4.0 Scope of the Assessment

The scope of the assessment includes those factors that need to be considered in a screening level assessment, as identified in section 16 of CEAA:

a) *The environmental effects of the project, including the environmental effects of malfunctions or accidents that may occur in connection with the project and any 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;*
b) *The significance of the effects referred to in paragraph (a);*
c) *Comments from the public that are received in accordance with this Act and the regulations;*
d) *Measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project; and*
e) *Any other matter relevant to the screening… that the responsible authority… may require to be considered.*

It should also be noted that that the definitions of environment and environmental effect under CEAA are as follows:

*"**Environment**" means the components of the Earth, and includes:*

a) *Land, water and air, including all layers of the atmosphere;*
b) *All organic and inorganic matter and living organisms; and*
c) *The interacting natural systems that include components referred to in paragraphs (a) and (b).*

*"**Environmental effect**" means, in respect of a project:*

a) *Any change that the project may cause in the environment, including any change it may cause to a listed wildlife species, its critical habitat or the residences of individuals of that species, as those terms are defined in subsection 2(1) of the Species At-Risk Act,*

b) *any effect of any such change referred to in paragraph (a) on*
    i. *health and socio-economic conditions,*

ii. physical and cultural heritage,

iii. the current use of lands and resources for traditional purposes by aboriginal persons, or

iv. any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, or

c) any change to the project that may be caused by the environment.

d) Environmental effects of the project, including the environmental effects of malfunctions or accidents that may occur in connection with the project, and any 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, and any effect that the environment may have on the project, such as from extreme weather events.

4.1 Environmental Assessment Method

This environmental assessment meets the requirements of Section 16(1) of the *CEAA* and guidance provided by INFC on the conduct of the EA. The assessment approach actively engaged regulators and the public early in the study to gain concurrence on the issues with the goal of minimizing review time and potential for regulatory delays. The objectives of the assessment were to:

- Consider the potential for both positive and negative changes on the environment;
- Outline mitigation and impact management measures;
- Assess residual and cumulative environmental effects; and
- Identify compliance and effects monitoring needs associated with the roadway project.

To provide clarity in the assessment, the approach focuses on those issues directly relevant to roadway planning, construction and operation in general and the proposed project in particular. Consistent with standard environment assessment practice, the assessment progresses through the following stages:

- Description of the project;
- Identification of Valued Environmental Components (VECs);
- Establishment of boundaries (spatial and temporal);

- Description of the existing environment;
- Assessment of environmental effects;
- Proposed mitigation measures, prediction of residual impacts;
- Prediction of cumulative effects; and
- Proposed compliance, effects monitoring, and follow-up programs.

It is noted that protection measures include those that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project. These environmental protection measures are appropriate and have been included in the design of the project. With the practice of proactive environmental planning and management, the mitigations to be added between impact identification and evaluation of residual impacts are minimized. Only mitigation that must be developed for the particular project, such as site-specific challenges or new regulatory requirements will be described in detail.

4.2 Valued Environmental Components

In order to focus on valued, vulnerable or representative components of the environment, the assessment will focus on valued environmental components (VECs) for potential interactions with the project. The VECs were evaluated to determine if potential pathways or linkages exist by which the project activities or works may affect the VEC. In identification of VECs, only species or environmental components present or known are considered. Those species or components which are not present are not included as there is no potential for project effects. The first step in the assessment was the identification of environmental issues through VEC scoping. The scoping was based on:

- Review of applicable legislation and regulations;
- Review of existing data with respect to the proposed project;
- Public consultations;
- Concerns of regulatory agencies, stakeholders, scientific community; and
- The proponent's knowledge of highway planning, construction and operation.

Table 4 provides this evaluation.

Table 4 – TFD Part A VEC Scoping and Pathway Analysis

Component of Concern	Values	Possible Source or Pathway	Rationale for Inclusion or Exclusion	Direct or Indirect Effect
Surface water quantity and quality	• Importance in the hydrologic cycle and ecological function (e.g., surface water discharge) • Importance as contributing to flow supporting fish habitat and wetlands	Construction sediment generation; accidental release of contaminants; Stormwater drainage included in design	Included – Regulatory - protected by *Fisheries Act* and provincial legislation; Valued by public	Direct
Groundwater quantity and quality	• Importance in the hydrologic cycle and ecological function (e.g., surface water discharge) • Importance as a water supply, particularly to rural users	Contamination, spills; potable water supply disruption; source of water for habitat	Included – protected by law; valued	Direct
Bedrock Geology, Surficial Geology and Soils	• Landscape feature • Role in potential for sediment generation or other contaminant release	Contamination of surface water/ground water	Included – protected by law; valued	Direct
Air Quality and	• Important component of the environment, supporting the health and well being of human and other ecosystem components • Emissions of gaseous and particulate emissions considered in the relevant legislation, and commonly associated with roadway construction projects	Vehicle emissions, dust, noise, fugitive emissions, greenhouse gas emissions	Included, protected by law, valued	Direct
Noise	• Considered due to potential for disturbance of human and wildlife	Air and vibration pathways	Included, protected by law, valued	Indirect
Vegetation	• Landscape feature of value to humans and wildlife (Species of Special Concern considered separately)	Subject to removal	Included, valued	Direct
Wetlands	• Role in ecological, hydrological and hydrogeological function • Valued by public and Provincially regulated	Pathways affecting water quality, fish, amphibians, migratory birds and at-risk species	Included – protected by provincial legislation and federal policy, valued.	Indirect
Wildlife (including fish and fish habitat)	• Ecological function (Species of Special Concern considered separately) • Valued by public and regulated • Related commercial / recreational values	Subject to habitat removal; Pathways affecting surface water or groundwater; direct habitat loss from construction	Included, - habitat likely to Included, protected by law, valued	Direct and Indirect (Indirect for fish and fish habitat)

Component of Concern	Values	Possible Source or Pathway	Rationale for Inclusion or Exclusion	Direct or Indirect Effect
Migratory Birds	• Ecological function (Species of Special Concern considered separately) • Valued by public and regulated • Related commercial / recreational values	Direct habitat loss from construction; Pathways affecting surface water or groundwater; direct habitat loss from construction	Included – protected by MCBA	Direct and Indirect
Species of Special Concern	• Ecological function (Species of Special Concern considered separately) • Valued by public and regulated	Pathways affecting habitat, or individual mortality	Included – protected by ESA (Ont.), SARA	Direct
Land Use (including Area of Natural and Scientific Interest)	• Valued by the public and scientific community	Subject to loss	Included, valued	Direct
Land Use by Aboriginal Peoples	• Federal 'duty to consult' • Valued by public	Pathways affecting potential resources	Included, valued, federal responsibility	Indirect
Physical and cultural heritage, structures/sites or things of historical, archaeological, paleontological or architectural significance	• Valued by public and regulated	Loss or disturbance of archaeological, historical, paleontological or architectural resources	Included – valued; public concern	Indirect

4.3 Project Interactions

The project component/activity and environment interaction matrix for the entire project is provided in **Table 5**.

Table 5 – Potential Project to Environmental Interaction Matrix

COMPONENTS AND ACTIVITIES	Surface Water Quality/Hydrology	Groundwater Quality/Quantity	Geology/ Soils	Air /Atmospheric Conditions	Noise	Vegetation	Wetlands	Wildlife	Migratory Birds	Species of Special Concern	Land Use (Including Area of Natural and Scientific Interest)	Land Use - Aboriginal	Physical and Cultural Heritage Historical / Archaeological
Construction (permanent and temporary roads)													
Site Preparation	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Construction of new and temporary roadways	✓			✓	✓						✓		
Construction of a new pedestrian pathway/sidewalk	✓			✓	✓						✓		
Installation of traffic control signals, road signs and street lighting	✓										✓		
Construction, installation or modification of stormwater management structures	✓			✓	✓						✓		
Temporary construction lay-down areas	✓										✓		
Disposal of waste materials	✓												
Site restoration	✓		✓	✓	✓	✓							
Use and storage of construction vehicles and equipment	✓			✓	✓						✓		
Transportation and storage of construction materials	✓			✓	✓						✓		
Operation (permanent and temporary roads):													
Operation: presence of ROW; vehicular traffic	✓			✓	✓			✓	✓	✓			
Maintenance (permanent and temporary roads):													
General Repair and Maintenance	✓					✓			✓				
Winter Maintenance: de-icing salt application; snow plowing	✓	✓					✓						
Decommissioning (temporary road):													
Temporary road removal and site restoration	✓			✓	✓						✓		

4.4 Evaluating Significance

Following the direction provided in the Scoping Document, to determine whether the project is likely to cause significant adverse environmental effects, a significance framework has been applied. The framework includes the following considerations:

- Magnitude - the predicted amount or level of disturbance to an existing condition;
- Geographic extent - the area over which the effect is likely to occur or be noticeable;
- Duration - the length of time the effects of a project will last;
- Frequency - the rate of re-occurrence of the effect and /or the phenomenon or event causing the effect;
- Reversibility - the time the environment will take to recover from the initial effect after the source of the disturbance is removed or ceases; and
- Ecological context - the sensitivity of the environment.

When a significant adverse environmental effect is considered likely it is based on:

- Probability of occurrence: the likelihood that adverse effects will occur;
- Scientific uncertainty: the confidence level associated with results; and
- Support by the description of the existing environment, the description of project activities, the potential interactions (environmental effects) and the mitigation measures.

4.5 Boundaries for Environmental Effects Assessment

Study boundaries set the limits of the area (spatial) and period of time (temporal) examined in the assessment. Boundaries were defined by good practice and professional judgement, as well as through discussions with other stakeholder agencies.

4.5.1 Spatial Boundaries

The spatial boundaries of the study, which represent the area in which potential effects could occur, were selected by professional judgement and scientific literature review, considering the

potential for effects. The assessment considers interactions and potential effects of the project relating to project, local and regional study areas.

The *project study area* is a 100 m wide corridor from the center of the proposed median of the future roadway or existing road widening area. In cases where features or VECs may be affected outside of this area, the study area was expanded to include such features. For example, wetlands and watercourses were included within 500 m downstream of the proposed roadworks.

The *regional study area* varies with the component addressed and is based on administrative or political boundaries for indirect socio-economic effects or natural system boundaries for cumulative biophysical effects. Indirect effects of the project are considered in a regional context; however, the limited extent of the project provides little potential for indirect effects to interact regionally. Cumulative effects are considered within a regional study area within the Kanata portion of the City of Ottawa, where appropriate. The regional study area extends to include other past, existing or reasonably foreseeable projects that contribute to cumulative effects with this project.

4.5.2 Temporal Boundaries

The temporal boundaries of the assessment include the duration of the construction period, and the long-term operations and maintenance period. While decommissioning Terry Fox Drive is considered as part of the project assessment, the duration of operation of the project is indefinite and the timing and nature of decommissioning is not predictable. Temporal boundaries vary according to project phase. In the construction phase, specific construction-related effects are short. Effects associated with the operational period are long term, as the roadway is intended to be operational indefinitely.