of the trail.

4.4.2 Aquatic Species

According to Fisheries and Oceans Canada (DFO) Aquatic Species at Risk mapping (DFO 2013), Rainbow Creek is considered to be Redside Dace (*Clinostomus elongatus*) habitat. Redside Dace is classified by the MNR as Endangered under the *Endangered Species Act* (ESA) and as such, is afforded full protection of the act. As the trail will cross Rainbow Creek, Redside Dace habitat has the potential to be impacted by the trail if appropriate design/mitigation measures are not employed. Mitigation measures are discussed in Section 5.1.

5.0 Conclusions and Recommendations

Given the adjacent residential and commercial land use, it is not surprising to see existing trails created by local residents and shoppers who traverse through the woodland. As no manner exists to prevent pedestrian traffic through the study area, development of a trail would be recommendable for various reasons:

- To encourage local residents to enjoy and participate in the nature found within their backyards and neighbourhood;
- A clearly marked trail would encourage users to stay on-path, limiting the extent of foot traffic and associated damage to vegetation and potential wildlife habitat as a point source rather than diffused throughout the study area;
- A higher volume of traffic through the valleylands may result from development of a trail, however, the increased exposure to frequent users may discourage negative behaviours such as loitering or dumping, as has been observed within the study area historically;
- A trail with information signage can provide education opportunities to users about the wildlife, vegetation and natural features along the route, bringing users closer to nature and establishing a sense of appreciation; and,
- A sense of appreciation may bring with it a sense of protection and accountability for the maintenance of the valleyland natural area.

Recommendations on siting the trail are as follows:

- Design a path to avoid wetlands and, where access is required, construct elevated boardwalk crossings for wetlands to facilitate water movement;
- In order to minimize impact on the vegetation, single access points would be established at the boardwalk locations. Boardwalks would be located and constructed for wetland crossings so that natural vegetation remains intact and boardwalk lengths and widths can be limited. Boardwalks, when installed correctly, should maintain the function of wetland/habitat features. Additionally, boardwalks may be designed to offer some opportunity for wetland education to the general public through naturalist information signage;
- Avoid the encroachment, or removal of any feature that is considered to hold water during the spring and early summer period (i.e. vernal pools, seeps, wetland/marsh communities); and,
- Avoid encroachment to the Butternut located on-site, and provide a protective 25m radius buffer to prevent damage to roots.

5.1 RECOMMENDATIONS FOR BRIDGE DESIGN

As the proposed bridge will cross Redside Dace habitat, the MNR may be required to review the crossing under the ESA. For watercourses that have been identified as Redside Dace habitat, the area of protection includes the channel along with the meander belt width and a 30 m buffer extending from the meander belt width. As the bridge and trail will be located within this area of Rainbow Creek, the trail and bridge may potentially require a permit under the ESA. The MNR has provided guidance for development in Redside Dace habitat. The following guidance is provided for consideration during bridge design:

- Minimize the width of the crossing;
- Cross over straight sections of the stream where there is less likelihood of erosion;
- Cross at areas that have already been disturbed and avoid disturbance in new areas of the stream; and,
- Bridges should be high enough to allow light penetration into the watercourse (MNR 2011).

The proposed trail alignment is located within areas that are currently disturbed by local public use of the valley and as a result, a formal trail is not anticipated to increase disturbance to Redside Dace habitat within the valley. Mitigation measures installed during construction as per MNR guidelines (i.e., double-row, non-woven silt fencing separated by straw bales) will minimize potential impacts to Redside Dace habitat. While the proposed bridge location crosses Redside Dace habitat, the current location is on a straight section of stream, as per MNR guidelines. The proposed location will require the removal of minor amounts of vegetation along the banks of Rainbow Creek for the trail and bridge. If the MNR guidance provided for bridges can be incorporated into the final design, a permit under the ESA can be avoided and the project may be approved under a Letter of Advice from the MNR. Should the project move forward, MNR staff should be engaged early in the detailed design process to discuss the trail and bridge locations and their concerns regarding impacts to Redside Dace habitat. Consultation with MNR staff will identify their preferred bridge design and location that will assist in obtaining approval under a Letter of Advice. PermiTting and Approvals

The following additional studies, permits and/or approvals may be required for development of the proposed trail.

- MNR – submission of an Information Gathering Form for three Threatened/Endangered species observed or known to occur within the study area:
    - Butternut: a Butternut Health Assessment be undertaken by a Butternut Health Assessor certified through MNR to determine whether Butternut is retainable/non-retainable; results must be submitted to the MNR for review. An audit by the MNR regarding the assessment may be undertaken within 30 days of submission, during which time Butternut cannot be harmed or removed unless notice has been received in writing from the district manager approving this assessment report. Retainable Butternut are protected and

cannot be removed without an authorization under the Endangered Species Act 2007, i.e. without either (1) an overall benefit permit or, if no more than 10 trees are concerned, (2) a planting plan that has been approved by the OMNR, or has not been approved or refused within 30 days following its submission to the OMNR district office. Non-retainable trees do not meet the retention guidelines based on the crown vigour assessment and the levels of cankers on the root flare and/or stem. These trees can be removed upon approval of this BHA report by the OMNR district manager, or if 30 days have lapsed since OMNR received this report, and provided there are no municipal bylaws or other legislation prohibiting their removal. Please note the Ontario Recovery Team encourages that all Butternut trees be conserved and removal of diseased trees is not an objective of the Recovery Strategy. Hybrid Butternut trees and are not afforded protection under the Endangered Species Act, 2007. Hybrid trees can be removed if desired under the ESA, but as mentioned above might be subject to other legislation; and,

  - Chimney Swift: the individual observed was foraging and not observed within roosting habitat. Chimney Swift require large-diameter trees with sizable cavities for nesting, which were not observed. Since such required habitat is not anticipated to be removed, and no man-made suitable breeding structures (chimneys, buildings) are also not anticipated to be maintained or removed, permitting is not likely. However, this species should be included in the Information Gathering Form (IGF) submitted to the MNR as part of the consultation process in the project's next phase. Redside Dace: Known Redside Dace in Rainbow Creek. The bridge and trail design should be included in the IGF as part of the consultation process to determine if they may require a permit under the ESA.

- Toronto and Region Conservation Authority – a permit may be required under the Ontario Regulation 166/06: Toronto and Region conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses with particular respect to construction of the bridge or trail within the TRCA Regulated Area limits; and,
- Fisheries and Oceans Canada (DFO) – Under the newly revised Fisheries Act (2013), once the bridge design has been completed, a self-assessment should be conducted by a qualified fisheries biologist to determine if construction of the bridge is considered low risk to fish and fish habitat or will result in serious harm to fish. If the self-assessment determines that the bridge will result in serious harm to fish, a request for project review should be submitted to DFO.

6.0 Closure

This Report has been prepared by Stantec Consulting Ltd. for the sole benefit of the City of Vaughan, and may not be used by any third party without the express written consent of the City of Vaughan. Any use which a third party makes of this Report is the responsibility of such third party.

The data presented in this Report are in accordance with our understanding of the Project as it was presented at the time of our Report. In the event that changes or alterations are made to the Project, we reserve the right to review our data with respect to any such changes.

We trust this Report meets your current requirements. Please do not hesitate to contact us if you should have any questions or require further information.

Respectfully Submitted,

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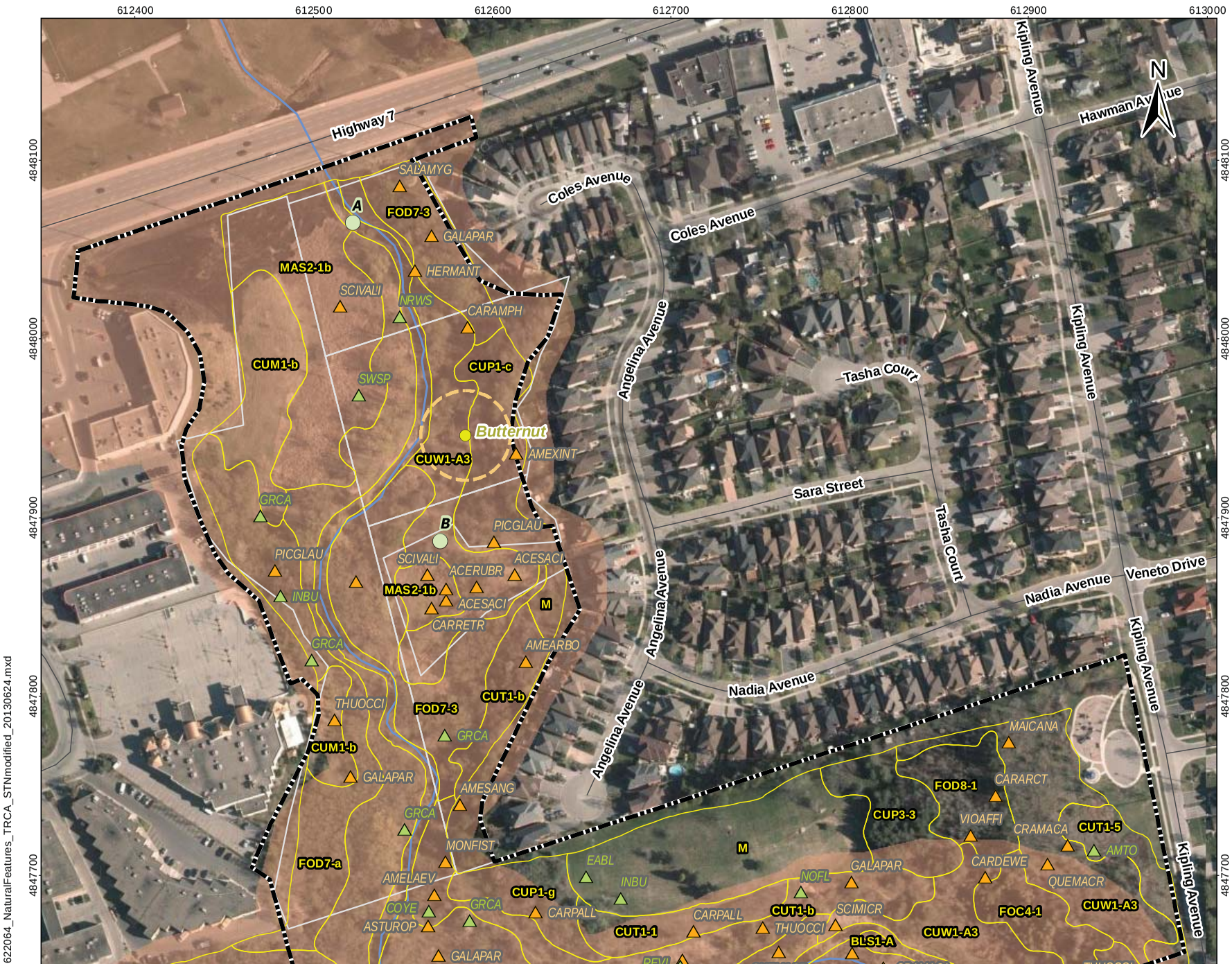
APPENDIX A

Figures



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APPENDIX B

Vegetation List

LATIN NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS TRCA RANKING	LOCAL STATUS YORK
	LOCAL STATUS SOURCE									TRCA April 2003	VARGA 2000
	LAST UPDATE/ INITIALS										July 2002/KH
PTERIDOPHYTES		**FERNS & ALLIES**									
Dryopteridaceae		**Wood Fern Family**									
Cystopteris	*bulbifera*	Bulblet Bladder Fern	5	-2		S5			G5	L4	X
Dryopteris	*carthusiana*	Spinulose Wood Fern	5	-2		S5			G5	L5	X
Equisetaceae		**Horsetail Family**									
Equisetum	*variegatum* ssp. *variegatum*	Variegated Horsetail	5	-3		S5			G5T	L4	U
GYMNOSPERMS		**CONIFERS**									
Pinaceae		**Pine Family**									
Picea	*glauca*	White Spruce	6	3		S5			G5	L3	X
Pinus	*nigra*	Austrian Pine		-5	-1	SE2			G?	L+	
Pinus	*strobus*	Eastern White Pine	4	3		S5			G5	L4	X
Pinus	*sylvestris*	Scotch Pine		5	-3	SE5			G?	L+	X
DICOTYLEDONS		**DICOTS**									
Anacardiaceae		**Sumac or Cashew Family**									
Rhus	*typhina*	Staghorn Sumac	1	5		S5			G5	L5	X
Toxicodendron	*radicans*	Climbing Poison-ivy	5	-1		S5			G5T	L4	R5
Toxicodendron	*rydbergii*	Poison-ivy	0	0		S5			G5T	L5	X
Apiaceae		**Carrot or Parsley Family**									
Angelica	*atropurpurea*	Great Angelica	6	-5		S5			G5	L3	R9
Pastinaca	*sativa*	Wild Parsnip		5	-3	SE5			G?	L+	X
Apocynaceae		**Dogbane Family**									
Apocynum	*androsaemifolium*	Spreading Dogbane	3	5		S5			G5T?	L4	X
Apocynum	*cannabinum* var. *cannabinum*	Indian Hemp		1		S5			G5T	L5	U
Asclepias	*syriaca*	Common Milkweed	0	5		S5			G5	L5	X
Cynanchum	*rossicum*	Swallow-wort				SE5			G?	L+	X
Asteraceae		**Composite or Aster Family**									
Achillea	*millefolium*	Common Yarrow	0	3		S5			G5T5	L5	
Cirsium	*arvense*	Canada Thistle		3	-1	SE5			G?	L+	X
Erigeron	*annuus*	Annual Fleabane	0	1		S5			G5	L5	
Erigeron	*philadelphicus var . philadelphicus*	Philadelphia Fleabane	1	-3		S5			G5T?	L5	X
Eupatorium	*maculatum var . maculatum*	Spotted Joe-pye-weed	3	-5		S5			G5T5	L5	X
Helianthus	*tuberosus*	Jerusalem Artichoke		0	-1	SE5			G5	L5	X
Hieracium	*praealtum*	Glaucos King Devil				SE1			G?	L+	
Inula	*helenium*	Elecampane		5	-2	SE5			G?	L+	X
Solidago	*canadensis var. canadensis*	Canada Goldenrod	1	3		S5			G5	L5	X
Solidago	*gigantea*	Giant Goldenrod	4	-3		S5			G5	L5	X
Sonchus	*asper* ssp. *asper*	Spiny-leaved Sow-thistle		0	-1	SE5			G?T?	L+	X
Symphyotrichum	*cordifolium*	Heart-leaved Aster	5	5		S5			G5	L5	X
Symphyotrichum	*novae-angliae*	New England Aster	2	-3		S5			G5	L5	X
Taraxacum	*officinale*	Common Dandelion		3	-2	SE5			G5	L+	X

Tragopogon	*pratensis* ssp. *pratensis*	Meadow Goat's-beard		5	-1	SE5			G?T?	L+	X
Tussilago	*farfara*	Coltsfoot		3	-2	SE5			G?	L+	X
Balsaminaceae		**Touch-me-not Family**									
Impatiens	*capensis*	Spotted Touch-me-not	4	-3		S5			G5	L5	X
Boraginaceae		**Borage Family**									
Hackelia	*virginiana*	Virginia Stickweed	5	1		S5			G5	L5	R5
Lithospermum	*officinale*	Common Gromwell		5	-1	SE5			G?	L+	X
Brassicaceae		**Mustard Family**									
Hesperis	*matronalis*	Dame's Rocket		5	-3	SE5			G4G5	L+	X
Caprifoliaceae		**Honeysuckle Family**									
Lonicera	*tatarica*	Tartarian Honeysuckle		3	-3	SE5			G?	L+	X
Sambucus	*canadensis*	Common Elderberry	5	-2		S5			G5	L5	X
Viburnum	*lentago*	Nannyberry	4	-1		S5			G5	L5	X
Viburnum	*opulus*	Guelder Rose		0	-1	SE4			G5	L+	X
Caryophyllaceae		**Pink Family**									
Saponaria	*officinalis*	Bouncing-bet		3	-3	SE5			G?	L+	X
Cornaceae		**Dogwood Family**									
Cornus	*alternifolia*	Alternate-leaved Dogwood	6	5		S5			G5	L5	X
Cornus	*amomum* ssp. *obliqua*	Silky Dogwood	5	-4		S5			G5T?	L4	R7
Cornus	*stolonifera*	Red-osier Dogwood	2	-3		S5			G5	L5	X
Cucurbitaceae		**Gourd Family**									
Echinocystis	*lobata*	Prickly Cucumber	3	-2		S5			G5	L5	X
Dipsacaceae		**Teasel Family**									
Dipsacus	*fullonum* ssp. *sylvestris*	Wild Teasel		5	-1	SE5			G?T?	L+	X
Elaeagnaceae		**Oleaster Family**									
Elaeagnus	*angustifolia*	Russian Olive		4	-1	SE3			G?	L+	X
Medicago	*lupulina*	Black Medick		1	-1	SE5			G?	L+	X
Melilotus	*alba*	White Sweet-clover		3	-3	SE5			G?	L+	X
Robinia	*pseudo-acacia*	Black Locust		4	-3	SE5			G5	L+	X
Vicia	*cracca*	Tufted Vetch		5	-1	SE5			G?	L+	X
Fagaceae		**Beech Family**									
Quercus	*macrocarpa*	Bur Oak	5	1		S5			G5	L4	X
Quercus	*rubra*	Red Oak	6	3		S5			G5	L4	X
Geraniaceae		**Geranium Family**									
Geranium	*robertianum*	Herb-robert		5	-2	SE5			G5	L+?	X
Grossulariaceae		**Currant Family**									
Ribes	*triste*	Wild Red Currant	6	-5		S5			G5	L3	U
Guttiferae		**St. John's-wort Family**									
Hypericum	*perforatum*	Common St. John's-wort		5	-3	SE5			G?	L+	X
Juglandaceae		**Walnut Family**									
Juglans	*cinerea*	Butternut	6	2		S3?	END	END	G4	L3	X
Juglans	*nigra*	Black Walnut	5	3		S4			G5	L5	R
Mentha X	*piperita*	Pepper Mint		-5	-1	SE4			HYB	L+	X
Lythraceae		**Loosestrife Family**									
Lythrum	*salicaria*	Purple Loosestrife		-5	-3	SE5			G5	L+	X
Oleaceae		**Olive Family**									

Fraxinus	*pennsylvanica*	Red Ash	3	-3		S5			G5	L5	X
Syringa	*vulgaris*	Common Lilac		5	-2	SE5			G?	L+	X
Onagraceae		**Evening-primrose Family**									
Circaea	*lutetiana* ssp. *canadensis*	Yellowish Enchanter's Nightshade	3	3		S5			G5T5	L5	X
Oxalidaceae		**Wood Sorrel Family**									
Papaveraceae		**Poppy Family**									
Chelidonium	*majus*	Celandine		5	-3	SE5			G?	L+	X
Sanguinaria	*canadensis*	Bloodroot	5	4		S5			G5	L5	X
Plantaginaceae		**Plantain Family**									
Plantago	*major*	Common Plantain		-1	-1	SE5			G5	L+	X
Plantago	*rugelii*	Rugel's Plantain	1	0		S5			G5	L5	X
Primulaceae		**Primrose Family**									
Lysimachia	*ciliata*	Fringed Loosestrife	4	-3		S5			G5	L5	X
Lysimachia	*nummularia*	Moneywort		-4	-3	SE5			G?	L+	X
Ranunculaceae		**Buttercup Family**									
Anemone	*virginiana* var. *virginiana*	Thimbleweed	4	5		S5			G5T	L5	X
Ranunculus	*acris*	Tall Buttercup			-2	SE5			G5	L+	X
Rhamnaceae		**Buckthorn Family**									
Rhamnus	*cathartica*	Common Buckthorn		3	-3	SE5			G?	L+	X
Rosaceae		**Rose Family**									
Amelanchier	*arborea*	Downy Juneberry		3		S5			G5	L4	X
Crataegus	*species*	Hawthorn species									
Crataegus	*coccinea var. fulleriana*	Fuller's Hawthorn	4	5		S2?			G5T3T5Q		
Crataegus	*monogyna*	English Hawthorn		5	-1	SE5			G5	L+	X
Crataegus	*punctata*	Large-fruited Thorn	4	5		S5			G5	L5	X
Fragaria	*virginiana* ssp. *virginiana*	Scarlet Strawberry	2	1		SU			G5T?	L5	X
Geum	*aleppicum*	Yellow Avens	2	-1		S5			G5	L5	X
Geum	*canadense*	White Avens	3	0		S5			G5	L5	X
Malus	*pumila*	Common Crabapple		5	-1	SE5			G5	L+	X
Physocarpus	*opulifolius*	Ninebark	5	-2		S5			G5	L3	
Potentilla	*recta*	Rough-fruited Cinquefoil		5	-2	SE5			G?	L+	X
Prunus	*serotina*	Black Cherry	3	3		S5			G5	L5	X
Prunus	*virginiana* ssp. *virginiana*	Choke Cherry	2	1		S5			G5T?	L5	X
Rosa	*blanda*	Smooth Rose	3	3		S5			G5	L4	U
Rosa	*multiflora*	Multiflora Rose		3	-3	SE4			G?	L+	X
Rubus	*idaeus* ssp. *strigosus*	Wild Red Raspberry	0	-2		S5			G5T5	L5	X
Rubus	*occidentalis*	Thimble-berry	2	5		S5			G5	L5	X
Rubiaceae		**Madder Family**									
Galium	*palustre*	Marsh Bedstraw	5	-5		S5			G5	L4	X
Salicaceae		**Willow Family**									
Populus	*balsamifera* ssp. *balsamifera*	Balsam Poplar	4	-3		S5			G5T?	L5	X
Populus	*deltoides* ssp. *deltoides*	Eastern Cottonwood	4	-1		SU			G5T5	L5	X+
Populus	*tremuloides*	Trembling Aspen		0		S5			G5	L5	X
Salix	*petiolaris*	Slender Willow	3	-4		S5			G4	L3	X
Sapindaceae		**Maple Family**									
Acer	*negundo*	Manitoba Maple	0	-2		S5			G5	L+?	X
Acer	*platanoides*	Norway Maple		5	-3	SE5			G?	L+	X

Acer	*saccharum*	Sugar Maple	4	3		S5			G5T?	L5	X
Acer X	*freemanii*	Freeman's Maple								L4	XSR
Verbascum	*thapsus*	Common Mullein		5	-2	SE5			G?	L+	X
Solanaceae		**Nightshade Family**									
Solanum	*dulcamara*	Bitter Nightshade		0	-2	SE5			G?	L+	X
Tiliaceae		**Linden Family**									
Tilia	*americana*	American Basswood	4	3		S5			G5	L5	X
Ulmaceae		**Elm Family**									
Ulmus	*americana*	White Elm	3	-2		S5			G5?	L5	X
Urticaceae		**Nettle Family**									
Laportea	*canadensis*	Wood Nettle	6	-3		S5			G5	L5	X
Urtica	*dioica* ssp. *dioica*	European Stinging Nettle		-1	-1	SE2			G5T?	L+	X
Vitaceae		**Grape Family**									
Parthenocissus	*inserta*	Inserted Virginia-creeper	3	3		S5			G5	L5	X
Vitis	*riparia*	Riverbank Grape	0	-2		S5			G5	L5	X
MONOCOTYLEDONS		**MONOCOTS**									
Alismataceae		**Water-plantain Family**									
Alisma	*plantago-aquatica*	Common Water-plantain	3	-5		S5			G5	L4	X
Araceae		**Arum Family**									
Arisaema	*triphyllum* ssp. *triphyllum*	Small Jack-in-the-pulpit	5	-2		S5			G5T5	L4	X
Cyperaceae		**Sedge Family**									
Carex	*species*	Sedge species									
Carex	*aurea*	Golden-fruited Sedge	4	-4		S5			G5	L4	U
Carex	*blanda*	Woodland Sedge	3	0		S5			G5?	L5	X
Carex	*deweyana var. deweyana*	Dewey's Sedge	6	4		S5			G5	L4	X
Carex	*radiata*	Radiate Sedge	4	5		S4			G4	L5	X
Juncaceae		**Rush Family**									
Juncus	*effusus* ssp. *solutus*	Soft Rush	4	-5		S5			G5T?	L4	X
Juncus	*tenuis*	Path Rush	0	0		S5			G5	L5	X
Liliaceae		**Lily Family**									
Convallaria	*majalis*	Lily-of-the-valley		5	-2	SE5			G5	L+	X
Poaceae		**Grass Family**									
Dactylis	*glomerata*	Orchard Grass		3	-1	SE5			G?	L+	X
Phalaris	*arundinacea*	Reed Canary Grass	0	-4		S5			G5	L+?	X
Poa	*nemoralis*	Woodland Spear Grass		0	-1	SE3			G5	L+	X
Poa	*pratensis* ssp. *pratensis*	Kentucky Bluegrass	0	1		S5			G5T5	L+	X

FLORISTIC SUMMARY & ASSESSMENT

Species Diversity

Total Species:	**118**	
Native Species:	**74**	63%
Exotic Species	**44**	37%
Regionally Significant Species	enter manually	
Locally Significant Species	enter manually	

Co-efficient of Conservatism and Floristic Quality Index			
Co-efficient of Conservatism (CC) (average)		**3.3**	
CC 0 to 3	*lowest sensitivity*	33	46%
CC 4 to 6	*moderate sensitivity*	38	54%
CC 7 to 8	*high sensitivity*	0	0%
CC 9 to 10	*highest sensitivity*	0	0%
Floristic Quality Index (FQI)		**28**	
Presence of Weedy & Invasive Species			
mean weediness		**-1.9**	
weediness = -1	*low potential invasiveness*	18	43%
weediness = -2	*moderate potential invasiveness*	10	24%
weediness = -3	*high potential invasiveness*	14	33%
Presence of Wetland Species			
average wetness value		**1.0**	
upland		28	24%
facultative upland		28	24%
facultative		25	22%
facultative wetland		25	22%
obligate wetland		9	8%

APPENDIX C

Wildlife LIst

1			Band-winged Meadowhawk	*Sympetrum semicinctum*	S4	G5							
1			Black Saddlebags	*Tramea lacerata*	S4	G5							
AMPHIBIANS													
1			Mudpuppy	*Necturus maculosus*	S4	G5	NAR	NAR	10		L2		
1			Red-spotted Newt	*Notophthalmus viridescens*	S5	G5T5					L1		
1			Blue-spotted Salamander	*Ambystoma laterale*	S4	G5					L1		
1			Spotted Salamander	*Ambystoma maculatum*	S4	G5					L1		
1			Northern Redback Salamander	*Plethodon cinereus*	S5	G5							
1			American Toad	*Anaxyrus americanus*	S5	G5							
1			Tetraploid Gray Treefrog	*Hyla versicolor*	S5	G5					L2		
1			Western Chorus Frog (carolinian)	*Pseudacris triseriata*	S4	G5	NAR	NAR			L2		
1			Spring Peeper	*Pseudacris crucifer*	S5	G5					L2		
1			Bullfrog	*Lithobates catesbeiana*	S4	G5			1		L1		
1			Northern Green Frog	*Lithobates clamitans*	S5	G5							
1			Wood Frog	*Lithobates sylvatica*	S5	G5					L2		
1			Northern Leopard Frog	*Lithobates pipiens*	S5	G5	NAR	NAR			L3		
REPTILES													
1			Snapping Turtle	*Chelydra serpentina*	S3	G5	SC	SC			L3		
1			Eastern Musk Turtle	*Sternotherus odoratus*	S3	G5	THR	SC		7	L2		
1			Midland Painted Turtle	*Chrysemys picta marginata*	S5	G5T5							
1			Slider	*Trachemys scripta*	SNA	G5							
1			Northern Map Turtle	*Graptemys geographica*	S3	G5	SC	SC	30-50				
1			Blanding's Turtle	*Emydoidea blandingi*	S3	G4	THR	THR			L2		
1			Eastern Gartersnake	*Thamnophis sirtalis*	S5	G5							
1			Eastern Ribbon Snake	*Thamnophis sauritus*	S3	G5	SC	SC			L2		
1			Redbelly Snake	*Storeria occipitomaculata*	S5	G5					L3		
1			Brown Snake	*Storeria dekayi*	S5	G5		NAR					
1			Smooth Greensnake	*Opheodrys vernalis*	S4	G5					L3		
1			Ringneck Snake	*Diadophis punctatus*	S4	G5				7	L2		
1			Eastern Milksnake	*Lampropeltis triangulum*	S3	G5	SC	SC			L3		
BIRDS													
1			Canada Goose	*Branta canadensis*	S5	G5							
1			Wood Duck	*Aix sponsa*	S5	G5					L3		
1			American Black Duck	*Anas rubripes*	S4	G5							
1	1	1	Mallard	*Anas platyrhynchos*	S5	G5							
1			Hooded Merganser	*Lophodytes cucullatus*	S5B,S5N	G5				7	L2		
1			Ring-necked Pheasant	*Phasianus colchicus*	SNA	G5							
1			Green Heron	*Butorides virescens*	S4B	G5							
1			Turkey Vulture	*Cathartes aura*	S5B	G5							
1			Northern Harrier	*Circus cyaneus*	S4B	G5	NAR	NAR	55		L3	X	Sandilands 2005
1			Sharp-shinned Hawk	*Accipiter striatus*	S5	G5	NAR	NAR	20-30		L3		Sandilands 2005
1			Cooper's Hawk	*Accipiter cooperii*	S4	G5	NAR	NAR	4-50+		L3		Sandilands 2005
1	1		Red-tailed Hawk	*Buteo jamaicensis*	S5	G5	NAR	NAR					
1			American Kestrel	*Falco sparverius*	S5B	G5						X	
1			Virginia Rail	*Rallus limicola*	S5B	G5					L3		
1			Sora	*Porzana carolina*	S4B	G5					L3		
1			Killdeer	*Charadrius vociferus*	S5B, S5N	G5							
1			Spotted Sandpiper	*Actitis macularia*	S5	G5							

A - IV. MEANDER BELT STUDY

Memo

Stantec

To:	Mike Dartizio Markham	From:	Hamish Trenam Markham
File:	160622064	Date	December 10, 2013

Reference: Kipling Trail, The City of Vaughan
Historic Assessment of Channel Planform within Rainbow Creek

GENERAL

- Available imagery: **2002,** 2004, 2006, 2008, 2010, and **2012**. Bolded years represent imagery used to generate figures. Period of record: approx. 10 years.
- Rainbow Creek was assessed from Highway 7 (upstream) to a point approximately 1 km downstream of Highway 7.
- Rainbow Creek flows from north to south with a bend to the east approximately 550 m downstream of Highway 7.
- Meanders are largely confined or partially confined within a relatively narrow valley, therefore limited potential for substantial planform shifts. Sinuosity in 2002 was 1.17, and sinuosity in 2012 was 1.20.

REACHES

- Two reaches were identified:
    - Upstream Reach – Defined as the area from the south side of Highway 7 to the point where Rainbow Creek bends towards the east; and
    - Downstream Reach – Defined as the area from the point where Rainbow Creek bends towards the east to the property line (approximately 1 km downstream of Highway 7).

CRITERIA

- The meander belt was delineated using Parish Geomorphic's "Belt Width Delieation Procedures" published on January 30, 2004.
- Based on site conditions, procedures for a confined meander were used.

RATE OF EROSION

- The rate of erosion within both the upstream and downstream reaches.
- The 100-year rate of erosion in the upstream reach is estimated to be 28 m, the 100-year rate of erosion in the downstream reach is estimated to be 44 m.
- The zone around the Mid-channel bar (MCB) in the downstream reach has experienced an extremely high rate of erosion, approximately 35 m in 10 years (a rate of 350 m per 100-years) in addition to a significant planform shift.
- The zone immediately upstream of the proposed bridge in the downstream reach has experienced a high rate of erosion (in comparison to the rest of the reach) of approximately 111 m per 100-years. This portion of the channel is considered to be unstable.

Reference: Kipling Trail, The City of Vaughan
Historic Assessment of Channel Planform within Rainbow Creek

- Within the proximity of the bridge the rate of erosion is approximately 37 m per 100-years. This portion of the channel is considered moderately stable; however, its proximity to unstable portions of the reach could lead to significant channel adjustment.

FIGURE 1.0 – Channel Migration & Meander Belt Delineation, Rainbow Creek

- MCB in both 2002 and 2012. MCB shows significant evolution over the 10 year period.
- Upstream planform in 2002 very similar to upstream planform in 2012.
- Planform downstream of the east bend is significantly different in 2012 when compared to 2002. The length of the MCB had decreased by half and a shift in channel has occurred.

RECOMMENDATIONS

Based on the channel migration and meander belt delineation, the proposed Rainbow Creek crossing location is located at a point in the channel that has not migrated significantly over the last 10 years; however, the crossing located the proximity of a portion of the channel that has historically experience changes in channel alignment. To minimize risk to the bridge, three alternatives are suggested:

- Relocation of the crossing to a more stable reach; or
- Increase the span of the bridge to allow for some channel adjustment; or
- Installation of erosion control measures to minimize channel migration.

All three alternatives would require consultation with the City's Parks Development staff. If the second or third alternatives were to be considered hydraulic analysis, TRCA and erosion threshold and velocity calculations could be required; the third alternative would require detailed floodplain modeling and consultation with the TRCA.

Stantec Consulting Ltd.

Hamish Trenam, B.A.Sc.
Water Resources EIT
Hamish.Trenam@stantec.com

Attachment: Figure 1.0

c. Tim Gallagher (Stantec) and Yasmine Abdel Hay (Stantec)

July, 2013
160622064

Stantec Consulting
300–675 Cochrane Dr. West Tower
Markham, ON
L3R 0B8
Tel. 905.944.7777
Fax. 905.474.9889
www.stantec.com

LEGEND
- 2002 Top of Bank
- 2012 Top of Bank
- Meander Belt
- 2012 Contours

Client/Project
The City of Vaughan
Kipling Trail

Figure No.
1.0

Title
Channel Migration and Meander Belt Delineation
RAINBOW CREEK

A - V. GEOTECHNICAL ASSESSMENT

Stantec Consulting Ltd.
300 - 675 Cochrane Drive West Tower
Markham ON L3R 0B8
Tel: (905) 944-7777
Fax: (905) 474-9889

July 19, 2013
File: 160622064

The Corporation of the City of Vaughan
2141 Major Mackenzie Drive, Level 100
Vaughan ON L6A 1T1

Reference: Geotechnical Review of Proposed Trail Location for Kipling Trail Feasibility Study between Kipling Avenue and Martin Grove Road, south of Highway 7 City of Vaughan, ON

Stantec Consulting Ltd. (Stantec) was retained by The Corporation of the City of Vaughan (Vaughan) to complete a Feasibility Study which is to include a conceptual trail design; habitat, archaeological, hydrological and ecological studies; a geotechnical review of the proposed trail location and a meander belt study for the proposed Kipling Trail between Kipling Avenue and Martin Grove Road, south of Highway 7, Vaughan, Ontario.

This letter report will provide recommendations for the long term stable slope line of the valley bank for the purposes of locating the trail outside hazardous lands and will also provide preliminary recommendations for the design of the trail infrastructure.

PROPOSED PROJECT

A feasibility study is required to determine the scope of work required to connect the eastern side of the open space located south of Highway 7 and to the east of the neighbourhood along Kipling Avenue to Vaughan Grove Park and its adjacent sports fields. The proposed trail will connect the neighbourhood to the east of the site, to the Vaughan Grove Sports Park and sports fields, as well as the neighbouring school identified as Holy Cross Catholic High School.

SITE DESCRIPTION

The site is located on Lots 4 and 5, Concession 8 in the City of Vaughan, Ontario. The site is a natural area that includes a tributary of Rainbow Creek and is identified as part of the Parkway Belt West Lands. The site is located south of Highway 7, near the intersection of Highway 7 and Kipling Avenue, and is located near a residential development to the east and a commercial area to the west and the Vaughan Grove Sports Park located to the west and southwest.

The valley wall on the east bank and floodplain is generally well vegetated with trees and the area has an overall slope varying from 1.5:1.0 to 6.8:1.0 (Horizontal: Vertical); the bank is flatter on the south limit from Highway 7 extending south past the outfall structure with a slope of 2.8:1.0 (Horizontal: Vertical) to 5.0:1.0 (Horizontal: Vertical). Based on the geometry outlined on the Flood Plan Topographic Plan the southwest and south side of the property generally has a slope of approximately 1.5:1.0 (Horizontal: Vertical) to 2.8:1.0 (Horizontal: Vertical). The vegetation on the bank consists predominantly of rough grass, shrubs and trees of varying maturity. Sections of the bank are exposed to bare soil and there is evidence of historic transitional slope failures. There was no evidence of seepage on the bank. Active erosion was also noted at several locations at the toe of the bank during the site reconnaissance.

The tableland south of the residential development on Nadia Avenue is generally flat with scattered rough grass, shrubs and trees of varying maturity.

REGIONAL GEOLOGY

The Physiography of Southern Ontario by Chapman and Putnam (1984) indicates that the study area is situated within physiographic region identified as the Peel Plain. The Peel Plain is characterized as a level to undulating tract of clayey soils covering approximately 800 square kilometers across central portions of the Regional Municipalities of York, Peel and Halton. There is a gradual and relatively uniform slope towards Lake Ontario. In general, the Peel Plain consists of glacial till deposits.

The Quaternary Geology of Ontario, Southern Sheet, Map 2556, issued by the Ministry of Northern Development and Mines, 1991, indicates that the overburden soils in the region consists predominantly of Halton Till deposits primarily comprised of silt and silty clay soils. Isolated Glaciolacustrine deposits are also identified east of the Humber River the study area consisting of both coarse textured and fine textured deposits. Coarse-textured glaciolacustrine deposits are typically comprised of sand, gravelly sand and gravel soils with minor silt and clay inclusions. Fine-textured glaciolacustrine deposits are typically comprised of silt and clay soils with minor sand and gravel inclusions.

The region is underlain by bedrock of the Georgian Bay Formation. This bedrock, of Upper Ordovician age, is typically comprised of various shades of grey shale with limestone interbedding.

The Bedrock Geology of Ontario, Southern Sheet, Map 2544, issued by the Ministry of Northern Development and Mines, 1991, indicates that the bedrock underlying the region consists of limestone, dolostone, shale, and siltstone.

The site is in an area underlain by shale bedrock of the Georgian Bay Formation. A review of the Ontario Geological Survey (OGS) surficial geology of southern Ontario (online database) and water well records obtained from the Ministry of the Environment (MOE) indicates that shale bedrock was encountered at depths ranging from of 3.7 m to 6.0 m below existing grade on the floodplain of Rainbow Creek.

A review of the water well records obtained from the Ministry of the Environment (MOE) for the area of the site indicated that the shallow static groundwater level ranged from approximately 3.0 m to 5.4 m below grade.

SCOPE OF WORK

The scope of work for the Desktop Study was as follows:

- Review geological maps, online database(s), water well records, reports, and associated documents that were available in our offices, the City of Vaughan's office or from readily-available public sources, with specific relevance to the study area location or surrounding area and region; and,
- Evalutes the soil and groundwater conditions reported in consideration of the intended installation of the proposed infrastructure, and specifically the alignment of the proposed trail system. This will include recommendations for the proposed trail system including base preparation, trail pavement design, slope stabilization and recommendations for the proposed bridge structure.

A site reconnaissance was also conducted on May 16, 2003 to observe the existing land forms and conditions in the study area.

DISCUSSION AND RECOMMENDATIONS

PRELIMINARY SLOPE STABILITY ASSESSMENT

Visual Observations

Based on our visual assessment, the majority of the ground banks appeared to be well vegetated, covered with a combination of grass, shrubs, and trees of varying maturity, in a thin veneer of topsoil. Visual evidence of active surface and toe erosion and of historic translational slope failures was observed at several locations at the time of our assessment. Evidence of water seepage was not evident.

Slope Considerations

Based on the regional geology, the overburden soils are likely to consist predominantly of Halton Till deposits primarily comprised of silt and silty clay soils. As indicated above, isolated Glaciolacustrine deposits are also identified east of the Humber River in the study area consisting of both coarse textured and fine textured deposits. Coarse-textured glaciolacustrine deposits are typically comprised of sand, gravelly sand and gravel soils with minor silt and clay inclusions. The fine-textured glaciolacustrine deposits are typically comprised of silt and clay soils with minor sand and gravel inclusions.

Shale bedrock of the Georgian Bay Formation was observed in places, at the toe of the ground banks and within the floodplain of the creek.

Shallow static groundwater level is expected to range from approximately 3.0 m to 5.4 m below grade.

The creek is generally more than 15 m away from the eastern boundary of the toe of the bank, except along the easternmost 170± m to 460± m section from Kipling Avenue, where it approaches to within 8± m at three (3) locations.

The watercourse system along the subject property may be classified as a 'confined system' in accordance with The Ontario Ministry of Natural Resources, Technical Guide "*River & Stream Systems: Erosion Hazard Limit*" Dated 2002.

A preliminary slope stability analysis using an assumed soil type and soil parameters was carried out using the commercial modeling software package, Slope/W by Geo Slope International. The analysis was carried in consideration of the information obtained from the published physiographic description in the area of site. The soil parameters used for the analysis as follows:

Slope Stability Soil Parameters

Soil type	Parameter		
	Unit Weight (γ)	Friction Angle (Φ)	Cohesion (c)
Sandy Clay Till	20	28	5

The results of the analysis indicate that the critical slip surface at the analyzed section for the existing condition and the condition with the addition of the development have a factor of safety of approximately 1.2 to 2.3.

Based on the results of the slope stability analyses, the bank along the east property boundary is considered to be stable.

Evidence of rill erosion was observed at the crest of the valley wall which is likely caused by surface runoff from rainfall or snowmelt. It should be noted that weather and environmental factors may deteriorate the surface of the bank resulting in further erosion at the crest of the valley. Therefore, it is important that the surface vegetation be maintained and even increased if signs of degradation are observed.

Toe, Stable Slope and Erosion Allowances

Toe Erosion Allowance

Based on Table 3 of the Technical Guide "*River & Stream Systems: Erosion Hazard Limit*" and considering that evidence of active erosion was encountered at the toe of the bank in some locations, which consists of silt, silty clay and sand, gravelly sand and gravel soils with minor silt and clay inclusions and given that the existing flood plain ranges from 0 m to greater than 15 m in width an erosion allowance at the easternmost 170± m to 460± m section from Kipling Avenue can be established as 0 to 8 m.

Stable Slope Allowance

Based on the assumed soil type a stable slope allowance of 1 vertical: 3 horizontal is recommended.

Erosion Access Allowance

The Technical Guide "*River & Stream Systems: Erosion Hazard Limit"* suggest that a minimum erosion access of 6 m be provided to allow access for maintenance of the slope.

It is noted that weather and environmental factors may deteriorate the surface of the slope which may result in degradation of the stability of the slope. Therefore, it is important that the surface vegetation be maintained and even increased if signs of degradation are observed.

Design Minimum Factors of Safety

Based on Table 4.3 of the Technical Guide "*River & Stream Systems: Erosion Hazard Limit*" recommends the design minimum factor of safety for the Land Use D Infrastructure and Public Use to be 1.4 to 1.5.

BRIDGE FOUNDATION

As noted above, the condition of the shale bedrock could be characterized as of 'very poor quality' based on the methods described in the Canadian Foundation Engineering Manual (1992 Edition). We have based our calculation of bearing reactions and resistances on supported by literature references providing supporting data for the strength of the Georgian Bay Formation shale bedrock.

Conventional spread footing foundations placed on the underlying, weathered shale bedrock (upper 3 m to 5 m of bedrock) may be designed using an assumed factored Ultimate Limit States (ULS) resistance of 0.8 MPa. This bearing resistance assumes a dimension of 2.0 m for the spread footings. The ULS value includes a resistance factor of 0.5. The estimated settlement for the spread footing foundations is 15 mm, for the resistance stated. As the stresses required to induce settlements of 25 mm (affecting the serviceability of the structure) will exceed the ULS factored resistance, ULS will govern in the design.

The prepared surface of the rock should be "broom cleaned" and inspected immediately prior to placing the concrete to confirm that all loose, deleterious and disturbed material has been removed, that there are no clay inclusions or voids, and the surface is suitable for the planned construction. It is recommended that rock cores and star holes be drilled at several footing locations to verify the condition of the shale bedrock, below the footings.

Footing excavations should be inspected and approved by a Geotechnical Engineer at the time of construction. All loose, soft, wet, or disturbed materials should be removed prior to placement of concrete and reinforcing steel for footings.

Provided the foundations are designed and constructed in accordance with comments and recommendations provided herein, the total and differential settlement should be limited to less than 15 mm.

Given the depth to the surface of the bedrock as indicated above, there will be satisfactory earth cover provided for adequate frost protection (1.2 m in the region with reference to OPSD Drawing 3400.011) for the conventional spread footing foundations.

Where it is necessary to place footings at different levels, the upper footing must be founded below an imaginary 10:7 (Horizontal: Vertical) line drawn up from the base of the lower footing. The lower footing must be constructed first to minimize the risk of undermining the upper footing.

Where construction is undertaken during winter conditions, the footing subgrade must be protected from freezing.

TRAIL DESIGN

The following pavement structures can be considered for the walkway.

Light Duty Asphalt Pavement Structure Design

Material	Pavement Structure	Compaction Requirements
HL3 (asphaltic concrete)	75 mm	92% MTRD
OPSS Granular 'A' Base	300 mm	98 % SPMDD

Limestone Screening Walkway Structure Design

Material	Pavement Structure	Compaction Requirements
Limestone Screenings	75 mm	98% SPMDD
OPSS Granular 'A' Base	150 mm	98 % SPMDD

The base materials should be compacted to a minimum of 98% SPMDD. The asphaltic concrete should be compacted to a minimum of 92% of Maximum Theoretical Relative Density (MTRD).

The finished sub-grade surface and the pavement surface should be above the surrounding grade and graded to direct runoff water away from the pavement surface.

In this respect, a suitable gravel topped consisting of limestone screenings and asphalt pavement would include the use of a woven geosynthetic such as 270R geotextile filter fabric (as manufactured by Terrafix) or equal, placed on the proof rolled and compacted surface of the sub-grade. The surface of the sub-grade must also be sloped to provide positive drainage.

In the low lying areas and areas susceptible to direct runoff water, the base should be placed above the surrounding grade on a drainage layer comprised of crushed limestone with a minimum thickness of 200 mm and the sides of the trail should slope down to shallow depressions for drainage. Weeper subdrains connected to a positive outlet should be installed below the depressed area at a depth of 1.2 m below the trail surface.

As an alternative, boardwalk structure that uses widely spaced piers as a foundation can used. In do consideration of the boardwalk design, the force of velocity of the creek during floodwaters must be taken into account.

SUMMARY

In accordance with the procedures and guidelines in The Ontario Ministry of Natural Resources, Technical Guide "*River & Stream Systems: Erosion Hazard Limit*" Dated 2002, the recommended stable slope allowance of 1 vertical: 3 horizontal will provide a minimum factor of safety of 1.5. The toe erosion allowance of 0 to 8 m and erosion access allowance of 6 m have been applied to the recommended stable slope allowance to define the long term stable slope line as shown on the Preliminary Long Term Stable Slope Line Drawing. The proposed trail system should be located behind this line.

The preliminary recommendations provided should be confirmed by a geotechnical investigation prior to implementation of the trail design. It should be noted that a stable slope allowance steeper than 1 vertical:3 horizontal may be permitted based on the geotechnical investigation.

Reference: Geotechnical Review of Proposed Trail Location for Kipling Trail Feasibility Study between Kipling Avenue and Martin Grove Road, south of Highway 7
City of Vaughan, ON

We trust this letter meets your present requirements; however, should you require anything further, please feel free to contact this office.

Sincerely,

STANTEC CONSULTING LTD.

Original signed by

Eric Fron, C.E.T.
Geotechnical Engineering
Tel: (905) 415-6365
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Original signed by

Ron Howieson, P.Eng
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EF/RH/tlc

v:\01224\active\1609\160950548\reports\160950548 letter of opinion tnpi west slope of bronte creek 5 10 2013.doc

A - VI. TRCA BRIDGE DESIGN REQUIREMENTS - AUGUST 2008

TRCA Pedestrian Bridge Crossing
Permit Requirements
August, 2008

The TRCA Watercourse Crossing Guidelines outline the permit application requirements for major stream crossings. However, it is recognized that pedestrian bridge crossings often have shorter design lifespan than major crossings and do not have the same potential to impact flood levels. The criteria for sizing pedestrian crossings are less stringent; however the following information must be provided:

- A letter report/design brief should be provided that speaks to the fluvial geomorphological condition of the channel (including channel stability and erosion rate along with a plan view of the channel showing at least two meanders upstream and downstream of the crossing), recent flooding history of the channel and the reason for the crossing at this location, the design flows and velocities, and an erosion and sediment control plan.

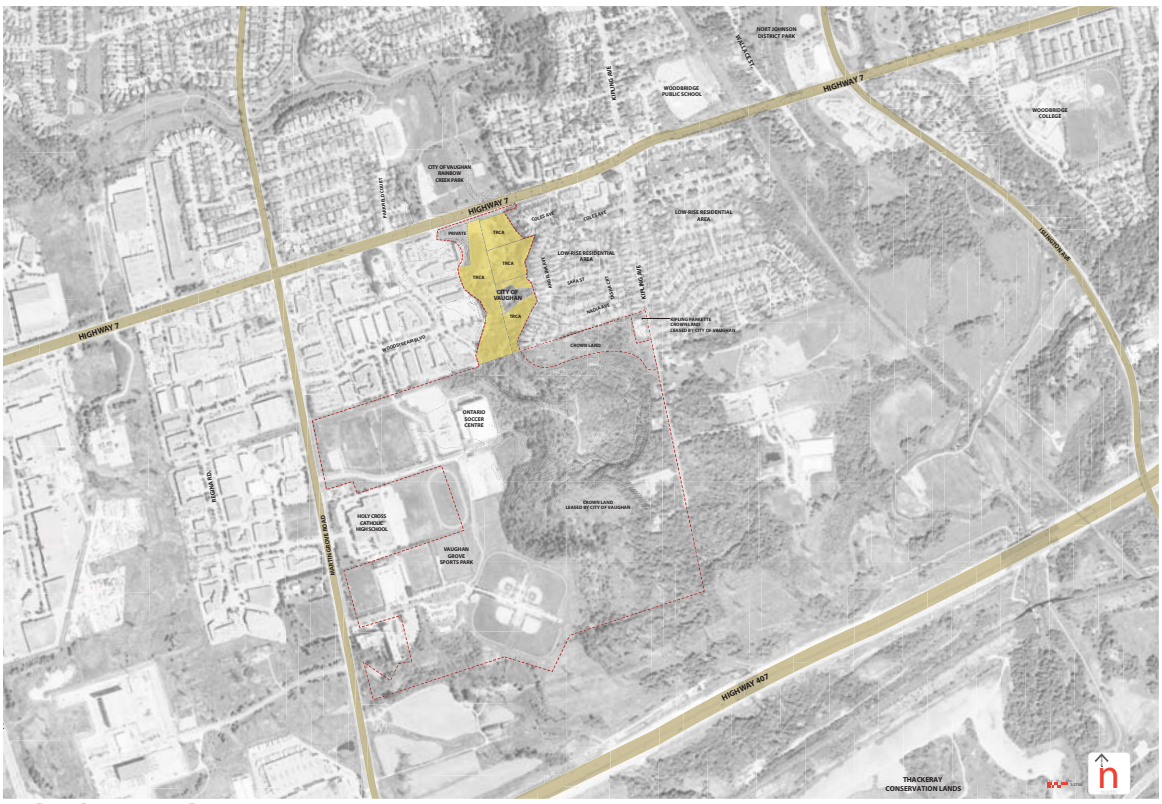
- A drawing of the proposed crossing should be provided that includes: a clear indication of the span of the exiting (if any) and the proposed structure and the top of bank. The location of the erosion and sediment control features is also necessary to show that silt fencing will be placed outside of the channel.

- TRCA typically requires 25yr and/or 50 yr erosion limit analysis for pedestrian bridge crossings. The erosion limit should be calculated based on an analysis of historical orthophotography or based on a multiple of the bankfull channel width. Please see the TRCA's Watercourse Crossing Guidelines for more information.

- The proponent should provide stone sizing based on the anticipated velocities through the channel. Typically, stone should be sized using a minimum of the 25 year design storm but this should be re-assessed on a site by site basis. Stone sizing should be included on the drawing as a detail and in the letter report there should be a clear indication of the hydraulic regime through the channel.

A - VII. PUBLIC INFORMATION CENTRE (PIC)

PIC PANELS AND COMMENTS



kipling trail
feasibility study

context **plan**

VAUGHAN | Stantec | september 2015

Conceptual image of a 3.0m Switchback

Conceptual image of a Bridge Structure

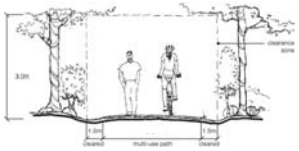
Conceptual image of a 3.0m Trail

Conceptual image of Trail

Conceptual image of an Educational Signage

Conceptual image of a P-Gate

Conceptual image of a Pedestrian Bridge



Example of a Typical Minimum Cross-Section for a Class 1 Multi-Use Recreational Pathway
SOURCE: The City of Vaughan Pedestrian and Bicycle Master Plan Class Environmental Assessment Study

* Unlit, no Winter maintenance.

Conceptual Trail Layout Plan
Potential Trail Entrance Sign
Potential Interpretive/Educational Sign
Potential Trail (PH I)
Potential Trail (PH II)
Potential Areas Requiring Compensation Planting
Study Area
Contour Lines (1m intervals)

kipling trail
feasibility study

preliminary **landscape master plan**

VAUGHAN | Stantec | september 2015

VIEW 1 - STEEP SLOPES WITHIN THE STUDY AREA

VIEW 2 - VERNAL POOL AREA

VIEW 3 - TRAIL ACCESS POINT ON EAST EDGE

VIEW 4 - STEEP SLOPES AND EROSION ISSUES

VIEW 5 - EXISTING GRANULAR PATH

VIEW 6 - ENTRY POINT NEAR SOCCER CENTRE

VIEW 7 - LOOKING NORTH ALONG ANGELINA AVE AT TERMINUS OF EXISTING SIDEWALK

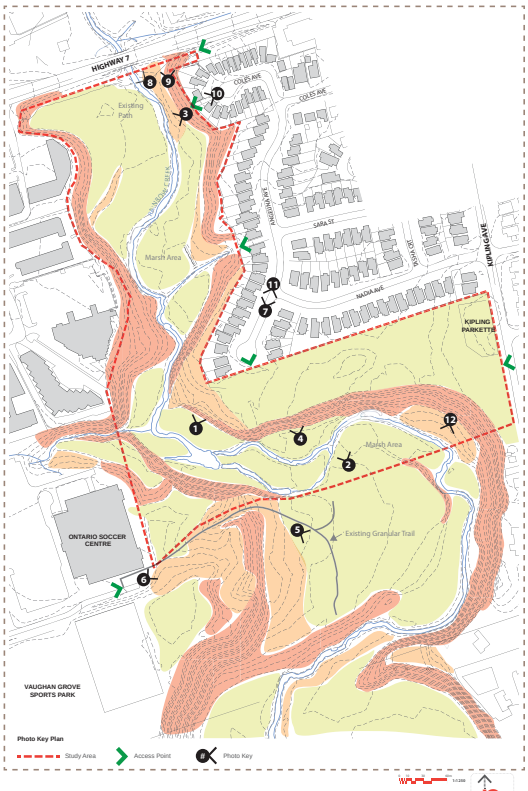
VIEW 8 - LOOKING NORTH AT THE HIGHWAY 7 UNDERPASS

VIEW 9 - LOOKING WEST ALONG HIGHWAY 7 ON NORTH EDGE OF STUDY AREA - POTENTIAL LINK

VIEW 10 - CONDITION OF EXISTING CONCRETE SIDEWALK WITHIN RESIDENTIAL NEIGHBOURHOOD

VIEW 11 - LOOKING SOUTH AT TERMINUS OF EXISTING SIDEWALK

VIEW 12 - POTENTIAL CREEK CROSSING LOCATION



kipling trail
feasibility study

existing **site conditions**

september 2015

CITY OF VAUGHAN - PARKS DEVELOPMENT

COMMENT SHEET
KIPLING TRAIL FEASIBILITY STUDY

Tuesday, September 15, 2015
The Soccer Centre - Canada Room
7:00 p.m. to 8:30 p.m. drop in

Please provide your comments by September 29, 2015 to:
Mike Kari, Landscape Architect
City of Vaughan
Parks Development
2141 Major Mackenzie Drive
Vaughan, Ontario L6A 1T1
Fax # (905) 303-2068
E-mail: mike.kari@vaughan.ca and melanie.morris@vaughan.ca

Summary Feedback:

	Yes	No
Indicate your support for a potential Phase 1 Trail	☑	☐
Indicate your support for a potential Phase 2 Trail	☑	☐
Indicate your support for future Phase Trail connection to the South	☑	☐

General comments and suggestions:

This is a great idea! I support it 100%
It will be safer for children having trails
as now they use it as is with only dirt path.
Use asphalt as much as possible for most
trails as it is easier to walk + bike on

Note: Contact information is not required except if you wish to be contacted in case of communications regarding the plans.

Stantec

CITY OF VAUGHAN - PARKS DEVELOPMENT

COMMENT SHEET
KIPLING TRAIL FEASIBILITY STUDY

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Fax # (905) 303-2068
E-mail: mike.kari@vaughan.ca and melanie.morris@vaughan.ca

Summary Feedback:

	Yes	No
Indicate your support for a potential Phase 1 Trail	☑	☐
Indicate your support for a potential Phase 2 Trail	☑	☐
Indicate your support for future Phase Trail connection to the South	☑	☐

General comments and suggestions:

Note: Contact information is not required except if you wish to be contacted in case of communications regarding the plans.

CITY OF VAUGHAN - PARKS DEVELOPMENT

COMMENT SHEET
KIPLING TRAIL FEASIBILITY STUDY

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2141 Major Mackenzie Drive
Vaughan, Ontario L6A 1T1
Fax # (905) 303-2068
E-mail: mike.kari@vaughan.ca and melanie.morris@vaughan.ca

Summary Feedback:

	Yes	No
Indicate your support for a potential Phase 1 Trail	☐	☒
Indicate your support for a potential Phase 2 Trail	☐	☒
Indicate your support for future Phase Trail connection to the South	☐	☒

General comments and suggestions:

1) I think we do not require to have a connection between the South Kipling community and the Soccer CTR.

2) DEVELOPING A BIKE PATH THAT would connect to Humber River bike path.

Note: Contact information is not required except if you wish to be contacted in case of communications regarding the plans.

CITY OF VAUGHAN - PARKS DEVELOPMENT

COMMENT SHEET
KIPLING TRAIL FEASIBILITY STUDY

Tuesday, September 15, 2015
The Soccer Centre - Canada Room
7:00 p.m. to 8:30 p.m. drop in

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E-mail: mike.kari@vaughan.ca and melanie.morris@vaughan.ca

Summary Feedback:	Yes	No
Indicate your support for a potential Phase 1 Trail	☐	☒
Indicate your support for a potential Phase 2 Trail	☐	☒
Indicate your support for future Phase Trail connection to the South	☐	☒

General comments and suggestions:

We have serious safety concerns regarding this potential Kipling Trail Development.

We believe this project will disrupt the tranquility that our neighbourhood currently enjoys and introduce a number of safety concerns for both the neighbourhood residents as well as any potential users of the trail.

We believe that these safety / disruption concerns far outweigh any potential minor benefits that this project may provide. Not to mention the cost of creating this trail system using taxpayers / public funding. We believe there is better use of our public funds - ie park expansion, soccer baseball, tennis courts.

We are strongly against this plan in its current version and unfortunately do not foresee any viable solution that would address adequately our safety and disruption concerns

Note: Contact information is not required except if you wish to be contacted in case of communications regarding the plans.

03 Oct 15 11:40a RICK VILLANI, Broker 905-856-3065 p.1

CITY OF VAUGHAN - PARKS DEVELOPMENT

COMMENT SHEET
KIPLING TRAIL FEASIBILITY STUDY

Tuesday, September 15, 2015
The Soccer Centre - Canada Room
7:00 p.m. to 8:30 p.m. drop in

Please provide your comments by September 29, 2015 to:
Mike Kari, Landscape Architect

City of Vaughan
Parks Development
2141 Major Mackenzie Drive
Vaughan, Ontario L6A 1T1
Fax # (905) 303-2068
E-mail: mike.kari@vaughan.ca and melanie.morris@vaughan.ca

Summary Feedback:	Yes	No
Indicate your support for a potential Phase 1 Trail	☐	☒
Indicate your support for a potential Phase 2 Trail	☐	☒
Indicate your support for future Phase Trail connection to the South	☐	☒

General comments and suggestions:

WE STRONGLY OPPOSE ANY TRAILS ON THE SUBJECT LANDS. THE ONLY RESIDENCES THAT ATTENDED THE FEASIBILITY STUDY PRESENTATION/ DISCUSSION WERE THOSE OPPOSED TO IT. THIS INDICATES THAT THERE IS NO SUPPORT FOR ANY TRAILS WHATSOEVER FROM THE COMMUNITIES DIRECTLY AFFECTED.

DURING THE SPRING THAW, RAINBOW CREEK CAN BECOME A VERY POWERFUL RIVER. IN THE WINTER, IT MAY LOOK FROZEN OVER, BUT HAS RUNNING WATER BELOW THE THIN ICE. WE ALL KNOW THAT "KIDS WILL BE KIDS", NO MATTER HOW MANY TIMES THEY ARE CAUTIONED TO STAY OFF OR AWAY FROM THESE DANGEROUS CONDITIONS, CURIOUSITY AND ADVENTURE WILL GET THE BEST OF SOME OF THEM. IT'S ONLY A MATTER OF TIME THAT ONE OF THEM WILL BE HURT OR WORSE.

THE WINTER TIME BRINGS SHORT DAYLIGHT HOURS. MANY OF THESE CHILDREN THAT PLAY ON SCHOOL TEAMS WILL BE COMING HOME IN THE DARK. WALKING THROUGH A DARK RAVINE CAN PRESENT MANY NEGATIVE SCENARIOS. FURTHERMORE, SINCE IT WOULD BE A NON-LIT, NON-MAINTAINED TRAIL, HIGH SNOW FALLS AND ICEY CONDITIONS WILL ADD MORE RISK.

I HAVE PERSONALLY HAULED TONS OF GARBAGE LEFT BEHIND BY KIDS AND ADULTS. IT'S UNFORTUNATE THAT SOME THINK

NAME	OF THIS BEAUTIFUL, NATURAL CONSERVATION LAND AS A
ADDRESS	DUMPING GROUND. THE TRAILS WILL ONLY GIVE THEM
	ACCESS TO GO FURTHER IN TO DUMP WHATEVER AND
PHONE #	NOT BE SEEN. WE KNOW THAT THIS HAS AND WILL
E-MAIL	HAPPEN. TO SUM UP, WE LOVE THE OUTDOORS AND

Note: Contact information is not required except if you wish to be contacted in case of communications regarding the plans.

BELIEVE THE WHOLE AREA DESERVES TO BE LEFT UNTOUCHED. THE NATURAL SETTING WAS WHAT CONVINCED US TO BUY OUR HOME HERE. VAUGHAN HAS SOMETHING VERY UNIQUE HERE AND WE WANT TO SEE IT LEFT ALONE.

Stantec

CITY OF VAUGHAN - PARKS DEVELOPMENT

COMMENT SHEET
KIPLING TRAIL FEASIBILITY STUDY

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General comments and suggestions:

I feel that this will change the uniqueness of this community. It is definitely a safety issue as it will bring in and give access to outsiders into our community. It will take away from our tranquil/quiet neighborhood.
I really see no value in adding a walkway that is going to be upkept and really does not lend itself to a safe environment. for the people in my community. I am definitely Not a supporter to this!

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To Whom It may Concern:

My husband and I are disappointed with the proposal that is to be trying to be passed by the City of Vaughan for our area.

The Phase 1 Trail is not a lite area and it scares me as I find it dangerous.

This will be creating more congestion for traffic. Not only with cars with the buildings on Kipling but also this will be potentially a bike trail whereby creating more congestion. The other concern would be the drug trafficking that may potentially occur.

In the past 7 years, there has been many incidents whereby the police officers and offenders were involved. Lately, there has been many helicopters circling my area for a long time long for someone who has broken the law. This will cause the person to get a better escape way.

I should feel safe in this neighbour but I don't find it so. I have 2 small children which I consider their well-being and I am not sure if you have considered that there is plenty of small kids in this area.

I would like for you both to consider our concerns and not to proceed with the Phase 1 & 2 Trails.

The only benefit I find from this study is that it is a large area to get a good stretch for exercise.

These are our thoughts.