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# **Environmental Impact Statement (EIS) Guideline for the Review of the Proposed Red Hill Creek Expressway North-South Section Project**

**October 15, 1999**

**Issued by  
The Red Hill Creek Expressway Review Panel**

## **1.0 Introduction**

This document contains the Environmental Impact Statement (EIS) Guidelines for the preparation of an EIS by the Regional Municipality of Hamilton-Wentworth (the Proponent). The purpose of the EIS Guidelines is to provide specific guidance to the Proponent on the content of the EIS. The EIS developed in accordance with these guidelines will serve as the basis for the Panel's review of the proposed Red Hill Creek Expressway North-South Section project (the Project) and will enable the Panel and any interested party to understand and assess the potential adverse and beneficial environmental effects of the Project. The Project, an approximately eight-kilometre long expressway, would connect the Lincoln Alexander Parkway to the Queen Elizabeth Way through the Red Hill Creek Valley.

The document contains a Main Text and five (5) Annexes as follows:

- The Main Text outlines for the Proponent and interested parties, the Panel's overall approach to the review, the principles which should guide the Proponent's environmental assessment, and the general methodology for the preparation and presentation of the EIS by the Proponent;
- Annex 1 - Definition of Terms: outlines the definitions which apply throughout these guidelines;
- Annex 2 - Scope of Project: outlines the Project components included in the Panel's Terms of Reference issued by the Minister of the Environment on July 5, 1999;
- Annex 3 - Area Map of the Project;

- Annex 4 - Approach to the Environmental Impact Statement: provides detailed information on the suggested approach the Proponent should use in developing the Environmental Impact Statement (EIS);
- Annex 5 - Scope of the Environmental Impact Statement: outlines the detailed issues the Panel will review in order to adequately consider the factors outlined in the Panel's Terms of Reference.

The draft version of these EIS Guidelines was initially prepared [ When preparing the Draft EIS Guidelines, the Agency reviewed the Red Hill Creek Expressway EA Screening Report Scoping Document, January, 1999 , prepared by Fisheries and Oceans Canada, and the Red Hill Creek Expressway North-South Section, Draft Summary Report, Volume 2, July 1998, prepared by the Proponent.] and issued by the Canadian Environmental Assessment Agency on August 11, 1999, for a 45-day public comment period. During this period, the Panel held scoping meetings in the Hamilton-Wentworth area from September 9-12 to seek oral and written comments from the public on the issues to be included in the environmental review. During this exercise, the Panel heard and considered oral comments submitted by more than 100 individual members of the public or representatives of groups. Prior to finalizing these EIS Guidelines, the Panel also reviewed and considered 176 additional written comments submitted by interested parties during the EIS Guidelines comment period which expired on September 25, 1999. Comments provided in writing were considered as fully as those received during the scoping meetings.

## **1.1 Background**

The federal environmental assessment process was initially triggered for the Project in May, 1998, when the Proponent indicated that it would need a *Fisheries Act* authorization. At that time, Fisheries and Oceans Canada began a screening of the Project under the *Canadian Environmental Assessment Act*. Following a request by the Minister of Fisheries and Oceans, the Project was then referred from a screening to a review panel in May, 1999, by the Minister of the Environment. The referral was based on the level of public concern and the federal government's determination that the Project may have significant adverse environmental effects. Under section 25 of the *Canadian Environmental Assessment Act*, both these factors constitute conditions which can warrant a referral to a review panel.

The Panel is aware that the Proponent filed a court challenge on August 4, 1999, related to this review. However, the Panel understands that

despite the court challenge, the Region will still require a *Fisheries Act* authorization in relation to the Project and a federal environmental review will ultimately be required.

In the interest of conducting an efficient and timely review, the Panel is proceeding with the review of the Project as mandated. Although the Proponent has previously indicated that it will not participate in the review given the court challenge, it is the Panel's hope that the Proponent will reconsider its position and prepare the EIS based on these guidelines.

## **2.0 Focus of Review**

The Project to be reviewed by the Panel includes the construction, operation and modification (including expansion from a 4-lane to a 6-lane expressway) of the proposed north-south section of the Red Hill Creek Expressway and ancillary works, based on a 6-lane design "footprint". The roadway components of the Project include the Valley portion from the Dartnall Road interchange to the QEW, as well as the QEW/expressway interchange and improvements to the QEW/Burlington Street interchange. Detailed information on the scope of the Project is outlined in Annex 2.

The Proponent's proposed new design changes to the Project offer substantial improvements in respect to route location and environmental protection. However, the Proponent has indicated that despite these environmental improvements, various environmental impacts resulting from the Project will nonetheless be "high". For example, in the *Red Hill Creek Expressway North-South Section, Executive Summary, June 1998*, the Proponent indicates that:

- "high-level" impacts to ecosystem functions will occur throughout the entire Red Hill Creek valley system;
- "high-level" impacts will occur in portions of the Van Wagner's Marsh wetlands;
- particulate matter and total suspended particulate is predicted to exceed provincial criteria 13% of the time;
- changes in sound levels as a result of expressway operation are predicted to be "significant" in noise sensitive areas;
- visual impacts within some sections of the Project area are predicted to be "high."

In light of the information already existing respecting the Project's impacts and in keeping with their mandate, the Panel's ultimate task will be to evaluate the significance of the adverse environmental effects resulting from the Project and to make recommendations as to whether any adverse environmental effects determined by the Panel to be significant after mitigation are justifiable in the circumstances. In order to do so, it is the Panel's belief that, as several persons indicated during the scoping meetings, a holistic approach to the review must be taken and not one that looks at issues in isolation. Accordingly, the Panel has decided that:

- **An ecosystem based approach must be adopted for the review.** In order to gain an adequate understanding of the effects the Project may have on various ecosystem components, the Panel believes that ecosystem components cannot be evaluated in isolation of one another. Rather, an ecosystem-based approach must be adopted to ensure that the review addresses both the direct impacts that the Project will have on the various ecosystem components, as well as the interactions that will occur between ecosystem components as a result of the Project being carried out.
- **Socio-economic issues, such as the Project's transportation potential to negatively or positively affect economic development within the Region, must be included in the review.** In addition, members of the community constitute part of the environment to be assessed by the Panel. As such, adverse and beneficial effects of the Project on members of the community with respect to health, recreation and other aspects of social well-being, need to be examined by the Panel to ensure a holistic understanding of the Project's effects.
- **An understanding of past and future environmental, economic and social trends in Hamilton-Wentworth and how the Project will influence these trends is required.** The inclusion of a time perspective, from the early planning of the Project (late 1970's) to its operation over the next few decades (to 2020), is important in order to provide the Panel with a full understanding of the cumulative environmental effects of the Project in combination with other past, present and reasonably foreseeable projects.

The Panel will consider the need for, alternatives to, and alternative means of carrying out the Project in assessing the justifiability of any significant residual environmental effects identified, and in formulating its recommendations to the federal government. Finally, the Panel will

generally consider the extent to which the Project meets the sustainable development objectives outlined in the Region of Hamilton-Wentworth's Official Plan, Vision 2020 and Red Hill Creek Watershed Action Plan documents.

The Panel's review will be guided by its Panel Operational Procedures which it issued on August 12, 1999. The Panel will meet its process requirements in an efficient and timely manner, and will focus on ensuring a fair and balanced consideration of all issues related to the Project.

The Panel recognizes that a substantial amount of useful and relevant information currently exists related to the Project. In addition, the Panel understands that the Proponent has recently or will soon finalize new environmental study documentation as a follow-up to the *Red Hill Creek Expressway, North-South Section, Draft Summary Report, Volume 2, July 1998*. In order to minimize duplication, the Panel encourages the Proponent to make maximum use of these documents in preparing the EIS. When relying on this information, the Proponent should comment on the relevance and accuracy of the existing information with respect to current conditions. Finally, the Proponent should also outline any limitations related to the conclusions that can be drawn from this existing information.

The Panel has had the opportunity to read many of the documents related to this Project and has also reviewed and considered all comments received from the public on the Draft EIS Guidelines. Through this scoping exercise, the Panel has gathered a substantial amount of valuable and useful information to assist it in its review. However, the Panel has identified some areas where it would need additional information in order to adequately consider the factors outlined in its Terms of Reference. These include:

- up-to-date traffic studies of current and forecasted inter- and intra-regional traffic patterns;
- how other proposed major transportation infrastructures (e.g. the "NAFTA" highway) may affect the current need for the expressway;
- the effects of atmospheric emissions related to the Project on health, particularly among the young and elderly, during periods of high traffic volume and/or adverse weather conditions for dispersal of emissions;
- effects of the environment on the Project (i.e. such as air inversions, fog, flooding, etc.);

- the Proponent's current views of how the Project relates to the Region's sustainable development strategies outlined in various documents such as the Region's Official Plan, Vision 2020 and the Red Hill Creek Watershed Action Plan;
- the detailing of all economic costs and benefits associated with the planning, construction, operation and modification (including expansion from a 4-lane to a 6-lane expressway) of the Project;
- an outline of the general economic costs, major benefits, and environmental impacts of feasible alternatives identified for the Project;
- adequacy of mitigation measures to reduce the anticipated adverse environmental effects of the Project;
- uncertainties related to the effects of the Project on migration of contaminants from local landfills; and
- evidence as to how industrial, commercial and residential growth and contraction trends for urban and suburban areas of Hamilton-Wentworth Region would be affected by the Project and their consequential impact on the environment.

In light of the limited information available to the Panel in the above areas, the Panel requests that the Proponent place particular focus on these areas in the information to be provided in the EIS. Specific information requested by the Panel related to the above issues is included in Annex 5.

## **2.1 Preparation of the EIS**

Annex 5 outlines the detailed issues that the Proponent is required to address in the EIS. It also includes detailed information on how to describe and assess these issues. For clarity and ease of reference, the Panel suggests that the EIS follow the same order as that presented in Annex 5.

While Annex 5 provides a framework for preparing a complete and accessible document, it is the responsibility of the Proponent to provide sufficient data and analysis to allow the identification of any potential adverse and beneficial environmental effects of the Project, the determination of potential significant adverse environmental effects, and the evaluation of the justifiability of any significant adverse environmental effects by the Panel, the public, technical and regulatory agencies and other interested parties.

It is possible that Annex 5 includes matters that, in the judgement of the Proponent, are not relevant or significant to the Project. Conversely, it is also possible that Annex 5 may have omitted issues deemed relevant or significant for the purposes of the review by the Proponent. If such matters are omitted from or added to the EIS, they should be clearly indicated so that the public and other interested parties have an opportunity to comment. Where the Panel disagrees with the Proponent regarding the omission or addition of information, it may choose to disregard the additional information provided or may require the Proponent to provide any missing information.

## **2.2 Review of EIS**

Following submission of the EIS by the Proponent, the Panel will make the EIS available to the public and other interested parties and will receive comments, during a 60-day review period, on the adequacy of the EIS as a response to the EIS Guidelines. The Panel will consider oral comments as fully as written comments. Within 30 days of the close of this review period, the Panel will determine if the EIS contains adequate information to hold public hearings. If the information provided in the EIS is determined not to be sufficient, the Panel will request additional information. The Panel will only proceed to public hearings when it has determined that the EIS contains adequate information to allow effective public review of the Project.

During the 30-day public hearings phase, the Panel will seek public input to assist it in reaching its conclusions and making its recommendations with regard to the Project.

## **2.3 Panel Report**

Within 90 days following the public hearings, the Panel will prepare and submit a report to the federal government. The report will include, but will not be limited to, a description of the public review process, a summary of any comments received from the public and the rationale, conclusions and recommendations of the Panel. Following receipt, the federal government will make the report available to the public and will respond, with Governor in Council approval, to the recommendations contained in the report.

### **3.0 Respect for the Principle of Sustainable Development and Consideration of Community Knowledge**

#### **3.1 Respect for the Principle of Sustainable Development**

Promotion of sustainable development (development that meets the needs of the present, without compromising the ability of future generations to meet their own needs) is a fundamental purpose of environmental assessment. The Panel's Terms of Reference outline three factors that it must consider which are directly associated with sustainable development. These factors are:

1. the extent to which biological diversity is affected by the Project;
2. the capacity of renewable and non-renewable resources that are likely to be significantly affected by the Project to meet the needs of the present and those of the future; and
3. the extent of application of the precautionary principle to the Project [The Rio Declaration of 1992, to which Canada is a signatory, states that the precautionary approach requires that: Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing cost-effective measures to prevent environmental degradation.] .

The Panel interprets progress towards sustainable development as meeting the following goals:

1. the preservation of ecosystem integrity, including the capability of natural systems, local and regional, to maintain their structure and functions and to support biological diversity;
2. respect for the right of future generations to the sustainable use of renewable and non-renewable resources; and
3. the attainment of durable social and economic benefits.

The Panel requires the Proponent to demonstrate how the Project meets the three goals directly noted above. It is the Panel's belief that the application of the precautionary principle can play an important role in meeting the goals of sustainable development. Ways in which the Proponent may demonstrate that the Project conforms to the precautionary principle and in turn meets the three goals of sustainable development noted above are included in Annex 4. In addition, the



Proponent is also encouraged to reference Vision 2020 policies and plans which may be relevant to the Project.

### **3.2 Consideration of Community Knowledge**

Community knowledge, including traditional knowledge which is rooted in the traditional life of Aboriginal people, is acquired as a result of a sustained relationship between a population and an environment. Community knowledge has an important contribution to make to a full assessment of the effects of the Project. This knowledge is based on personal observation, collective experience and oral transmission over generations. The Proponent should be aware of any specific concerns based on local community knowledge and expertise when preparing the EIS.

## **Annex 1**

### **Definition of Terms**

**"Agency"**

means the Canadian Environmental Assessment Agency;

**"Contingency Plan"**

means a program intended to address malfunctions, accidents or unplanned events that may occur in connection with the project;

**"CEAA"**

means the *Canadian Environmental Assessment Act*;

**"Community Knowledge"**

means knowledge acquired as a result of a sustained relationship between a population and an environment (including but not limited to traditional ecological knowledge).

**"Cumulative Environmental Effects"**

means cumulative environmental effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out;

**"EIS Guidelines"**

means the direction provided to the Proponent by the Panel on matters that must be addressed in the Proponent's Environmental Impact Statement;

**"Environment"**

has the same meaning as in s. 2 of the CEAA;

**"Environmental Assessment"**

means an assessment of the environment effects of the project that is conducted in accordance with the Terms of Reference and CEAA;

**"Environmental Effect"**

has the same meaning as in s. 2 of the CEAA;

**"Environmental Impact Statement"**

means the report that presents the results of the environmental assessment conducted by the Proponent;

**"Follow-up Program"**

has the same meaning as in s. 2 of the CEAA;

**"Interested Party"**

means, in respect of an environmental assessment, any person or body (e.g. members of the general public, representatives of organizations, government agencies) having an interest in the outcome of the environmental assessment for a purpose that is neither frivolous nor vexatious;

**"Mitigation"**

has the same meaning as in s. 2 of the CEAA;

**"Panel"**

means the review panel established by the Minister of the Environment pursuant to CEAA and composed of the persons appointed by the Minister of the Environment pursuant to section 33 (1) of CEAA to conduct an assessment of the Project;

**"Precautionary Principle"**

means the application of prudent foresight, the recognition of uncertainty, and, when decisions must be taken, to err on the side of caution;

**"Project"**

means the construction, operation and modification of an expressway to link two existing east-west limited access expressways in Hamilton, Ontario (Lincoln Alexander Parkway and the Queen Elizabeth Way) and ancillary works proposed by the Regional Municipality of Hamilton-Wentworth

**"Proponent"**

means The Regional Municipality of Hamilton-Wentworth;

**"Public Registry"**

means a registry established by the Agency in accordance with s. 55 of the CEAA;

**"Responsible Authority"**

has the same meaning as in s. 2 of the CEAA.

## **Annex 2**

### **Scope of Project**

The expressway would link two existing east-west limited access expressways in Hamilton, Ontario (Lincoln Alexander Parkway and the Queen Elizabeth Way). The Project includes the construction and operation of the expressway and any required ancillary works.

Below is the scope of the Project based in part on the current Red Hill Creek Valley section expressway design, outlined in the Region's May 1996 Ontario Ministry of the Environment *Exemption Order* [Regional Municipality of Hamilton-Wentworth. Red Hill Creek Expressway North-South Section Exemption Order, May 1996 ] and June 1998 *Draft Summary Report, Volume 2* [ Regional Municipality of Hamilton-Wentworth and Ontario Ministry of Transportation. 1998. Red Hill Creek Expressway, North-South Section, Draft Summary Report, Volume 2, July 1998 .] . The Proponent shall demonstrate the link (e.g. functional or economic necessity) between the expressway and other Project components. The Proponent shall also indicate if the predicted environmental effects of the individual Project components listed below relate specifically to the Project, to mitigation for the Project, or to other projects or activities included in the cumulative effects assessment.

The proponent's proposal is the Valley portion of the Red Hill Creek Expressway from the Dartnall Road interchange (at the eastern terminus of the Mountain portion of the Red Hill Creek Expressway, now referred to as the "Linc") through the Red Hill Creek Valley to the interchange connect with the QEW between the Burlington Street/QEW overpass (in the west) and the Centennial Parkway/QEW overpass (in the east).

The provincial *Environmental Assessment Act* approvals and the current impact assessment and design work being conducted by the Region of Hamilton-Wentworth are based on a 6-lane design "footprint", even though the proposal specifies a 4-lane divided highway. The 6-lane design accommodates potential future expansion. [The Expressway design criteria includes the ability to stage construction from a 4-lane rural roadway to a 6-lane freeway, as noted on pp. 15-16 of the May 1996 Ontario Ministry of Environment Exemption Order .] The review panel will also use the 6-lane design footprint as a basis for the assessment of potential environmental effects.

The expressway consists of [ Sources: Region of Hamilton-Wentworth. 1998. Red Hill Creek Expressway. Application for Authorization Under the Fisheries Act. 06/29/98; and Regional Municipality of Hamilton-

Wentworth and Ontario Ministry of Transportation. 1998. Red Hill Creek Expressway, North - South Section, Draft Summary Report, Volume 2, July 1998.]:

- a 4-lane divided highway, rural cross-section (with a 6-lane design "footprint");
- two northbound lanes and two southbound lanes (each 3.75 m wide);
- a fifth lane (southbound) in the vicinity of the Niagara Escarpment to accommodate slower moving traffic;
- a 100 km/hour design speed with a 90 km/hour posted speed;
- interchanges at:
  - Mud Street
  - Greenhill Avenue
  - King Street (overpass constructed in 1991)
  - Queenston Road (overpass constructed in 1991)
  - Barton Street
  - Queen Elizabeth Way (ramps and collector lanes) (see QEW/Expressway Interchange, below)
  - Burlington Street interchange redesign (see Improvements to the QEW/Burlington Street Interchange, below);
- a 8.5 m median with concrete barrier across the Escarpment and viaduct (Niagara Escarpment to Glencastle Drive);
- a 15.5 m landscaped median along all other sections of the expressway ;
- ramp lanes (3.5 m wide) associated with the interchanges.

Special pedestrian/cyclist access to destinations east and west of the expressway will be provided at the Niagara Escarpment, Greenhill Avenue and Barton Street interchanges and under the QEW at Woodward Avenue.

### **QEW/Expressway Interchange**

An interchange with the expressway is proposed at the QEW. The QEW is proposed to be widened from 6 to 8 lanes between the existing interchanges of Highway 20 and Burlington Street to accommodate the expected growth in traffic volumes on the QEW and high levels of weaving traffic that result from the construction of the expressway . This

will necessitate a new, wider bridge at Burlington Street to accommodate the eight lanes on the QEW. In addition, extensive ramp construction will be required to safely accommodate high volumes of traffic entering and exiting the QEW. Other roadway improvements, such as an improved median and illumination, will also be required in this section.

### **Improvements to the QEW/Burlington Street Interchange**

Improvements at the QEW/Burlington Street interchange are required to maintain continued safe operation of traffic flows on the QEW and to and from Burlington Street. The re-design of the Burlington Street interchange would provide weaving distances that conform to MTO traffic safety criteria, between the Burlington Street and the expressway interchange near Highway 20.

Option C, as illustrated in the Region's *Draft Summary Report, Volume 2, July 1998*, will be assessed relative to the scope of the Project for the Valley section.

### **Wetland Infilling Near Van Wagners Marsh and Red Hill Marsh from QEW Lane Expansion Between the Burlington Street and Centennial Parkway Overpasses of the QEW**

Portions of the Van Wagner's Marsh and Red Hill Creek Marsh will be directly impacted by the expansion of lanes on the QEW between the Burlington Street and Centennial Parkway overpasses.

### **Water Crossings of Red Hill Creek**

There are 8 proposed expressway crossings of the Red Hill Creek, in addition to the existing bridges and culverts.

### **Red Hill Creek Channel Realignment**

The Region proposes to realign a 5 km section of the Red Hill Creek and associated floodplain along the west side of the Expressway in a pattern consistent with local topography, geology and vegetation. The new creek alignment will be stabilized with natural materials instead of concrete channels ... [Regional Municipality of Hamilton-Wentworth and Ontario Ministry of Transportation. 1998. Red Hill Creek Expressway: North - South Section. Draft. Executive Summary . June 1998. p. 4.] . The extent of the realignment of Red Hill Creek may be up to 6.5 km in length.

## **Storm Water Management Facilities**

The Region has proposed the construction of dry stormwater management areas to prevent flooding of the expressway and QEW during major storm events. In addition, it is proposed that runoff from the expressway and some existing local storm sewer outfalls (draining existing built-up areas) be directed to stormwater management facilities (wetland or wet ponds) to prevent further degradation of the water quality of the Red Hill Creek and Hamilton Harbour.

Proposed storm water management facilities are illustrated on the Project Mitigation maps included in the Region of Hamilton-Wentworth's *Draft Summary Report, Volume 2, July 1998*.

## **Relocation of the Trans Northern Pipeline**

The construction of the expressway will require the relocation of an existing Trans Northern refined petroleum products pipeline within the expressway corridor, in the vicinity of the Niagara Escarpment.

## **Railway Bridge and Spur Re-alignment**

The expressway requires a railway bridge at the CNR line north of Barton Street. In addition, a spur re-alignment is required to the west of the CNR crossing.

## **Relocation of Recreational Trail System**

An existing recreational trail system within the Red Hill Creek Valley will be relocated. The Region of Hamilton-Wentworth has indicated that "a trail designed for pedestrian and cyclist use will be permanently established along the west side of Red Hill Valley from the Niagara Escarpment to Melvin/Barton Street. From that point the valley trail will connect to Woodward Avenue, and under the QEW to the waterfront trail system" [ Regional Municipality of Hamilton-Wentworth and Ontario Ministry of Transportation. 1998. Red Hill Creek Expressway: North - South Section. Draft. Executive Summary . June 1998. p. 10.] .

## **Wildlife and Pedestrian Crossing at the Niagara Escarpment**

A new connection to the Bruce Trail would be established. This proposed crossing would serve as a wildlife corridor, as well as a pedestrian link to the Bruce Trail (for recreational use).

The Region has indicated that the section of trail [Bruce Trail] impacted by the Expressway will be realigned to connect under the proposed structure located near the foot of the Niagara Escarpment [ Ibid. ] .

### **Combined Sewer Overflow (CSO)**

A Pollution Prevention Plan, which proposes combined sewer overflow systems in the Red Hill Creek Valley in order to reduce the amount of sewage that is currently directly discharged (untreated) into the Red Hill Creek and Hamilton Harbour, has been prepared by the Region of Hamilton-Wentworth. With the construction of the expressway , a CSO pipe could be built to address three of the existing combined sewer discharges. At present, CSO outfalls in the Melvin Avenue / Heath Street, Queenston Road and Lawrence Road areas discharge sewage and stormwater directly into Red Hill Creek.

The Region proposes to construct a 2.2 to 3.0 metre diameter CSO pipe from Lawrence Road to the CNR tracks north of Barton Avenue, within the expressway right-of-way. With the installation of this pipe, the frequency of CSO pollution entering Red Hill Creek would be reduced from approximately 20 to 27 times per year to approximately two times per year. The Region has indicated that the ability to build this pipe within the Expressway means that the pollution problem can be addressed much sooner than previously anticipated and at a lower cost (Executive Summary, June 1998, p. 4).

This CSO pipe project has been approved by the Ministry of the Environment, through the Class Environmental Assessment for Municipal Water and Wastewater Projects.

### **Decommissioning/Relocation of Hydrometric Station on Red Hill Creek**

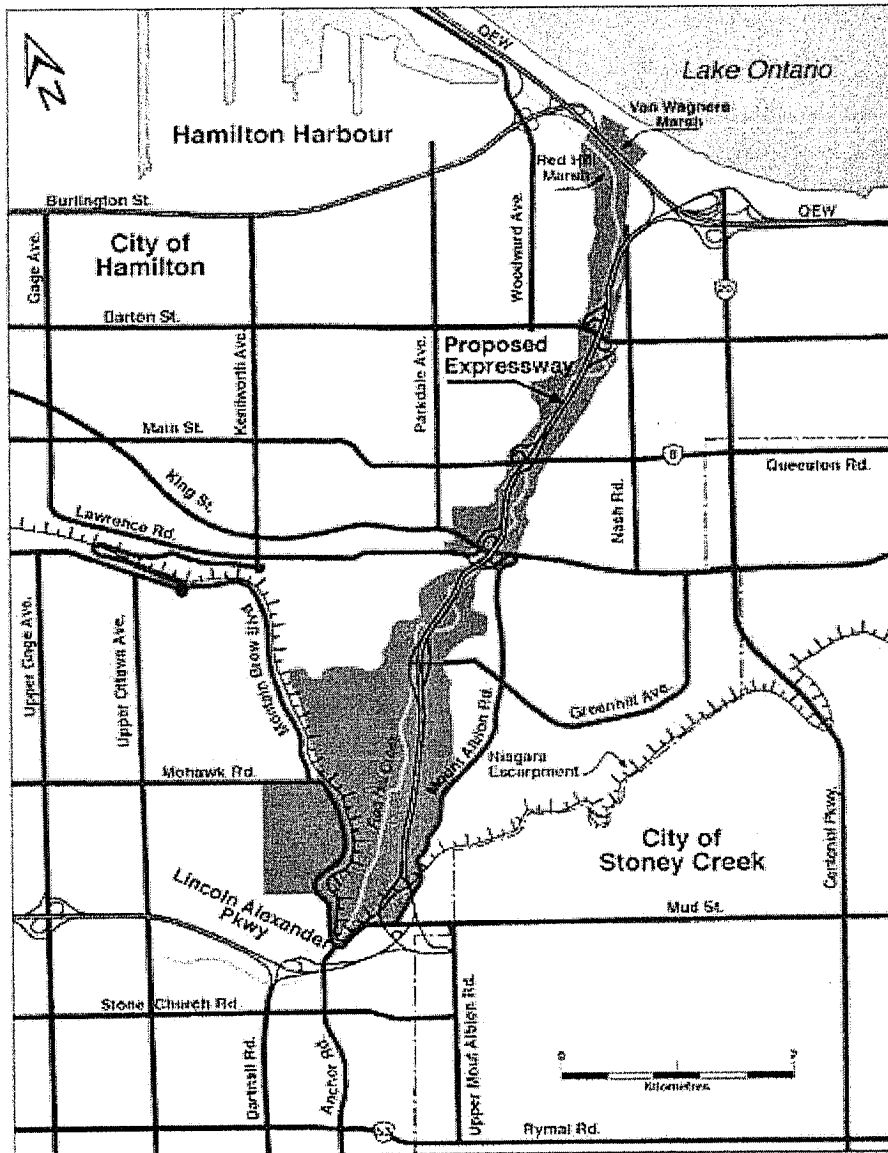
The hydrometric station (02HA014) on the Red Hill Creek immediately upstream of Queenston Road requires decommissioning/relocation. This station is cost shared under the Canada/Ontario Cost Sharing Agreement for Water Quantity Surveys, and is operated and maintained by Environment Canada (EC). EC, Ontario Ministry of Natural Resources and Ontario Ministry of the Environment are signatories to this agreement and are responsible under the terms of the cost share agreement to approve and oversee any work related to a cost shared station.

### Previously Completed Works

The concrete channels which convey Red Hill Creek past Queenston Road and King Street are previously completed works and will be examined as part of the Project, to the extent that they will be modified to complete the proposal.

### Annex 3

### Area Map of the Proposed Project





## **Annex 4**

### **Approach to the Environmental Impact Statement**

The following annex provides information on the suggested approach the Proponent should use in developing the Environmental Impact Statement (EIS).

#### **1.0 Respect for the Principle of Sustainable Development**

As indicated in section 3.0 of the Main Text, promotion of sustainable development is one of the main purposes of environmental assessment. The Panel recognizes that application of the precautionary principle can play a significant role in meeting the objectives of sustainable development. The Panel understands the application of the precautionary principle to generally require:

1. that the onus of proof should lie with the Proponent to show that a proposed action will not lead to serious or irreversible environmental damage, especially with respect to overall environmental function and integrity, considering system tolerance and resilience;
2. analysis based on scientific research and high-quality information; and
3. access to information, public participation, and open and transparent decision-making.

As part of the review, the Panel will examine the extent to which the Proponent has considered sustainable development objectives in Project planning. In this regard, the Proponent should include, at a minimum, a discussion of:

1. the extent to which the Project conforms to the precautionary principle;
2. the extent to which the Project may make a positive overall contribution towards the attainment of ecological and community sustainability, both at the local and regional levels;
3. how monitoring, management and reporting systems will attempt to ensure continuous progress towards sustainability; and
4. the Proponent's intended use of appropriate indicators (including, but not limited to, Sustainable Community Indicators adopted by the Proponent in 1996) to determine whether continuous progress towards sustainability is being maintained.

## **2.0 Detailed Approach for the Preparation and Presentation of the EIS**

### **2.1 Comprehensive Public Involvement**

Public involvement is a central objective of the overall review process and a means to ensure that the Proponent addresses public concerns. The Panel recognises that the Proponent has carried out substantial consultations in relation to this Project in the past. However, in preparing the EIS, the Proponent should evaluate the need for additional consultations with residents and organizations that are likely to be affected by the Project, and other parties who may be interested in the Project.

In addition to public consultation, meaningful public involvement in the environmental assessment review requires that the Proponent:

1. continue to provide up-to-date information describing the Project to the public and especially to the communities likely to be most affected by the Project; and
2. explain the results of the EIS in a clear direct manner to make the issues comprehensible to as wide an audience as possible (see section 2.3).

### **2.2 Study Strategy and Methodology**

The Proponent is expected to observe the intent of the EIS Guidelines and to identify adverse and beneficial environmental effects of the Project and to describe in detail any significant adverse environmental effects caused by the Project.

The Proponent should explain and justify methods used to predict potential adverse and beneficial environmental effects of the Project on valued ecosystem components (VECs), on the interactions among these components and on the relations of these components within the environment. The information presented must be substantiated. In particular, the Proponent should describe how VECs were identified and what methods were used to predict and assess the adverse and beneficial environmental effects of the Project on these components. The value of a component not only relates to its role in the ecosystem, but also to the value placed on it by humans. The culture and way of life of the people using the area affected by the Project may themselves be considered valued components. In this regard, the Panel suggests that

the Proponent seeks public input respecting the identification of the VECs to be discussed in the EIS.

In describing methodology, the Proponent should explain how it used scientific, engineering, traditional and other knowledge to reach its conclusions. Any assumptions made should be clearly identified and justified. All data, models and studies must be documented so that the analyses are transparent and reproducible. All data collection methods should be specified. The uncertainty, reliability and sensitivity of models used to reach conclusions should be indicated. The sections on the existing environment and on potential adverse and beneficial environmental effects predictions and assessment should be prepared to the highest standards in the relevant subject area. All conclusions should be substantiated.

Although the Proponent has a fair level of flexibility in selecting and substantiating methodologies and parameters to be used in reaching its conclusions, the Panel in certain instances, has offered suggestions as to the methodology or parameters to be used by the Proponent. In such instances, the Proponent may follow the suggestions of the Panel or alternatively, may use other methodologies or parameters which it considers more appropriate to reach its conclusions. In such cases, the Proponent should substantiate the reasons for employing methodologies and/or parameters other than those suggested by the Panel.

The EIS should identify all significant gaps of knowledge and understanding where they are relevant to key conclusions presented in the EIS. The steps to be taken by the Proponent to address these gaps should also be identified. Where the conclusions drawn from scientific and technical knowledge are inconsistent with the conclusions drawn from community knowledge, the EIS should contain a balanced presentation of the issues and a statement of the Proponent's conclusions.

### **2.3 Presentation of the EIS**

For clarity and ease of reference, it is suggested that the EIS be presented in the same order as Annex 5. However, in certain sections of the EIS, the Proponent may decide that the information is better presented following a different sequence. The EIS should include a guide that cross-references the EIS Guidelines with the EIS so that points raised in the EIS Guidelines are easily located in the EIS.

In the interest of brevity, the EIS should make reference to, rather than repeat, information that has already been presented in other sections of the document. A key subject index would also be useful and should reference locations in the text by volume, section and sub-section. As well, the names of the Proponent's key personnel and/or contractors/sub-contractors responsible for preparing the EIS should be listed. Supporting documentation should be provided in separate volumes, and should be referenced by volume, section and page in the text of the main EIS. The Proponent is encouraged to make the EIS text available on an Internet website.

The Proponent should present the EIS in the clearest language possible. However, where the complexity of the issues addressed requires the use of technical language, a glossary defining technical words and acronyms should be included. The Proponent should provide charts, diagrams and maps wherever useful to clarify the text, including perspective drawings that clearly convey what the developed Project site would look like.

## **2.4 EIS Summary**

It is essential to the public hearings stage of the environmental assessment that residents of those communities likely to be affected by the Project have an adequate understanding of the proposed Project and its potential adverse and beneficial environmental effects. The Proponent should therefore prepare a summary of the EIS that will provide the reader with a concise but complete overview of the EIS, including all the information listed in Annex 5. This summary should be made available in English and French. The Proponent should also make use of electronic distribution formats as much as possible.

## **2.5 Submission of EIS**

Upon finalization of the EIS, the Proponent shall submit 1 reproducible copy of the EIS Guidelines (e.g. electronic format) and 20 hard-copies of the EIS to the Panel for placement on the Public Registry, distribution to interested parties having received participant funding for the hearings phase of the review, and for copying and distribution to other interested parties as requested.

## **2.6 Physical Model**

As is done for other major infrastructure proposals, the Proponent should also prepare an updated physical model of the Project, based on the 6-lane design footprint, for use by the Panel and reference at the public hearings.

## **Annex 5**

### **Scope of the Environmental Impact Statement**

The following outlines the detailed issues the Panel will review in order to adequately consider the factors outlined in its Terms of Reference. As indicated in the Main Text, the Panel suggests that the Environmental Impact Statement (EIS) follow the same order (i.e. headings and discussion of issues) as outlined below.

The Panel encourages the Proponent to make maximum use of existing information in meeting the information requirements outlined below. When making use of existing information, the Panel encourages the Proponent to either include the information directly in the EIS or, more simply, to clearly direct (e.g. through cross-referencing) the Panel to where it may obtain the information (i.e. indicate documents or sections of documents and where they may be obtained if information is not included in the EIS).

### **0.0 Table of Contents**

The Proponent should provide an annotated table of contents for all volumes and background reports, and any other information that will help the reader find his or her way around the EIS.

### **1.0 Introduction**

This section should orient the reviewer to the EIS by briefly introducing the geographic setting, the Project, the underlying rationale for the Project, the Proponent, the federal environmental assessment review process in the context of the Terms of Reference, the role of the EIS in the overall environmental assessment process, and the content and format of the EIS.

#### **1.1 The Setting**

The Proponent should provide a concise description of the geographic setting in which the Project is proposed to take place. This description should integrate the natural and human elements of the environment in order to explain the interrelationships between the physical and biological aspects and the people and their communities.

## **1.2 The Project**

The Proponent should briefly summarize the Project, its history, purpose, location, scale, components, activities, scheduling and costs. The Proponent should include the components outlined in Annex 2.

## **1.3 The Proponent**

This section should introduce reviewers to the Proponent with summary information on the nature of organizational accountability for:

1. the design, construction, operation and modification (including expansion from a 4-lane to a 6-lane expressway) of the Project;
2. the implementation of environmental mitigation measures and environmental monitoring; and
3. the carrying out of past commitments and undertakings related to the environment, in particular, those related to the construction and operation of the Lincoln Alexander Expressway.

## **1.4 The Planning Context**

The Proponent should identify the planning context for the environmental assessment of the Project. The need for the environmental assessment under the *Canadian Environmental Assessment Act* should be identified. Policy and planning considerations, such as government policies, regulations, and land use plans, that have a bearing on the Project should be discussed. These should include, but are not limited to:

1. Red Hill Creek Watershed Action Plan
2. Hamilton Harbour Remedial Action Plan (HHRAP)
3. Great Lakes Water Quality Agreement (1978; 1987 Protocol)
4. Canada-Ontario Agreement (COA) Respecting the Great Lakes Basin Ecosystem, 1994
5. Vision 2020
6. Hamilton-Wentworth Official Plan
7. Hamilton Air Quality Initiative
8. Niagara Escarpment Plan
9. Ontario Wetlands Policy Statement (1992)

10. The World Biosphere Reserve designation for the Niagara Escarpment

## **2.0 Public Involvement**

The Proponent should indicate how it has ensured meaningful public involvement relating to the Project in the recent past and/or as part of this review. In particular, the Proponent should discuss how it has consulted with residents and organizations that are likely to be affected by the Project, and other parties who may be interested in the Project. The Proponent should describe the objectives of these consultations, the methodology used, the results, and the ways in which the Proponent intends to address the concerns identified. The Panel is particularly interested in the Proponent's response to public comments that were provided as part of the 1996 Exemption Order.

## **3.0 Boundaries for the Environmental Assessment**

By defining the spatial and temporal boundaries, the Proponent will establish a frame of reference for identifying and assessing the environmental effects associated with the Project. Different boundaries may be appropriate for each valued ecosystem component being considered.

### **3.1 Spatial Boundaries and Scale**

In determining the spatial boundaries to be used in assessing the potential adverse and beneficial environmental effects, the Proponent should consider, but be not limited to, the following criteria:

1. the physical extent of the proposed Project;
2. the extent of aquatic and terrestrial ecosystems potentially affected by the proposed Project;
3. the extent of potential effects arising from noise and atmospheric emissions, and
4. land use for commercial, cultural, recreational and aesthetic purposes by communities whose areas encompass a), including but not limited to East Hamilton.
5. the size, nature and location of past, present and reasonably foreseeable projects and activities which could interact with items b) and c).

These boundaries must also indicate the range of appropriate scales at which particular baseline descriptions and the assessment of environmental effects should be presented. The Proponent is not required to provide a comprehensive baseline description of the environment at each of the above scales, but should provide sufficient detail to address the relevant environmental effects of the Project and the alternatives included in the Proponent's review. The EIS should contain a justification and rationale for all boundaries and scales chosen.

### **3.2 Temporal Boundaries**

In describing and predicting the environmental effects of the Project, the Proponent shall cover the period from the start of any pre-construction activity associated with the Project through construction, operation, including maintenance and repairs, and any modifications (including expansion from a 4-lane to a 6-lane expressway) of the Project up to the year 2020.

In characterizing the environmental effects of the Project, the Proponent shall consider the current baseline environment and environmental trends within the study area. The description of the existing baseline and environmental trends shall include a consideration of past projects and activities carried out by the Proponent and/or others (from circa. 1975) within the study area.

In assessing cumulative environmental effects within the study area, the Proponent shall consider the effects of the Project in combination with other past, present and reasonably foreseeable projects (from circa. 1975 to 2020).

As is the case for the determination of spatial boundaries, the temporal boundaries must indicate the range of appropriate scales at which particular baseline descriptions and the assessment of environmental effects will be presented.

### **4.0 Detailed Project Description**

The Proponent should provide a detailed description of the Project. The detailed description should include a discussion of the following factors:

1. an explanation of the need and purpose for the expressway as it relates to the current traffic problems within the Hamilton-Wentworth area;



2. location of the Project and the timing for the Project and related works;
3. relevant information on the Project's history and current status;
4. major components of the Project described in Annex 2 and their location, including using maps and models indicating: boundaries of the Project in relation to other rights of way (e.g. rail lines, liquid petroleum pipelines, road interchanges), existing infrastructure, land uses, waste disposal areas, temporary and permanent existing and proposed transportation systems and routes, important environmental features (Red Hill Creek, Niagara Escarpment and wetlands) and local neighborhoods;
5. design features of the Project including, but not restricted to, traffic operating speed, traffic volume, safety features, efficiency, network aspects (provision of roadway continuity and links to existing road infrastructure). Assumptions underlying these design features should be explicitly stated;
6. a description of those aspects of the Project, including accidents and malfunctions (e.g. analysis of traffic safety and the potential for hazardous/toxic spills), that could reasonably be expected to affect the environment;
7. an explanation of how the environment has influenced the design of the Project. This should include, but is not limited to, geographical (the grade of the slopes within the valley), geological (the stability of surficial deposits) and meteorological (frequency and severity of fog, air inversions, precipitation and flooding) considerations;
8. analysis of forecasted traffic pattern shifts following construction of the Project. It is suggested that a representative sample of regional motorists, truckers and other vehicle users be questioned directly on their anticipated transportation route choices following construction of the Project;
9. a discussion of how design, engineering and management plans are consistent with the maintenance of ecosystem function and integrity;
10. any relationship to a series of separate projects or to a larger project should be stated, as it could have implications for the consideration of alternatives, cumulative environmental effects and mitigation options, in particular the Proponent should provide the initial projections and current statistics on the actual usage of the Lincoln Alexander Expressway on traffic volumes, safety, efficiency and speeds design and actual performance;

11. identification and application of criteria used to determine the technical and economic feasibility of the alternatives to the Project (e.g. transportation, natural, social, economic and cultural environment);
12. the detailing of all environmental, social and economic costs and benefits associated with the planning, construction, operation and modification (including expansion from a 4-lane to a 6-lane expressway) of the Project;
13. an analysis of alternatives to the expressway including, but not limited to: alternative routes, the "do nothing" scenario, management of transportation demand using available infrastructure, improving existing roadways, or alternative modes of transportation (including urban transit) and non-highway based facilities to a level of detail which is sufficient to allow the Panel and the public to compare the Project with the alternatives in terms of the economic costs and the environmental, social and economic benefits;
14. an analysis of alternative means of carrying out the expressway including, but not limited to, alternative routings, configurations, and terminal points;
15. identification of the potential adverse and beneficial environmental effects of each feasible alternative means to a level of detail which is sufficient to allow the Panel and the public to compare the Project with the alternatives in terms of the environmental, social and economic costs and benefits;
16. reasons for selection of the Project as the preferred alternative, including the reasons for rejection of other alternatives;
17. the extent to which the Project conforms to publicly adopted regional, provincial and federal policies and plans (as identified in section 1.4);
18. a demonstration of how the Proponent has applied the precautionary principle in its Project design and management; and
19. a risk assessment of those conditions (such as lower population or economic-growth) that might impair the fulfillment of the Proponent's plans and commitments regarding the avoidance or mitigation of adverse effects.

#### **4.1 Regulatory Environment**

The Proponent should identify all federal and provincial environmental and other related laws, regulations and associated standards that require

compliance in respect to the Project and explain how such requirements will be met. Each regulatory approval required should be listed with the following details:

1. activity requiring approval and when it is required (with specific reference to the 1996 Exemption Order);
2. regulatory agency;
3. name of approval or permit; and
4. associated legislation.

## **4.2 Project Components and Activities**

The description should address all phases of the Project in sufficient detail to allow the Proponent to predict potential adverse and beneficial environmental effects and address public concerns about the Project. The Proponent should describe Project phases such as pre-construction, construction, operation, and modification (including expansion from a 4-lane to a 6-lane expressway).

### **4.2.1 Construction Phase**

This section should include information regarding all construction activities, schedules, methods to transport materials, infrastructure and personnel requirements.

#### **4.2.1.1 Activities**

Activities described should include but not be limited to:

1. all site preparation;
2. all site clearing including vegetation, alteration of landforms, soil and rock removal, infilling of creek channels, alterations to wetlands and their functions, and associated disposal or storage methods;
3. all water diversions and creek channel realignments;
4. all construction-related earth works including borrow pits, quarries, highway earth works, trenching, stream crossings, and removal, transport and disposal of contaminated materials from existing landfill sites or other areas along the proposed corridor;
5. handling and storage of explosives;
6. timing and location of blasting activities;

7. the use, transportation, handling and storage of all hazardous materials, and other bulk materials required to complete the project;
8. plans for protecting natural features, wildlife and aquatic resources during construction;
9. site rehabilitation including, but not limited to, removal of temporary services and the re-vegetation of affected areas;
10. construction management procedures to ensure regulatory compliance with specific attention to protecting existing natural features;
11. plans for handling problems created for roadway users during construction;
12. description of location and other details of access roads and increased use of existing roads and other transportation facilities; and,
13. any effluent and emissions in terms of quantity and characteristic caused or attributable to construction activities.

#### **4.2.1.2 Components of the Project**

Activities outlined in section 4.2.1.1 should be described in relation to the construction of each of the major components of the Project as indicated in Annex 2.

#### **4.2.2 Operation and Maintenance Phase**

This section should include, but not be restricted to, information regarding all activities, schedules, duration, infrastructure and personnel requirements during the operation and maintenance phase:

1. types of maintenance required under normal conditions and maintenance/emergency repairs anticipated under extreme weather conditions;
2. monitoring and contingency plans to identify and correct problems along the route;
3. description and characterization of all effluents and emissions expected to be released from the Project and the traffic using it;
4. all water diversion, withdrawal and drainage operations and structures;
5. estimates of traffic type, frequency and volume; and,

6. other projects or activities relevant to the assessment of the Project's effects.

#### **4.2.3 Modification Phase**

This section should describe the Proponent's approach to, and conceptual plans for potential modifications including expansion activities from a 4-lane to a 6-lane expressway. The Proponent should also specify the life expectancy of the Project as currently proposed, and the conditions which would necessitate modifications to the Project. Expansion or other modification activities should be generally described and should include, to the extent possible, an overview of planned activities such as those outlined in section 4.2.1.1.

#### **4.3 Environmental Protection Plan**

The Proponent should describe its Environmental Protection Plan and its environmental management system through which it will deliver this plan. The plan should provide an overall perspective on how potentially adverse environmental effects will be managed over time and should include:

1. a plan to control, minimize, and mitigate any contaminants, such as heavy metals, salt, suspended solids, oxygen demanding materials or organic contaminants that may be released or generated by the Project;
2. a fish habitat impact, mitigation, compensation and monitoring management plan which addresses the requirements of Fisheries and Oceans Canada;
3. a plan to control the effects of air emissions from the Project, such as sulphur and nitrogen oxides, dioxins and particulates;
4. plans to manage human/wildlife interactions at the site and adjacent areas and address hazards to wildlife presented by the Project;
5. emergency response and contingency plans, including plans for addressing spills and other accidents and malfunctions both on land and in water; and,
6. plans for ongoing site rehabilitation during all phases of the Project, particularly relating to stream rehabilitation and maintenance.

## **5.0 Existing Environment**

The purpose of this section is to describe the existing environment prior to Project development and what is valued by the members of the public who live in the Regional Municipality of Hamilton-Wentworth, at a level and scale of detail that enable readers to understand the material presented.

This section of the EIS should provide a baseline description of the environment (as defined in the Terms of Reference, including the components of the existing environment and environmental processes, their interrelations and interactions, and the variability in these components, processes, and interactions over time scales appropriate to this EIS (see section 3.2). The Proponent's description of the existing environment should be in sufficient detail to permit the identification, assessment and determination of the significance of potentially adverse environmental effects that may be caused by the Project and to adequately identify and characterize the beneficial effects of the Project.

This description should include, but not necessarily be limited to those valued ecosystem components (VECs), processes, and interactions that either were identified to be of public concern during scoping sessions or that the Proponent considers likely to be affected by the proposed Project. The location of these VECs should be indicated on maps or charts. In doing so, the Proponent should indicate to whom these concerns are important and the reasons why, including social, economic, recreational, and aesthetic considerations. The Proponent should also indicate the specific geographical areas or ecosystems that are of particular concern, and their relation to the broader regional environment and economy, e.g., the contribution of the Red Hill Creek and Valley area to critical habitat and migration routes, bird and fish population stocks, the presence of particular species in the Region.

In describing the physical and biological environment, the Proponent should take an ecosystem approach that takes into account both scientific and community knowledge and perspectives regarding ecosystem health and integrity. The Proponent should identify and justify the indicators and measures of ecosystem and social health and integrity it uses, and these should be related to Project monitoring and follow-up measures.

In describing the socio-economic environment, the Proponent should provide information on the functioning and health of the socio-economic

environment, encompassing the impacts that affect the people and communities in the study area.

For the biological environment, baseline data in the form of inventories alone is not sufficient for the Panel to assess impacts. The Proponent should consider the resilience of species, communities, and habitat. The Proponent is not required to generate new stock assessments for species other than fish in affected aquatic environments, but it should include all available historical data on population stocks and status. Emphasis should be on those species, communities and processes identified as valued ecosystem components during the scoping sessions. However, the interrelations of these phenomena and their relation to the entire ecosystem and communities of which they are a part must be indicated. The Proponent should address such issues as habitat, nutrient and chemical cycles, food chains, productivity, as these may be appropriate to understanding the impact of the Project on ecosystem health and integrity. Range and probability of natural variation over time should also be discussed

In providing baseline information on the environment, the Proponent should present a sufficient time-depth of data and information to establish norms, trends, and extremes, to the extent that such information is available. The Proponent should comment on the quality and reliability of these data and their applicability for the purpose used, and clearly identify gaps, insufficiencies, and uncertainties, especially those that should be remedied for monitoring purposes.

The baseline, while necessarily relying on recent and current data, should not be a static or equilibrium description of the environment. Therefore, to assist in identifying and accounting for trends in and alterations of the environment that are not directly related to the Project, the Proponent should:

1. generally identify:
  1. the activities of the Proponent and others, natural or anthropogenic, that have already affected the environment since circa. 1975;
  2. how these have affected the environment; and
  3. whether these effects are ongoing;
2. indicate how activities since the construction of portions of the Red Hill Creek Expressway and associated road/rail bridges may have altered the environment described; and,

3. provide a description of the likely condition of the environment within the expected lifespan of the Project and if the Project were not implemented. Considerations should include, but not be limited to, possible local and regional impacts on air quality and climate, variation in wildlife abundance and distribution, existing condition of riparian vegetation along the Red Hill Creek, contaminant distribution, and demographic and socio-economic trends, including indicators of economic and social well-being.

A key objective of the above is to maximize the possibility of distinguishing between the Project's potential adverse and beneficial environmental effects on the environment, and the effects of other factors, particularly those identified in (a) and (c) above, and the analysis should be relevant to this objective. It is not intended that the Proponent undertake new research for this purpose. However, in making use of existing information, its analysis must be supported by sound evidence and account for all relevant information including local perspectives, appropriate scientific literature and community knowledge. Boundaries and scale should be appropriate to those elements of the environment discussed, (e.g., biological, physical, socio-economic, cultural).

### **5.1 Physical Environment: Baseline Description**

The Proponent should describe the components, processes, and interrelations of the existing physical environment.

1. bedrock geology and hydrogeology;
2. surface geology and soils;
3. sensitive slopes, and stream-banks;
4. areas of ground instability and flood zones;
5. local microclimate and regional climate and meteorology;
6. landforms, special, sensitive, or unique geological or landform features (e.g. Niagara Escarpment, wetlands and stream and riparian zones);
7. location and condition of existing contaminated sites, including all known landfills and points of sewage contamination within the study area;
8. important physical and chemical parameters of ground and surface waters, at the sub-watershed and watershed level;



9. as required information on Windermere Basin as it functions as receiving water for the Red Hill Creek such as, but not limited to, temperature, flow rate, water table height, physical and chemical stratification, stream and water levels, normal seasonal variations, quality, supply and present use of surface and groundwater, drainage and discharge patterns, sediment loading capacity, and historical channel movement of surface waters. A discussion of how these features impact contaminant migration from the Red Hill Creek to Windermere Basin and the water quality in Windermere Basin near the Creek's discharge point should be included.
10. pertinent physical and chemical properties of sediment in the Red Hill Creek and Windermere Basin, including sediment profiles;
11. local and regional ambient air quality, including air inversion conditions, and noise levels. This should include levels in locations directly adjacent to the Project. The levels should also be characterized to include both daily averages and high and low peaks. The levels should also reflect hourly, daily and seasonal fluctuations;
12. current levels of and trends in any environmental contaminants such as, but not limited to, heavy metals, particulate matter (including a range of particle sizes), organochlorines, sulphur and nitrogen oxides, carbon monoxide and dioxide, hydrocarbons or other chemicals, in air, water, soil or sediments.

## **5.2 Biological Environment: Baseline Description**

Without limiting the range of considerations, the Proponent should consider the following components, the interactions between these components, and their interactions with the physical and biological environment:

1. local and regional species occurrence and distribution, range, abundance, and population status, including seasonal variation and variability over multiple years;
2. habitat and life cycle requirements;
3. migratory patterns and routes and the corresponding sensitive periods where these routes cross habitat affected by the Project with particular reference to the Red Hill Creek valley as in its role as a migratory route between the Niagara Escarpment and Lake Ontario;
4. status and productivity of habitat;

5. current condition and health of the species;
6. existence of any rare species or populations or those with federal, provincial, regional or local designated status (i.e., vulnerable, threatened, endangered or extirpated), and their habitats; and,
7. other issues identified through public consultations.

The Proponent should consider the status of lower trophic levels as these relate to ecosystem health and productivity, to biodiversity and to valued species. The Proponent should indicate how its biodiversity studies were carried out.

The Proponent should also consider plant and vegetation communities of ecological, economic or other human importance, including wetlands such as marshes (e.g. Van Wagner's Marsh), and shallow waters, and their productivity, health and ecological functions.

### **5.3 Socio-economic Environment: Baseline Description**

Without limiting the range of considerations, the Proponent should consider the following components, the interactions between these components, and their interactions with the socio-economic environment:

1. the social, economic and cultural setting of the Project area;
2. population and community distribution. This should include contraction and growth patterns and information on demographics including population, age and employment statistics. Emphasis should also be placed on those communities in close proximity to the Red Hill Creek corridor;
3. current attitudes of the local and regional population, highway users and recreational facility users and others towards the Project;
4. current status and role of public transportation;
5. transportation growth and traffic trends since circa. 1975, including a discussion of how induced traffic has affected these trends. Whenever possible, past traffic studies, including information pertaining to past traffic forecasts and accuracy of those predictions, should be used as a basis for discussion;
6. up to date transportation studies on current inter- and intra-regional traffic patterns. Studies should include information on traffic flows, average speeds, timing of traffic, origins and destinations, accident rates, induced traffic and vehicle mix;

7. analysis of current major transportation problems within the Region of Hamilton-Wentworth (e.g. with respect to traffic congestion, safety issues, etc.);
8. up-to-date medium (to 2010) and long-term (to 2020) local and regional transportation demand forecasts (including probabilities and margins of error);
9. relationship of the arterial roadways to the current uses of the Red Hill Creek valley area and the Niagara Escarpment;
10. any Official Plans within the Project area pertaining to land or water use;
11. present and potential conflicts or restriction in terms of existing land use patterns(e.g. contaminated sites, protected areas);
12. where appropriate, current land ownership and property values in the Red Hill Creek valley and surrounding areas should be addressed;
13. historical, archaeological, cultural and paleontological sites of the area including aboriginal treaties in force or under negotiation;
14. protected areas such as parks, sanctuaries or wetlands, whether established or proposed;
15. level and value of recreational, educational, scenic and other social uses of the Project area, (e.g. use of parks, golf courses, football fields, trails, pedestrian paths, and open spaces), especially by the young;
16. an analysis of trends and the current status of greenspace, parks, and other recreational areas in East Hamilton and the Region;
17. health of the residents of the area most directly impacted by the Project, particularly the young and the elderly;
18. a review of the various costings of the Project and the involvement of community, municipal, provincial and federal government organizations and institutions, including their powers, responsibility, and financing for the Project; and
19. past and present industrial, commercial and residential growth and contraction trends for urban and suburban areas of Hamilton-Wentworth Region.

## **6.0 Impact Assessment, Mitigation Measures, Residual Effects, and Cumulative**

### **Environmental Effects**

The purpose of this section is to indicate what will happen as a result of the Project, in what ways the environment may be changed, where, and for how long, and whether residents and the environment will be better or worse off because of the construction, operation and modification of the Project.

This section should:

1. identify what physical, biological and socio-economic changes may be expected to occur as a result of the Project including accidents, malfunctions and unplanned events. The effects of worst case scenarios should be addressed as appropriate;
2. assess these effects and their significance;
3. describe and justify the Proponent's plans to mitigate the adverse effects of the Project and enhance its beneficial effects and assess the likely effectiveness of those plans;
4. identify any residual effects (including the permanent loss of habitat) of the Project, and the Proponent's plans to compensate for these; and,
5. assess potential adverse and beneficial cumulative environmental effects of the Project.

#### **6.0.1 Environmental Effects**

In predicting and evaluating the potential adverse and beneficial environmental effects of the Project, the Proponent should provide substantial detail and state clearly what elements and functions of the environment may be lost or enhanced, where, how much, for how long, and with what overall effect. In predicting and evaluating the potential adverse and beneficial environmental effects of Project alternatives, the Proponent should provide sufficient detail to allow the Panel and the public to compare adequately the potential adverse and beneficial environmental effects of the alternatives in relation to the Project.

The Proponent should indicate the degree of uncertainty in predicting the potential adverse and beneficial environmental effects identified. The EIS should provide a comprehensive analysis of the short and long-term effects of the Project on the environment and on interactions, and

indicate the sensitivity of the function, integrity, and health of the environment to these predicted effects. With respect to the biological environment, while consideration of species-specific effect is essential, due consideration should also be given to impacts on biological processes and ecosystem health and integrity.

The prediction of potential adverse and beneficial environmental effects should be based on clearly stated hypotheses of causal relations. The Proponent should specify the indicators used and how these indicators would measure and verify these effects in subsequent monitoring, especially to distinguish the effects of the Project from those of other activities or processes.

### **6.0.2 Significance**

The EIS should contain a detailed analysis of the significance of the potential adverse environmental effects it predicts. It should contain sufficient information to enable the Panel and other reviewers to understand and review the Proponent's judgment of the significance of effects. The Proponent should define the terms used to describe the level of significance. The Proponent should assess the significance of predicted effects according to the following categories:

1. magnitude;
2. geographic extent;
3. timing, duration and frequency;
4. degree to which effects are reversible or mitigable;
5. ecological and social/cultural context;
6. probability of occurrence;
7. the capacity of renewable and non-renewable resources (including but not limited to recreational areas) to meet the needs of the present and those of the future; and,
8. standards, guidelines or objectives.

The analysis should also clarify the effects of the Project on matters of public concern as identified in the Proponent's consultation process and as raised in the public scoping sessions.

### **6.0.3 Geographic Scale**

The EIS should pay particular attention to the geographical scale of anticipated impacts, by characterizing them as appropriate in or at the:

1. local regional and provincial levels;
2. traditional use areas;
3. ecosystem level (e.g., watershed, streams, wetlands, Niagara Escarpment, with particular emphasis on critical habitat); and,
4. local land use areas, and indicating the relation of each to (a) and (b) above, (e.g., proportion of habitat or population in specified area in relation to these larger areas, with particular attention to what is critical to ecosystem health).

#### **6.0.4 Mitigation**

The Proponent should describe general and specific measures intended to mitigate the potentially adverse environmental effects of the Project. Mitigation is defined as the elimination, reduction or control of the adverse environmental effects of the project, and includes restitution for any damage to the environment caused by such effects through replacement, restoration,

compensation or any other means. The Panel expects that these different components of mitigation (including restitution - refer to section 6.4) may be described in different parts of the EIS. Mitigation measures introduced here for the first time should be discussed in greater detail. Mitigation (including restitution) described elsewhere in the EIS should be listed and referenced. The Proponent should indicate which measures respond to statutory or regulatory requirements, and which go beyond these.

All proposed components of mitigation should be described by phase, timing and duration. Information must be provided on methods, equipment, procedures, and policies associated with the proposed mitigation or restitution. The Proponent should discuss and evaluate the effectiveness of the proposed measures and assess the risk of mitigation failure and the potential severity of the consequences. Information should be provided on similar mitigation methods used with similar projects and the degree of success achieved.

The Proponent should indicate what other mitigation measures were considered (including the various components of mitigation) and explain why they were rejected. Trade-offs between cost savings and effectiveness of the various forms of mitigation should be justified. The Proponent should identify who is responsible for the implementation of these measures and the system of accountability.

The EIS should to the extent possible avoid repetition by identifying the potential adverse environmental effects and the proposed mitigation measures in the same discussion, and do this by specific effect, first with respect to adverse environmental effects of the Project on the physical and biological environment and, secondly with respect to the socio-economic, including cultural, environment.

## **6.1 Physical and Biological Impacts and Mitigation**

The impacts of the Project on the existing physical and biological environment, as characterized by sections 5.1 and 5.2 should be identified and assessed, and the proposed mitigation measures described. Particular attention should be paid to effects related to the following:

1. contaminant or pollution releases during all phases of the Project;
2. water quality and quantity, including groundwater, runoff, and surface water in the Red Hill Creek watershed and Windermere Basin;
3. hydrological cycle including flooding potential and frequency of occurrence;
4. fish and fish habitat, especially in the affected watershed and Windermere Basin;
5. terrestrial or aquatic habitat loss, impairment of ecosystem function, or changes in productivity;
6. loss of biodiversity;
7. resident and migratory wildlife and birds and their habitat;
8. local and regional air quality, microclimates and climate within the study area as affected by the Project during peak traffic and other periods;
9. drainage patterns, erosion, and stream flows;
10. geology, slope stability and flood zones;
11. functional changes in wetlands;
12. Niagara Escarpment;
13. vegetation with particular reference to the temporary and long-term effects of replacement vegetation as it relates to climatic (e.g. air temperature and quality) and aquatic functions (e.g. stream temperature and productivity);

14. regionally, provincially and nationally rare/endangered species within the study area;
15. wildlife and corridors with particular reference to the Red Hill Creek valley as it functions as a migration corridor between the Niagara Escarpment and Lake Ontario;
16. noise levels;
17. sediment quality and re-suspension and release of contaminated sediments; and,
18. contaminated sites, former and active landfills, and existing sewage outflows.

To the extent that is possible, the discussion of these effects and their proposed mitigation should give full consideration to community knowledge of the environment and of appropriate and effective mitigation measures.

## **6.2 Socio-economic Impacts and Mitigation**

The Proponent should describe and assess the beneficial and adverse effects of the Project on the socio-economic and cultural environment. In considering the local social and economic effects of the Project, the Proponent should pay special attention to the attitudes and perceptions of local residents.

The Proponent should identify and describe the feasible measures that would mitigate adverse effects. Particular attention should be paid to the effects related to the following:

1. location and construction of the Project both in the immediate area and the region including, but not limited to, urban sprawl;
2. economic activity and opportunities including, but not limited to, employment levels, property taxes, and property values;
3. changes in quality of life caused by the construction, operation and modification of the Project including, but not limited to, human health and well-being;
4. population size, composition and distribution both locally and regionally and the implication of changes;
5. present and future land and water use, including, changes in aesthetics and/or economic, education and recreational opportunities caused by the construction, operation and modification of the Project in terms of increased noise levels, lowered air and



water quality, alteration of visual and topographic characteristics of the area;

6. archeological, historical, cultural, and scenic sites;
7. the portions of the Bruce Trail and other pedestrian paths within the Red Hill Creek Valley;
8. temporary and permanent restrictions on land use during construction, operation and modification;
9. local and regional transportation pattern shifts including, but not limited to shifts in traffic flows, average speeds, timing of traffic, sources and destinations, accident rates, induced traffic and vehicle mix; and
10. current use of lands and resources for traditional purposes by Aboriginal people.

### **6.3 Residual Effects**

The Proponent should describe and assess residual environmental effects using the categories for significance set out in section 6.0.2. Residual effects include those beneficial or adverse effects that may remain at each stage of the Project after proposed mitigation or enhancement measures are implemented, including emergency response and contingency plans.

### **6.4 Restitution**

As part of the proposed measures to mitigate potentially adverse environmental effects, the Proponent should outline its restitution (e.g. compensation) plans and policies for addressing adverse residual environmental effects, including compensation for:

1. loss of fish habitat in accordance with Fisheries and Oceans Canada's policy for the Management of Fish Habitat; and
2. damage caused by the Proponent's activities to the environment, to property, or to the land and resource use of others.

The Proponent should also include a discussion of past restitution measures taken for other infrastructure projects, and the successes of such measures.

## **6.5 Sustainable Use of Renewable and Non-Renewable Resources Effects**

The Proponent should include a consideration of the potential adverse environmental effects on the capacity of renewable and non-renewable resources that are likely to be significantly affected by the Project to meet the needs of the present and those of the future. The Proponent should clearly identify the renewable and non-renewable resources that may be affected by the Project and the criteria used in determining whether their sustainable use will be affected. Sustainable use may be based on ecological consideration such as, integrity, productivity, and carrying capacity.

## **6.6 Possible Malfunctions or Accidents**

The Proponent should identify and describe the probability of possible malfunctions or accidents associated with the Project, and the potential adverse environmental effects of these events. The description should include the safeguards that have been established by the Proponent to protect against such occurrences and the contingency procedures in place.

## **6.7 Cumulative Environmental Effects**

The Proponent should identify and assess the cumulative adverse and beneficial environmental effects of the Project in combination with other past, present or reasonably foreseeable projects and/or activities within the study area. The approach and methodologies used to identify and assess cumulative effects should be explained.

In assessing the impacts of cumulative environmental effects of the Project in combination with other projects and/or activities, the Proponent should identify any changes in the original environmental effects and significance predictions for the individual Project. The Proponent should also discuss the effectiveness of the proposed mitigation and/or other restitution measures and the response to such changes, as well as the implications for monitoring and follow-up programs as described in section 7.

## **7.0 Monitoring and Follow Up Programs**

This section of the EIS should provide information on proposed monitoring programs and actions to be taken to respond to monitoring results, including plans for a formal follow-up program to verify the predictions contained in the EIS.

## 7.1 Monitoring

The Proponent should describe the environmental and socio-economic monitoring programs to be incorporated into all phases of the Project in order to ensure that regulatory requirements are met, sustainable development objectives are advanced and that adverse impacts are avoided or minimized and beneficial impacts maximized as predicted in the EIS. The Proponent should describe how the results of monitoring programs will be used to refine or modify the design and implementation of management plans, enforcement and penalties for non-compliance, and mitigation measures and Project operations.

The proposed approach for monitoring should be described. The Proponent should explain the reasons for any cases where it is not possible to specify the details of a monitoring program in the complete EIS that is submitted to the Panel. The Proponent should explain when and how the program will be defined, and when it will be reviewed by public and regulatory agencies. This description should include:

1. the objectives of the monitoring program and a schedule for collection of the monitoring data required to meet these objectives;
2. the relationship of the various components of the monitoring program to specific regulatory requirements;
3. the selection of the subjects and indicators to be monitored, and the criteria used in their selection including the role played by ecological risk monitoring in determining subjects and indicators;
4. the frequency, duration and geographic extent of monitoring, and the justification for these decisions;
5. approaches and methods used to analyse monitoring data;
6. reporting and response mechanisms, including criteria for initiating a response, and the procedures to be followed. The reasons for selecting these criteria should be explained;
7. the approaches and methods for monitoring the potential cumulative adverse environmental effects of the Project in combination with other projects and activities in the Project study area;
8. integration of monitoring results with other aspects of the Project including adjustments to operating procedures and refinement of mitigation measures;

9. procedures to assess the effectiveness of monitoring programs, mitigation measures, and recovery programs for areas disturbed by the Project;
10. sources of funding for all monitoring programs; and
11. quality assurance and quality control measures to be applied to monitoring programs.

The Proponent should provide a table showing all environmental components and indicating where monitoring is proposed.

## **7.2 Follow-Up Program**

The Terms of Reference require the Panel to consider the need for and requirements of a follow-up program. A follow-up program is a formal, ongoing process to verify the accuracy of the environmental assessment of the Project and determine the effectiveness of mitigation measures. If either of these two steps identify unforeseen adverse impacts, then the existing mitigation measures should be adjusted or, if necessary, new mitigation or compensation measures should be developed.

The Proponent should identify from their perspective:

1. the need for such a follow-up program and its objectives;
2. how it will be structured including enforcement and penalties for non-compliance;
3. which elements of the monitoring program described in section 7.1 it would incorporate;
4. the roles to be played by the Proponent, regulatory agencies, and others in such a program;
5. possible involvement of independent researchers;
6. the sources of funding for the program; and
7. reporting.

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