

**Draft Guidelines for the Preparation of an
Environmental Impact Statement
Pursuant to the Canadian Environmental Assessment Act
for the
Town of Shelburne
Long Term-Well Water Supply Project**

CANADIAN ENVIRONMENTAL ASSESSMENT AGENCY



December 2011

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ABBREVIATIONS

The Act	Canadian Environmental Assessment Act
The Agency	Canadian Environmental Assessment Agency
BCF-CC	Building Canada Fund - Communities Component
CEPA	Canadian Environmental Protection Act
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
EA	Environmental assessment
EC	Environment Canada
EIS	Environmental impact statement
EMPs	Environmental management plans
EMS	Environmental management system
FA	Federal Authority
FedDev	Federal Economic Development Agency for Southern Ontario
HC	Health Canada
INFC	Infrastructure Canada
Km	Kilometres
NRCan	Natural Resources Canada
PM	Particulate matter
Project	Shelburne Long Term Well Water Supply Project
Proponent	Town of Shelburne
QA/QC	Quality assurance/quality control
RA	Responsible Authority
SARA	Species at Risk Act
UTM	Universal Transverse Mercator
VEC	Valued Ecosystem Component

Cover Page Photo Credit: Town of Shelburne

PART 1 – BACKGROUND

1 INTRODUCTION

The purpose of this document is to identify for the Town of Shelburne (the Proponent) the information requirements for the preparation of an Environmental Impact Statement (EIS) for the proposed Town of Shelburne Long Term Well Water Supply Project (the Project). The Project is to be assessed under the Comprehensive Study process pursuant to the *Canadian Environmental Assessment Act* (the Act).

These Environmental Impact Statement Guidelines (EIS Guidelines) specify the nature, scope and extent of the information required to support the comprehensive study. The Proponent shall prepare and submit an EIS that: identifies the potential adverse environmental effects, including cumulative effects, of the Project. In addition, the EIS shall identify technically and economically feasible measures (and alternatives) to mitigate those effects; and evaluates whether the proposed project will result in any significant adverse environmental effects.

The EIS Guidelines outline the minimum federal information requirements while providing the Proponent with flexibility in selecting methods to compile data for the EIS. The EIS Guidelines may be amended as more information about the project and the environment becomes available. For any information or assessments that have been described in this document and are not included in the EIS, the Proponent may offer a rationale for exclusion, for consideration by the Canadian Environmental Assessment Agency. Such a request and the response to it will be part of the public record.

The Proponent is encouraged, when speaking with other government organizations, Aboriginal groups, the public and stakeholders, to ensure that the EIS clearly documents and addresses any concerns raised or suggestions provided.

1.1 Proposed Project

The Town of Shelburne (the proponent) proposes to develop a new water supply production well to provide additional drinking water supply to the town.

The proposed Well Site is 3km west of the town of Shelburne and is approximately 95 meters deep. Groundwater will be pumped from the proposed Well Site via a water main constructed for the Project along existing right-of-ways to a connection with the Town's existing water supply system infrastructure. The proposed water main route will follow 2nd Line southeast to Highway 89, and then continue eastwards along Highway 89 until it connects with the Town's existing water supply.

Correspondence with the proponent's consultant has indicated that the Town would prefer to pump raw water to the pump house/treatment facility at existing wells. However, the option of treatment at the new wells is included as part of the Project.

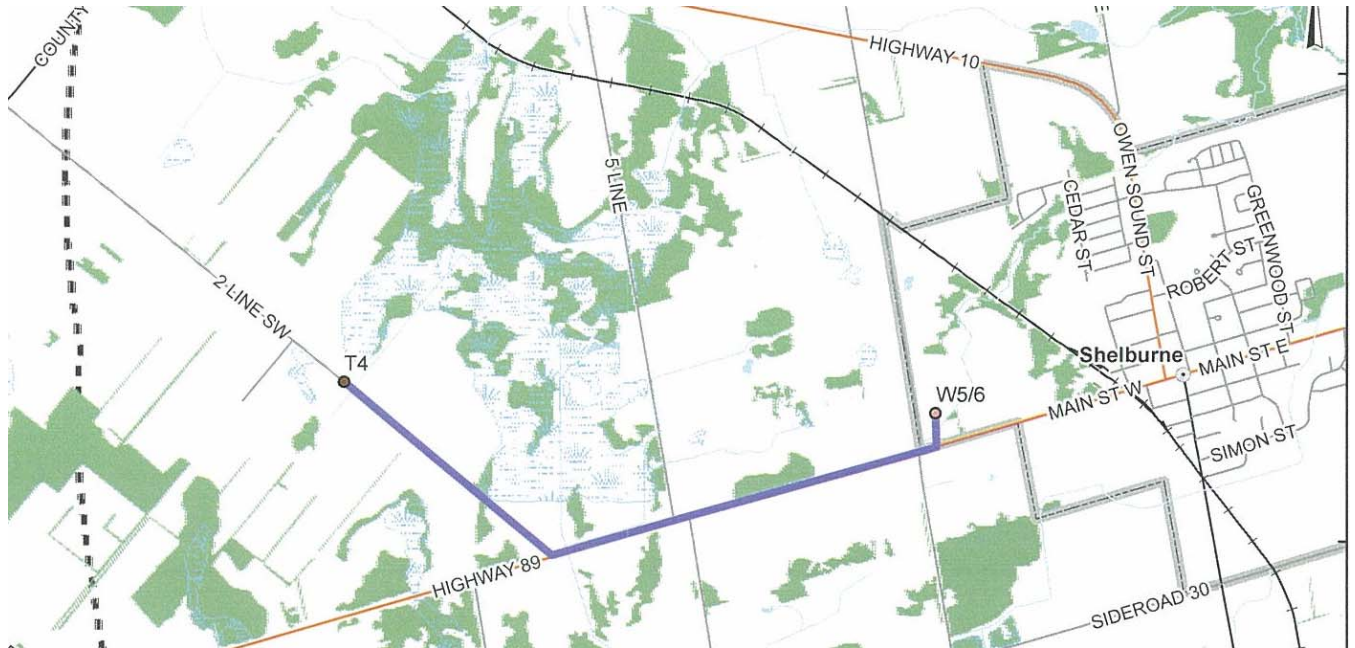


Figure 1: Project Location Map (Credit: Golder Associates Ltd.)

1.2 Environmental Assessment Process

Under section 5 of the *Canadian Environmental Assessment Act*, an environmental assessment is required before a federal authority can provide funding for the purposes of enabling a Project to be carried out in whole or in part, unless the source of funding is specifically excluded from this requirement under certain circumstances which do not apply to this project.

- The provision of funding is being considered by Infrastructure Canada (INFC) as part of the Building Canada Fund - Communities Component (BCF-CC) Regular Intake in order to enable this project to proceed.

The Agency determined that the project as proposed by the Proponent is described in Part III, Section 10, of the Schedule within the *Comprehensive Study List Regulations* under the *Canadian Environmental Assessment Act*, which states,

“10. The proposed construction, decommissioning or abandonment of a facility for the extraction of 200,000 m³/yr or more of groundwater or an expansion of such a facility that would result in an increase in production capacity of more than 35 percent.”

In accordance with the Act, for the purposes of the comprehensive study, the Agency will be carrying out the duties of the responsible authority (RA) until the Minister is provided with the comprehensive study report.

INFC is considered an RA for this project as a result of the potential provision of funding that will enable the project to proceed. The Federal Economic Development Agency (FedDev) for Southern Ontario, as a result of a service agreement with INFC, will also be involved as a Federal Authority (FA) for the purposes of this assessment.

Health Canada (HC), Environment Canada (EC), and Natural Resources Canada (NRCan) are participating in the assessment as FAs as they have indicated they possess expert information that could be useful to the environmental assessment.

2 GUIDING PRINCIPLES

2.1 Environmental Assessment as a Planning Tool

Environmental assessment (EA) is a planning tool used to ensure that projects are considered in a careful and precautionary manner in order to avoid or mitigate the possible adverse effects of development on the environment. It also serves the purpose to encourage decision makers to take actions that promote sustainable development and thereby achieve or maintain a healthy environment and a healthy economy.

The EA of this project shall therefore, in a manner consistent with the purposes above, identify its possible environmental effects; propose measures to mitigate adverse effects; and predict whether there will be likely significant adverse environmental effects after technically and economically feasible mitigation measures are implemented. The preparation and review of the EIS, as a component of the EA process, is critical in achieving this objective.

2.2 Public Participation

One of the purposes of the Act (Section 4 (1)) is to ensure opportunities for timely and meaningful public participation throughout the EA process. The public will have the opportunity to comment on the Project and the conduct of the comprehensive study, the Proponent's environmental impact statement and the Agency's comprehensive study report. The Minister of the Environment shall take into account public input when issuing the environmental assessment decision statement.

Meaningful involvement in the EA takes place when all parties involved have a clear understanding of the proposed project as early as possible in the review process. Achieving this objective requires that the Proponent is required to provide current information about the

project to the public and especially to the communities likely to be most affected by the project.

2.3 Aboriginal Consultation

The Proponent must ensure that it engages with Aboriginal people that may be affected by the Project and that have asserted or established Aboriginal or treaty rights. In preparing the EIS, the Proponent must ensure that Aboriginal people have access to the information that they require in respect of the project and how the project may impact them.

When the Crown contemplates conduct that may have potential adverse impacts on established or potential Aboriginal and treaty rights, it has a legal duty to consult with Aboriginal groups before making a decision to proceed with the proposed conduct. For the purposes of the federal Crown consultation, the Proponent is required to describe in the EIS how the concerns respecting Aboriginal groups shall be addressed. That description shall include a summary of discussions, the issues or concerns raised, and shall consider and describe any asserted or established Aboriginal and treaty rights. This information shall be used by the Crown to assess the potential impact of the project on asserted or established Aboriginal rights, Aboriginal and treaty rights, and the measures to prevent, mitigate, compensate or accommodate those potential effects.

2.4 Traditional and Local Knowledge

Section 16.1 of the Act states that “community knowledge and aboriginal traditional knowledge may be considered in conducting an EA”, and the definition of an environmental effect in the Act addresses the current use of lands and resources for traditional purposes by Aboriginal persons.

Traditional and local knowledge has an important contribution to make to an EA. Traditional and local knowledge refers to the broad base of knowledge held by individuals and by communities that may be based on teachings, personal observation and experience or passed on from one generation to another through oral and/or written traditions. This tradition is dynamic, substantive, and distinct living knowledge.

Traditional and local knowledge, in combination with other information sources is valuable in achieving a better understanding of potential effects of projects. Traditional and local knowledge may, for example, contribute to the description of the existing physical, biological and human environments, natural cycles, resource distribution and abundance, long and short-term trends, and the use of lands and water resources. It may also contribute to project siting and design, identification of issues, the evaluation of potential effects and their significance, the effectiveness of proposed mitigation and/or compensation, cumulative effects and the consideration of follow-up and monitoring programs and accommodation (if required).

Certain issues relevant to the review process are firmly grounded in traditional and local knowledge, such as; harvesting, land use, physical and cultural heritage resources. Although the basis for traditional and local knowledge and science-based knowledge can differ, they may on their own or together, contribute to the understanding of these issues.

The EA shall promote and facilitate the contribution of traditional and local knowledge to the review process. It is recognized that approaches to traditional and local knowledge, customs and protocols may differ among communities and persons with respect to the use, management and protection of this knowledge. The Proponent shall incorporate into the EIS the traditional and local knowledge to which it has access or that it may reasonably be expected to acquire through appropriate due diligence, in keeping with appropriate ethical standards and without breaching obligations of confidentiality, as set out in Section 2.8 of this document. Agreement from Aboriginal groups regarding the use, management and protection of their existing traditional knowledge information during the EA and post-EA should be obtained.

The Agency shall consider the views of communities, Aboriginal groups and traditional and local knowledge holders during the comprehensive study review process.

2.5 Sustainable Development

Sustainable development, as defined in the *Act*, means development that meets the needs of the present, without compromising the ability of future generations to meet their own needs.

Projects should not unduly affect the carrying capacity of the ecosystems (and populations) with which they interact. Economic decisions need to be predicated on maintenance of ecological integrity, as healthy ecological systems provide for a healthy economy.

The EIS should consider these concerns and should incorporate the comments received during public and Aboriginal participation. The EIS should also, in considering the project, (including alternative means of carrying out the project), address the relationships and interactions among the various components of the ecosystems with the goal of meeting the needs of present as well as future populations.

2.6 Precautionary Approach

Under the *Act*, one of the purposes of federal EA is to ensure that projects are considered in a careful and precautionary manner before authorities take action in connection with them, to ensure that such projects do not cause significant adverse environmental effects. The precautionary principle encourages federal decision-makers to take a cautionary approach, or to err on the side of caution, especially where there is a large degree of uncertainty or high risk.

Principle 15 of the 1992 *Rio Declaration on Environment and Development* states that “Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.”

In applying the precautionary approach, the Proponent shall:

- demonstrate that all aspects of the project have been examined and planned in a careful and precautionary manner in order to ensure that they would not cause serious or irreversible damage to the environment, especially with respect to environmental functions and integrity, considering system tolerance and resilience, and/or the human health of current or future generations;
- outline and justify the assumptions made about the effects of all aspects of the project and the approaches to minimize these effects;
- ensure that alternative means of carrying out the project are evaluated and compared in light of risk avoidance, adaptive management capacity and preparation for surprise;
- ensure that in designing and operating the project, priority has been and would be given to strategies that avoid the creation of adverse effects;
- identify any proposed follow-up and monitoring activities, particularly in areas where scientific uncertainty exists in the prediction of effects; and
- present public views on the acceptability of all of the above.

In doing so, the Proponent shall consider the guiding principles set out in the Government of Canada *Framework for the Application of Precaution in Science-based Decision Making About Risk* (2003).

2.7 Use of Existing Information

In preparing the EIS, the Proponent is encouraged to make use of existing information relevant to the project. When relying on existing information to meet the requirements of various sections of the EIS Guidelines, the Proponent shall either include the information directly in the EIS or clearly direct (e.g. through cross-referencing) the reader to where it may obtain the information. When relying on existing information, the Proponent shall also comment on how the data have been applied to the project, clearly separate factual lines of evidence from inference, and state any limitations on the inferences or conclusions that can be drawn from them according to the criteria for information quality set out in the EIS Guidelines. For instance:

- assumptions should be clearly identified and justified;
- all data, models and studies shall be documented such that the analyses are transparent and reproducible;

- the uncertainty, reliability and sensitivity of models used to reach conclusions shall be indicated;
- conclusions should be substantiated; and,
- the studies should be prepared using best available information and methods.

2.8 Use of Confidential Information

The EIS that is made publicly available for comment should not contain:

- information that is sensitive or confidential (i.e., financial, commercial, scientific, technical, personal, cultural or other nature), that is treated consistently as confidential, and the person affected has not consented to the disclosure; or
- information that is likely to endanger the life, liberty or security of a person through its disclosure.

3 PREPARATION AND PRESENTATION OF THE EIS

3.1 Agency Guidance

In preparing the EIS, the Proponent is encouraged to consult relevant Agency guidance and policy on topics to be addressed, e.g. the Agency’s operational policy statement: *Addressing “Need for”, “Purpose of”, “Alternatives to” and “Alternative means”* under the *Canadian Environmental Assessment Act* (November 2007). This document and other guidance material can be found at [Canadian Environmental Assessment Agency - Policy & Guidance - Guidance Materials](#).

3.2 Study Strategy and Methodology

The Proponent is expected to observe the intent of the EIS guidelines and to consider the environmental effects (as defined in the *Act*) that are likely to arise from the project (including situations not explicitly identified in these guidelines), the technically and economically feasible mitigation measures that will be applied, and the significance of any residual effects. It is possible that the EIS Guidelines may include matters that, in the judgement of the Proponent, are not relevant or important to the project. If such matters are omitted from the EIS, they shall be clearly indicated with appropriate justification so that the Agency, technical and regulatory agencies, Aboriginal groups, the public and any other interested party have an opportunity to comment on this judgement. Where the Agency disagrees with the Proponent's decision, it may require the Proponent to provide additional information in order for the Agency to be in a position to reach a conclusion.

In describing methods, the Proponent shall document how it used scientific, engineering, traditional and local knowledge to reach its conclusions. Assumptions shall be clearly identified and justified. All data, models and studies should be documented such 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.

All significant gaps in knowledge and understanding related to key conclusions presented in the EIS should be identified. 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 traditional knowledge, the EIS shall contain a balanced presentation of the issues and a statement of the Proponent's conclusions.

3.3 Presentation and Organization of the EIS

To facilitate the identification of the documents submitted and their placement in the Canadian Environmental Assessment Registry, the title page of the EIS and its related documents should contain the following information:

- project name and location;
- title of the document, including the term “environmental impact statement”;
- subtitle of the document;
- name of the Proponent; and
- the date.

The EIS should be written in clear, precise language. A glossary defining technical words, acronyms and abbreviations shall be included. The Proponent shall provide charts, diagrams, tables, maps and photographs, where appropriate, to clarify the text. Perspective drawings that clearly convey the various components of the project shall also be provided. Wherever possible, maps shall be presented in common scales and datum to allow for comparison and overlay of mapped features.

Consideration should be given to having a stand-alone section for the cumulative effects assessment.

For purposes of brevity and to avoid repetition, cross-referencing is preferred. The EIS may make reference to the information that has already been presented in other sections of the document, rather than repeating it. Detailed studies (including all relevant and supporting data and methodologies) shall be provided in separate appendices and shall be referenced by appendix, section and page in the text of the main document of the EIS.

The Proponent shall provide copies of the EIS for distribution, including an electronic version in an unlocked, searchable, PDF format, as directed by the Agency.

The EIS shall specify the organization of the document. This should include a list of all tables, figures, and photographs referenced in the text of the EIS. A Table of Concordance, which

cross references the information presented in the EIS with the information requirements identified in the EIS Guidelines, should be provided. A complete list of supporting literature and references should also be provided.

3.4 Executive Summary

The EIS shall contain an executive summary which shall include the following:

- a concise description of all key facets of the project;
- a succinct description of the consultation conducted with Aboriginal groups, the public, and government agencies, with a summary of the issues raised and solutions found and/or suggested during these consultations;
- a general overview of the key effects of the project and proposed technically and economically feasible mitigation measures; and
- the Proponent's conclusions and significance determinations from the assessment.

If appropriate, the Agency may use the Executive Summary of the EIS as the basis for the Comprehensive Study Report (CSR).

PART 2: STRUCTURE AND CONTENT OF THE EIS

4 INTRODUCTION AND PROJECT BACKGROUND

4.1 The Proponent

The Proponent shall:

- provide contact information (e.g. name, address, phone, fax, email);
- identify itself and the name of the legal entity that would develop, manage and operate the project;
- explain corporate and management structures, as well as insurance and liability management related to the project;
- specify the mechanism used to ensure that corporate policies will be implemented and respected for the project;
- summarize key elements of its environment, health and safety management system and discuss how the system will be integrated into the project; and
- identify key personnel, contractors, and/or sub-contractors responsible for preparing the EIS.

4.2 Project Overview

The Proponent shall briefly summarize the project, by presenting the project components, associated and ancillary works, activities, scheduling details, the timing of each phase of the project and other key features. If the project is part of a larger sequence of projects, the Proponent shall outline the larger context and present the relevant references, if available.

The intent of this overview is to provide the key components of the project, not a detailed description, which is outlined in Section 5.3 of this document.

4.3 Project Location

The EIS shall contain a concise description of the geographical setting in which the project is proposed to take place. This description should focus on those aspects of the environment important for understanding the potential environmental effects of the project. The description should also 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. The following information may be included:

- any existing designated environmentally sensitive areas, such as national, provincial and regional parks, ecological reserves, wetlands, estuaries, and habitats of provincial or federally listed species at risk and other sensitive areas;
- the current land use in the area and the relationship of the project facilities and components with any existing land use including traditional, private and crown lands;
- local communities;
- traditional Aboriginal territories, treaty lands, Indian reserve lands;
- the UTM coordinates of the main project site; and
- the environmental significance and value of the geographical setting in which the project will take place and the surrounding area.

The EIS shall provide an expanded description and mapping of the project location, including each of the project components.

4.4 Participants in the Environmental Assessment

Clearly identify the main participants in the EA including jurisdictions other than the federal government, Aboriginal groups, community groups, environmental organizations etc.

4.5 Regulatory Framework and the Role of Government

To understand the context of the EA, this section should identify, for each jurisdiction, the government bodies involved in the EA as well as the EA processes. More specifically:

- identify the environmental and other specific regulatory approvals and legislation that are applicable to the project at the federal, provincial, regional and municipal levels;
- identify government policies, resource management, planning or study initiatives pertinent to the project and/or EA and discuss their implications;
- identify policies and guidelines of the Aboriginal groups being consulted that are pertinent to the project and/or EA and discuss their implications;
- identify any Aboriginal treaties that are pertinent to the project and/or EA;
- identify any relevant Land Use Plans, Land Zoning, or Community Plans;
- identify and delineate major components of the project and identify those being applied for and constructed within the duration of approvals under provincial and federal legislation; and
- provide a summary of the regional, provincial and/or national objectives, standards or guidelines that have been used by the Proponent to assist in the evaluation of any predicted environmental effects.

5 PROJECT DESCRIPTION

Relevant guidance material for sections 5.1, 5.2 and 5.3 can be found at [Canadian Environmental Assessment Agency - Policy & Guidance - Guidance Materials](#) (see Operational Policy Statements).

5.1 Need for and Purpose of the Project

The Proponent shall clearly describe the rationale or need for the Project. This description shall define the problem or opportunity the Project is intending to solve or satisfy. The EIS shall identify the main function of the Project. In this context, the EIS shall present the fundamental rationale for proceeding with the development at this time within the context of regional, provincial and national economies, as well as global implications of supply and demand on metal prices and markets.

The Proponent is required to clearly describe the purpose of the Project by defining what is to be achieved by carrying out the Project. In addition, the purpose of each of the Project facilities and activities and their relevance to the overall project development plan shall also be discussed.

The “rationale or need for” and “purpose of” the Project shall be established from the perspective of the Proponent and provide the context for the consideration of alternatives.

5.2 Project Setting

Location

The EIS shall include a concise description of the geographic setting in which the Project is proposed to take place and shall include site, regional and watershed maps. The following shall be considered for each map type:

- regional map - two shall be provided, one to 1:100 000 scale and a second to a 1:50 000 scale;
- land use maps – depicting municipal boundaries, Crown land tenure, private land tenure and land use designations.

In addition to the requested maps, in order to illustrate the regional setting and clearly locate the Project within that setting, the EIS shall include site plans at the appropriate scale and photographs (as necessary).

5.3 Project Description

The EIS shall include an expanded description of the phases of the Project, including site preparation, construction and operation as described in the Town of Shelburne Long-Term Well For Additional Water Supply Project – Project Description, September 2011. The

description of project phases shall include, but not be limited to, the physical works and activities listed in section 6.1.

Within the description section, the EIS should indicate the intended maximum permitted pumping rate for the new well.

As this is a long-term infrastructure project, impacts associated with decommissioning will not be assessed within the EIS.

6 PROJECT SCOPING

6.1 Scope of the Project

The Town of Shelburne proposes to construct a new water supply production well with a production capacity of 1,348 m³/day (491,290 m³/yr). Major project components include: the well, a pump house housing equipment to extract and convey raw water to the existing water supply system and a new water main, covering a distance of approximately four kilometres along existing right of ways (2nd Line southeast and eastwards along Highway 89).

Treatment may take place at either one of the Town's existing wells or within the new pump house.

This Project involves, but is not limited to, the following physical works and activities:

- Stripping of topsoil at the Well Site and along the water main route if not installed through directional drilling;
- Construction equipment delivery and lay down;
- Installation of concrete foundations and construction of well house;
- Installation of fencing;
- Installation of pump system and components;
- Excavation and backfilling for water main pipe installation;
- Inspection and testing of project components;
- Any required mitigation and compensation;
- Site restoration including topsoil and re-vegetation;
- Construction of a back-up well; and
- Routine operations at the Well Site and along water main route, including inspection, monitoring, and testing.

The scope of project shall include all components of the Project as proposed by the Proponent.

6.2 Factors to be Considered

The environmental assessment includes a consideration of the following factors listed in paragraphs 16(1) (a) to (d) and subsection 16(2) of the Act:

1. 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;
2. The significance of the effects referred to in paragraph 1 above;
3. Comments from the public that are received during the review;
4. Comments from Aboriginal groups that are received during the review;
5. Measures that are technically and economically feasible and that would accommodate adverse environmental effects with an impact on potential or established Aboriginal and Treaty rights;
6. Measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project;
7. The purpose of the project;
8. Alternative means of carrying out the project that are technically and economically feasible and the environmental effects of any such alternative means;
9. The need for, and the requirements of, any follow-up program in respect of the project;
10. The capacity of renewable resources that are likely to be significantly affected by the project to meet the needs of the present and those of the future;

As well, three additional factors are required pursuant to paragraph 16(1) (e) of the Act:

11. The need for the project;
12. Alternatives to the project; and,
13. Benefits to Canadians (see section 12).

6.3 Scope of the Factors

Scoping establishes the boundaries of the EA and focuses the assessment on relevant issues and concerns. By defining the spatial and temporal boundaries, a frame of reference for identifying and assessing the environmental effects associated with the project shall be established. Different boundaries may be appropriate for each valued ecosystem component (VEC).

A description of the boundaries of the proposed project in a regional context showing existing and planned future land use, Aboriginal traditional territories/treaty lands/Indian Reserves, current infrastructure and proposed improvements to these infrastructure, including transportation (all modes), power distribution corridors and lines, and urban areas, shall be provided.

6.3.1 Determination of Valued Ecosystem Components (VECs)

The EIS shall explain and justify methods used to predict the effects of the project on all components of the environment, including biophysical and socio-economic components, the interactions among these components and on the relations of these components within the environment.

After considering all potential interactions between the components of the project and the environment, the assessment should focus on those which are likely to be measurable. The information presented shall be substantiated. The Proponent shall describe how the VECs were selected and what methods were used to predict and assess the adverse 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 VECs. The spatial and temporal boundaries used in the assessment may vary as appropriate, depending on the VEC.

Table 6-1 provides a proposed preliminary matrix of likely project-environment interactions to be considered in the assessment of environmental effects of the project. The assessment will consider construction and operational phases of the Project.

Table 6-1 Project Environmental – Interaction Matrix

	ECOSYSTEM COMPONENTS									
Project works and activities	Water quality and quantity (ground and surface)	Fish and fish habitat, aquatic ecosystems	Terrain and soils	Vegetation including country	Wildlife and wildlife habitat (Avifauna)	Human health	Acoustic environment	Atmospheric environment	Aboriginal land and resource use	Physical and cultural heritage (archaeology)
<i>Construction phase</i>										
Stripping of topsoil at the Well Site and along the water main route (in not installed through directional drilling)	√	√	√	√	√		√	√	√	√
Construction equipment delivery and lay down			√				√	√		
Installation of concrete foundation and construction of well house	√				√		√	√	√	√
Installation of fencing (as warranted)			√				√	√		

Installation of pump system and components							√	√		
Installation of water treatment facilities (if option is taken to treat on-site)							√	√		
Excavation and backfilling for water main pipe installation	√	√	√	√	√		√	√	√	√
Inspection and testing of project components	√						√			
Site restoration including topsoil cover and re-vegetation		√	√	√	√		√	√	√	
Construction of a back-up well	√	√	√				√	√		
<i>Operations phase</i>										
Routine operations and maintenance at the Well Site and along the water main route	√	√	√	√	√	√		√	√	

The VECs that will be assessed in the EIS will include the following components or features within them which are indicative of the important effects for the whole component:

1. water quality and quantity, including surface and groundwater;
2. fish and fish habitat, and aquatic ecosystems including benthos and sediment quality;
3. terrain and soils;
4. vegetation;
5. wildlife and wildlife habitat; including avifauna, federally and provincially listed species at risk; and wetlands;
6. human health;
7. Aboriginal land and resource use;
8. acoustic environment;
9. atmospheric environment; and
10. physical and cultural heritage (archaeology).

Proposals to modify this list of VECs in the EIS may be made, following consultations with the public, Aboriginal groups, federal and provincial government departments and relevant stakeholders.

It is anticipated that the components identified as 1-7, in the list are the most likely to have interactions with the Project. However, as potential interactions are also possible on components 8-10, a qualitative assessment of impacts on these elements should also be undertaken. Following consideration in the EIS, if interactions of the second category of components are found to be very limited, they will be scoped out of the assessment and no further study will be undertaken.

As mentioned in the Proponent's submitted project description (Town of Shelburne Long-Term Well For Additional Water Supply Project – Project Description, September 2011), the proposed well and associated water mains are adjacent to a locally significant wetland (Willow Brook Swamp). The Agency expects the Proponent to make specific reference to the possible effects on this wetland via the assessment of impacts to VECs.

6.3.2 Spatial Boundaries

Clearly indicate the spatial boundaries to be used in assessing the potential adverse and beneficial environmental effects of the proposed project. The EIS shall contain a justification and rationale for all boundaries chosen. It is important to note that the spatial boundaries for each VEC may not be the same.

Study boundaries shall be defined taking into account (where applicable) the spatial extent of potential environmental effects, traditional and local knowledge, current and proposed land use by Aboriginal groups, ecological, technical and social and cultural considerations. These boundaries shall also indicate the range of appropriate scales at which particular baseline descriptions and the assessment of environmental effects are presented. The description of the project setting shall be presented in sufficient detail to address the relevant environmental effects of the project.

The Proponent is advised to consult with federal and provincial departments and agencies, local government and Aboriginal groups, taking into account public comments, to confirm the spatial boundaries used in the EIS.

The EIS shall identify the proposed spatial study boundaries for the VEC groups outlined in section 6.3.1 and any others proposed by the Proponent.

As the proposed site is near the surface water divide of the Grand River and Nottawasaga Valley watersheds, the spatial boundaries associated with the assessment of impacts to water quality and quantity should take into consideration the possible influence of this well within both watersheds. The well head protection areas (WHPA) for the existing Shelburne water wells currently extend into the Grand River watershed; the WHPA of the new well will also. The spatial boundaries of the Project should include the combined WHPA for all the wells.

The EIS shall contain a justification and rationale for all boundaries and scales chosen.

6.3.3 Temporal Boundaries

The temporal boundaries of the project should span both the construction and operational phase. Temporal boundaries shall also consider seasonal and annual variations related to VECs for all phases of the project, where appropriate.

If the full temporal boundaries are not used, the EIS shall identify the boundaries used and provide a rationale for the temporal boundaries selected.

7 PROJECT ALTERNATIVES

7.1 Assessment of Alternatives and Selection of the Proposed Project

The EIS shall include an analysis of alternative means of carrying out the Project that are technically and economically feasible and the environment effects of any alternatives means. Further, the EIS shall include a consideration of the alternatives to the Project. For further guidance, the Proponent is referred to the Canadian Environmental Assessment Agency guidance document *Addressing 'Need for', 'Purpose of', 'Alternatives to' and 'Alternative Means' under the Canadian Environmental Assessment Act (CEAA 1998)*. The Proponent is encouraged to demonstrate how the preferred alternative contributes to sustainable development.

7.2 Alternatives to the Project

The EIS must include an analysis of alternatives to the project; describing functionally different ways to meet the project's need and achieve the project's purpose from the perspective of the proponent. The proponent will:

- identify the alternatives to the project that were considered
- develop criteria to identify the major environmental, economic and technical costs and benefits of the alternatives; and
- identify the preferred alternatives to the project based on the relative consideration of the environmental, economic and technical costs and benefits.

This analysis must be done to a level of detail which is sufficient to allow the Agency, technical and regulatory agencies, the public and Aboriginal groups to compare the proposed project with its alternatives.

When assessing project alternatives, the proponent is encouraged to take into account the relations and interactions among various components of the ecosystem, including affected Aboriginal and other communities, and any adverse impacts on potential or established Aboriginal and Treaty rights. Further, the proponent is encouraged to demonstrate how the preferred alternative contributes to sustainable development.

7.3 Alternative Means of Carrying Out the Project

The EIS shall identify and describe alternative means of carrying out the project that are technically and economically feasible (paragraph 16(2) (b) of the Act) and assess the environmental effects of any such alternative means.

The Agency recommends the following procedural steps for addressing alternative means:

- identify the alternative means to carry out the project.
 - develop criteria to determine the technical and economic feasibility of the alternative means;
 - describe each alternative means in sufficient detail; and
- identify those alternative means that are technically and economically feasible.
 - identify the environmental effects of each alternative means.
 - identify those elements of each alternative means that could produce environmental effects in sufficient detail to allow a comparison with the environmental effects of the project.
- identify the preferred means.
 - identify the preferred means based on the relative consideration of environmental effects; and of technical and economic feasibility;

- determine and apply criteria that identify alternative means as unacceptable on the basis of significant adverse environmental effects; and
- determine criteria to examine the environmental effects of each remaining alternative means to identify a preferred alternative.

Any potentially adverse environmental impacts of the technically and economically feasible alternatives on potential or established Aboriginal and Treaty rights should also be identified.

8 CONSULTATION

8.1 Public Consultation

For any consultations undertaken with the general public, the Proponent shall describe the ongoing and proposed consultations and information sessions with respect to the Project at the local, regional and provincial levels, where applicable. It shall provide a summary of discussions; indicate the methods used and their relevance; locations; the persons and organizations consulted; the concerns raised; the extent to which this information was incorporated in the design of the Project as well as in the EIS; and the resultant changes. Moreover, the Proponent shall describe any outstanding issues and describe ways to address these outstanding issues. The Proponent shall also provide a description of efforts made to distribute project information and provide a description of information and materials that were distributed during the consultation process.

8.2 Government Agency Consultation

Provide all relevant information as outlined in section 8.1 above.

8.3 Aboriginal Consultation

For any consultations undertaken with Aboriginal groups provide all relevant information as outlined in section 8.1 above.

The Proponent shall actively solicit Aboriginal concerns during the course of the EA. The Crown and Proponent shall examine opportunities to mitigate the environmental effects of the project on Aboriginal groups' current use of lands and resources for traditional purposes and other Aboriginal interests considered under the *Canadian Environmental Assessment Act*. The Crown and Proponent shall also consider the potential need to take further actions to accommodate Aboriginal groups for adverse environmental impacts to potential or established Aboriginal and treaty rights caused by the proposed federal conduct and associated proposed Project.

For the purpose of developing the EIS, the Proponent shall continue to consult with Aboriginal groups with respect to their perspectives and opinions about the Project and the potential effects of the Project on their Aboriginal interests.

The EIS shall include a summary of the consultations undertaken with Aboriginal people and groups prior to the submission of the EIS. The Proponent shall also explain the results of the EIS in a clear and direct manner to make the issues understandable to as wide an audience as possible.

For the purposes of facilitating federal Crown Consultations, the Proponent is required to describe in the EIS how the concerns respecting Aboriginal groups will be addressed. That description shall include a summary of discussions, the issues or concerns raised, and shall consider and describe any asserted or established Aboriginal and treaty rights. The EIS shall document the potential environmental effects of the Project on asserted or established Aboriginal and treaty rights, and the measures to prevent or mitigate those potential effects.

The EIS shall:

- describe consultations undertaken prior to the submission of the EIS, the methods used and their rationales, perspectives and opinions expressed about the Project, issues raised and the ways in which the Proponent has responded to these issues;
- outline a proposal for a consultation process with Aboriginal groups which the Proponent, intends to carry out for the purposes of the review of the EIS.

In preparing the EIS, the Proponent shall ensure that Aboriginal groups have access to the information that they require in respect of the Project and of how the Project may impact them. The Proponent shall provide copies of the EIS to Aboriginal groups for information and consultation purposes and during the EIS review stage.

The Proponent shall consult with Aboriginal groups in accordance with the consultation process outlined in the EIS. A summary of the completed, ongoing and future consultation with Aboriginal people and groups shall be provided. This summary shall include information from each group respecting concerns related to the project and which asserted or established Aboriginal and treaty rights are potentially affected by the Project and how such rights may be affected. It shall also include a description of how the concerns of groups and/or potential impacts to asserted or established Aboriginal and treaty rights have been considered and/or addressed. There shall also be a summary of any outstanding issues that remain.

The EIS shall include a list and discussion of key issues identified throughout the engagement and consultation activities with Aboriginal groups. Information on each issue shall be included in a Table of Concordance which in turn shall clearly indicate which section of the EIS includes a discussion of the issue.

8.3.1 Aboriginal Traditional Knowledge

The EIS shall describe where and how Aboriginal traditional knowledge is incorporated into the assessment, including in effects prediction, and determining mitigation measures. Where Aboriginal traditional knowledge is not available or not provided in a timely manner the EIS shall describe efforts taken to obtain it.

9 EXISTING ENVIRONMENT

The EIS shall provide a baseline description of the environment, including the components of the existing environment and environmental processes, their interrelations and interactions as well as the variability in these components, processes and interactions over time scales appropriate to this EIS. The Proponent's description of the existing environment shall 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, to adequately identify and characterize the beneficial effects of the Project, and provide the data necessary to enable effective testing of predictions during the follow-up program. The information describing the existing environment may be provided in a stand alone chapter of the EIS or may be integrated into clearly defined sections within the effects assessment of each VEC.

The baseline description should include results from studies done prior to any physical disruption of the environment due to initial site clearing activities planned as part of the site preparation phase. The baseline description shall include characterization of environmental conditions resulting from historical and present activities in the local and regional study area (see Cumulative Effects section). The EIS shall compare baseline data, in areas on which the assessment will focus, with applicable federal, provincial, municipal or other legislative requirements, standards, guidelines or objectives.

The baseline description shall include those VECs, processes and interactions that are likely to be affected by the Project. The Proponent shall also describe the nature and sensitivity of the area within and surrounding the Project. The Proponent shall also indicate the specific geographical areas or ecosystems that are of particular concern, and their relation to the broader regional environment and economy. Relevant information about the VECs is to be presented graphically to document physical and biological (e.g., home range) characteristics.

If the background data have been extrapolated or otherwise manipulated to depict environmental conditions in the study areas, modeling methods and equations shall be described and shall include calculations of margins of error and other relevant statistical information, such as confidence intervals and possible sources of error. Such information can be included in the main body of the EIS or in supporting documents that are referenced in the EIS.

9.1 Physical and Biological Environment

In describing the physical and biological environment, the Proponent shall take an ecosystem approach that considers both scientific and traditional knowledge and perspectives regarding ecosystem health and integrity. The Proponent shall consider the extent to which biological diversity (e.g. ecosystems and/or species diversity) is affected by the Project. The Proponent shall propose and present a rationale for the indicators and measures of ecosystem health, human health, and social health and integrity it uses. These shall be related to Project monitoring and follow-up measures.

For the biological environment, baseline data in the form of inventories alone is not sufficient for the purposes of the EIS. The Proponent shall consider the sensitivity/resilience of species populations, communities and their habitats. As appropriate, the Proponent shall summarize pertinent historical information on the size and geographic extent of animal populations as well as density.

Habitat at regional and local scales should also be defined, as appropriate, in ecological mapping of aquatic and terrestrial vegetation types and species (e.g., ecological land classification mapping). Habitat use should be characterized by type of use (e.g., spawning, breeding, migration corridors, feeding, nursery, rearing, wintering), frequency and duration. Emphasis shall be on those species, communities and processes identified as VECs. However, the interrelations of these components and their relation to the entire ecosystem and communities of which they are a part shall be indicated. The Proponent shall address issues such as habitat, nutrient and chemical cycles, food chains, productivity, to the extent that they are appropriate to understanding the effect of the Project on ecosystem health and integrity. Range and probability of natural variation over time shall also be considered.

9.1.1 Water Quality and Quantity

Surface Water

The EIS shall describe surface water quality and hydrology at the site, local and regional study areas. Where appropriate, maps and figures shall be provided. The description shall assess:

- the hydrological regimes of nearby rivers, streams, and wetlands, and include seasonal fluctuations and year-on-year variability of all surface waters under normal flow, low flow, flooding, and drought conditions;
- the interactions between surface water and groundwater flow systems and indicate areas of interaction; and
- surface water quality and provide maps, figures and a description of sampling protocols and analytical methods.

Groundwater

This section of the EIS shall describe the geology and hydrogeology at the site, local and regional study areas. The description shall include:

- a review of the physical geography and the geology of the area as it pertains to local and regional groundwater flow systems and aquifer/aquitard systems in the study area;
- maps of relevant surface such as surficial and bedrock geology, surface topography, bedrock topography, sediment thickness, and pertinent geological cross-sections;
- a conceptual model of groundwater flow indicating hydrostratigraphy, groundwater recharge, groundwater flow paths and interactions with surface water;
- groundwater hydrographs from available monitoring wells;
- a discussion of groundwater interactions with surface waters;
- a description of baseline groundwater quality at the site and local study area; and
- a comparative analysis of the quality in terms of drinking water criteria, in particular with respect to arsenic.

The following information may also be used to characterise the study area:

- a map and inventory of nearby water well records, monitoring wells, springs and water users, with analysis of information on the local groundwater resource in the area including physical, chemical and biological characteristics;
- maps of potentiometric surfaces of relevant aquifers to delineate regional, local and site groundwater flow patterns and identify recharge and discharge areas;
- hydrogeologic data and maps to characterize and delineate the properties and extent of aquifers and aquitards, as well as define their physical and hydraulic boundaries; and
- information on Shelburne municipal wells including logs, pumping tests, well head protection areas (WHPA) and pumping rates.

9.1.2 Fish and Fish Habitat

Although impacts to fish and fish habitat are not considered likely as a result of the project, preliminary baseline data should be collected and reported in the EIS to appropriately characterise the environment surrounding the project. Should it be determined that impacts to nearby water bodies are likely, additional baseline data may be required to adequately assess impacts and allow for the development of mitigation measures and compensation plans.

The EIS shall include scientifically defensible baseline data that characterizes fish habitat, fish habitat use and fish community within each water body.

This should include the characterization of fish habitat use as spawning, rearing/nursery, feeding, migratory corridor and over wintering/summer refuge.

9.1.3 Terrain and Soil

The EIS shall include:

- baseline mapping and description of landforms and landform processes and soils within the local and regional Project area, including the water main route, to support the effects assessment for all terrestrial disciplines.

9.1.4 Vegetation

The EIS shall characterize the baseline vegetative communities within the area potentially affected by the Project. In particular, the EIS shall include information on the following key communities, species groups or ecosystems that have intrinsic ecological or social value:

- Forests (including areas considered interior forest habitat);
- wetland ecosystems;
- riparian ecosystems; and,
- plant species and ecological communities of conservation concern.

9.1.5 Wildlife

The EIS shall describe and identify:

- the terrestrial species and their habitat at the site and within the local and regional study areas;
- any species of conservation concern and their associated habitat (general, regulated or critical);
- all protected and conservation areas established by federal, provincial and municipal jurisdictions (e.g., wilderness areas, parks, sites of historical or ecological significance, nature reserves, federal migratory bird sanctuaries and wildlife management areas).

The EIS shall describe and identify any biological species of conservation status at a federal, provincial, regional or local level and their critical habitats, as outlined in the sections above.

Information on the habitats (i.e. vegetation communities and bio-physical features) to be impacted/disturbed by the project should be described and compared to the habitat preferences (during all life-cycle phases) of all species at risk whose ranges overlap with the work area. If the habitat preferences of any species at risk are present, a qualified biologist should conduct a

thorough biological inventory of the habitats that have the potential to support species at risk and that will be affected/disturbed by the project, and this should be documented in the EIS.

The following details shall also be provided:

- identification of species of conservation concern that may occur at any point throughout the year in the Project area will be identified and information on relative abundance, distribution and habitat use of these species; and
- the relative abundance, distribution and habitat use of wildlife species of conservation concern, including description of the methodology (survey description, timing, etc.) for each species of conservation concern identified.

9.1.6 Acoustic Environment

The EIS shall describe current ambient noise levels at the site and in the local study areas, and include information on its source(s), geographic extent and temporal variations.

9.1.7 Atmospheric Environment

The EIS shall describe the climate and meteorological conditions at the site, local and regional study areas. Any off-site data used in the description shall be discussed, including an analysis of how representative data is of conditions at the Project site.

9.2 Human Health

The Proponent will provide data on the baseline levels of contaminants in the groundwater at the proposed Well Site and the Town's wells in order to characterize the current and proposed drinking water supply.

Please refer to section 3 of the Health Canada guidance document "*Useful Information for Environmental Assessment*" for more information.

9.3 Aboriginal Land and Resource Use

The EIS shall include:

- An identification of the lands, waters and resources of specific social, economic, archaeological, cultural or spiritual value to Aboriginal people, in relation to asserted and established Aboriginal and treaty rights on which adverse environmental effects could occur.
- Where available, information concerning traditional activities, including activities for food, social, ceremonial and other cultural purposes, in relation to such lands, waters and resources with a focus on the current use of lands, waters and resources for traditional purposes.

Note - traditional land use may include areas where traditional activities such as camping, travel on traditional routes and gathering of country foods (hunting, fishing, trapping, planting and harvesting) are conducted. Spiritual sites should also be considered as a traditional use activity of importance to Aboriginal people.

9.4 Physical and Cultural Heritage Resources

The EIS shall identify any terrestrial and aquatic areas containing features of historical, archaeological, paleontological, architectural or cultural importance. A description of the nature of the features located in those areas shall be provided.

10 ENVIRONMENTAL EFFECTS ASSESSMENT

10.1 Assessment Methodology

Potential effects from all components of the project shall be discussed. The Proponent shall indicate the project's effects during construction and operation and describe these effects using appropriate criteria. In predicting and assessing the project's effects, the Proponent shall indicate important details and clearly state the elements and functions of the environment that may be affected, specifying the location, extent and duration of these effects and their overall impact. The EIS shall assess impacts during operation from the project at the intended maximum permitted pumping rate for the new well.

In undertaking the environmental effects assessment, the Proponent shall use best available information and methods. All conclusions shall be substantiated. Predictions shall be based on clearly stated assumptions. The Proponent shall describe how it has tested each assumption. With respect to quantitative models and predictions, the Proponent shall discuss the assumptions that underlie the model, the quality of the data and the degree of certainty of the predictions obtained.

The assessment of the effects of each of the components and activities, in all phases, shall be based on a comparison of the biophysical and human environments between the predicted future conditions with the project and the predicted future conditions without the project. The assessment shall reveal the environmental effects of the project, the technically and economically feasible mitigation measures proposed to be implemented and an assessment of the effectiveness of those measures. Where mitigation measures are proposed to be implemented for which there is little experience or for which there is some question as to their effectiveness, the potential risks and effects to the environment should those measures not be effective should be clearly and concisely described.

The consideration of views from the public and Aboriginal groups, including any perceived changes attributed to the project, shall be recognized and addressed in the assessment method.

10.1.1 Risk Assessment Framework

Where appropriate, the Proponent is expected to employ standard ecological risk assessment frameworks that categorize the levels of detail and quality of the data required for the assessment. These tiers are as follows:

- Tier 1: Qualitative (expert opinion, including traditional and local knowledge, literature review, and existing site information);
- Tier 2: Semi-quantitative (measured site-specific data and existing site information); and
- Tier 3: Quantitative (recent field surveys and detailed quantitative methods).

Thus, if the Tier 2 assessment still indicates a potential for effects to VECs, a Tier 3 assessment would need to be conducted to reduce the level of uncertainty. If the risk characterization component is uncertain this may necessitate the probabilistic modelling of the population level consequences of the proposed project.

10.1.2 Impact Matrix

An impact matrix methodology in combination with identification of VECs should be used to evaluate various social and environmental effects of the proposed project, as well as the impact of environmental effects on asserted and established Aboriginal and treaty rights. The assessment should include the following general steps:

1. identification of the activities and components of the project;
2. predicting/evaluating the likely environmental effects on identified valued ecosystem components;
3. identification of technically and economically feasible mitigation measures for any significant adverse environmental effects;
4. determination of any residual environmental effects;
5. ranking of each residual adverse environmental effect based on various criteria; and
6. determination of the potential significance of any residual environmental effect following the implementation of mitigation.

10.1.3 Mitigation Measures

Under the Act, 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. Every comprehensive study conducted under the Act shall consider measures that

are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project.

As a first step, the Proponent is encouraged to use an approach based on the avoidance and reduction of the effects at the source. Such an approach may include the modification of the design of the project or relocation of project components.

The Proponent shall describe the standard mitigation practices, policies and commitments that constitute technically and economically feasible mitigation measures and that will be applied as part of standard practice regardless of location. The Proponent shall then describe its environmental protection plan and its environmental management system, through which it will deliver this plan. The plan shall provide an overall perspective on how potentially adverse effects would be minimized and managed over time. As well, the Proponent shall describe its commitments, policies and arrangements directed at promoting beneficial or mitigating adverse socioeconomic effects. The Proponent shall discuss the mechanisms it would use to require its contractors and sub-contractors to comply with these commitments and policies and with auditing and enforcement programs.

The EIS shall specify the actions, works, minimal disturbance footprint techniques, best available technology, corrective measures or additions planned during the project's various phases (construction, operation) to eliminate or reduce the significance of adverse effects. The impact statement shall also present an assessment of the effectiveness of the proposed technically and economically feasible mitigation measures. The reasons for determining if the mitigation measure reduces the significance of an adverse effect shall be made explicit.

The Proponent shall indicate what other technically and economically feasible 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 shall be justified. The Proponent shall identify who is responsible for the implementation of these measures and the system of accountability.

For certain VECs, where adverse residual effects are anticipated and are unavoidable, the Proponent shall implement compensation measures. These measures shall apply both to the biophysical environment and the human environment. The choice of measures is made in cooperation with the users and relevant authorities. Any compensation measures put in place for the Project, including those provided under agreement, shall be described.

In addition, the Proponent shall identify the extent to which technology innovations will help mitigate environmental effects. Where possible, it shall provide detailed information on the nature of these measures, their implementation, and their management and on whether follow-up will be required.

10.1.4 Residual Effects

After having established the technically and economically feasible mitigation measures, the EIS should present any residual effects of the project on the biophysical and human environments after these mitigation measures have been taken into account. The residual effects, even if very small or deemed insignificant should be described.

The EIS shall include a summary (see section 10.8) of the project's residual effects so that the reader clearly understands the real consequences of the project, the degree to which effects can be mitigated and which effects cannot be mitigated or compensated.

10.1.5 Determination of the Significance of Residual Effects

Relevant guidance material for this section can be found at Canadian Environmental Assessment Agency - Policy & Guidance - Guidance Materials (see Procedural Guides).

The EIS shall identify the criteria used to assign significance ratings to any predicted adverse effects. The EIS shall contain a detailed analysis of the significance of the potential residual adverse environmental effects it predicts. It shall contain clear and sufficient information to enable the Agency, technical and regulatory agencies, Aboriginal groups and the public to understand and review the Proponent's judgment of the significance of effects. The Proponent shall define the terms used to describe the level of significance.

The following elements should be used in determining the significance of residual effects:

- magnitude;
- geographic extent;
- timing, duration and frequency;
- reversibility;
- ecological and social context; and
- existence of environmental standards, guidelines or objectives for assessing the impact.

In assessing significance against these criteria, the EIS shall, where possible, employ relevant existing regulatory documents, environmental standards, guidelines, or objectives such as prescribed maximum levels of emissions or discharges of specific hazardous agents into the environment or maximum acceptable levels of specific hazardous agents in the environment. The EIS should contain a section which explains the assumptions, definitions and limits to the criteria mentioned above in order to maintain consistency between the effects on each VEC.

The analysis of the significance of the effects shall contain sufficient information to allow the Agency, technical and regulatory agencies, Aboriginal groups and the public to understand and evaluate the reasoning of the Proponent. The Proponent shall provide a summary of the regional, provincial, Aboriginal or national objectives, standards or guidelines that have been used to assist in the evaluation of the significance of environmental effect.

If significant adverse effects are identified, the Proponent shall determine the probability (likelihood) that they will occur. The Proponent shall also address the degree of scientific uncertainty related to the data and methods used within the framework of its environmental analysis.

The EIS shall clearly explain the method and definitions used to describe the level of the adverse effect (e.g. low, moderate, high) for each of the above categories and how these levels were combined to produce an overall conclusion on the significance of adverse effects for each VEC. This method shall be transparent and reproducible.

10.1.6 Summary of Effects Assessment

For all key valued ecosystem components that were assessed, the Proponent shall provide in a Table format, a summary of the following key information:

- a concise summary of the Project's effects;
- a summary of mitigation and compensation measures;
- a brief description of any potential residual effects;
- a brief description of cumulative effects; and
- a determination of the significance of residual effects.

10.2 Physical and Biological Environment

In conducting the effects assessment on the physical and biological environment, the Proponent shall give consideration to the guidance provided in the following sections.

10.2.1 Water Quality and Quantity

10.2.1.1 Hydrology and Hydrogeology

Surface Water

Utilizing the baseline data, the EIS shall assist in the development of water quality and quantity predictions and mitigation requirements.

The EIS shall evaluate the potential impact to surface water bodies as a result of:

- well construction (e.g. sediment, spills)
- well operation including the capture of water that would otherwise discharge to streams and the lowering of the water table on wetlands.

The assessment should also evaluate potential surface water impacts resulting from changes in groundwater and surface water interactions.

Groundwater

The EIS shall consider the potential impacts caused by the withdrawal of groundwater during project development (i.e. construction, operations), or the creation of physical changes to the aquifers within the project area (e.g. pipelines may influence drainage). The evaluation shall consider the potential impacts resulting from:

- changes to groundwater flow (direction or fluxes);
- changes to groundwater quality;
- changes in groundwater availability to local users;
- changes to groundwater discharge to streams; and
- changes to wetland water levels or flows.

This assessment shall be supported by quantitative estimates where possible.

10.2.2 Fish and Fish Habitat

The EIS shall identify potential effects on fish and fish habitat during all phases of the Project.

The potential effects and planned mitigation strategies for avoiding impacts to fish and fish habitat shall be identified for the following at a minimum:

- footprint of development; and
- infrastructure development.

The analysis of potential effects shall consider:

- habitat loss or alteration, including aquatic vegetation and sensitive areas such as spawning grounds, nursery/rearing areas, feeding areas, summer/winter refuges and migration corridors;
- potential for changes in migratory fish behaviour as a result of changes in water quality and quantity; and
- mortality of fish.

10.2.3 Terrain and Soil

The EIS shall identify potential effects on terrain and soil during all phases of the Project. The EIS shall outline:

- measures taken to prevent contamination of soil during construction and operation; and
- rehabilitation techniques during restoration.

10.2.4 Vegetation

The EIS shall identify potential effects on vegetation during all phases and on all the components of the Project.

The EIS shall include a detailed assessment of key indicator communities, species groups or ecosystems representative of overall ecosystem condition and are sensitive to Project activities.

The EIS shall:

- assess the potential effects of the Project on vegetation, including species known to be important to Aboriginal people and groups; and
- develop mitigation measures to minimize or eliminate Project effects on vegetation, ecosystem function and wildlife habitat.

10.2.5 Wildlife

The EIS shall identify potential effects on wildlife during all phases and on all the components of the Project. The EIS shall include:

- the identification and assessment of the potential effects on local wildlife, including migratory birds protected under the *Migratory Birds Convention Act*;
- a summary of the amount and type of wildlife habitat potentially impacted by the Project, including any impacts on wildlife movement corridors and forest interior habitat; and
- identification of mitigation measures to minimize or eliminate any adverse effects on wildlife, including wildlife habitat.

Species at Risk

The EIS shall address issues related to species at risk for the areas potentially affected by the Project. This shall include the identification and assessment of the potential effects of the Project on wildlife species of conservation concern (i.e., COSEWIC-listed species, species listed under the *Species at Risk Act* and/or *Endangered Species Act* and their habitats).

10.2.6 Acoustic Environment

The EIS shall assess the potential for noise effects resulting from the Project. The EIS shall:

- identify and assess the impacts from potential noise sources including reference to construction and operational phases as well as to noise associated with increased road traffic;

- identify potential receptors and describe the proximity of identified receptors to Project operations including identification and description of whether particular receptors may have a heightened sensitivity to noise exposure or expectation of peace and quiet;
- describe mitigation and noise management measures including the conditions for mitigation and evaluate Project compliance with appropriate noise guidelines.

The Proponent should refer to Health Canada's document *Useful Information for Environmental Assessments* for more details on assessing potential noise impacts from the project.

10.2.7 Atmospheric Environment

- The baseline climate data collected as per Section 9.1.7 should be used to assist in the air quality assessment.

Criteria Air Contaminants

The EIS shall identify the potential effects on air quality associated with all Project phases. \ The analysis shall include a qualitative assessment of short-term air quality impacts from site preparation and construction-related activities and any long term impacts from emissions during operation.

The EIS should also include a discussion of the following:

- measures considered to minimize the release of greenhouse gasses and air contaminants (dust - both emissions and fugitive, particulate exhaust fumes and other air contaminants);
- impacts on identified sensitive receptors including biological receptors such as vegetation, fish, wildlife and human health.

Dustfall

The EIS documentation shall consider measures to mitigate dustfall during construction.

Greenhouse Gases

With respect to Greenhouse Gases (GHGs), the EIS shall:

- identify mitigation measures considered to control Project GHG emissions; and
- discuss the sensitivity of the Project to changes in specific climate and related environmental parameters, including total annual rainfall, total annual snowfall, frequency and/or severity of precipitation extremes, lake levels and stream flow.

Additional guidance can be obtained from *Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners* (CEAA 2003).

10.3 Socio-Economic Environment

10.3.1 Human Health

The EIS shall include consideration of the potential effects of construction and operational phases when assessing impacts to human health. The EIS shall examine the potential effects of the Project on human health, primarily in relation to drinking water, but also including noise and air quality. The EIS should demonstrate:

- How it will meet provincial drinking water standards. Any water designated for drinking and recreation shall be assessed for potential contamination and shall meet the Guidelines for Canadian Drinking Water Quality and Guidelines for Canadian Recreational Water Quality. Use of drinking water treatment systems shall be discussed;
- the effect of the Project on air quality, including a qualitative assessment of the potential for health risks from air emissions resulting from all phases of the project.
- the expected duration of noise due to construction and operation activities and an evaluation of the severity of predicted changes in noise levels and how they may affect human health; and
- mitigation measures and monitoring of air quality, water quality and noise.

The Proponent should refer to Health Canada's document *Useful Information for Environmental Assessments* (Health Canada, 2007) for more details on assessing human health in the EIS.

10.3.2 Aboriginal Land and Resource Use

Aboriginal Interest and Current Use of Lands and Resources by Aboriginal Persons

The EIS shall provide information regarding the effects of the Project on Aboriginal groups' interests and on asserted or established Aboriginal and treaty rights. Based on information provided by Aboriginal groups, or, if Aboriginal groups do not provide this information, on available information from other sources, the Proponent shall identify:

- any potential social and/or economic effects to Aboriginal groups that may arise as a result of environmental effects of the Project on a group by group basis;
- any potential environmental effects on current and proposed uses of land and resources by Aboriginal persons for traditional purposes including, but not limited to, hunting, fishing, trapping, cultural and other traditional uses of the land (e.g. collection of medicinal plants, use of sacred sites);

- any environmental effects which have effects on lifestyle, culture and quality of life of Aboriginal groups;
- measures to avoid, mitigate, compensate or accommodate environmental effects which may limit the current use of lands and resources for traditional purposes;
- any environmental effects of the Project which result in effects on heritage and archaeological resources in the Project area that are of importance or concern to Aboriginal groups; and
- the residual impacts of any effects identified above on asserted or established Aboriginal and treaty rights.

10.3.3 Physical and Cultural Heritage Resources

Physical and cultural heritage resources shall be considered in the EIS. According to Canadian Environmental Assessment Agency guidance document *Reference Guide: Assessing Environmental Effects on Physical and Cultural Heritage Resources* (April 1996), a cultural heritage resource is a human work or a place that gives evidence of human activity or has spiritual or cultural meaning, and that has historic value. Cultural heritage resources are distinguished from other resources by virtue of the historic value placed on them through their association with an aspect(s) of human history. This interpretation of cultural resources can be applied to a wide range of resources, including, cultural landscapes and landscape features, archaeological sites, structures, engineering works, artefacts and associated records.

When undertaking the effects assessment on cultural and heritage resources, the Proponent shall follow the Guiding Principles outlined earlier in these Guidelines.

The EIS shall assess the potential effects of on site and off site components of the Project on archaeological and heritage resources. The proponent should consult with the provincial Ministry of Tourism and Culture to determine if an archaeological impact assessment is required. If an assessment has already been conducted, the EIS should summarize the results and proposed measures to mitigate effects.

10.4 Effects of the Environment on the Project

The definition of an ‘environmental effect’ under the Act includes any change to the project that may be caused by the environment. Therefore the EIS shall take into account how local conditions and natural hazards, such as severe and/or extreme weather conditions and external events (e.g. flooding, ice jams, rock slides, landslides, fire, drought, low snowfall during winter, outflow conditions and seismic events) could adversely affect the project.

The sensitivity of the project to long-term climate variability and effects shall be identified and discussed. The Canadian Environmental Assessment Agency Procedural Guide, *Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners* (2003), provides guidance for incorporating climate change considerations in an EA.

The EIS shall provide details of planning, design and construction strategies intended to minimize the potential environmental effects of the environment on the project.

10.5 Effects of Potential Accidents or Malfunctions

The Proponent shall identify the probability of potential accidents and malfunctions related to the project, including an explanation of how those events were identified, potential consequences (including the environmental effects), the worst case scenarios and the effects of these scenarios.

The geographical and temporal boundaries for the assessment of malfunctions and accidents may be different than those in the scope of factors for each VEC. This shall include an identification of the magnitude of an accident and/or malfunction, including the quantity, mechanism, rate, form and characteristics of the contaminants and other materials likely to be released into the environment during the accident and malfunction events.

The EIS shall also describe the safeguards that have been established to protect against such occurrences and the contingency/emergency response procedures in place if an accident and/or malfunction does occur.

The assessment of the environmental effects of potential accidents, malfunctions and unplanned events may include, but is not limited to those considerations associated with the following Project activities or eventualities:

- the transport of goods which are potentially harmful to the environment, to and from the Project site;
- waste management and disposal (solid and liquid);
- handling and use of chemicals on-site;
- evaluation of worst case scenarios;
- premature closure of the Project during any phase;
- controlled and uncontrolled discharges (surface water and groundwater); and
- any other Project component or system that has the potential, through accident or malfunction, to adversely affect the natural environment.

Detailed contingency and response plans should be presented.

10.6 Capacity of Renewable Resources

The EIS shall include an assessment of the capacity of 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 EIS shall identify those resources likely to be significantly affected by the Project, and describe how the Project could affect their sustainable use.

With respect to water resources, the EIS should demonstrate that the proposed rate of groundwater withdrawal is sustainable and will not produce any long-term declines in water levels (i.e. that groundwater recharge is sufficient to sustain pumping rates).

10.7 Cumulative Environmental Effects

The Proponent shall identify and assess the cumulative environmental effects of the Project, including on site and off site components, in combination with other past, present or reasonably foreseeable projects and/or activities within the study areas. The approach and methods used to identify and assess cumulative effects shall be explained. The Canadian Environmental Assessment Agency's Operational Policy Statement OPSEPO/ 2- 2007, *Addressing Cumulative Environmental Effects under the Canadian Environmental Assessment Act*, and the *Cumulative Effects Assessment Practitioner's Guide* (CEAA 1999) provide further guidance for conducting cumulative effects assessment.

Cumulative effects may result if:

- implementation of the project being studied caused direct residual negative effects on the environmental components, taking into account the application of technically and economically feasible mitigation measures; and/or
- the same environmental components are affected by other past, present or reasonably foreseeable future actions (projects or activities).

Environmental components that would not have an adverse effect from the project can, therefore, be omitted from the cumulative effects assessment. A cumulative effect on an environmental component may, however, be important even if the assessment of the project's effects on this component reveals that the effects of the project are minor.

The EIS shall describe the analysis of the total cumulative effect on a VEC over the life of the project, including the incremental contribution of all current and proposed projects and activities, in addition to that of the project. The EIS shall include different forms of effects (e.g. synergistic, additive, induced, spatial or temporal) and identify impact pathways and trends.

The Act (S. 16.2) allows for the consideration of information from relevant regional studies of environmental effects from possible future projects.

10.7.1 Scoping

The EIS shall identify other developments and activities that will be considered in the assessment of cumulative environmental effects, as well as document the sources of information used to arrive at this identification. A rationale should be provided for any components or other projects that will not be included in this analysis. This section should also define the spatial and temporal boundaries upon which cumulative environmental effects will be identified, predicted and evaluated.

In particular, the Agency requests that the quarry proposed by the Highland Companies Inc. in Melancthon be included in cumulative effects assessment of the EIS. In addition to the VECs, the assessment should address the potential interaction between the two projects with respect to water supply and whether both projects are drawing water from the same or connecting aquifers.

The EIS shall identify and justify the environmental components that will constitute the focus of the cumulative effects assessment. The Proponent's assessment should emphasize the cumulative effects on the main valued ecosystem components (VEC) that could potentially be most affected by any components of the project. To this end, the Proponent shall consider, without limiting itself thereto, the following components likely to be affected by the Project:

- aquatic resources/ecosystems/watersheds;
- groundwater and surface water resources; and
- key valued wildlife species, such as provincially or federally listed species at risk and Bird Conservation Region priority species.

The EIS shall identify and justify the spatial and temporal boundaries for the cumulative effect assessment for each VEC selected. The boundaries for the cumulative effects assessments will generally be different for different effects considered. These cumulative effects boundaries will also generally be larger than the boundaries for the corresponding project effects.

The final choice of VECs and the appropriate boundaries selected to assess the cumulative effects for each VEC shall be determined in consultation with the public, Aboriginal groups, federal and provincial government departments and relevant stakeholders.

If the project is likely to result in improved infrastructure in the area or may facilitate access into the area, the Proponent should evaluate the likelihood of further development in the area that could result in increase cumulative effects on the same valued ecosystem components.

10.7.2 Methodology for Identifying, Predicting and Assessing Cumulative Environmental Effects

The EIS should describe the detailed methodology used to determine the environmental effects of these other developments and activities. The methods used to combine the Proponent's project effects with those of other foreseeable developments and activities, and the methods used to determine the significance of those combined effects, should also be described. The rationale for choosing selected baseline conditions against which cumulative environmental effects are assessed should also be explained.

10.7.3 Potential Cumulative Effects

The EIS shall identify the sources of potential cumulative effects. Specify other projects or activities that have been or will be carried out that could cause effects on each selected VEC within the boundaries defined, and whose effects would act in combination with the residual effects of the project.

The objective is *not* to identify two classes of environmental effects. Instead, the EIS should identify a *single* set of environmental effects that take into account the aggregate effect of the project in the context of other foreseeable developments and activities acting upon the environment.

10.7.4 Mitigation Measures

The EIS shall identify technically and economically feasible measures that will mitigate any significant adverse cumulative environmental effects. The Proponent shall assess the effectiveness of the mitigation measures. In cases where measures exist that are beyond the scope of the Proponent's responsibility that could be effectively applied to mitigate the effects, the Proponent shall identify these effects and the parties that have the authority to act. In such cases, the Proponent shall summarize the discussions that took place with the other parties in order to implement the necessary measures over the long term.

10.7.5 Determination of significance

The Proponent shall determine the significance of the residual cumulative environmental effects that remain after mitigation has been implemented for each cumulative effect (refer to Section 10.1.5).

10.8 Summary

For all key VECs that were assessed, the EIS should contain a table summarizing the following key information:

- concise summary of potential adverse environmental effects;

- summary of proposed mitigation and compensation measures;
- a brief description of potential residual effects;
- a brief description of potential cumulative effects;
- any applicable standards or guidelines;
- comments from the public and responses; and
- comments from Aboriginal groups and individuals and responses.

11 ECONOMIC AND SOCIAL BENEFITS OF THE PROJECT

Information on the predicted economic and social benefits of the project should be presented. This information will be considered by the Agency and technical and regulatory agencies in assessing the justifiability of any significant adverse environmental effects, if necessary.

12 BENEFITS TO CANADIANS

The Proponent shall describe how the EA process for the proposed project provided a benefit to Canadians. Factors to be considered include, but are not limited to:

- maximized environmental benefits
 - What were the environmental benefits created as a result of the project going through the EA process? (e.g., Will the project reduce habitat fragmentation of a species-at-risk? etc.)
- contribution of the EA to support sustainable development
 - Describe how the EA process for the project contributed to the concept of sustainable development for a healthy environment and economy.
- aboriginal Consultation and Public Participation
 - How did Aboriginal consultation and public participation in the EA influence the project design and the environmental effects analysis?
- technological innovations
 - Were there any new technologies developed to address environmental impacts that could be used for other projects?
- increases in scientific knowledge
 - Describe any new scientific information collected through the EA that could benefit the assessment of other projects.

- community and social benefits
 - Describe any changes in project design that resulted in benefits to communities and/or social benefits (e.g., enhanced access to wilderness areas for recreation).

13 ENVIRONMENTAL MANAGEMENT

13.1 Follow-Up Program

A formal follow-up program as per the requirements outlined in section 38 of the Act, is designed to verify the accuracy of the EA and to determine the effectiveness of the measures implemented to mitigate the adverse environmental effects of the project. The EIS should describe the proposed follow-up program plan in sufficient detail to allow independent judgment as to the likelihood that it will deliver the type, quantity and quality of information required to reliably verify predicted effects (or absence of them), and to confirm both the EA assumptions and the effectiveness of mitigation.

The description of the follow-up program shall include any contingency procedures/plans or other adaptive management provisions as a means of addressing unforeseen effects or for correcting exceedances as required to comply or to conform to benchmarks, regulatory standards or guidelines.

The EIS shall provide the following:

- a discussion of the proposed follow-up program and its objectives;
- a description of the main components of the program and each monitoring activity under that component;
- a discussion of the objectives the monitoring activity is fulfilling (i.e. confirmation of mitigation, confirmation of assumptions; verification of predicted effects);
- the structure of the program;
- a schedule for the finalization and implementation of the follow-up program;
- a description of the roles and responsibilities for the program and its review process, by both peers, Aboriginal groups, and the public;
- possible involvement of independent researchers;
- the sources of funding for the program; and
- information management and reporting.

13.2 Table of Commitment

The EIS shall summarize the Proponent's key commitments in implementing mitigations, contingency plans, monitoring, taking corrective actions, reclaiming the site and providing offsets for unavoidable Project effects. The summary of commitments shall include:

- a summary of all significant management commitments;
- any applicable standards, legislation and/or policies;
- a discussion of any special management practices or design feature commitments; and
- a table summarizing the timing and responsibility for each of the actions for which a commitment has been made.

14 ASSESSMENT SUMMARY AND CONCLUSION

This section of the report shall summarize the overall findings with emphasis on the main environmental issues identified.

REFERENCES

- Canada. 2003. A Framework for the Application of Precaution in Science-based Decision Making About Risk. Accessed January 15, 2009. <http://www.pco-bcp.gc.ca/docs/information/Publications/precaution/Precaution-eng.pdf>
- Canadian Environmental Assessment Agency. Operational Policy Statement. 2007. Addressing “Need for”, “Purpose of”, “Alternatives to” and “Alternative Means” under the *Canadian Environmental Assessment Act*. [Canadian Environmental Assessment Agency - Policy & Guidance - Operational Policy Statement - Addressing "Need for", "Purpose of", "Alternatives to" and "Alternative Means" under the CEA Act](#)
- Canadian Environmental Assessment Agency. Operational Policy Statement. 2007. Addressing Cumulative Environmental Effects under the *Canadian Environmental Assessment Act*. [Canadian Environmental Assessment Agency - Policy & Guidance - Operational Policy Statement - Addressing Cumulative Environmental Effects under the Canadian Environmental Assessment Act](#)
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- Canadian Environmental Assessment Agency, Reference Guide 1994: Addressing Cumulative Environmental Effects. [Canadian Environmental Assessment Agency - Policy & Guidance - The Responsible Authority's Guide](#)
- Canadian Environmental Assessment Agency. Procedural Guide. 1999 “Cumulative Effects Assessment Practitioners Guide”, Hegmann, G., C. Cocklin, R. Creasey, S. Dupuis, A. Kennedy, L. Kingsley, W. Ross, H. Spaling and D. Stalker. Prepared by: The Cumulative Effects Assessment Working Group and AXYS Environmental Consulting Ltd. <http://dsp-psd.pwgsc.gc.ca/Collection/En106-44-1999E.pdf>
- Health Canada, Guidelines for Canadian Drinking Water Quality, December 2010. http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/2010-sum_guide-res_recom/index-eng.php
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