

**Draft EA Guidelines  
(Scope of Project and Assessment)**

**Environmental Assessment of a Proposal for the  
Refurbishment and Continued Operations of Pickering  
B Reactors at the Pickering B Nuclear Generating  
Station**

Prepared by the Canadian Nuclear Safety Commission

September 2006

## TABLE OF CONTENTS

<b>1.0</b>	<b>PURPOSE</b> .....	<b>1</b>
<b>2.0</b>	<b>BACKGROUND</b> .....	<b>1</b>
<b>3.0</b>	<b>APPLICATION OF THE CANADIAN ENVIRONMENTAL ASSESSMENT ACT</b> ....	<b>2</b>
<b>4.0</b>	<b>IDENTIFICATION OF OTHER FEDERAL AND PROVINCIAL EXPERT DEPARTMENTS</b> .....	<b>2</b>
<b>5.0</b>	<b>DELEGATION OF ASSESSMENT STUDIES TO ONTARIO POWER GENERATION</b> .....	<b>3</b>
<b>6.0</b>	<b>PUBLIC REGISTRY</b> .....	<b>3</b>
<b>7.0</b>	<b>SCOPE OF THE PROJECT</b> .....	<b>4</b>
<b>8.0</b>	<b>FACTORS TO BE CONSIDERED IN THE SCREENING</b> .....	<b>5</b>
<b>9.0</b>	<b>ASSESSMENT METHODOLOGY</b> .....	<b>6</b>
<b>9.1</b>	<b>Structure of the EA Screening Report</b> .....	<b>6</b>
<b>9.2</b>	<b>Specific Information Requirements</b> .....	<b>7</b>
9.2.1	<i>Purpose of the Project</i> .....	7
9.2.2	<i>Project Description</i> .....	7
9.2.3	<i>Spatial and Temporal Boundaries of the Assessment</i> .....	10
9.2.4	<i>Description of the Existing Environment</i> .....	11
9.2.5	<i>Assessment and Mitigation of Environmental Effects</i> .....	12
9.2.6	<i>Assessment of Cumulative Effects</i> .....	14
9.2.7	<i>Assessment of the Effects on the Capacity of Renewable and Non-renewable Resources</i> .....	14
9.2.8	<i>Significance of the Residual Effects</i> .....	15
9.2.9	<i>Stakeholder Consultation</i> .....	15
9.2.10	<i>Follow-up Program</i> .....	16
<b>10.0</b>	<b>ENVIRONMENTAL ASSESSMENT PROCESS</b> .....	<b>16</b>
<b>11.0</b>	<b>CONCLUSIONS AND RECOMMENDATIONS FOR DECISION</b> .....	<b>17</b>
<b>12.0</b>	<b>CONTACTS FOR THE ASSESSMENT</b> .....	<b>17</b>
<b>13.0</b>	<b>REFERENCES</b> .....	<b>18</b>
<b>14.0</b>	<b>GLOSSARY OF TERMS</b> .....	<b>19</b>

## 1.0 PURPOSE

The purpose of this document is to provide guidance on the scope of the environmental assessment (EA) to be conducted in relation to Ontario Power Generation's (OPG) proposal to refurbish Units 5, 6, 7 and 8 of the Pickering B Nuclear Generating Station (NGS) to extend the operating life of the units to the end of the service life of the reactors estimated to be until about 2060. Pickering B is located on the Pickering NGS site in the City of Pickering, within the Regional Municipality of Durham, Ontario, on the north shore of Lake Ontario at Moore Point. The site is at about 32 km east-northeast of the City of Toronto (downtown) and 21 km southwest of the City of Oshawa. The site is shared with two other separately licensed facilities, the Pickering A NGS and the Pickering Waste Management Facility (PWMF). OPG has submitted a project description of the proposal to the Canadian Nuclear Safety Commission (CNSC).

A federal EA of the proposed project is required under the provisions of the *Canadian Environmental Assessment Act* (CEAA). Under the CEAA, the scope of the project and the scope of the factors included in the assessment are to be determined by the Responsible Authority that, in this case, is the CNSC.

The EA Guidelines describe the basis for the conduct of the EA, and focus the assessment on relevant issues and concerns. The document also provides specific direction to the proponent, OPG, on how to document the technical EA study which will be delegated to them by the CNSC staff pursuant to subsection 17(1) of the CEAA. The document indicates the necessary information to be submitted by the proponent to the CNSC to facilitate the development of the EA Screening Report. In addition, the EA Guidelines provide a means of communicating the CNSC's EA process to stakeholders.

## 2.0 BACKGROUND

OPG wrote and provided a project description to the CNSC, indicating their intent to refurbish and to continue to operate the Pickering B Units 5, 6, 7 and 8 with a view of extending their operating lives until about 2060 [References 1, 2 and 3].

Pickering B is currently licensed by the CNSC as a Class I Nuclear Facility under the *Nuclear Safety and Control Act* (NSCA). CNSC authorization of licensed activities at Pickering B is governed by the Nuclear Power Reactor Operating Licence PROL 08.10/2008, issued to OPG by the CNSC on August 3, 2006, pursuant to subsection 24(2) of the NSCA.

CNSC approval to refurbish and extend the operating life of these units requires an amendment pursuant to subsection 24(2) of the NSCA to their current operating licence. The EA to be completed under the CEAA will provide part of the information that the CNSC will use in considering OPG's proposal. The proposal will also be subjected to a thorough evaluation under the provisions of the NSCA and its regulations. That includes a detailed safety review as part of the CNSC licensing process which provides the public with the opportunity to provide input to the Commission prior to any licensing decision being made on the project.

The licensing application does not pertain to the other separately licensed facilities within the Pickering site, including the Pickering A and the existing on-site PWSMF.

### **3.0 APPLICATION OF THE CANADIAN ENVIRONMENTAL ASSESSMENT ACT**

The CNSC staff has determined, pursuant to paragraph 5 (1)(d) of the CEAA, that a federal EA is required before the CNSC can amend the current licence to provide OPG with authorization to refurbish and to continue to operate Units 5, 6, 7, and 8 of the Pickering B NGS. The CNSC is the Responsible Authority under the CEAA for the purposes of the assessment.

There are no other CEAA triggers, such as funding, being a proponent or disposing of an interest in land to support the proposed project, that involve the CNSC.

The proposed licensing action would involve authorization of activities relating to a physical work, namely the refurbishment and continued operation of the Pickering B NGS, and thus there is a project for the purposes of the CEAA. There are no identified exclusions from EA for the project pursuant to section 7 of the CEAA and Schedule I of the *Exclusion List Regulations* of the CEAA. Accordingly, CNSC authorization of the licensing for activities related to the refurbishment and continued operation of Units 5, 6, 7 and 8 of the Pickering B facility including the operations of the Pickering B NGS until about 2060, will require that a federal EA be conducted pursuant to the CEAA.

The project is not of a type identified in the *Comprehensive Study List Regulations* of the CEAA. At this time, CNSC staff is not aware of any potentially significant adverse environmental effects or public concerns associated with this project which would warrant a need to have it referred to a mediator or review panel pursuant to section 25 of the CEAA. Thus, the appropriate stream of assessment will be a screening. Therefore, pursuant to subsection 18(1) of the CEAA, the CNSC must ensure that a screening-level EA is completed and that a Screening Report be prepared before the proposed licensing decision can be made pursuant to the NSCA.

### **4.0 IDENTIFICATION OF OTHER FEDERAL AND PROVINCIAL EXPERT DEPARTMENTS**

CNSC is the only Responsible Authority (RA) identified under the CEAA for this screening at this time.

Pursuant to the CEAA *Federal Coordination Regulations*, the CNSC is currently consulting with a number of federal departments to determine whether they are likely to exercise one of the powers, functions or duties under section 5 of the CEAA and/or whether they possess expert assistance that could be used during the assessment in accordance with subsection 12(3) of the CEAA. These are; Health Canada (HC), Environment Canada (EC), Natural Resources Canada (NRCan), the Department of Fisheries and Oceans (DFO), the Department of Indian Affairs and Northern Development (DIAND) and Transport Canada.

The CNSC is also consulting the Ontario Ministry of the Environment (OMOE) to determine whether there are provincial EA requirements under the *Ontario Environmental Assessment Act* that are applicable to the proposal.

## **5.0 DELEGATION OF ASSESSMENT STUDIES TO ONTARIO POWER GENERATION**

Pursuant to subsection 17(1) of the CEAA, the CNSC will delegate to OPG the conduct of technical support studies for the EA, the development and implementation of a public consultation program, and the preparation of an EA Study Report.

OPG will submit a draft version of its EA Study Report and technical support studies to the CNSC. CNSC staff will distribute the draft EA Study Report and supporting documentation to Federal Authorities, and the appropriate provincial authorities, for review and comment. Based on comments received, CNSC staff may request the proponent to revise its EASR, or request that the proponent produce a final EA Study Report. When the EA Study Report is considered satisfactory to CNSC and Federal Authority technical reviewers, CNSC staff will prepare an EA Screening Report. A draft version of the EA Screening Report will be made available for review and comment by the public. CNSC staff will consider comments received, make appropriate revisions and submit a revised EA Screening Report to the Commission for consideration and decision.

## **6.0 PUBLIC REGISTRY**

The CNSC has established a public registry for the assessment as required by section 55 of the CEAA. This includes identification of the assessment in the Canadian Environmental Assessment Registry (CEAR), which can be accessed on the Internet Web site of the Canadian Environmental Assessment Agency ([www.ceaa.gc.ca](http://www.ceaa.gc.ca)). CEAR number for this project is 06-01-21226.

The CEAR will include the following documentation:

- description of the project;
- notices of commencement and termination;
- EA decisions; and
- notices requesting public input.

Interested parties will be able to obtain copies of these documents by accessing the CEAR website, and downloading the files. Interested parties may obtain copies of specific documents on the list from CNSC staff contacts (see section 12.0).

## 7.0 SCOPE OF THE PROJECT

In determining the scope of a project for an assessment under the CEAA, one must determine which physical works (e.g., facilities) are involved in the proposal and what specific undertaking(s) will be carried out in relation to those physical works. The physical works in this case are the Pickering B Units 5, 6, 7 and 8 and ancillary systems necessary for their operation through to about 2060. The proposed undertakings in relation to the physical works are the refurbishment and continued operation of these units until about 2060.

Decommissioning is not part of the scope of project; however, a description of the preliminary decommissioning plan will be required for this EA. Decommissioning will be subject to the requirements under the NSCA and a determination regarding the application of the CEAA will be made at that time.

The scope of project will consider refurbishment activities, including:

- site and facility preparation in support of refurbishment;
- refurbishment activities at each of the four Pickering B units comprising of the following activities:
  - defuelling and dewatering of the reactor;
  - management of heavy water during refurbishment;
  - replacement of reactor components (fuel channel assemblies and feeder pipes);
  - replacement of steam generators;
  - replacement or upgrade of systems and components for balance of plant;
  - preparation of low and intermediate-level refurbishment waste for storage;
  - transportation of low and intermediate-level refurbishment waste on the Pickering site; and
  - management of non-nuclear waste;
- construction of structures for the interim storage of low and intermediate-level steam generator and fuel assembly refurbishment waste at the Pickering site;
- interim storage of low and intermediate-level steam generator and fuel assembly refurbishment waste at the PWMF or transport off-site to the Western Waste Management Facility (WWMF) for centralized storage;
- transport off-site to the WWMF for centralized storage of low and intermediate-level miscellaneous refurbishment waste; and
- refuelling and restarting the reactors.

The scope of project will consider the following activities related to the continued operation of the refurbished power reactors until about 2060, including:

- continued operation, maintenance and generation of power by refurbished reactor units;
- continued management of operating low and intermediate-level waste;
- continued interim storage of used fuel at the Pickering Used Fuel Dry Storage Facility (PUFDSF) within the PWMF;
- conduct of ongoing maintenance and repair;

- construction of additional storage capacity at the PWMF PUFDSF for the used nuclear fuel to be produced from the proposed continued operation of the Pickering B units;
- interim storage for the additional used nuclear fuel and the refurbishment waste at the PWMF; and
- transport of routine operational low and intermediate-level waste to the WWMF.

In addition, the scope of project for this EA will also include the assessment of all waste management-related activities including waste reduction activities and decontamination.

There are other projects, past, present and future, and activities at the Pickering NGS which do not fall within the scope of the current project. These projects and activities have been the subject of other CNSC licences and include the expansion of low and intermediate waste storage capacity at the WWMF for routine operational and refurbishment wastes. A screening level EA for this increased capacity at the WWMF was completed and received a favourable EA decision from the CNSC on February 15, 2006. It should be noted that the WWMF receives the routine operational wastes from all of Ontario's power reactors, including Pickering, and is also the candidate site to receive for storage the low and intermediate level refurbishment waste from the Pickering B refurbishment waste project.

## **8.0 FACTORS TO BE CONSIDERED IN THE SCREENING**

The scope of the screening EA under the CEAA must include all the factors identified in paragraphs 16(1) (a) to (d) of the CEAA and, as provided for under paragraph 16(1) (e), any other matter that the CNSC requires to be considered.

Paragraphs 16(1) (a) to (d) require that the following factors be included:

- 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;
- the significance of the effects identified above;
- comments from the public that are received in accordance with the CEAA and its regulations; and
- measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project.

With the discretion allowed for in paragraph 16(1) (e) of the CEAA, the CNSC will also require consideration of:

- the purpose of the project;
- consideration of traditional and local knowledge, where relevant;
- the need for, and requirements of, a follow-up program in respect of the project; and

- 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.

Additional or more specific factors or issues to address in the EA may be identified following consultation with the expert Federal Authorities and stakeholders during the conduct of the EA.

## **9.0 ASSESSMENT METHODOLOGY**

### **9.1 Structure of the EA Screening Report**

CNSC staff will prepare the EA Screening Report under the following section headings, and recommends that the proponent's EA Study Report use a similar structure.

#### *Screening Report Section Headings:*

- 1) Introduction
- 2) Application of the CEAA
- 3) Scope of the Project
- 4) Scope of the Assessment
- 5) Project Description
- 6) Spatial and Temporal Boundaries of the Assessment
- 7) Description of the Existing Environment
- 8) Assessment and Mitigation of Environmental Effects
  - description of assessment methodology
  - effects of normal operations, malfunctions and accidents, and natural hazard
  - decommissioning
- 9) Cumulative Environmental Effects
- 10) Significance of Residual Effects
- 11) Stakeholder Consultation
- 12) Follow-up Program
- 13) Conclusions and Recommendations for Decision
- 14) References

The recommended structure serves as a framework for explaining how the assessment factors required by subsection 16(1) of the CEAA are to be considered systematically in the screening-level EA Study Report. In the EA Study Report, information about the project and the existing environment is necessary to permit such a systematic consideration; the results of the EA Study Report will be documented in the subsequent EA Screening Report to be prepared by CNSC staff.

The parts of the assessment that are to be delegated to OPG, in accordance with subsection 17(1) of the CEAA, are to be documented in the form of a technical EA Study Report (EASR) in a manner consistent with this structure. OPG's EA Study Report will be attached to the EA Screening Report as a supporting document.

## 9.2 Specific Information Requirements

### 9.2.1 *Purpose of the Project*

The EA Study Report should include a clear and comprehensive statement of the purpose of the project. In this case, the purpose of the project is to ensure continued contribution by Pickering B, to a reliable and stable electricity supply for industrial, commercial and residential consumers in Ontario.

The purpose of the screening is to determine if the proposed:

- refurbishment of Pickering B Units 5, 6, 7 and 8; and
- extended operation of these units until about 2060

is likely to cause significant adverse environmental effects.

The need for the electricity to be generated by OPG would involve consideration of broader public policy issues over which the CNSC has no regulatory authority. This issue would be better addressed by existing political or economic processes. It should also be noted that consideration of the need for a project under the CEAA is left at the discretion of the RA for a screening-level EA.

Similarly, the separate questions of “alternatives” to the project for generating electricity such as building a hydroelectric facility or conserving energy, or “alternative means” of carrying out the project such as location, size and number of plants, are matters that are beyond the CNSC’s legislated mandate and control under the NSCA.

### 9.2.2 *Project Description*

An adequate description of the project is necessary to permit a reasonable consideration in the screening of the environmental effects of the project. The main objective of the project description is to identify and characterize those specific components and activities of the project that have the potential to interact with, and thus result in a likely change or disruption to the surrounding environment, during normal operations and during malfunctions and accidents.

The description of the project will include and elaborate upon, the items identified in the project scope, supported with appropriate maps and diagrams.

The description of the project will include a proposed schedule for the staged restart and return to service of the Pickering B Units 5, 6, 7 and 8. To ensure a conservative assessment approach, it should be assumed that all four Pickering B reactor units will continue operating through to about 2060. The maximum effects of operation would therefore be assessed even though all units may not be actually operating simultaneously during the entire period.

The Pickering B NGS is an existing licensed facility with an operating history. Actual environmental performance information, in addition to future performance predictions, will therefore be considered in describing the characteristics of the project to the extent that it is relevant to the assessment.

The following information addressing the refurbishment and the continued operation phases of the project will be provided in summary form; where applicable, reference may be made to more detailed information.

*General Information, Design Characteristics and Normal Operations:*

- the location of the project;
- the planned operational life (justified on a unit-by-unit basis where applicable);
- the basic configuration, layout, shape, size, design and operation of the facility;
- the key operational components of the plant (following completion of refurbishment work), including a discussion of component age and wear issues where relevant to future environmental performance and reliability;
- the key components of the plant and its physical security systems (excluding prescribed information), designed specifically to isolate the project from the surrounding environment, or to prevent, halt or mitigate the progress or results of malfunctions and accidents;
- identify and describe engineered and administrative controls, including use of an approved margin of subcriticality for safety, which would assure that the entire process will be subcritical under normal and credible abnormal conditions – accidents or accident sequences – that have frequency of occurrence equal to or greater than one in a million years;
- a discussion of other past events that are relevant to the assessment of future environmental performance and reliability;
- the stored inventories of radioactive and other hazardous materials used as part of the project, including locations and storage methods, and criticality control plans;
- the sources, types and quantities of radiological and non-radiological waste, including hazardous waste, predicted to be generated by the project;
- the on-site processes for the management of radioactive and non-radioactive waste, including hazardous waste, such as collection, handling and transportation, to be generated by the project;
- the sources, quantities and points of release from the project of routine radiological and non-radiological emissions and effluents, including thermal (heat) releases;
- the predicted doses to workers involved with the operations and activities that are within the scope of this project;
- the sources and characteristics of any fire hazards;
- the sources and characteristics of any noise, odour, dust and other likely nuisance effects from the project;

- results of past emission and effluent monitoring at the Pickering B NGS site as relevant to establishing a pre-project environmental baseline and making future predictions of environmental performance. Limitations in the coverage and/or accuracy of past monitoring information should be discussed;
- the predictions of future emissions and effluents from the project under normal operating conditions;
- the sources and characteristics of any potential risks (including radiological risks) to workers, the public or the environment from the project;
- key operational procedures relevant to protection of workers, the public and the environment relating to the project, including the criticality control program; and
- a description of the relevant organizational and management structure, and staff qualification requirements with emphasis on safety and environmental management programs.

### *Malfunctions and Accidents*

Information on project malfunctions and accidents is also necessary to permit consideration of relevant environmental effects in the screening. The information on malfunctions and accidents may be included in the general project description or presented in a separate section of the EA Screening Report, and will include:

- an identification and discussion of any past abnormal plant operations, accidents and spills to the extent that they are relevant to the current assessment;
- a description of specific criticality events and a demonstration that consequences of the events do not violate criteria established by international standards [Reference 4] and national guidance [Reference 5] as a trigger for a temporary public evacuation;
- a description of any contingency, clean-up or restoration work in the surrounding environment that would be required during, or immediately following, the postulated malfunction, accident and criticality events.

Early in the conduct of the EA studies, the malfunctions and accidents to be considered in the EA will be reviewed and must be accepted by CNSC staff.

### *Preliminary Decommissioning Plan*

A preliminary decommissioning plan for the facility will be included in the assessment. The preliminary plan will document the preferred decommissioning strategy, including a justification of why this is the preferred strategy. It will also include end-state objectives, the major decontamination, disassembly and remediation steps; the approximate quantities and types of waste generated; and an overview of the principal hazards and protection strategies envisioned for decommissioning.

### 9.2.3 *Spatial and Temporal Boundaries of the Assessment*

The consideration of the environmental effects in the screening needs to be conceptually bounded in both time and space. This is more commonly known as defining the *study areas* and *time frames*, or spatial and temporal boundaries, of the screening assessment.

The geographic study areas for this screening must encompass the areas of the environment that can reasonably be expected to be affected by the project, or which may be relevant to the assessment of cumulative environmental effects. Study areas will encompass all relevant components of the environment including the people; non-human biota; land; water; air and other aspects of the natural and human environment. Study boundaries will be defined taking into account ecological, technical and social/political considerations.

The following geographic study areas are suggested:

- Site Study Area:* The Site Study Area includes the facilities, buildings and infrastructure at the Pickering B facility and the area within the 914 metre exclusion zone for the site which encompasses both land surface and part of Lake Ontario water surface. This area is illustrated on Figure 2.1 of OPG's Project Description [Reference 3].
- Local Study Area:* The Local Study Area is comprised of an area which lies outside of the Site Study Area. It is defined as an area which includes lands within the City Of Pickering, the Town of Ajax, and the eastern part of the Greater Toronto Area (Scarborough). This study area also includes a portion of Lake Ontario abutting the property and used by those communities for activities such as recreation and community water supply and waste water discharge. The spatial coverage of this study area is generally illustrated on Figure 1.1 of OPG's Project Description [Reference 3].
- Regional Study Area:* The Regional Study Area extends beyond the Local Study Area and can be defined as the area within which there is the potential for cumulative and socio-economic effects. This area generally extends from the Darlington NGS in the east, the eastern part of the City of Toronto to the west and includes the municipalities in the Regional Municipality of Durham north of the Pickering site.

It should be noted that the area covered by the above-noted study areas may be modified, as required, to include unexpected wider-spread effects arising from the project.

The temporal boundaries for this assessment must establish over what period of time the project-specific and cumulative effects are to be considered. The initial time frame for the assessment will be the duration of the project; that is, the planned operational life of Pickering B through to the end of the service life of the reactors estimated to be about 2060 and the decommissioning based on a preliminary decommissioning plan even though decommissioning is not included as part of the scope of the project. Where the effects of the project are anticipated to continue beyond the operation of the facility (for example, as a result of environmental contamination from the project), then a time frame appropriate for describing and taking into account potentially longer-term residual effects will be used.

Both the study areas and time frames will remain flexible during the assessment to allow the full extent of likely environmental effects to be considered in the screening. For instance, should the results of modelling demonstrate that there is dispersion of a contaminant that is likely to cause an environmental effect beyond the boundaries identified above, adjustments to the study areas or time frames will be made to take into account these effects in the EA.

#### 9.2.4 *Description of the Existing Environment*

A description of the existing environment is needed to determine the likely interactions between the project and the surrounding environment and, conversely, between the environment and the project. Both the biophysical environment and the socio-economic (human, cultural) environment are to be considered.

Present physical security systems must be included in the description (excluding prescribed information).

An initial screening of likely project-environment interactions will be used in identifying the relevant components of the environment that need to be described. In general, the environmental components that are typically described in the various study areas include, but are not necessarily limited to:

- human health;
- surface water;
- atmosphere;
- aquatic environment;
- geology and hydrogeology;
- terrestrial environment;
- land resources;
- cultural heritage and aboriginal environment; and
- socio-economic conditions.

These environmental components should be further divided into environmental sub-components.

Valued Ecosystem Components (VECs) in the existing environment will be identified and used as specific assessment end-points. VECs are environmental attributes or components identified as having a legal, scientific, cultural, economic or aesthetic value. VECs should be identified following consultations with the public, First Nations, federal and provincial government departments and other relevant stakeholders. The VECs proposed in the EA methodology for this project will be reviewed and accepted by CNSC staff in the early phases of the EA study.

The required level of detail in the description of the existing environment will be less where the potential interactions between the project and various components of the environment are weak, or remote in time and/or space.

Relevant existing information, including traditional knowledge, may be used to describe the environment. Where that information is significantly lacking, additional research and field studies may be required to complete the screening assessment. CNSC staff will review any work done by OPG to fill identified gaps in information as progress is being made.

#### *9.2.5 Assessment and Mitigation of Environmental Effects*

The consideration of environmental effects in the screening should be done in a systematic and traceable manner. The assessment methodology will be summarized. The results of the assessment process should be clearly documented using summary matrices and tabular summaries where appropriate.

##### *Assessment of Effects Caused by the Project*

The assessment will be conducted in a manner consistent with the following general method:

- 1) Identify the potential interactions between the project activities and the existing environment during construction and normal operations, and during identified relevant malfunctions and accidents.***

Specific attention will be given to interactions between the project and the identified VECs. In this step, the standard design and operational aspects from the project description that prevent or significantly reduce the likelihood of interactions occurring with the environment should be reviewed. Opportunities for additional impact mitigation measures are addressed in step 3 below.

- 2) Describe the resulting changes that likely would occur to the components of the environment and VECs as a result of the identified interactions with the project.***

Each environmental change must be described in terms of whether it is direct or indirect, and positive or adverse.

Identified changes in socio-economic conditions and various aspects of culture, health, heritage, archaeology and traditional land and resource use may be limited to those that are likely to result from the predicted changes that the project is likely to cause to the environment. The consideration of public views, including any perceived changes attributed to the project, should be recognized and addressed in the assessment methodology.

For each identified effect, the predicted magnitude, duration, frequency, timing, probability of occurrence, ecological and social context, geographic extent, and the degree of reversibility, should be considered in determining if it is a likely adverse effect.

Quantitative as well as qualitative methods may be used to identify and describe the likely adverse environmental effects. Professional expertise and judgment may be used in interpreting the results of the analyses. The basis of predictions and interpretation of results, as well as the importance of remaining uncertainties, will be clearly documented in the EA study report.

**3) *Identify and describe mitigation measures that may be applied to each likely adverse effect (or sequence of effects), and that are technically and economically feasible.***

Mitigation strategies should reflect avoidance, precautionary and preventive principles; that is, emphasis should be placed on tempering or preventing the cause or source of an effect, or sequence of effects, before addressing how to reverse or compensate for an effect once it occurs.

Where the prevention of effects cannot be assured, or the effectiveness of preventive mitigation measures is uncertain, further mitigation measures in the form of contingency responses, including emergency response plans, will be described.

Where cost/benefit analyses are used to determine economic feasibility of mitigation measures, the details of those analyses will be included or referenced.

**4) *Describe the significance of the residual environmental effects that likely will occur as a result of the project, having taken into account the implementation of the proposed mitigation measures.***

The criteria for judging and describing the significance of the residual (post-mitigation) effects will include: magnitude, duration, frequency, timing, and probability of occurrence, ecological and social context, geographic extent, and degree of reversibility. Specific assessment criteria proposed in the EA methodology for this project will be submitted to CNSC staff in the early phases of the EA study for review and acceptance. Existing regulatory and industry standards and guidelines are relevant as points of reference for judging significance. However, professional expertise and judgement should also be applied in judging the significance of any effect. All applicable federal and provincial laws must be respected.

The analysis must be documented in a manner that readily enables conclusions on the significance of the environmental effects to be drawn. The CNSC, as the RA for the EA project, must document in the screening report a conclusion, taking into account the mitigation measures, as to whether the project is likely to cause significant adverse environmental effects.

#### *Assessment of Effects of the Environment on the Project*

The assessment must also take into account how the environment could adversely affect the project, for example, from severe weather or seismic events. The assessment must also take into account any potential effects of climate change on the project, including an assessment of whether the project might be sensitive to changes in climate conditions during its life span.

This part of the assessment will be conducted in a step-wise fashion, similar to that described for the foregoing assessment of the project effects. The possible important interactions between the natural hazards and the project will be first identified, followed by an assessment of the effects of those interactions, the available additional mitigation measures, and the significance of any remaining residual environmental effects.

#### *9.2.6 Assessment of Cumulative Effects*

The effects of the project must be considered together with those of other projects and activities that have been, or will be carried out, and for which the effects are expected to overlap with those of the project (i.e., overlap in same geographic area and time). These are referred to as *cumulative environmental effects*.

An identification of the specific projects and activities considered in the cumulative effects will be included in the EA. In general, the cumulative effects assessment will consider the combined effects of the project with the neighbouring or regional industries and other developments.

The information available to assess the environmental effects from other projects can be expected to be more conceptual and less detailed as those effects become more remote in distance and time to the project, or where information about another project or activity is not available. The consideration of cumulative environmental effects may therefore be at a more general level of detail than that considered in the assessment of the direct project-environment interactions.

Where potentially significant adverse cumulative effects are identified, additional mitigation measures may be necessary.

#### *9.2.7 Assessment of the Effects on the Capacity of Renewable and Non-renewable Resources*

The assessment must also take into account whether the likely project-related environmental effects will have an impact on the capacity of natural and non-renewable resources to meet the needs of the present and those of the future.

The potential interactions between the project and the environment will be identified and assessed in order to determine the likelihood of interactions between the project and resource sustainability.

Three environmental aspects are associated with renewable resources that may be affected by the project: the terrestrial environment, surface water and groundwater resources, and the aquatic environment.

#### 9.2.8 *Significance of the Residual Effects*

The preceding steps in the screening will consider the significance of the environmental effects of the project on the environment; of the natural hazards on the project; of project malfunctions and accidents; and of other projects and activities that could cause cumulative effects.

The screening will consider all of these effects in coming to a final conclusion as to whether the project, taking into account the mitigation measures, will likely cause significant adverse environmental effects. The CNSC, as the RA, will document this conclusion in the screening report.

#### 9.2.9 *Stakeholder Consultation*

The assessment will include notification of, and consultation with, the potentially affected stakeholders, including the local public. Various media will be used to inform and engage individuals, communities, interest groups, local governments and other stakeholders in the assessment. OPG is expected to hold appropriate public consultation meetings. The proponent's stakeholder consultation program will be monitored by the CNSC staff throughout the EA process.

Throughout the EA process, various stakeholders, including the following, will be consulted:

- federal government
- provincial government
- local government
- established committees
- OPG employees
- general public
- First Nations and aboriginal communities
- neighbouring residents
- local businesses
- non-government organizations and interest groups

The EA Screening Report will contain a summary review of the comments received during this EA process. The EA Screening Report will indicate how issues identified have been considered in the completion of the assessment, or where relevant, how they may be addressed in any subsequent licensing and compliance process.

---

The CNSC will also establish a public consultation process in the review and decision-making process for the screening report. This will include opportunities for the public to review and comment to CNSC staff on the draft EA Screening Report. Opportunities could also be provided to comment and present interventions before the Commission on the EA Guidelines before they are finalized and later in the process on the final EA Screening Report before the Commission renders its decision on the EA in accordance with section 20 of the CEEA.

OPG has included a draft version of its “Community and Stakeholder Consultation and Communication Plan”. This plan is outlined in Appendix A of the document entitled “Project Description for the Pickering B Refurbishment for the Continued Operations Environmental Assessment (June 2006) [Reference 3]. Early in the assessment, CNSC staff will review this plan and provide comments with respect to its acceptability.

#### *9.2.10 Follow-up Program*

A preliminary design and implementation plan for a follow-up program will be included in the EA Study Report.

The purpose of the follow-up program is to assist in determining if the environmental and cumulative effects of the project are as predicted. It is also to confirm whether the impact mitigation measures are effective, and to determine if any new mitigation strategies may be required. The design of the program will be appropriate to the scale of the project and the issues addressed in the EA.

If an amendment to the Pickering B NGS operating licence is granted to OPG under the NSCA, the CNSC licensing and compliance program will be used as the mechanism for ensuring the final design and implementation of any follow-up program and the reporting of program results. The follow-up program would be based on the regulatory principles of compliance, adaptive management, reporting and analysis.

## **10.0 ENVIRONMENTAL ASSESSMENT PROCESS**

The following points indicate the key steps likely to be followed by CNSC staff during the environmental assessment process.

- Determination of the application of the CEEA to the project; application of the CEEA Federal Coordination Regulations; establishment of the Canadian Environmental Assessment Registry, consisting of internet and project files; and stakeholder notification;
- Preparation and distribution of draft EA Guidelines for review by proponent, federal and provincial authorities; CNSC staff review and disposition of comments received;
- Distribution of draft EA Guidelines to the public for review;
- CNSC staff review and disposition of comments received;
- Revise draft EA Guidelines, taking into consideration comments received and submit to the Commission for consideration;

- CNSC staff issuance of EA Guidelines and delegation of public consultation and technical studies to the proponent;
- Receipt of draft EA Study Report from the proponent, OPG;
- Distribution of the draft EA Study Report to a review team (CNSC staff, federal and provincial authorities);
- Revision by the proponent, as appropriate, of the EA Study Report;
- Acceptance by CNSC staff of the EA Study Report;
- CNSC staff preparation of the draft EA Screening Report;
- Public review and comment on the draft EA Screening Report;
- CNSC staff review and dispositioning of public comments;
- CNSC completion of the EA Screening Report;
- Submission of final EA Screening Report to Commission for consideration and decision in accordance with section 20 of the CEAA.

## 11.0 CONCLUSIONS AND RECOMMENDATIONS FOR DECISION

The EA Screening Report will present a conclusion by CNSC staff as to whether the project is likely to cause significant adverse environmental effects, taking into account the appropriate mitigation measures. CNSC staff will make recommendations to the Commission regarding the EA decision and on project-related public concerns, consistent with section 20 of the CEAA. The Commission will make its decision on the EA Screening Report following consideration of the said report. If the Commission concludes that the project is not likely to cause significant adverse environmental effects, taking into account the appropriate mitigation measures, it may proceed with consideration of OPG's application for approvals and associated amendment to its operating licence, under the provision 24(2) of the NSCA.

## 12.0 CONTACTS FOR THE ASSESSMENT

Anyone wishing to obtain additional information or provide comments on any aspect of the environmental assessment being conducted on the proposed refurbishment and continued operation of Pickering B reactor Units 5, 6, 7 and 8 may do so through the following CNSC staff contacts:

<p>Claude David Environmental Assessment Specialist Environmental Assessment and Protection Division Canadian Nuclear Safety Commission 280 Slater Street, P.O. Box 1046 Ottawa, Ontario K1P 5S9 Phone: 1-800-668-5284 Fax: (613) 995-5086 Internet: <a href="mailto:ceaainfo@cnsccsn.gc.ca">ceaainfo@cnsccsn.gc.ca</a></p>	<p>T.E. Schaubel Director Pickering Regulatory Program Division Canadian Nuclear Safety Commission 280 Slater Street, P.O. Box 1046 Ottawa, Ontario K1P 5S9 Phone: 1-800-668-5284 Fax: (613) 995-5086 Internet: <a href="mailto:ceaainfo@cnsccsn.gc.ca">ceaainfo@cnsccsn.gc.ca</a></p>
---	--

### 13.0 REFERENCES

1. OPG Letter, D.P. McNeil to T. Schaubel, “Proposed Refurbishment of Pickering B for Continued Operation – Project Description for Environmental Assessment”, June 15, 2006. BITS 1307371. With Attachment, “Project Description for the Pickering B Refurbishment for Continued Operations Environmental Assessment” (June 2006).
2. OPG Letter, J. Hankinson to T. Schaubel, “Proposed Refurbishment of Pickering B for Continued Operation Submission”, June 28, 2006. BITS 1343073.
3. OPG Document. “Project Description for the Pickering B Refurbishment for Continued Operations Environmental Assessment” (June 2006). BITS 1307371.
4. Food and Agriculture Organization of the United Nations, International Atomic Energy Agency, International Labour Organization, OECD Nuclear Energy Agency, Pan American Health Organization, United Nations Office for the Co-Ordination of Humanitarian Affairs, World Health Organization, “Preparedness and Response to Nuclear or Radiological Emergency, Safety Requirements”, Safety Standards Series No. GS-R-2, IAEA, Vienna, Austria, 2002.
5. Health Canada, Canadian Guidelines for Intervention during a Nuclear Emergency”, Document H46-2/03-32E, Ottawa, Ontario, November 2003.

## 14.0 GLOSSARY OF TERMS

1. Environmental effect means, in respect of a project,
  - (a) any change that the project may cause in the environment, including any effect of any such change on health and socio-economic conditions, on physical and cultural heritage, on the current use of lands and resources for traditional purposes by aboriginal persons, or on any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, and
  - (b) any change to the project that may be caused by the environment, whether any such change occurs within or outside Canada.
2. Decommissioning means those actions taken, in the interest of health, safety, security and protection of the environment, to retire a licensed activity/facility permanently from service and render it to a predetermined end-state condition.