ONTARIO POWER GENERATION

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OPG Proprietary

February 1, 2024

CD# NK054-CORR-00531-10920

MR. M. BROEDERS
Director, Advanced Reactor Licensing Division

Canadian Nuclear Safety Commission
280 Slater Street
Ottawa, ON
K1P 5S9

Dear Mr. Broeders:

DNNP – Notification of Document Changes to NK054-PLAN-07730-00014 Environmental Monitoring and Environmental Assessment Follow-up (EMEAF) Plan for Darlington New Nuclear Project

The purpose of this letter is to provide written notification to CNSC staff that revision R002 of NK054-PLAN-07730-00014, "Environmental Monitoring and Environmental Assessment Follow-up Plan for the Darlington New Nuclear Project" (Enclosure 1) has been issued and implemented. This written notification is in accordance with Licence Condition G.2 of DNNP PRSL 18.00/2031 and its associated Licence Conditions Handbook (LCH) which requires notification when this document is implemented per the Compliance Verification Criteria for Licence Condition 9.1.

Apart from formatting and minor editorial updates, the key changes applied in this revision are summarized in Attachment 1.

If you have any questions, please contact Ms. Sevana Bedrossian, Senior Manager, Regulatory Affairs-DNNP Licensing at (416) 716-3879 or by e-mail at sevana.bedrossian@opg.com.

Sincerely,

Mark R. Knutson, P.Eng.
Senior Vice President
Chief Enterprise Engineer and Chief Nuclear Engineer
Ontario Power Generation Inc.

Enc.

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Summary of Regulatory Commitments, Regulatory Obligations and Regulatory Management Actions Made/Concurrence Requested

CD# NK054-CORR-00531-10920

Submission Title: DNNP – Notification of Document Changes to NK054-PLAN-07730-00014, Environmental Monitoring and Environmental Assessment Follow-up Plan for the Darlington New Nuclear Project

Regulatory Commitments (REGC):

No.	Description	Date to be Completed
	None	

Regulatory Management Action (REGM):

No.	Description	Date to be Completed
	None	

Regulatory Obligation Action (REGO):

No.	Description	Date to be Completed
	None	

Concurrence Requested: None.

ATTACHMENT 1

Attachment 1 to OPG Letter, M. Knutson to Mr. Broeders, "DNNP – Notification of Document Changes to NK054-PLAN-07730-00014, Environmental Monitoring and Environmental Assessment Follow-up Plan for the Darlington New Nuclear Project"

CD# NK054-CORR-00531-10920

Change Summary for DNNP Environmental Monitoring and Environmental Assessment Follow-up (EMEAF) Plan Revision R002

Prepared By: Shirley Leung
Checked By: Cammie Cheng

A high-level summary of the changes to the EMEAF Plan for the DNNP in Revision 2 is listed below. Additional details are provided in the Revision history of the EMEAF Plan for the DNNP.

- Aligned with the relevant changes in the latest revision of the DNNP Commitments Report (NK054-REP-01210-00078 R009)
    - Added in Section 1.3 that D-P-12.3 (Methodology Reports for EMEAF for Surface Water Environment) will be completed prior to the commencement of licensed activities associated with shoreline protection and in-water works.
    - Development of an Adaptive Management System for the algae hazard to the cooling water intake at DNNP will occur prior to operation; therefore, it has been moved from a site preparation phase (P-AQ-3) activity to a construction phase activity (C-AQ-4).
- Incorporated recent feedback from Indigenous Nations and communities
    - Updated language around the Gunshot Treaty and inherent and Treaty rights
- Added noise monitoring during the operations phase for a minimum of one year (O-AE-2).
- Added an Environmental Assessment (EA) follow-up objective to confirm the effectiveness of mitigation measures associated with dewatering to activity (C-GH-1).

ENCLOSURE 1

Enclosure 1 to OPG Letter, M. Knutson to Mr. Broeders, “DNNP – Notification of Document Changes to NK054-PLAN-07730-00014, Environmental Monitoring and Environmental Assessment Follow-up Plan for the Darlington New Nuclear Project”

CD# NK054-CORR-00531-10920

Environmental Monitoring and Environmental Assessment Follow-up Plan for the Darlington New Nuclear Project

NK054-PLAN-07730-00014-R002

ONTARIO POWER GENERATION

Coversheet

Public Information	
Document Number: **NK054-PLAN-07730-00014**	
Sheet Number: **n/a**	Revision: **R002**

Title:
Environmental Monitoring and Environmental Assessment Follow-Up Plan for the Darlington New Nuclear Project

Environmental Monitoring and Environmental Assessment Follow-Up Plan for the Darlington New Nuclear Project

NK054-PLAN-07730-00014 R002

2023-12-14

Public Information

Cammie Cheng 15 Dec 2023

Accepted by: Cammie Cheng
Senior Manager,
Environment, Health and Safety
Nuclear

ENVIRONMENTAL MONITORING AND ENVIRONMENTAL ASSESSMENT FOLLOW-UP PLAN FOR THE DARLINGTON NEW NUCLEAR PROJECT

Submitted by:

Ontario Power Generation Inc.

NK054-PLAN-07730-00014 R002

December 2023

Prepared by:
Ecometrix Inc. for Ontario Power Generation

ONTARIO POWER GENERATION

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Darlington Lands Acknowledgement

The lands and waters on which the Darlington New Nuclear Project (DNNP) is situated are the traditional and treaty territory of the Michi Saagiig and Chippewa Nations, collectively known as the Williams Treaties First Nations, which includes Curve Lake First Nation, Hiawatha First Nation, Alderville First Nation, Chippewas of Beausoleil First Nation, Chippewas of Georgina Island First Nation, Chippewas of Rama First Nation, and the Mississaugas of Scugog Island First Nation.

The DNNP is within the territory of the Gunshot Treaty and the Williams Treaties of 1923. These Treaty Rights were reaffirmed in 2018 in a settlement with Canada and the Province of Ontario.

To acknowledge the treaty and traditional territory, is to recognize the rights of the First Nations. It is to recognize the history of the land, predating the establishment of the earliest European colonies. It is also to acknowledge the significance for the Indigenous peoples who lived and continue to live upon it, to acknowledge the people whose practices and spiritualties are tied to the land and water and continue to develop in relation to the territory and its other inhabitants today.

ALDERVILLE FIRST NATION | BEAUSOLEIL FIRST NATION | CURVE LAKE FIRST NATION | GEORGINA ISLAND FIRST NATION | HIAWATHA FIRST NATION | SCUGOG ISLAND FIRST NATION | RAMA FIRST NATION

Revision Summary

Revision Number	Date	Comments
R000	14-June-2021	Initial Issue.
R001	28-October-2022	Updated to align with R007 of the DNNP Commitments Report (issued in 2021), and to reflect the feedback received following engagement with regulatory stakeholders and Indigenous Nations and communities. The main changes are: • The title of this document has been revised to match the title referenced in the DNNP Commitments Report under D-P-12.1; • A Site map has been added (Figure 1-1, Section 1.2); • Identified the SMR technology selected in Section 1.2; • Expanded on adaptive management process in Section 1.5.3; • Added reference to CSA N288.7-15 in Section 2.1; • Air quality monitoring during the operations phase was added for a minimum of one (1) year (O-AE-1) (Section 4.1.2 and Appendix A); • Addition of a new activity (C-AQ-3) for the development of an impingement and entrainment sampling program as a condition of authorization under the Fisheries Act that will need to be obtained from DFO prior to operations (Section 4.3.3 and Appendix C); • Removed stormwater follow-up activities during site preparation and construction; stormwater monitoring to occur in the operation phase, after the stormwater discharge points are constructed; • The coastal engineer's assessment in the surface water environment was modified from a baseline activity (B-SWE-4) to a site preparation activity (P-SWE-4); • Included consideration of Round Whitefish in the cumulative effects assessment of permanent aquatic effects (P-AQ-1), to account for remaining commitments transferred over from D-P-15.1, Round Whitefish Action Plan (Section 4.3.2 and Appendix C); • Amphibian monitoring for the Western Chorus Frog was added during site preparation for a minimum of 2 years (P-TE-2) (Section 4.4.2 and Appendix D); • Revised scope of transportation safety monitoring (B-TT-1, P-TT-1, C-TT-1, O-TT-1) to focus on the monitoring of traffic volumes and collision data, instead of project-related road degradation, since the current plan for the DNNP does not require significant amounts of soil movement off-site (Section 4.7.2 and Appendix G); and • Editorial (non-intent) revisions.
R002	14-Dec-2023	Updated to align with R009 of the DNNP Commitments Report (issued in 2023) and to incorporate recent feedback from Indigenous Nations and communities. The main changes are: • Updated language around the Gunshot Treaty and inherent and Treaty rights;

		• Removal of status of EMEAF activities. The intent is to track status of EMEAF activities outside of the EMEAF Plan, through annual EMEAF progress reporting; • Updated to acknowledge OPG's intent to licence three additional SMRs for a total of four; • Added in Section 1.3 that D-P-12.3 (Methodology Reports for Environmental Monitoring and EA Follow-up for Surface Water Environment) will be completed prior to the commencement of licensed activities associated with shoreline protection and in-water works, consistent with R009 of the Commitments Report; • Added noise monitoring during the operations phase for a minimum of one (1) year (O-AE-2) (Section 4.1.3 and Appendix A); • Development of an Adaptive Management System for the algae hazard to the cooling water intake at DNNP will occur prior to operation; therefore, it has been moved from a site preparation phase (P-AQ-3) activity to a construction phase activity (C-AQ-4). This aligns with R009 of the Commitments report; • Added an EA follow-up objective to confirm the effectiveness of mitigation measures associated with dewatering to activity C-GH-1; • Added text on the new Durham Regional Official Plan that was adopted on May 17, 2023; and • Editorial (non-intent) revisions.

1.0 INTRODUCTION

1.1 Purpose of the Environmental Monitoring and Environmental Assessment Follow-Up Plan

The purpose of this document is to provide an Environmental Monitoring and Environmental Assessment Follow-Up (EMEAF) Plan to assist the development and implementation of EMEAF activities for Ontario Power Generation's (OPG) Darlington New Nuclear Project (DNNP).

A preliminary Environmental Assessment (EA) follow-up program for the DNNP is documented in Chapter 11 of the DNNP Environmental Impact Statement (EIS) (OPG 2009a). The preliminary follow-up program was subsequently refined through the Joint Review Panel (JRP) process, feedback from stakeholders such as Responsible Authorities (RAs), Federal Authorities (FAs), provincial ministries and the public, as well as engagement with Indigenous Nations and communities.

The DNNP Commitments Report (OPG 2023a) documents the key commitments OPG has made for the DNNP through specific deliverables. The EMEAF Plan is identified under Deliverable D-P-12.1, Environmental Monitoring and Environmental Assessment Follow-up Plan, and additional details are grouped by environmental component in Deliverables D-P-12.2 to D-P-12.9. The activities presented in the EMEAF Plan are aligned with the DNNP EA follow-up activity requirements in the DNNP Commitments Report and include associated baseline activities.

The EMEAF Plan is developed to meet the requirements of the *Canadian Environmental Assessment Act* (CEAA 1992). OPG's EMEAF Plan for DNNP will be implemented under existing procedures within the OPG Environmental Management System (EMS), OPG-PROG-0005 (see Section 2.0 for details).

The EMEAF Plan along with its associated monitoring plans/ methodology reports are collectively referred to as the EMEAF Program.

1.2 Description of the Project

The DNNP is situated at the existing Darlington Nuclear (DN) site which is located on the north shore of Lake Ontario in the Municipality of Clarington, within the Regional Municipality of Durham, about 70 km east of Toronto. The DNNP is located on the eastern third of the DN site (Figure 1-1). The DNNP site is adjacent to the existing Darlington Nuclear Generating station (DNGS), the Tritium Removal Facility, and the Nuclear Sustainability Services – Darlington Waste Management Facility (NSS-DWMF).

The DNNP, as described in Chapter 2 of the EIS (OPG 2009a), consists of the site preparation, construction, operation, and decommissioning of up to four nuclear power reactors supplying up to 4,800 megawatts of electrical generating capacity for supply to the Ontario grid. At the time the EIS was conducted, no specific reactor technology had been

selected; rather, the EIS considered a Plant Parameter Envelope, developed based on the limiting design parameters from the reactor technologies under consideration for the DNNP at that time, as the basis for the environmental assessment.

In August 2012, the CNSC issued a ten-year Nuclear Power Reactor Site Preparation Licence (PRSL) for the DNNP. The DNNP PRSL allows OPG to conduct site preparation activities for the future construction and operation of a new nuclear generating station on the DNNP site. In December 2013, the Government of Ontario requested that OPG defer construction of the DNNP but maintain the existing licence. In October 2021, the CNSC approved a renewal of the PRSL for another 10 years.

On November 13, 2020, OPG announced resumption of planning activities for the DNNP to construct a grid-scale Small Modular Reactor (SMR) facility. At the end of 2021, OPG selected the BWRX-300 technology, a 300 MWe water cooled, natural circulation SMR. While the DNNP Licence to Construct application submitted in 2022 is for the construction of one BWRX-300 SMR, the DNNP is envisaged as a build out of up to four BWRX-300 reactors. OPG has commenced planning for three additional SMRs, for a total of four SMRs. Thus, supporting infrastructure will be constructed to allow for additional nuclear capacity in the future (e.g., intake and discharge for the condenser cooling water, switchyard). A comprehensive review of the EIS for four BWRX-300 reactors was undertaken by OPG to ensure that the conclusions of the EIS remain valid (OPG 2023b). The EIS review concluded that the deployment of four BWRX-300 at the DNNP site does not alter the EIS conclusions and the EMEAF program remains suitable.

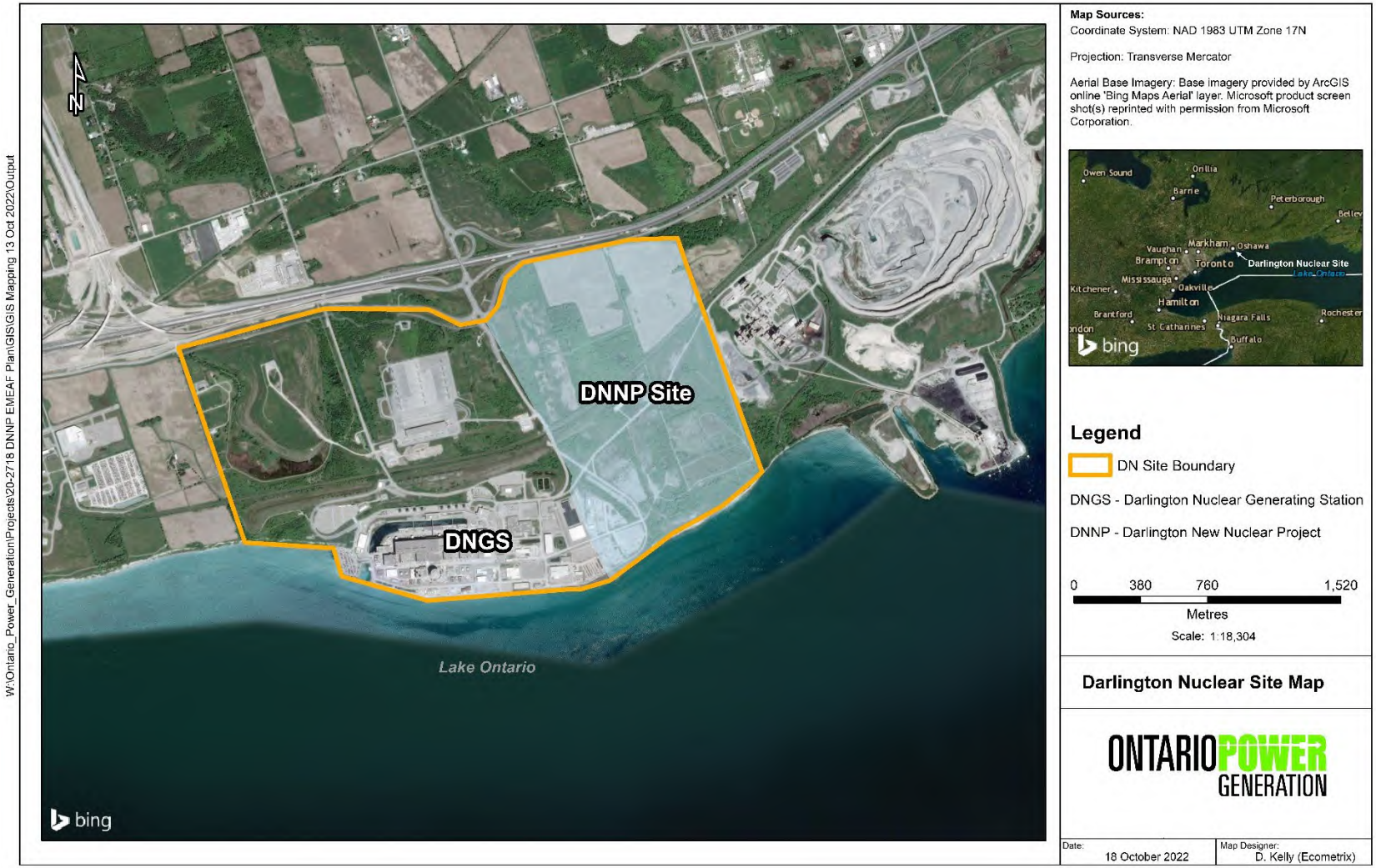


Figure 1-1: DNNP Within the DN Site

1.3 Basis

The EMEAF activities (or follow-up activities) presented in this Plan are aligned with OPG's commitments made through the EIS (OPG 2009a), PRSL application (OPG 2009b), JRP process, PRSL renewal application (OPG 2020b), applications to other federal regulatory authorities filed by OPG, and relevant sections of the Licence Conditions Handbook (LCH) for the DNNP PRSL. The EMEAF activities are also aligned with the requirements derived from the Government of Canada (GOC) response to the JRP EA Report Recommendations (GOC 2012). OPG's EMEAF commitments are documented in the DNNP Commitments Report (OPG 2023a) and listed in Appendix J of this EMEAF Plan.

OPG's commitments for the EMEAF Plan include follow-up activities that will take place prior to site preparation and during the site preparation, construction, and operation phases of the DNNP. The EMEAF Plan is applicable for a total of up to four SMRs.

The scope and nature of the activities described in the EMEAF Plan will be reviewed and adjusted if needed as part of the adaptive management process to address subsequent phases of the Project (e.g. decommissioning), evolving site conditions (including the construction of additional SMRs), and monitoring data as it is acquired (see Section 1.5.3 on Adaptive Management).

The EMEAF Plan and scope for the follow-up activities was developed for the environmental components listed below through a consultative process involving the CNSC, Environment and Climate Change Canada (ECCC), Fisheries and Oceans Canada (DFO), Transport Canada (TC), and other regulatory stakeholders (see Section 3.2) as well as through engagement with Indigenous Nations and communities:

- Atmospheric environment;
- Surface water environment;
- Aquatic environment;
- Terrestrial environment;
- Geological and hydrogeological environment;
- Land use environment;
- Traffic and transportation environment; and
- Health – Human and Non-Human Biota (radiological and non-radiological).

Section 4.0 provides further details on the scope of EMEAF activities for each environmental component listed above. OPG's commitments related to the radiation and radioactivity

environment are covered under D-C-6 “Radiological Environmental Monitoring Program”, now called the Environmental Monitoring Program (EMP).

Methodology reports or monitoring plans are prepared in accordance with associated project phases or prior to the start of relevant activities.

The EMEAF Plan and methodology reports for each environmental component were provided to the CNSC prior to the commencement of PRSL licensed activities as committed in the DNNP Commitments Report under Deliverable D-P-12, Environmental Monitoring and Environmental Assessment Follow-up (OPG 2023a); with exception of the methodology reports under D-P-12.3 (Methodology Reports for Environmental Monitoring and EA Follow-up for Surface Water Environment) which will be completed prior to the commencement of licensed activities associated with shoreline protection and in-water works; D-P-12.4 (Methodology Reports for Environmental Monitoring and EA Follow-up for Aquatic Environment) which will be completed prior to the commencement of licensed activities with potential adverse impact to the aquatic environment; and those under D-P-12.9 (Health - Non-Human Biota and Human Health) which will be completed prior to the commencement of licensed activities for the construction phase (OPG 2023a).

1.4 Regulatory Context

Under the *Canadian Environmental Assessment Act* (CEAA 1992), every comprehensive study of a project and every mediation or assessment by a review panel should include “consideration of the need for, and requirements of, any follow-up program”. A “follow-up program” is defined as a program for:

- Verifying the accuracy of the environmental assessment of the project; and
- Determining the effectiveness of any measures taken to mitigate the adverse environmental effects of the project.

The requirement for OPG to implement an EA follow-up program is documented in the LCH for the DNNP PRSL, which states “the licensee shall implement and maintain an environmental assessment follow-up program”. As per the Final EIS for DNNP (Appendix 1 of OPG 2009a), the CNSC determined that OPG “must include a framework upon which environmental monitoring, including environmental effects monitoring where relevant, and follow-up actions will be based throughout the life of the project, should the project proceed.”

Additionally, CNSC REGDOC 2.9.1 provides guidance on EA follow-up programs (CNSC 2020). REGDOC 2.9.1 indicates that the follow-up monitoring should include:

- Pre-project baseline data;
- Compliance data (e.g., established environmental quality criteria);
- Regulatory documents, standards, or guidelines; and

- Real-time data consisting of data collected in the field.

CNSC REGDOC 1.1.5 provides supplemental guidance for SMR licensing (CNSC 2019). Under Environmental Protection the document points to existing Canadian Standards Association (CSA) standards for additional guidance. No supplemental guidance specific to environmental monitoring is provided.

1.5 Objectives of the EMEAF Program

As identified in Section 1.1, the activities outlined in the EMEAF Plan includes the activities committed to in the DNNP Commitments Report under Deliverable D-P-12, Environmental Monitoring and Environmental Assessment Follow-up (OPG 2023a).

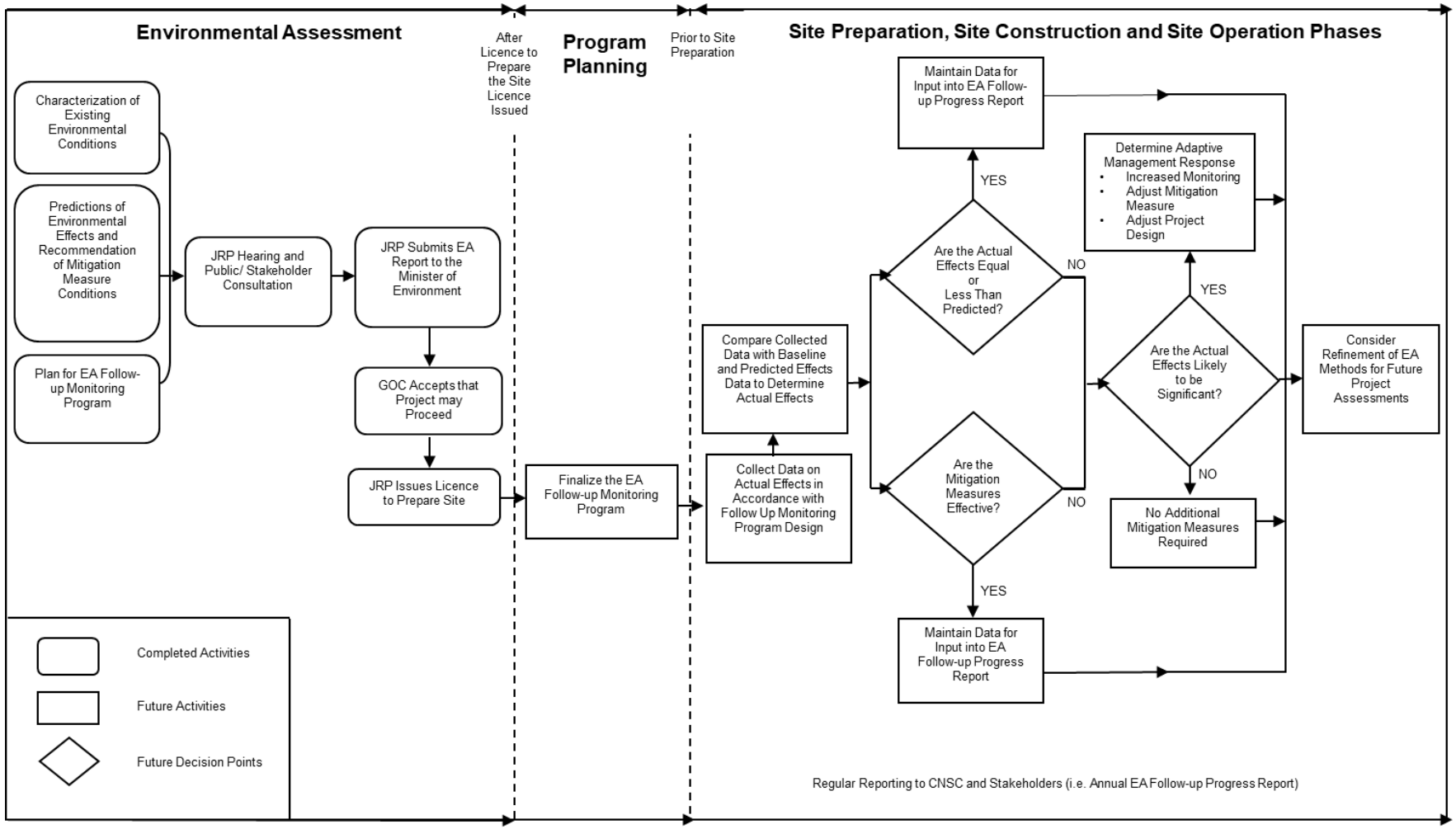
The EMEAF Plan has been prepared to comply with the Canadian Environmental Assessment Agency's Operational Policy Statement on follow-up programs in accordance with the PRSL and its associated LCH.

Activities under the EMEAF Plan will be designed to meet one or more of the following objectives listed in the LCH, as applicable by activity:

- Identify adequate baseline characterization data for use in follow-up monitoring;
- Verify predictions of environmental effects identified in the environmental assessment;
- Determine the effectiveness of mitigation measures in order to modify or implement new measures where required;
- Support the implementation of adaptive management measures to address previously unanticipated adverse environmental effects;
- Provide information on environmental effects and mitigation that can be used to improve and/or support future environmental assessments including cumulative environmental effects assessments; and
- Support environmental management systems used to manage the environmental effects of projects [i.e., DNNP activities].

Figure 1-2 shows the activities and future decision points for the EA follow-up program (i.e., monitoring elements of the program). The overall goal of the EMEAF program is to determine the validity of EIS conclusions and the effectiveness of mitigation measures implemented. The data collected will provide the necessary information needed to determine the effectiveness of mitigation measures, as well as provide understanding of whether actual effects are equal to or less than the predicted effects.

Figure 1-2: Activities and Future Decision Points in the EA Follow-Up Program



1.5.1 Baseline Characterization Data for use in EA Follow-up Monitoring

Reliable baseline characterization data form the basis from which DNNP effect comparisons are made against future follow-up monitoring results from the DNNP. OPG has undertaken a number of baseline characterization studies and continues to characterize the Project baseline prior to site preparation and prior to each subsequent project phase, as needed (see Appendices A through H for details). The specific scope and objectives of baseline characterization will depend on the parameters to be measured, and the data requirements needed to resolve an existing or emergent issue in the environmental component. Statistical analyses will be utilized, where appropriate, to confirm the adequacy of baseline data as a benchmark against which to test for project effects.

1.5.2 Verify EA Predictions and Determine Effectiveness of Mitigation Measures

The EIS predicts no residual adverse effects on specific environmental components and their sub-components from the DNNP, provided that the mitigation measures proposed (and the commitments made by OPG) are implemented as they relate to each environmental component. The purpose of the follow-up activities is to provide the necessary data and information to help determine the effectiveness of the mitigation measures taken and to facilitate the verification of the EIS predictions of environmental effects from the DNNP, considering the implementation of mitigation measures. As concluded from the EIS review for the BWRX-300 reactor technology, the EA follow up monitoring remains suitable for the deployment of BWRX-300 (OPG 2023b). Should unanticipated adverse environmental effects emerge, they will be addressed through adaptive management measures.

An additional objective of the EMEAF activities is to assist in identifying or modifying mitigation strategies if needed to effectively ameliorate any adverse effects as part of adaptive management.

1.5.3 Adaptive Management

The collective EMEAF activities associated with the DNNP will be conducive to the principle of adaptive management. Adaptive management is a planned and systematic process to continuously improve environmental management practices by learning from their outcomes. Adaptive management provides the flexibility to identify and implement new mitigation measures or to modify existing measures throughout the life of the DNNP. In its simplest form, adaptive management, as it relates to effects mitigation and environmental monitoring, integrates design, management, and monitoring to systematically test assumptions, learn from experience, and apply the knowledge gained to subsequent actions (i.e., adapt).

The scopes of the collective EMEAF activities during subsequent phases of the Project will be informed by the EA follow up monitoring results, modified to address any implementation challenges, and tailored appropriately to the effects of the Project as it is further refined through detailed design and construction phases. As such, the specific details presented in the tables in Appendices A to H of this EMEAF Plan will continue to be reviewed and adjusted during planning and/or implementation of the EMEAF activities, as part of the adaptive management process.

Adaptive management will be a fundamental aspect in the interpretation of environmental monitoring results to ensure that the activities remain valid, appropriately encompassing, and responsive to the objectives. As each EMEAF activity is executed, OPG (or other contract parties) will compare the EMEAF activity results to EA Effects Threshold Criteria (see Section 3.2), or the applicable laws and regulations, including conditions contained in licences, approvals, and other regulatory requirements for the DNNP. The results of the comparison will inform the need for potential adaptive actions, such as increased monitoring frequency, modifications to mitigation measures, or implementation of new mitigation measures, if required.

Adaptive management is part of the EMEAF Program implementation framework (see Section 1.6), and the need for, and results of adaptive management measures, will be documented in the annual EA follow-up monitoring report, as described in Section 6.1.

Adaptive management is also inherent to the periodic Environmental Monitoring Programs (EMP) design review process documented in N-PROC-OP-0025. An EMP design review is triggered by major changes to site conditions, such as execution of the DNNP. As indicated in Section 2.1, EMEAF activities will be implemented through the DN EMP as supplementary studies. As such, the planning, implementation, and evaluation of any EMEAF activities through supplementary studies will be assessed as part of the EMP design review and will be direct inputs to the continual improvement process of the EMP.

The information obtained through the EMEAF activities for DNNP, and ongoing refinement, can be used to improve practices for the DNNP, and to support future environmental programs on and around the site. Therefore, the results, decisions, and processes should be well documented for future assessors and decision-makers.

1.6 EA Follow-Up Program Planning and Implementation Framework

The process for developing the details of each EA follow-up program element within the EMEAF Plan follows the approach outlined below to ensure that the program element satisfies the corresponding commitment that has been made by OPG and is consistent with requirements for EA Follow-Up. The steps followed to develop the EA follow-up program are:

(1) Review the preliminary EA Follow-Up Program identified in the 2009 EIS, relevant sections of the LCH, and identify commitments related to the program element in the latest DNNP Commitments Report (OPG 2023a).

(2) Identify existing baseline data or planned baseline data collection that will be used to establish benchmarks against which to test for project effects. Statistical analyses will be utilized, where appropriate, to confirm the adequacy of baseline data as a benchmark against which to test for project effects.

(3) Describe the program elements using the steps 1 to 5 of the systematic planning process identified in CSA N288.4.

a. Define the objectives (e.g. a defined objective that can be tied back to one of the general EA follow-up objectives).

b. Identify the information (i.e. EMEAF activities) required to meet each objective.

c. Define the spatial boundaries of the program (i.e. identify the areas that could potentially be affected by contaminant/physical stressors of the DNNP).

d. Determine how the data collected will be used to achieve the defined objective (i.e. questions to be resolved, replicability, statistical analyses to be completed, effect threshold criteria or other environmental protection criteria; schedule, timing and duration of data collection)

e. Specify program performance or data acceptance criteria (i.e. criteria that will demonstrate that the data collected can be used to meet the objectives).

Step 6 of the systematic planning process, detailed design, is outside the scope of this EMEAF Plan and will be completed in methodology reports. Preliminary scoping of the detailed work activities is provided as supplemental material in Appendix I.

(4) Identify and describe any appropriate adaptive management measures that may be taken to rectify unacceptable results (e.g. increased monitoring, modification of existing mitigation measures, introduction of additional mitigation measures).

(5) Identify how each element may be incorporated or coordinated with other monitoring programs proposed for the DNNP and with existing monitoring for the DN site.

(6) Review the details of program elements with the appropriate regulatory stakeholders and Indigenous Nations and communities.

1.7 Feedback on EMEAF Plan

1.7.1 Indigenous Nations and Communities

OPG engaged with participating William Treaties First Nations (WTFN) possessing rights in accordance with the Gunshot Treaty (1787-1788), the Williams Treaties (1923), and the Williams Treaties Settlement (2018). There are a number of other Indigenous Nations and communities with interests in the DNNP who were engaged in accordance with the DNNP Indigenous Engagement Plan. OPG shared the EMEAF Plan and held sessions to discuss its contents. OPG sought feedback on the EMEAF Plan as well as interest in opportunities for participating in follow up activities. A session was held in June 2021 with the Williams Treaties First Nations, who are the rights holders of the land on which the DNNP is situated. OPG has shared and continues to share the EMEAF methodology reports under D-P-12 with Indigenous Nations and communities, as the reports become available.

In August 2021, a session was held with the Metis Nation of Ontario Region 8 as an interested party. The Mohawks of the Bay of Quinte, although a party that has previously shown interest in certain aspects of the DNNP, were not able to meet with OPG.

OPG commits to working with Indigenous Nations and communities to incorporate Indigenous and Traditional knowledge, where available, in order to further understand the potential impacts of the project and strengthen assessment and decision-making. OPG endeavours to apply Indigenous and Traditional knowledge into the framework for this EMEAF Plan as well. OPG welcomes all information that can be used to provide insight and continues discussion with Indigenous Nations and communities to better integrate Indigenous and Traditional knowledge into the project.

This revision of the EMEAF Plan (R002) reflects the feedback from engagement with Indigenous Nations and communities on previous versions of the plan.

OPG recognizes that while the assessment of environmental effects from DNNP has been satisfied from the Western perspective, it may not fully address the impact of the DNNP on Indigenous inherent and treaty rights as they are understood today. OPG endeavors to continue to work with Indigenous Nations and communities having a historical relationship with the site to appropriately identify the impacts of the Project on them and to achieve feasible mitigation measures and/or accommodation.

1.7.2 Regulatory Stakeholders

The EMEAF Plan was developed and refined through a consultative process involving OPG technical staff, and federal, provincial, and municipal stakeholders (listed in Section 3.2). OPG shared the EMEAF Plan (R000) with stakeholders and subsequently held workshops to discuss the contents of the EMEAF Plan. Stakeholders were provided opportunity to review and comment on the EMEAF Plan. OPG provided detailed responses to all comments received and issued R001 of the EMEAF Plan (R001) to reflect the outcomes of these processes. This EMEAF Plan (R002) addresses some additional comments provided by regulatory stakeholders.

1.8 Validation of the Environmental Impact Statement Results

As committed by OPG during the JRP public review process (OPG 2020b), once the specific technology is selected and design information is available, OPG will ensure that the results (predicted effects) of the EIS remain valid. OPG identified in late 2020, plans to construct a grid-scale SMR facility on the DNNP site, and will ensure the continued applicability of the EIS conclusions. In December 2021, OPG selected the BWRX-300 for deployment at the DNNP site. In late 2022, OPG completed the EIS review (D-P-12.1(a)) which confirmed that the conclusions of the EIS remain valid and that the DNNP is not likely to cause significant adverse effects with the implementation of mitigation measures (OPG 2023b).

2.0 ENVIRONMENTAL MANAGEMENT SYSTEM

The DNNP will fall under the existing Ontario Power Generation Nuclear (OPGN) Management System, N-CHAR-AS-0002. The OPGN Management System is compliant with the applicable elements of CSA N286-12, Management System Requirements for Nuclear Facilities. A number of interfacing policies and programs fall within this charter.

OPG's Environmental Policy, OPG-POL-0021 requires that OPG develop an Environmental Management System (EMS) in accordance with the International Organization for Standardization (ISO) 14001 EMS standard. OPG's EMS is documented in OPG-PROG-0005, which implements the Environmental Policy. OPG's EMS ensures that activities are performed in a manner to prevent or mitigate adverse impacts on the natural environment. The long-term objective is to continuously improve environmental performance.

OPG's EMS is registered to the ISO 14001:2015 standard, which provides expectations to establish, implement, maintain, and continually improve an environmental management system.

The EMS provides direction to a number of related governing and controlled documents. Specifically, relevant to the EMEAF is N-PROC-OP-0025, Management of the Environmental Monitoring Programs, which provides direction and accountabilities for design, implementation, and operation of EMPs at OPG's Nuclear facilities. The EMEAF program for DNNP will be implemented under existing management procedures for the EMPs.

2.1 Relationship to Other Monitoring

The monitoring described in the EMEAF Plan includes the follow-up activities committed to in the DNNP Commitments Report under Deliverable D-P-12, Environmental Monitoring and Environmental Assessment Follow-up (OPG 2023a).

The EMEAF Plan will help identify efficiencies in the scope of the follow-up activities required at each phase of the DNNP such that the data collected can be shared to meet the collective requirements for the DNNP and DN site.

The monitoring elements in the EMEAF Plan will be carried out under existing environmental program governance at DN, primarily Management of the Environmental Monitoring Programs, N-PROC-OP-0025. Implementation of the monitoring elements may also fall under other existing programs. Groundwater monitoring elements will be implemented through the groundwater monitoring program for the DNNP, which will be fully compliant with CSA N288.7-15, Groundwater protection programs at Class I Nuclear Facilities and Uranium Mines and Mills (hereafter referred to as CSA N288.7). The CNSC licensing process (e.g., as documented in the Licence Condition Handbook), as well as the requirements of other applicable approvals and regulatory processes (e.g., Authorization under Paragraphs

34.4(2)(b) and 35(2)(b) of the *Fisheries Act*[1]) will serve as the means to verify that the EA follow-up program requirements are appropriately designed and carried out.

OPG's existing EMP for the DN site, documented in N-PROC-OP-0025, has been developed in accordance with the Canadian Standards Association (CSA) N288.4-10 Environmental Monitoring Programs at Class 1 Nuclear Facilities and Uranium Mines and Mills (hereafter referred to as CSA N288.4). CSA N288.4 is part of the CSA N288 suite of standards on environmental management of nuclear facilities which were developed to align with stakeholder expectations while incorporating current international best practices. The standard addresses the monitoring of radioactive and non-radioactive contaminants, physical stressors, potential biological effects, and pathways for both human and non-human biota. The monitoring program design is risk informed and based on the results of an environmental risk assessment completed for the facility. An updated version of N288.4 was issued in 2019 and OPG's EMP will in the future transition to compliance with N288.4-19.

N288.4 identifies three types of monitoring: pathways monitoring, biological effects monitoring, and supplementary studies. Supplementary studies are conducted to achieve specific well-defined objectives. Follow-up monitoring of mitigation measures implemented following an EA is one objective of supplementary studies as outlined in N288.4.

Follow-up activities in the EMEAF Plan are considered supplementary studies to the DN EMP and as such will be implemented through the existing EMP governance (as shown in Figure 2-1). This means that N288.4 will be applied to EMEAF activities under the EMEAF Plan and it will provide the overall guidance for planning, design and implementation of the follow-up monitoring programs, as shown in the implementation framework in Section 1.6. Once the objective of each supplementary study is achieved, a determination would be made based on the results of the study, to either close off the study or integrate it into the routine EMP.

[1] Referred to within the Commitments Report (OPG 2023a) as the "Authorization for Works or Undertakings Affecting Fish Habitat conditions", this will herein be referred to within the EMEAF as the DFO authorization under the *Fisheries Act* or DFO *Fisheries Act* Authorization.

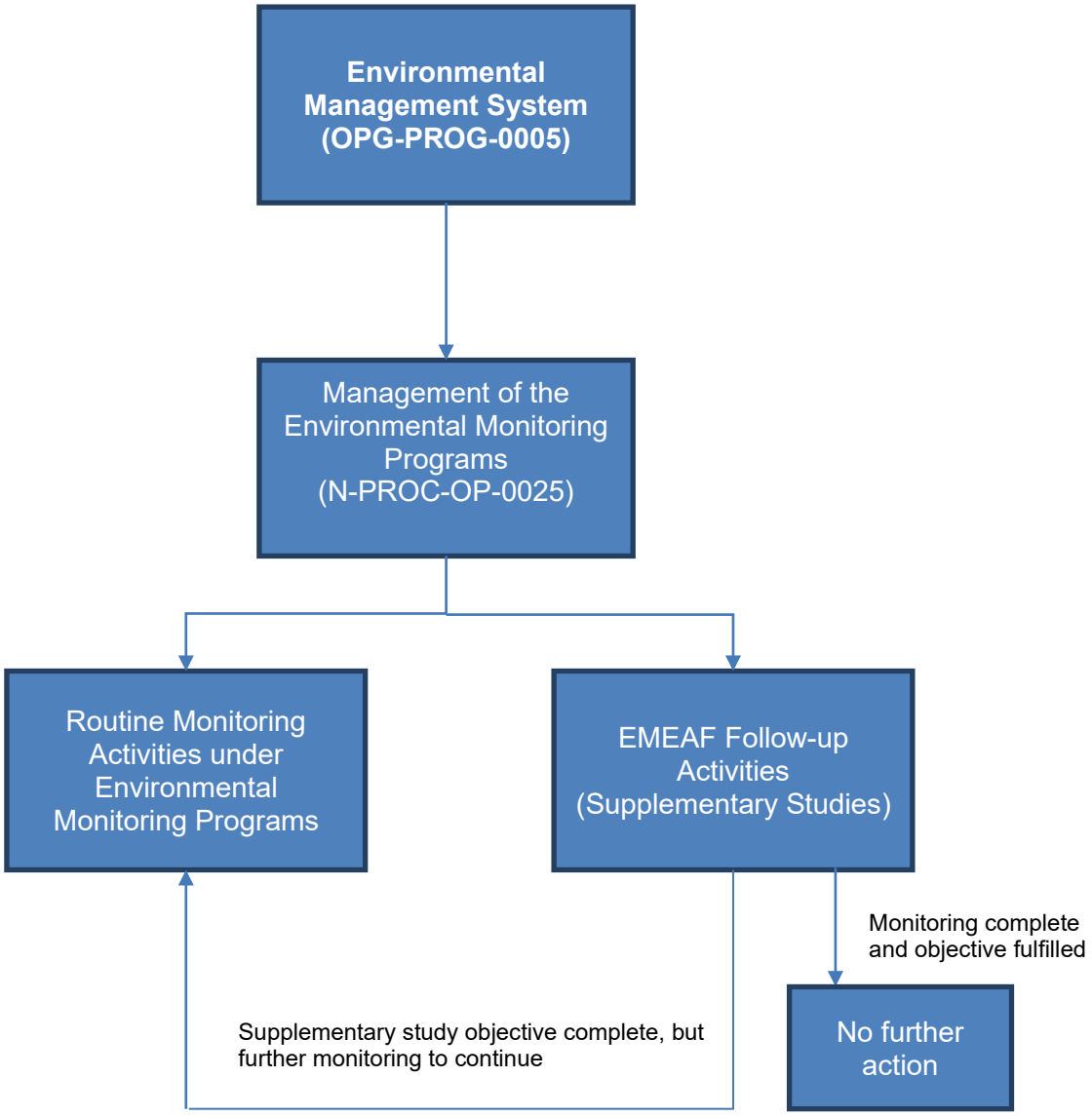


Figure 2-1: Integration of Follow-up Monitoring into Environmental Monitoring Program

3.0 EMEAF PLAN OVERVIEW

3.1 Organization of the Plan

Section 4.0 of this Plan provides an overview of the environmental components and sub-components that were assessed in the EA and subject to follow-up activities. The overview includes a description of the EA follow-up and/or monitoring objectives, completed or proposed baseline data collection, and adaptive management opportunities where applicable. The background information in Section 4.0 supplements the details in Appendix A to H, which describe each EMEAF activity that is to be completed prior to site preparation or during the

site preparation, construction, and operation phases of the DNNP. The EMEAF activities presented in the tables in Appendices A to H are aligned with OPG's commitments, which are consolidated and documented in the DNNP Commitments Report (OPG 2023a).

Table 3-1 provides a summary of the follow-up activities that comprise the DNNP EMEAF Plan and the phases in which they occur. Where an activity occurs in a specific phase, the corresponding activity number from the Appendix A to H tables is shown for reference. The Socio-Economic Environment EA follow-up activities are not discussed in this EMEAF Plan but will be addressed by Deliverable D-P-17 Communications, Consultation and Stakeholder Relations Program / Plan for the purposes of efficiency in the program/plan's scope of activities.

Follow-up program activities are focused on addressing specific EA follow-up objectives, and to the extent possible are designed with a defined duration, allowing results to be evaluated and corrective actions to be taken in a timely manner. Depending on the EA follow-up objectives, follow-up activities may occur throughout all phases or only during specific phases. Additional context can be found in Section 4.0.

Table 3-1: EA Follow-Up Activities

Environmental Component (OPG commitment ID)	Sub-Component	Follow-Up Activity Description	Prior to Site Preparation / Baseline	Site Preparation	Construction	Operation
Atmospheric Environment (D-P.12.2)	Air Quality	Measure air contaminants.	B-AE-1	P-AE-1	C-AE-1	O-AE-1
	Noise	Measure noise levels.	B-AE-2	P-AE-2	C-AE-2	O-AE-2
Surface Water Environment (D-P.12.3)	Site Drainage and Water Quality	Collect samples of lake water and sediment at shoreline and off-shore locations in the site study area.	B-SWE-1	P-SWE-1 (related to P-AQ-2) – (Not Required)	C-SWE-1 (related to C-AQ-2)	O-SWE-1
		If infill is required, collect samples of lake water and sediment within the future embayment area.	B-SWE-2	P-SWE-2 (Not Required)	C-SWE-2 (Not Required)	O-SWE-2 (Not Required)
		Collect and analyze samples of stormwater at stormwater discharge points.				O-SWE-3
	Lake Water Temperature	If once-through cooling is selected, periodically monitor lake water temperatures near the surface and at the bottom during commissioning.				O-SWE-5 (related to O-AQ-3)
	Lake Water Temperature,	Collect lake current, wave and temperature	B-SWE-3	P-SWE-3 (Not		

Environmental Component (OPG commitment ID)	Sub-Component	Follow-Up Activity Description	Prior to Site Preparation / Baseline	Site Preparation	Construction	Operation
	Lake Circulation and Shoreline Processes	measurements adjacent to the shoreline.		Required)		
	Lake Circulation and Shoreline Processes	Coastal engineer's assessment on the effects of the DNNP on neighbouring riparian landowners, shore processes, and aquatic resources.		P-SWE-4		
		If once-through cooling is selected, monitor performance of new intake (e.g., velocities and associated effects on substrates current deflection), and discharge (discharge velocities and associated effects on substrates and current deflection, thermal plumes) structures during commissioning.				O-SWE-4
	Various	If once-through cooling is selected, prior to operation, conduct a surface water risk assessment.			C-SWE-3 (related to C-AQ-1)	
Aquatic Environment (D-P.12.4)	Aquatic Biota	Undertake adult fish community surveys in the site study area and reference locations.	B-AQ-1			O-AQ-1
		Conduct impingement and entrainment sampling at DNGS (prior to site prep/baseline) and at DNGS and the DNNP once the DNNP is operational.	B-AQ-2		C-AQ-3	O-AQ-4
		If infill is required, monitor fish and other aquatic biota in and adjacent to the infill area to determine losses associated with lake infill construction.		P-AQ-2 (related to P-SWE-1) – (Not Required)		

Environmental Component (OPG commitment ID)	Sub-Component	Follow-Up Activity Description	Prior to Site Preparation / Baseline	Site Preparation	Construction	Operation
		Develop an Adaptive Management System for the algae hazard to the cooling water intake at DNNP. Operational issue not an environmental impact issue.			C-AQ-4	
		If the once-through cooling system is chosen for the DNNP, conduct a comprehensive surface water risk assessment.			C-AQ-1 (related to C-SWE-3)	
	Aquatic Habitat and Aquatic Biota	Conduct an assessment to determine the total area of permanent aquatic effects and incorporate any identified permanent aquatic effects into a cumulative effects assessment that includes the effects of impingement and entrainment, climate change, and overall potential effect on Round Whitefish.		P-AQ-1		
		If infill is required, monitor silt and sediment transport as it relates to aquatic biota and habitat as a result of construction activities associated with infill and partial bluffs.			C-AQ-2 (related to C-SWE-2) – (Not Required)	
		Monitor post-construction habitat conditions.				O-AQ-2
		If once-through cooling is selected, periodically monitor data on cooling water discharge temperature and plume characteristics in relation to fish habitat and susceptibility of Valued Ecosystem Component (VEC) species. Evaluate cumulative effects from the existing DNGS.				O-AQ-3 (related to O-SWE-5)

Environmental Component (OPG commitment ID)	Sub-Component	Follow-Up Activity Description	Prior to Site Preparation / Baseline	Site Preparation	Construction	Operation
Terrestrial Environment (D-P.12.5)	Vegetation Communities and Species	Conduct ecological land classification mapping of the vegetation communities at the DN site (including DNNP lands).	B-TE-3			
		Monitor conditions of terrestrial habitat (Cultural Meadow and Thicket, wetland ecosystems, and wildlife corridor) used by breeding birds, amphibians, and butterflies.		P-TE-2	C-TE-2	O-TE-2
	Insects Amphibians and Reptiles Mammal communities and species	Conduct insect, amphibian, reptile and mammal surveys prior to site preparation, and post construction with a focus on species at risk.	B-TE-5			O-TE-4
	Bird communities and species	Develop a Bank Swallow mitigation plan for implementation during Site Preparation and Construction, and verify the implementation of the plan throughout construction and operation. Undertake adaptive management approach.	B-TE-1 B-TE-2	P-TE-1	C-TE-1	O-TE-1
		Should cooling towers be chosen for condenser cooling, monitor bird communities, habitats, and bird collision impacts.				O-TE-3 (Not Required)
		Conduct Species at Risk surveys (e.g., Bobolink, Least Bittern) on the DNNP site prior to site preparation and operations.	B-TE-4			O-TE-4
	Mammal communities and species	Periodically conduct wildlife mortality surveys. (i.e., mammal road mortality surveys).		P-TE-3	C-TE-3	

Environmental Component (OPG commitment ID)	Sub-Component	Follow-Up Activity Description	Prior to Site Preparation / Baseline	Site Preparation	Construction	Operation
Geological and Hydrogeological Environment (D-P-12.6)	Groundwater Flow and Quality	Monitor groundwater flow and quality.	B-GH-1	P-GH-1	C-GH-1	O-GH-1
	Groundwater Flow	Conduct baseflow estimates at Darlington Creek.	B-GH-3		C-GH-3	
		Conduct groundwater flow modelling that incorporates post-development physical flow characteristics.				O-GH-4
	Soil Quality	Characterize and monitor soil quality.	B-GH-2	P-GH-2	C-GH-2	O-GH-2
	Groundwater Quality	Conduct an assessment of contaminant ingress/egress, to include the impact of wet and dry deposition of all contaminants of concern and gaseous emissions on groundwater quality.		P-GH-3		
		Monitor groundwater quality as part of the EMP.				O-GH-3
Land Use (D-P-12.7)	Land Use	Monitor land use policy in proximity to the DNNP site.	B-LU-1	P-LU-1	C-LU-1	
		Confirm projected population data in affected communities.		P-LU-2	C-LU-2	
Traffic and Transportation (D-P-12.8)	Transportation System Safety (Road)	Monitor traffic conditions, such as traffic volumes and collision data.	B-TT-1	P-TT-1	C-TT-1	O-TT-1
	Transportation System Safety (Marine)	If once-through cooling is selected, develop and undertake a follow-up program to verify no residual adverse effects on boating safety from an increased prohibitive zone.		P-TT-2	C-TT-2	O-TT-2
Health – Human and Non-Human Biota (D-P-12.9)	Non-Human Biota Human Biota	Review and update the Ecological Risk Assessment and Human Health Risk Assessment when reactor technology has been chosen, predicted effluent releases from the DNNP are known, and chemical emissions have been evaluated.		P-H+NHB-1 P-H+NHB-3		

Environmental Component (OPG commitment ID)	Sub-Component	Follow-Up Activity Description	Prior to Site Preparation / Baseline	Site Preparation	Construction	Operation
		Develop a comprehensive assessment of hazardous substance releases and the required management practices for hazardous chemicals on site, when reactor technology has been chosen.		P-H+NHB-2		
		Update the Ecological Risk Assessment and Human Health Risk Assessment if monitoring from other environmental components suggest changes that may lead to effects on human or non-human biota.			C-H+NHB-1 C-H+NHB-2	O-H+NHB-1 O-H+NHB-2
		If cooling towers are chosen, conduct an Ecological Risk Assessment on the blow down pond.				O-H+NHB-3 (Not Required)

Note:
Tracking of status of completion of EMEAF activities will be performed outside of the EMEAF Plan.

3.2 Organization of the Environmental Monitoring and Environmental Assessment Follow-up Plan Tables

The tables presented in the Appendices have the following column headings, which are described in this section.

Environmental Component

The scopes of the EMEAF activities will be integrated within a framework of individual aspects or “components” of the environment to ensure efficiency in the implementation of each activity and effective consideration of the monitoring results across studies. The environmental components and sub-components are consistent with those identified in the EA for the DNNP. Residual adverse effects on each component are described in Section 4.0 of this plan, along with an outline of associated monitoring. The appendix table for each environmental component provides additional detail on the associated monitoring program.

The EMEAF activities are organized into eight (8) Appendices (Appendices A to H) for the following environmental components:

- Appendix A – Atmospheric Environment;

- Appendix B – Surface Water Environment;
- Appendix C – Aquatic Environment;
- Appendix D – Terrestrial Environment;
- Appendix E – Geological and Hydrogeological Environment;
- Appendix F – Land Use;
- Appendix G – Traffic and Transportation Environment; and
- Appendix H – Health – Human and Non-Human Biota.

The Socio-Economic Environment EA follow-up mitigation measures proposed, and commitments made by OPG during the JRP public review process, and the Panel's recommendations (in accordance with the GOC's Response), as presented in the DNNP Commitments Report, will be addressed by Deliverable D-P-17 Communications, Consultation, and Stakeholder Relations Program / Plan, and are not discussed in this EMEAF Plan.

Activity Number

Each EMEAF activity for each environmental component has been assigned a unique activity number (for example, P-AE-1) for tracking purposes as follows. Activity numbers starting with,

"B" are baseline data collection and other activities to be undertaken prior to site preparation,

"P" are activities associated with the site preparation phase, or prior to construction phase,

"C" are associated with the construction phase, or prior to operation phase, and

"O" are associated with the operation phase of the DNNP.

Each environmental component is assigned an acronym for example, AE, is the acronym for Atmospheric Environment. Thus, P-AE-1 translates to an activity to be undertaken in the site-preparation phase – in the atmospheric environment – first activity.

Applicable Phase

The EMEAF activities are organized within each environmental component in the Appendices to align with the applicable project phase, which matches the CNSC licence phase (site preparation, construction, and operation). Subsequent phases of the project (e.g. decommissioning) will be incorporated as the scope and nature of the follow-up program is reviewed and adjusted on an ongoing basis, as part of adaptive management (OPG 2009a).

Environmental Sub-component

Within each environmental component are sub-components consistent with those identified in the EA for the DNNP, and they are described in Section 4.0 of this Plan.

Activity Description

Each EMEAF activity is described briefly in this section. The activities align with commitments made by OPG which are documented in the DNNP Commitments Report (OPG 2023a).

EA Conclusion

The EA conclusion that is made within Chapter 5 of the EIS report (OPG 2009a) associated with the environmental sub-component and follow-up activity is stated in this section, taking into consideration any in-design and additional mitigation measures that were incorporated into the assessment of likely effects and residual adverse effects in the EIS.

EA Follow-Up Objective

This section provides a concise description of the objective(s) of the EA follow-up activity. The objectives should be one or more of the EMEAF objectives identified in the LCH (listed in Section 1.5 of this EMEAF Plan).

Scope

This section describes the scope of the EMEAF activity including the activity duration, parameters to be monitored, frequency, and location.

EA Effects Threshold Criteria

Preliminary EA effects threshold criteria were established in Chapter 5 of the EIS (OPG 2009a) for each EA follow-up activity. These were identified in the EIS as evaluation criteria. The EA effects threshold criteria identify a threshold below which (typically) there are no predicted adverse effects. The criteria will be reviewed during detailed work planning and will be updated, if necessary (i.e., to reflect changes to applicable laws and other regulatory requirements).

Follow-Up Endpoint

All EA follow-up activities are expected to be discontinued when the objective has been satisfied. Where a follow-up activity extends across multiple phases, the endpoint is identified as the point at which the final activity has been completed, with consideration of whether or not the EA follow-up objectives have been met.

Relationship to Other Activities, Programs and Standards

This section identifies related follow-up activities, programs, and standards associated with the follow-up activity. Related follow-up activities are those which precede or follow the activity and are generally linked to the successful completion of an EA follow-up objective.

Related programs or standards identifies other OPG programs, standards, and regulatory requirements for the DNNP which could be supported by data/results from the EMEAF activity, or where data being collected under these programs may support an EMEAF activity. This section also identifies environmental protection plans that will be implemented as in-design mitigation measures for the DNNP (e.g. DNNP's Environmental Management and Protection Plan (EMPP) for the site preparation phase under D-P-3 of the Commitments Report (OPG 2023a)).

Stakeholders

The scope and details of the EMEAF Plan were refined for implementation through consultation with regulatory stakeholders including:

- Federal Regulatory Authorities (e.g., CNSC, Fisheries and Oceans Canada (DFO) and Transport Canada (TC);
- Other Federal Authorities (e.g., Health Canada (HC), Natural Resources Canada (NRC); and Environment and Climate Change Canada (ECCC));
- Provincial ministries (e.g., Ontario Ministry of the Environment Conservation and Parks (MECP), Ontario Ministry of Energy, Ontario Ministry of Transportation (MTO), and Ontario Ministry of Natural Resources and Forestry (MNRF));
- Emergency Management Ontario (EMO);
- Central Lake Ontario Conservation Authority (CLOCA); and
- Municipality of Clarington and Regional Municipality of Durham, City of Oshawa (Municipalities);

Engagement with Indigenous Nations and communities is discussed in Section 1.7.1.

Related Commitments Report Deliverables

This section references the related commitments and report deliverables as documented in the DNNP Commitments Report (OPG 2023a).

The related deliverable(s) / sub-deliverable(s) identified in this section correspond with commitments made by OPG during the JRP public review process, including commitments related to the Panel's recommendations (in accordance with the GOC's Response).

Within the "Other" subheading, the listed commitments have been identified to be related to the follow-up activity, but do not define the scope of the EMEAF activity. These "other" commitments are included for informational purposes.

3.3 Preliminary Work Activity Scoping

Preliminary work activities are presented in Appendix I for all of the EMEAF activities listed in the EMEAF Plan to support the work plan scoping. The EMEAF Plan is intended to provide the high-level program scope which is then used to develop methodology reports for implementation. At the present time, the level of detail to which the work activities may be scoped vary depending on various factors including the type of activity, the extent to which baseline data collection has been completed, and whether or not the scope of the activity is contingent on the detailed design of the DNNP. Due to these factors, the work activities presented in Appendix I are preliminary and provided for discussion and further refinement.

4.0 ENVIRONMENTAL COMPONENT FOLLOW-UP ACTIVITIES

The environmental components described here relate to the components identified in DNNP Commitment D-P-12, Environmental Monitoring and Environmental Assessment Follow-Up. The list of environmental components does not include the Radiation and Radioactivity environmental component, for which no EMEAF monitoring commitments were identified (OPG 2023a). OPG's commitments related to Radiation and Radioactivity are covered under D-C-6 "Radiological Environmental Monitoring Program", now called the EMP.

It is recognized that DNNP activities impact inherent and Treaty rights under the Gunshot Treaty (1787-1788), the Williams Treaties (1923), and the Williams Treaties Settlement (2018). OPG is continuing to understand the inherent and Treaty rights impacts in dialog with participating WTFNs. It is intended that plans and updates on monitoring activities will be shared with participating WTFNs.

4.1 Atmospheric Environment Follow-Up

4.1.1 Background

The Atmospheric Environment component is comprised of two environmental sub-components, outlined in Table 4-1. The Atmospheric Environment did not have Valued Ecosystem Components (VECs); rather, it has pathways for the transfer of effects to human health, to non-human biota, and to VECs in other environmental components. Since there are no VECs in the Atmospheric Environment, no residual adverse effects were attributed to either air quality or noise in Chapter 5 of the EIS for the Atmospheric Environmental component (OPG 2009a).

Table 4-1: Atmospheric Environment Follow-Up Summary

Sub-Component	Sub-Component Description	EA Conclusion	Follow-Up Activity Description	Activity Details (Appendix A)
Air Quality	Physical (climate and meteorology) and non-radiological chemical characteristics of the air shed in the vicinity of the DN site.*	No residual adverse effects on Air Quality (non-radiological) are predicted as a result of the project, considering the implementation of mitigation measures (Dust Management Plan).**	Measure air contaminants during site preparation, construction, and operation phases.	B-AE-1 P-AE-1 C-AE-1 O-AE-1
Noise	Sound level characteristics in the vicinity of the DN site.	No residual adverse effects on Noise conditions are predicted as a result of the project, considering the implementation of mitigation measures (Noise Management Plan).**	Measure noise levels during site preparation, construction, and operation phases.	B-AE-2 P-AE-2 C-AE-2 O-AE-2

* Radiological air quality is covered in the Radiation and Radioactivity component.

** Residual effects in other environmental components that may result from the sub-component pathway were described in the appropriate sections of the EIS (OPG 2009a).

OPG's EMEAF commitments for the atmospheric environmental component are documented in commitment number D-P-12.2 of the DNNP Commitments Report (OPG 2023a). The commitments, and any baseline studies completed to date, inform the details (scope, schedule, and work activities) of the Atmospheric Environment EA follow-up activities, which are outlined in Appendix A.

4.1.2 Air Quality

As documented in the Atmospheric Environment Assessment of Environmental Effects Technical Support Document (TSD) (SENES 2009b), there may be some localized, short-term dust emissions related to the DNNP during the site preparation and construction phases of the DNNP. With the implementation of a Dust Management Plan (an in-design mitigation measure), no residual adverse effects are predicted to be associated with the short-term dust emissions. The Dust Management Plan will be implemented as part of the nuisance effects (dust and noise) mitigation measures under the EMPP (Commitment #D-P-3.2).

EA follow-up activities will include measurement of Total Suspended Particulate (TSP), PM_{10} and $PM_{2.5}$ as well as volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs, specifically benzo(a)pyrene), NO_2, and SO_2. Monitoring will be conducted prior to site preparation (to collect baseline data), during the site preparation and construction phases of the DNNP, and a minimum of one year during operation phase, using continuous and/or semi-continuous sampling methods. The details of these activities are presented in Appendix A under B-AE-1, P-AE-1, C-AE-1, and O-AE-1. An adaptive management program will be employed throughout the site preparation and construction phases of the project, whereby the

scope of the air quality monitoring will adapt to information learned during the implementation of the program. For example, consecutive non-detectable quantities of a contaminant, or values that are close to baseline, may warrant consideration to suspend or reduce the scope of the program. Conversely, if consecutive exceedances for a given contaminant are identified, the scope of the program may be temporarily augmented to try and pinpoint the cause and to test the efficacy of any supplemental mitigative controls that have been implemented to avoid or eliminate adverse effects. If consistent exceedances of project effects criteria are identified, then adaptive management policies, such as increased road watering or diesel exhaust emission reductions, will be implemented through the site-specific environmental plans/procedures, which are the plans/procedures that OPG's contractors will develop and follow, where required, based on the DNNP EMPP. Any changes to the air quality monitoring program as a result of adaptive management will be communicated to the CNSC as part of the EMEAF program annual report (see Section 6.1).

The EA follow-up monitoring objective for P-AE-1, C-AE-1, and O-AE-1 is to confirm the effectiveness of mitigation measures and verify that there are no residual adverse effects passed on through this pathway. To meet this objective, the monitoring results will be analyzed and compared to modelling predictions completed for the EIS (i.e., Section 6.1 of SENES 2009b), baseline data, the Canadian Ambient Air Quality Standards (CAAQS), and the Ontario Ambient Air Quality Criteria (AAQC).

The EA follow-up objectives for air quality will be achieved following the construction phase and the first year of the DNNP's operation phase. EA follow-up monitoring will be conducted for a minimum of one year after the DNNP is fully operational to verify the EIS conclusion of no residual adverse effects. After follow-up activities are complete, air quality will continue to be measured or modelled in accordance with any requirements to meet Environmental Compliance Approval (ECA) conditions. ECAs will be managed similarly to how they are managed at the DNGS.

4.1.3 Noise

As documented in the Atmospheric Environment Assessment of Environmental Effects TSD (SENES 2009b), some measurable increases to noise levels are predicted at off-site receptor locations during the site preparation, construction, and operation phases of the DNNP. With the implementation of a Noise Management Plan (in-design mitigation measure), no adverse effects are predicted as a result of increased noise levels. In-design mitigation measures are design features included in the Project planning to pre-empt possible environmental effects, based on best practices and OPG experience. The Good Industry Management Practices that are included as "in-design" mitigation measures have been integrated into the DNNP EMPP. Per the DNNP EIS, Good Industry Management Practices is a technique, method or process that has been adopted by a significant proportion of the subject industry and shown to be effective at delivering the desired outcome with few problems, unforeseen complications, and negative results. Good Industry Management Practices are based on repeatable procedures that have been shown to be effective over time and for large numbers of applications. For the purpose of this EMEAF Plan, OPG deems Best Management Practices and Good Industry Management Practices to be equivalent. The Noise Management Plan will be implemented as

part of the nuisance effects (dust and noise) mitigation measures under the EMPP (Commitment #D-P-3.2).

EA follow-up activities will include measuring noise levels during site preparation and construction activities to confirm, during periods that are representative of reasonable worst-case scenarios, the effectiveness of the Noise Management Plan and verify the absence of residual adverse effects. The noise monitoring program will measure the increase in sound levels from site preparation and construction activities and will identify sound levels at a number of strategic locations at or outside of the DNNP, near sensitive Socio-Economic receptors. Noise monitoring will occur approximately 2 to 3 times per year (i.e., over seven (7) days) to cover peak construction periods. Results will be analyzed and compared to baseline monitoring results and to modelling predictions completed for the EIS (i.e. Section 6.3 of SENES 2009b).

Provided the monitoring and modelled values do not exceed the EA effects threshold criteria (Appendix A), the significance of the effect will be consistent with the assessment. If the results show regular exceedances of hourly sound level criteria, then adaptive management policies will be implemented, including, for example, extended noise monitoring and the implementation of noise control measures.

The EA follow-up objectives for noise will be achieved following the construction phase and a minimum of one year into the operation phase (O-AE-2). Following that, noise emissions will continue to be monitored or modelled in accordance with any requirements to meet ECA conditions.

4.2 Surface Water Environment Follow-Up

4.2.1 Background

The Surface Water Environment was comprised of four environmental sub-components listed below (Table 4-2). Similar to the Atmospheric Environment, the Surface Water Environment did not have VECs; rather, it has pathways for the transfer of effects to human and non-human biota and to other environmental components. Because these sub-components are pathways to VECs in other environmental components, no residual adverse effects were identified in Chapter 5 of the EIS for the Surface Water Environment component (OPG 2009a). However, EA follow-up activities will be conducted to confirm the effectiveness of the mitigation measures to validate the assumptions made in the EA and to verify that there are no residual adverse effects passed through to other environmental components.

Table 4-2: Surface Water Environment Follow-Up Summary

Sub-Component	Sub-Component Description	EA Conclusion	Follow-Up Activity Description	Activity Details (Appendix B)
Site Drainage and Water Quality	Stormwater and liquid effluents from the site and the resultant receiving water quality.	No residual adverse effects on Site Drainage and Water	Collect samples of lake water and sediment at shoreline and off-shore locations in the site study	B-SWE-1 P-SWE-1 [b] C-SWE-1

Sub-Component	Sub-Component Description	EA Conclusion	Follow-Up Activity Description	Activity Details (Appendix B)
		Quality are predicted considering the implementation of mitigation measures. [a]	area.	O-SWE-1
			Collect samples of lake water and sediment within the future embayment area.	B-SWE-2 P-SWE-2 [b] C-SWE-2 [b] O-SWE-2 [b]
			Collect and analyze samples of stormwater at stormwater discharge points.	O-SWE-3
Lake Water Temperature	Lake-wide thermal regime; near shore mean temporal and spatial temperature variations; and thermal plumes.	No residual adverse effects on lake water temperatures are predicted considering the implementation of mitigation measures. [a]	If once-through cooling is selected, periodically monitor lake water temperatures near the surface and at the bottom during commissioning.	O-SWE-5
			Collect temperature measurements adjacent to the shoreline.	B-SWE-3 P-SWE-3 [b]
Lake Circulation Shoreline Processes	**Lake Circulation:** Lake-wide circulation characteristics; near shore lake current direction and velocity; water velocities and directions near cooling water withdrawals and discharges; and cooling water withdrawal volumes and rates. **Shoreline Processes:** Processes that affect the nearshore conditions in the vicinity of the DN site (e.g., geomorphic setting and bathymetry; sediments; Lake Ontario water levels; wave conditions; and ice behaviour); sediment transport and deposition.	No residual adverse effects on Lake Circulation and Shoreline Processes are predicted.	Collect lake current and wave measurements adjacent to the shoreline.	B-SWE-3 P-SWE-3[b]
			Coastal engineer's assessment on the effects of the DNNP on neighbouring riparian landowners, shore processes and aquatic resources.	P-SWE-4
			If once-through cooling is selected, monitor performance of new intake and discharge structures during commissioning.	O-SWE-4
Applicable to all sub-components			If once-through cooling is selected, conduct comprehensive surface water risk assessment prior to construction.	C-SWE-3

[a] Residual effects in other environmental components that may result from the sub-component as a pathway was described in the appropriate section of the EIS (OPG 2009a).

[b] Activity no longer required, see details in Appendix B.

OPG's EMEAF commitments for the surface water environmental component are documented in commitment number D-P-12.3 of the DNNP Commitments Report (OPG 2023a). The

details (scope, schedule, and work activities) of the Surface Water Environment EA follow-up activities are provided in Appendix B.

Hydrology information pertaining to lake circulation, thermal plume monitoring, and stream base flow monitoring is available for various years. Specifically, lake circulation data are available from 2011-2012; and thermal monitoring data are available from 2011-2012 and 2017-2018. Stream hydrology base flow monitoring data are available from 2008 and 2019. Historical current and wave information is from the 2009 Surface Water Environment Existing Environmental Conditions TSD (Golder 2009a). Surface water quality data are available from 2007/2008, 2011-2012, and 2019. Sediment quality data are available from 2007/2008 and 2019. A comprehensive summary of surface water and hydrology studies is provided in the Ecometrix DNNP Supporting Studies – Environment report (Ecometrix 2022a).

4.2.2 Site Drainage and Water Quality

Based on the assessment provided in the Surface Water Environment Assessment of Environmental Effects TSD, no adverse environmental effects were identified for site drainage and water quality (Golder 2009b), considering the implementation of mitigation measures as described in Section 5.3.7.2 of the EIS (OPG 2009a).

The JRP recommended that water quality data be collected at a comprehensive number of shoreline and offshore locations prior to commencing in-water works (JRP rec. 13, JRP 2011). The Government of Canada further required OPG to have a water and sediment quality monitoring program as a condition of the DFO Fisheries Act Authorization (GOC response to JRP rec. 13,15, GOC 2012). A follow-up program will be conducted to collect samples of lake water and sediment during baseline and subsequent phases, as described in activities B-SWE-1, P-SWE-1, C-SWE-1, and O-SWE-1.

A follow-up program will also be conducted to collect samples at all stormwater discharge points (O-SWE-3) according to commitment D-P-12.3 (OPG 2009a, OPG 2023a). Stormwater monitoring will focus on the post-construction phase for a minimum of 1 year and will be considered complete if results indicate no residual adverse effects on water quality. This can be assessed through the routine DN ERA updates. The stormwater monitoring program will be conducted to confirm the effectiveness of mitigation measures, particularly the Stormwater Management Plan/Procedure (D-P-3.4) and the Erosion and Sediment Control Plan/Procedure (D-P-3.5), which are part of the EMPP, described in Sections 11.1 and 8.6, respectively; and to verify the EIS conclusion of no residual adverse effects to Lake Ontario water quality.

4.2.2.1 Follow-Up Activities No Longer Required under Site Drainage and Water Quality

The EIS concluded that the embayment created at the mouth of Darlington Creek as a result of lake infilling may experience increased algae growth and entrapment due to less mixing of the nutrients from Darlington Creek, warmer temperatures and the protected nature of the embayment (Golder 2009b). Additionally, construction of the infill area coffer dam, as well as the cooling water intake and discharge, could result in measurable suspended sediments at this location. It was anticipated that these effects would be temporary in nature due to the high

energy environment of the nearshore and the implementation of Good Industry Management Practices during the construction phase. A follow-up monitoring program to collect samples of lake water and sediment within the future embayment area during baseline and subsequent phases is described in activities B-SWE-2, P-SWE-2, C-SWE-2, and O-SWE-2. Currently there is no plan to implement lake infilling for the DNNP; therefore, these follow-up activities will not be required.

During operation, the potential creation of nuisance algae growth conditions, due to temperature increases or thermal barrier, at the east end of the proposed infill may have required additional measures to enhance circulation. As such, the adaptive management approach discussed in the EIS (OPG, 2009a) may have included additional measures if practicable. As indicated above, currently there is no plan to implement lake infilling for the DNNP; therefore, associated follow-up activities to monitor the general lake infill area (O-SWE-1, O-SWE-2) will not be required for this purpose. O-SWE-1 will be required to meet other commitments, as discussed earlier in Section 4.2.2.

4.2.3 Lake Circulation and Shoreline Processes

The effects on near neighbouring riparian landowners, shoreline processes, and aquatic resources as the result of the Project, will be further assessed by a coastal engineer when the detailed engineering design of the shoreline works is available (P-SWE-4). It is expected that the coastal engineer's assessment will confirm OPG's assessment of no predicted effects on near neighbouring riparian uses.

For once-through cooling, OPG will also monitor performance of the new intake (e.g., velocities and associated effects on substrates current deflection) and new discharge structure (discharge velocities and associated effects on substrates and current deflection; thermal plumes) during commissioning (O-SWE-4).

4.2.3.1 Follow-Up Activities No Longer Required under Lake Circulation and Shoreline Processes

Lake Circulation

The EIS concluded that the alterations along the shoreline, including lake infilling, and the intake and discharge of water from the operation of the service water system and the cooling water system of the once-through cooling option, would likely result in measurable changes in local circulation patterns in the nearshore environment of Lake Ontario. These would include the creation of a reduced energy area in the embayment area near the mouth of Darlington Creek. However, any measurable changes were not considered to result in a meaningful adverse effect to the lake circulation sub-component (OPG 2009d). Currently, there are no plans to implement lake infilling for the DNNP; therefore, follow-up activities associated with lake infilling will not be required.

In addition to the above predicted effects on lake circulation, the EIS also acknowledged that the cooling tower option, if implemented, would result in a withdrawal of lake water (4.5 m^3/s). It is predicted that this withdrawal would have no effect on the natural level of Lake Ontario at

the International Boundary, or on Lake Ontario discharges into the St. Lawrence River, given that the water levels are maintained through regulated control structures (Moses-Saunders power dam) and continuous input and output of large volumes of water. Should cooling towers be implemented for the DNNP, Surface Water Environment EA follow-up would include, during the site preparation phase (when detailed design is available), confirmation that the environmental and socio-economic effects downstream in the St. Lawrence River are minimal. There is no plan to implement the cooling tower option for the DNNP, and these EA follow-up activities are not considered further.

Shoreline Processes

Removal of the bluffs fronting the foreshore, associated with lake infilling, and the offshore deflection of alongshore currents and sediments (due to the presence of the infill area), as well as the intake and discharge of water associated with the service water and cooling water systems, were considered to result in a change in shoreline processes. This change, along with mitigation measures, was not considered to result in a residual adverse effect to Lake Ontario, including downdrift beaches (OPG 2009a). Currently there is no plan to implement lake infilling for the DNNP; therefore, follow-up activities associated with infilling will not be required.

EA follow-up monitoring for the Lake Circulation and Shoreline Processes sub-component, prior to site preparation (B-SWE-3) and post construction of the lake infill (P-SWE-3), and during the operation phase, included monitoring lake current and wave measurements to confirm the effectiveness of mitigation measures and continuing absence of residual adverse effects. Since there is no current plan to implement lake infilling for the DNNP these activities are no longer required for the sub-component.

4.2.4 Lake Water Temperature

The EIS predicted the effect of thermal discharges associated with the operation of the service water and cooling water systems that will likely result in a change to lake water temperatures in Lake Ontario (OPG 2009a). To pre-empt environmental effects, in-design mitigation measures will be incorporated into the DNNP design. As such, no residual adverse effect in the Surface Water Environment is predicted. Temperature measurements have been collected adjacent to the shoreline prior to site preparation (B-SWE-3).

Since once-through condenser cooling option technology has been selected for the DNNP, EA follow-up activities will include:

- Surface water risk assessment of the thermal and contaminant plumes during Construction Phase (C-SWE-3). A similar activity (i.e., C-AQ-1) is proposed for Aquatic Environment EA follow-up monitoring as this Surface Water Environment effect is a pathway to both aquatic habitat and biota. Should the surface water risk assessment predict a potential hazard, the CNSC will convene a follow-up monitoring scoping workshop with ECCC, DFO and other relevant authorities to develop an action plan (D-P-12.3). OPG will update the surface water risk assessment, as needed; and

- During operation, OPG will monitor lake water temperature to confirm the effectiveness of mitigation measures and continuing absence of residual adverse effects (O-SWE-5). A similar activity is proposed for Aquatic Environment EA follow-up monitoring as this Surface Water Environment effect is a pathway to both aquatic habitat and biota (i.e., O-AQ-3).

4.3 Aquatic Environment Follow-Up

4.3.1 Background

The Aquatic Environment was comprised of the two environmental sub-components (aquatic habitat and aquatic biota) that are potentially susceptible to effects of the DNNP and/or are pathways or mechanisms for transfer of an effect to another environmental component (Table 4-3). No residual adverse effects were identified for Aquatic Habitat. The following minor residual adverse effects (not significant) related to Aquatic Biota were identified in Chapter 9 of the EIS for the Aquatic Environment component (OPG 2009a), which may remain in spite of mitigation:

- Loss of some aquatic biota (i.e., benthic invertebrates, fish) during the construction of the lake infill and the intake and discharge structures; and

- Impingement and entrainment losses associated with operation of the once-through lake water cooling option, and to a lesser degree, with the cooling tower option.

EA follow-up activities will be developed and implemented to confirm the effectiveness of the mitigation measures, to validate the assumptions made in the EA, and to verify that there are no significant adverse effects to the Aquatic Environment during all phases of the DNNP. Currently, there is no plan to do any lake infilling or to implement the cooling tower option for the DNNP; therefore, associated follow-up activities will not be required.

Table 4-3: Aquatic Environment Follow-Up Summary

Sub-Component	Sub-Component Description	EA Conclusion	Follow-Up Activity Description	Activity Details (Appendix C)
Aquatic Biota	**Aquatic Biota:** The communities of underwater plants and animals that occupy the aquatic habitat defined above. These include, depending on habitat conditions, periphyton, aquatic macrophytes, phytoplankton, benthic invertebrates, zooplankton, and fish.	No significant residual adverse effects to Aquatic Biota considering the implementation of mitigation measures.	Undertake fish community surveys in the site study area and reference locations.	B-AQ-1 O-AQ-1
			Conduct impingement and entrainment sampling at DNGS and, during operation, at the DNNP site.	B-AQ-2 C-AQ-3 O-AQ-4
			Monitor fish and other aquatic biota in and adjacent to the infill area to determine losses associated with lake infill construction.	P-AQ-2 [a]
			Develop an Adaptive Management	C-AQ-4

Sub-Component	Sub-Component Description	EA Conclusion	Follow-Up Activity Description	Activity Details (Appendix C)
	Aquatic biota may also include rare, vulnerable, threatened, and endangered aquatic species.		System for the algae hazard to the cooling water intake at DNNP.	
			If the once-through cooling system is chosen for the DNNP, conduct a comprehensive surface water risk assessment.	C-AQ-1
Aquatic Habitat and Aquatic Biota	**Aquatic Habitat:** The physical areas of Lake Ontario, tributary watercourses and ponds within the study area. These areas were characterized by conditions of flow, current, bathymetry, temperature, substrates, and water quality that influence their status with respect to the federal *Fisheries Act.* **Aquatic Biota:** defined above.	No residual adverse effects on Aquatic Habitat and Aquatic Biota, considering the implementation of mitigation measures, which include the Fish Habitat Compensation Plan.	Conduct an assessment to determine the total area of permanent aquatic effects and incorporate any identified permanent aquatic effects into a cumulative effects assessment that includes the effects of impingement and entrainment, climate change, and overall potential effect on Round Whitefish.	P-AQ-1
			Monitor silt and sediment transport as it relates to aquatic biota and habitat as a result of construction activities associated with infill and partial bluffs.	C-AQ-2 [a]
			Monitor post-construction habitat conditions.	O-AQ-2
			If once-through cooling is selected, periodically monitor data on cooling water discharge temperature and plume characteristics in relation to fish habitat and susceptibility of VEC species. Evaluate cumulative effects from the existing DNGS.	O-AQ-3

[a] Activity no longer required, see details in Appendix C.

OPG's EMEAF commitments for the aquatic environmental component are documented in commitment number D-P-12.4 of the DNNP Commitments Report (OPG 2023a). The details (scope, schedule, and work activities) of the Aquatic Environment EA follow-up activities are provided in Appendix C.

Multiple baseline studies have been conducted for the aquatic environment since the preparation of the EIS. Specific studies and years in which monitoring was conducted are presented in the DNNP – Site Preparation Licence Renewal Activity Report – Environment (Ecometrix 2020).

4.3.2 Aquatic Habitat

Based on the assessment provided in the Aquatic Environment Assessment of Environmental Effects TSD (Golder and SENES 2009b), no residual adverse effects are predicted for aquatic

habitat provided that the mitigation measures (including the Fish Habitat Compensation Plan) function as expected.

To verify the assumptions used in predicting the effects, to confirm the predicted effects, and to verify that mitigation is effective, the Aquatic Environment EA follow-up activities will include, during site preparation, construction and operation phases, monitoring of conditions to confirm the effectiveness of mitigation measures, and continuing absence of residual adverse effects associated with the aquatic habitat. To address the GOC Response to JRP recommendation 37 (GOC 2012), the total area of permanent aquatic effects will be determined by OPG to properly scale mitigation and follow-up monitoring prior to construction, and the assessment will include a cumulative effects assessment which include the effects of impingement and entrainment, and climate change (P-AQ-1). The cumulative effects assessment under P-AQ-1 will also factor in potential effects on Round Whitefish populations, identified under deliverable D-P-15.1 “Round Whitefish Action Plan”. The CNSC accepted closure of deliverable D-P-15.1 (CNSC 2022) with the understanding that cumulative effects to Round Whitefish will be addressed and tracked under D-C-1.2.

During construction, silt and sediment transport will be monitored as it relates to aquatic biota and habitat as a result of infill and partial bluffs construction activities (C-AQ-2, in conjunction with C-SWE-2 – both no longer required). Post-construction habitat conditions will be monitored to confirm the effectiveness of mitigation measures (i.e., the Fish Habitat Compensation Plan, defined in D-P-14.1) and verify the predictions of no residual adverse effects (O-AQ-2). Currently, there are no plans to implement lake infill for the DNNP; therefore, associated follow-up activities will not be required. However, monitoring will be applicable for other shoreline works (e.g., shoreline protection and some minor lake bottom dredging).

Since a once-through cooling system was chosen for the project, OPG will periodically monitor data on cooling water discharge temperature and plume characteristics interpreted in relation of fish habitat, and the susceptibility of VEC species, to verify the EIS conclusions post-construction (O-AQ-3, in conjunction with O-SWE-5).

4.3.2.1 Follow-Up Activities No Longer Required under Aquatic Habitat

Within D-P-12.4 and GOC Response to JRP Recommendation #29, there is a commitment for OPG to continue the research element of the proposed Round Whitefish Action Plan (RWAP) for the specific purpose of better defining the baseline condition, including the population structure, genome, and geographic distribution of the Round Whitefish population as a basis from which to develop testable predictions of effects, including cumulative effects. This commitment is duplicated in deliverable D-P-15.1 “Round Whitefish Action Plan”. All Round Whitefish-related studies conducted to date, including fish community, thermal, impingement and entrainment, and genetic studies, indicate that none of OPG nuclear operations have an adverse effect on Round Whitefish or their habitat, and OPG’s operations are not contributing to species decline. In addition, the CNSC approved OPG’s request for closure of D-P-15.1 in May 2022 (CNSC 2022). Therefore, the specific commitment within D-P-12.4 to continue the research element of RWAP has already been addressed and closed within D-P-15.1 and does not need to be addressed within D-P-12.4.

4.3.3 Aquatic Biota

The construction of the lake infill and the intake and discharge structures is predicted to result in the loss of some aquatic biota (i.e., benthic invertebrates, fish). This effect was identified as a minor residual adverse effect on aquatic biota since the near shore environment of the proposed infill is a high energy zone (typically shallow; influenced by waves, storm events), with few documented invertebrate species (OPG 2009a). EA follow-up activities include, during the site preparation and construction phases, monitoring water quality (including suspended sediment) that may influence aquatic biota to confirm the continuing absence of significant residual adverse effects associated with the construction of the lake infill and the intake and discharge structures as part of Surface Water activities P-SWE-1 and P-SWE-2. In the event that measurable residual adverse effects do occur, an adaptive management strategy will be implemented to address changes to the environment associated with the aquatic ecosystem over time. Algae hazard at the cooling water intake will be addressed through an Adaptive Management System that includes a model-based monitoring system to define threshold levels of algal biomass that would trigger more intense monitoring, which could lead to proposed contingency measures (C-AQ-4). Currently, there are no plans to implement lake infilling for the DNNP; therefore, associated follow-up activities will not be required. However, monitoring will still be applicable for other shoreline works.

The operation of the once-through lake water cooling option, and to a lesser degree, the cooling tower option, is predicted to result in the loss of some aquatic biota. This effect was identified as a minor residual adverse effect on aquatic biota since the intake and discharge designs will incorporate fish behavioural principles, will be located at depths with less sensitive habitat, and will include compensation measures for potential impacts (OPG 2009a).

The EA follow-up activities will include, prior to the site preparation phase, monitoring of impingement and entrainment losses at the existing DNGS to confirm the existing baseline conditions so that future effects can be appropriately predicted. This task has already been completed as part of B-AQ-2. In addition, impingement and entrainment losses associated with the DNGS and DNNP will also be monitored during the operation phase, to verify the continuing absence of significant residual adverse effects and cumulative effects (O-AQ-4). The impingement and entrainment plan (C-AQ-3) will be developed as a condition of the authorization under the Fisheries Act which will need to be obtained from DFO prior to operation of the once-through cooling system.

Prior to construction, a surface water risk assessment will be conducted to consider the combined thermal and contaminant plume and the physical displacement effect of altered lake currents as a hazardous pulse exposure to fish species whose larvae passively drift through the area (C-AQ-1, in conjunction with C-SWE-3). Should the risk assessment predict a potential hazard, additional follow-up scoping will be conducted in conjunction with the CNSC, ECCC, and DFO, plus other stakeholders depending on interest.

Finally, during the operation phase, for the once-through condenser cooling option, the cooling water discharge temperature and plume characteristics will be interpreted in relation to fish habitat and susceptibility of VEC species, to verify EIS predictions (O-AQ-3, in conjunction with O-SWE-5).

4.4 Terrestrial Environment Follow-Up

4.4.1 Background

The Terrestrial Environment was comprised of the following six environmental sub-components and associated VECs that are potentially susceptible to effects of the DNNP, and is summarized in Table 4-4:

- Vegetation Communities and Species – Ecological Land Classification (ELC) Communities (cultural meadow and thicket, shrub bluff, wetland, woodland, migrant songbird habitat, migrant butterfly stopover area, winter raptor feeding and roosting areas, and rare species);
- Insects – monarch butterflies and rare dragonfly species;
- Bird Communities and Species – breeding birds, migrant songbirds and their habitat, migrant bird strikes and waterfowl staging areas and winter habitat, and rare species;
- Amphibians and Reptiles – breeding habitat and key summer habitat;
- Mammal Communities and Species – breeding community and species; and
- Landscape Connectivity – Landscape Connectivity, Areas of Natural and Scientific Interest (ANSIs) and Environmentally Significant Areas (ESAs).

Table 4-4: Terrestrial Environment Follow-Up Summary

Sub-Component	Sub-Component Description	EA Conclusion	Follow-Up Activity Description	Activity Details (Appendix D)
Vegetation Communities and Species	Includes Cultural Meadow and Thicket Ecosystem, Shrub Bluff Ecosystem, Wetland Ecosystem and Woodland Ecosystem.	Loss within the DN site of up to approximately 40 to 50 ha of mostly Cultural Meadow Ecosystem. Residual adverse effects are not significant due to implementation of mitigation measures which includes replanting.	Conduct ecological land classification mapping of the vegetation communities at the DN site (including DNNP lands).	B-TE-3
			Monitor conditions of terrestrial habitat (Cultural Meadow and Thicket, wetland ecosystems, and wildlife corridor) used by breeding birds, amphibians, and butterflies.	P-TE-2 C-TE-2 O-TE-2
Insects	Includes dragonflies and damselflies, and butterfly stopover areas.	Loss of up to approximately 24 to 34 ha of habitat on the DN site currently used as butterfly habitat during	Conduct insect, amphibian, reptile, and mammal surveys prior to site preparation, and post construction with a	B-TE-5 O-TE-4

Sub-Component	Sub-Component Description	EA Conclusion	Follow-Up Activity Description	Activity Details (Appendix D)
		migration. Residual adverse effects are not significant due to implementation of mitigation measures from replanting.	focus on species at risk.	
Bird Communities and Species	Includes breeding birds and communities, waterfowl staging areas and winter habitat, migrant songbirds and their habitat, and inter raptor feeding and roosting areas.	Loss of nesting habitat for up to 1,000 active Bank Swallow burrows. Residual adverse effects are not significant due to implementation of mitigation measures which includes development of artificial habitat.	Develop a Bank Swallow mitigation plan for implementation during Site Preparation and Construction and verify the implementation of the plan throughout construction and operation. Undertake adaptive management approach.	B-TE-1 B-TE-2 P-TE-1 C-TE-1 O-TE-1
		Bird strike mortalities associated only with the operation of cooling towers, assuming cooling towers are selected. Residual adverse effects are not significant.	None recommended due to DNNP plans to utilize a once-through cooling system.	O-TE-3 [a]
		Decrease in populations of breeding birds on the DN site. No residual adverse effects are likely.	See Vegetation Communities.	P-TE-2 C-TE-2 O-TE-2
			Conduct Species at Risk surveys (e.g., Bobolink, Least Bittern) on the DNNP site prior to site preparation and operation.	B-TE-4 O-TE-4
Amphibians and Reptiles	Includes breeding and key summer habitat.	The Project will result in the removal of three amphibian breeding areas (Treefrog Pond, Polliwog Pond and Dragonfly Pond); however, no residual adverse effect is likely.	See Follow-Up Activity description under Insects.	B-TE-5 O-TE-4
Mammal Communities and Species	Includes breeding mammals.	Loss of up to 113 ha of habitat which represents Meadow Vole habitat; however, no residual adverse effect is likely.	See Follow-Up Activity description under Insects.	B-TE-5 O-TE-4
		No adverse effects.	Periodically conduct wildlife mortality surveys. (i.e., mammal road	P-TE-3 C-TE-3

Sub-Component	Sub-Component Description	EA Conclusion	Follow-Up Activity Description	Activity Details (Appendix D)
			mortality surveys).	
Landscape Connectivity	Includes wildlife corridors.	Periodic and short-term disruption to wildlife travel along the east-west wildlife corridor during the Site Preparation and Construction phase of the Project. Residual adverse effects are not significant.	None	None

[a] Activity no longer required, see details in Appendix D.

EA follow-up activities will be developed and implemented to confirm the effectiveness of the mitigation measures, to validate the assumptions made in the EA, and to verify that there are no significant adverse effects to the Terrestrial Environment during all phases of the DNNP.

OPG's EMEAF commitments for the terrestrial environment are documented in commitment number D-P-12.5 of the DNNP Commitments Report (OPG 2023a). The commitments and any baseline studies completed to date, inform the details (scope, schedule, and work activities) of the Terrestrial Environment EA follow-up activities, which are outlined in Appendix D.

4.4.2 Vegetation Communities and Species, Insects, Amphibian and Reptiles, Breeding Birds

As described in Section 5.5 of the EIS (OPG 2009a), the following three residual effects were associated directly with one consequence of the DNNP, specifically, the loss of up to approximately 50 ha of terrestrial habitat on the DN site as a result of its development:

- Loss within the DN site of up to approximately 40 to 50 ha of mostly Cultural Meadow Ecosystem;
- The net loss of up to approximately 24 to 34 ha of on-site habitat currently used as butterfly habitat during migration; and
- Decrease in populations of breeding birds on the DN site.

Baseline monitoring under these environmental sub-components was completed as part of the DN Biodiversity program. Existing baseline monitoring under the DN Biodiversity program also included ecological land classification (ELC) mapping of vegetation communities and is discussed further in Appendix D under activity B-TE-3. Baseline data will be used for comparison against future follow-up monitoring results.

Additional EA follow-up activities will include; during site preparation, construction, and operation of the DNNP, monitoring conditions of terrestrial habitat used by breeding birds, amphibians, and butterflies to confirm the effectiveness of mitigation measures and continued absence of significant residual adverse effects. Monitoring will also include annual surveys of breeding birds, amphibians, and butterflies (including P-TE-2, C-TE-2, and O-TE-2). Habitat restoration (i.e., replanting vegetation communities including Cultural Meadow and Cultural Thicket) will occur post construction. During site preparation, amphibian surveys will incorporate the draft Western Chorus Frog Detection Protocol for Ontario (P-TE-2).

EA follow-up monitoring will also include a follow-up program during operation for insects, amphibians and reptiles, and mammal species and communities with a focus on species at risk, to verify the conclusions of the Ecological Risk Assessment (see Appendix D, activity O-TE-4). It is assumed that this follow-up monitoring would be discontinued within five years following the start of the operation phase after which sufficient data will likely be available to make a conclusion of no residual adverse effect. Existing baseline monitoring of breeding birds and amphibians and reptiles occurs as part of the DN Biodiversity Program (including B-TE-4 and B-TE-5). No targeted insect surveys have occurred since the EA; however, insect observations (migrant butterfly and dragonfly) are recorded as incidental observations (Beacon 2019). Incidental observations of mammals are recorded; however, annual bat surveys have been initiated since 2012 since four bat species have become listed as species at risk provincially and federally since the EA was undertaken. The DN Biodiversity Program also includes an annual census of breeding amphibians at Coot's Pond and Treefrog Pond.

The DN Biodiversity Program breeding bird surveys include monitoring of the Least Bittern (part of Appendix D, activity B-TE-4). Since the EA, Least Bittern has not been documented as breeding at the DN site. There have been two recordings of Least Bittern on site which were identified as likely late migrants and wandering non-breeding birds. One Least Bittern was observed in Coot's Pond in 2012 and identified as a possible breeder. One Least Bittern was found dead in 2018 in the east end of the Protected Area (Beacon 2019).

Species-specific surveys have also been undertaken for Eastern Meadowlark and Bobolink as part of the DN Biodiversity Program annually following their listing on the provincial ESA in 2012 and 2010, respectively (part of Appendix D, activity B-TE-4). Site specific occurrences of Bobolink have been documented and greater understanding of habitat use and breeding location fidelity at the DN site has been developed (Beacon 2019).

4.4.3 Bird Communities and Species

4.4.3.1 Bank Swallow Habitat

The EIS identified the loss of habitat for up to 1,000 active Bank Swallow burrows (based on 2007 – 2009 data) as a minor residual adverse effect of the DNNP (OPG 2009a). Mitigation of this effect is based on the adaptive management approach, which may include the construction of artificial habitat for Bank Swallows on the DN site or off-site, provision of nesting habitat for related insectivore bird species, integration of interpretive opportunities, acquisition and protection of existing colony areas that are not on the DN property, and funding research into the decline of aerial foragers. Based on monitoring of the effectiveness

of the mitigation measures implemented, adoption of the best solution will occur for future implementation.

In 2014, Bank Swallow became a Threatened species under the provincial Endangered Species Act. In 2017, Bank Swallow became a Threatened species under the federal Species at Risk Act. EA follow-up activities will include, during site preparation, construction, and operation of the DNNP, monitoring of the implementation of the Bank Swallow mitigation plan, as required. Bank Swallow colonies will be monitored annually during site preparation, construction, and operation of the DNNP to confirm the continued absence of significant residual adverse effects. Adaptive management will be incorporated throughout. The details of these activities are presented in Appendix D under B-TE-1, B-TE-2, P-TE-1, C-TE-1, and O-TE-1. Follow-up program activities are expected to be discontinued once effectiveness of mitigation measures has been demonstrated (approximately five years following the start of the operation phase).

4.4.3.2 Follow-up Activities No Longer Required under Bird Communities and Species – Bird Strikes

A residual adverse effect was identified for the Bird Communities and Species subcomponent related to bird strike mortalities associated only with the operation of cooling towers, assuming cooling towers are selected. Bird strikes will occur as a result of the presence of tall buildings, including natural draft cooling tower structures, if selected for condenser cooling. However, since OPG does not currently plan on constructing cooling towers, monitoring commitments associated with bird strikes with cooling towers are not applicable.

4.4.4 Mammal Communities and Species

A likely effect was identified for the Mammal Communities and Species subcomponent due to the loss of up to 113 ha of habitat which represents Meadow Vole habitat. While no residual adverse effect was identified, the DNNP Commitments Report (OPG 2023a) identifies under D-P-12.5 a commitment to monitor the effectiveness of mitigation measures for mammals. After vegetation habitat is restored, the use of habitat by mammals will be monitored. The details are presented in Appendix D under O-TE-2 and O-TE-4.

No residual adverse effects were identified for the Mammal Communities and Species subcomponent; however, the DNNP Commitments Report (OPG 2023a) identifies under D-P-12.5 a commitment to periodically conduct wildlife mortality studies during site preparation and construction, to confirm EA assumptions regarding road mortality and continuing absence of adverse effects. The details of these activities are presented in Appendix D under P-TE-3 and C-TE-3.

4.4.5 Landscape Connectivity

A landscape connectivity study was completed in 2010 to identify existing wildlife corridors on the DN site and adjacent areas, assess effects of DNNP on corridor function, and to identify areas where enhancements could be made to improve corridor function. There is an existing east-west corridor providing connectivity from Bowmanville Marsh west to Second Marsh. This

corridor is used by small and medium sized mammals, migratory insects such as butterflies and dragonflies, and for seed dispersal.

Access for wildlife travel along the wildlife corridor extending east – west across the DN site, from Bowmanville Marsh to Second Marsh, is likely to be interrupted at a point in time during site preparation and construction phases. To minimize the disruption, in-design mitigation will be implemented, to the extent practicable, including DNNP design to maintain access for wildlife on the east-west wildlife corridor during construction activities and to enhance the corridor function for the long-term. In-design mitigation is included as part of D-P-3.7 and is not part of the EMEAF follow-up activities under D-P-12.5.

4.5 Geological and Hydrogeological Environment Follow-Up

4.5.1 Background

The Geological and Hydrogeological Environment was comprised of three environmental sub-components that are pathways or mechanisms for transfer of an effect to another environmental component: soil quality, groundwater quality, and groundwater flow (Table 4-5). Since they were determined to be pathways and not VECs, no residual adverse effects were attributed to soil quality, groundwater quality, or groundwater flow in Chapter 5 of the EIS for the Geological and Hydrogeological Environment component (OPG 2009a).

Table 4-5: Geological and Hydrogeological Environment Follow-Up Summary

Sub-Component	Sub-Component Description	EA Conclusion	Follow-Up Activity Description	Activity Details (Appendix E)
Soil Quality	Physical and chemical characteristics of the surface and subsurface materials in the vicinity of the DN site.	No residual adverse effects are predicted on Soil Quality as a result of the Project, considering the use of mitigation measures (Good Industry Management Practices for stormwater management).*	Characterize and monitor soil quality.	B-GH-2 P-GH-2 C-GH-2 O-GH-2
Groundwater Quality	The chemical characteristics of the ground watershed in the vicinity of the DN site.	No residual adverse effects are predicted on Groundwater Quality as a result of the Project, considering the use of mitigation measures (Good Industry Management Practices for stormwater management).*	Monitor groundwater quality.	B-GH-1 P-GH-1 C-GH-1 O-GH-1
			Conduct an assessment of contaminant ingress/egress, to include the impact of wet and dry deposition of all contaminants of concern and gaseous emissions on groundwater quality.	P-GH-3

Sub-Component	Sub-Component Description	EA Conclusion	Follow-Up Activity Description	Activity Details (Appendix E)
			Monitor groundwater quality as part of the EMP.	O-GH-3
Groundwater Flow	The rate of flow and volume of groundwater in the vicinity of the DN site.	No residual adverse effects are predicted on Groundwater Flow as a result of the Project, considering the implementation of mitigation measures (Design and implementation of stormwater management features).*	Monitor groundwater flow.	B-GH-1 P-GH-1 C-GH-1 O-GH-1
			Conduct baseflow estimates at Darlington Creek.	B-GH-3 C-GH-3
			Conduct groundwater flow modelling that incorporates post-development physical flow characteristics.	O-GH-4
* Residual effects in other environmental components that may result from the sub-component as a pathway was described in the appropriate section of the EIS (OPG 2009a).				

OPG's EMEAF commitments for the geological and hydrogeological environmental component are documented in commitment number D-P-12.6 of the DNNP Commitments Report (OPG 2023a). The details (scope, schedule, and work activities) of the Geological and Hydrogeological Environment EA follow-up activities are provided in Appendix E.

Baseline data collections which have occurred to date include annual groundwater sampling reported through the DNGS groundwater monitoring program and the ongoing geotechnical investigation. The annual DNGS groundwater monitoring program samples a number of wells across the DNNP Site Study Area, which continues on an annual basis for conventional parameters and either quarterly, semi-annually, or annually for tritium (OPG 2020a). The geotechnical investigation included sampling in 2022 of a number of new and existing groundwater wells on the DNNP site. Sample analysis included metals, anions, base neutral and acid extractables and phenolics, petroleum hydrocarbons F1 to F4, benzene, toluene, ethylbenzene, xylenes, polychlorinated biphenyls, radionuclides, alkalinity, and field parameters. Groundwater flow patterns have remained unchanged from the interpretations originally made in the Geological and Hydrogeological Environment Existing Conditions TSD (OPG 2009a, Ecometrix 2022a).

4.5.2 Soil Quality

As documented in the Geological and Hydrogeological Environment Assessment of Environmental Effects TSD (CH2M 2009b), likely effects on soil quality will largely be as a result of changes associated with the management of stormwater during site preparation, construction and operation of the DNNP. These changes are not considered to represent an adverse effect in the Geological and Hydrogeological Environment, however, Good Industry Management Practices during site preparation, construction and operation of the DNNP will be implemented for stormwater management to pre-empt possible environmental effects. To

confirm the effectiveness of the mitigation measures and the continuing absence of residual adverse effects passed through to other environment components, EA follow-up activities will include monitoring soil quality on-site during site preparation, construction and operation of the DNNP under activities P-GH-2, C-GH-2, and O-GH-2 in fulfillment of commitment D-P-12.6. Effects will be determined through comparison to applicable regulatory guidelines and baseline characterization under B-GH-2.

Appropriate remediation measures will be implemented if necessary, if the presence of contaminated soil is identified, taking into account the nature of the contaminant(s) and the extent of contamination, if present.

A baseline soil sampling program was carried out in 2019 to provide chemical characterization of shallow soils. Soil samples were collected from 18 locations across DNNP Site Study Area, twelve of the areas were on the DNNP lands (Ecometrix 2022a). The sampling locations included potentially impacted areas, locations sampled in 2007-2008 in support of the EIS, and additional locations across the DNNP Site Study Area to obtain horizontal coverage necessary for baseline characterization (Ecometrix 2022a). An additional soil sampling program was completed in 2021, which included comprehensive soil characterization to support the Hazardous Waste Management Plan (D-P-3.6, GOC response to JRP Rec. 2) and to collect baseline soil quality data to support the Site Geotechnical Investigation (D-P-9.1 and GOC response to JRP rec.10). Data from the soil sampling program also informs the soil baseline for EA follow-up.

4.5.3 Groundwater Quality

As documented in the Geological and Hydrogeological Environment Assessment of Environmental Effects TSD (CH2M 2009b), likely effects on groundwater quality will largely be as a result of changes associated with the management of stormwater during site preparation, construction and operation of the DNNP. These changes are not considered to represent an adverse effect in the Geological and Hydrogeological Environment, however, good industry management practices during site preparation, construction and operation of the DNNP will be implemented for stormwater management to pre-empt possible environmental effects. To confirm the effectiveness of the mitigation measures and the continuing absence of residual adverse effects, EA follow-up activities include monitoring groundwater quality on-site site preparation, construction and operation of the DNNP as part of activities P-GH-1, C-GH-1, and O-GH-1 to fulfill OPG's commitments under D-P-12.6. The scope of the groundwater quality monitoring program will evolve with each successive stage of the DNNP to accommodate any need to decommission, relocate, or replace monitoring wells located within grading and construction areas. Groundwater flow and quality monitoring in the operation phase will continue until stable flow conditions are reached, which is currently assumed to be two years (D-P-12.6).

On-site groundwater quality is currently monitored at the DN site, with a focus on DNGS. Groundwater monitoring at the DNNP site will fall under the existing DNGS groundwater monitoring program. Baseline groundwater quality monitoring is part of the annual DNGS groundwater monitoring program which includes a number of wells across the DNNP Site Study Area – these wells are sampled on an annual basis for conventional parameters and

either quarterly, semi-annually or annually for tritium (OPG 2020a). Baseline groundwater quality has also been collected in 2021 and 2022 through the ongoing geotechnical investigation. Monitoring frequency will be increased to semi-annual at the start of the site preparation phase under activity P-GH-1 to be consistent with D-P-12.6. Additional wells will be sampled as needed.

In support of the Construction Licence Application for the DNNP, an assessment was conducted of the ingress and transport of contaminants in groundwater on site during successive phases of the project, in fulfillment of the GOC response to JRP rec. 17. The assessment will include consideration of the impact of wet and dry deposition of all contaminants of potential concern and gaseous emissions on groundwater quality (tritium is the main radionuclide with potential to measurably impact groundwater; however, tritium is not the primary radionuclide that will be released from the BWRX-300). Enhanced groundwater and contaminant transport modelling will be conducted, extending to appropriate model boundaries.

Off-site well water monitoring is currently a component of the existing DN EMP, with a focus on tritium given that atmospheric deposition is the primary source of tritium in off-site groundwater. OPG's commitments related to the EMP are documented in commitment number D-C-6.1 of the DNNP Commitments Report (OPG 2023a). The monitoring of tritium in well water at off-site locations will continue as part of the EMP, but will also be reported as part of the EA follow-up program under activity O-GH-3 for up to five years after start-up, as part of OPG's commitment in D-P-12.6.

4.5.4 Groundwater Flow

The 2009 EIS identified that groundwater flow conditions will be changed permanently by the DNNP due to permanent dewatering (CH2M 2009b). However, the EIS review concluded that for the BWRX-300, dewatering will only occur during construction; therefore, groundwater flow would only be affected temporarily during construction. During operation, dewatering would cease and the effects on groundwater flow would be negligible (OPG 2023b). During all phases, the ultimate flow direction and discharge point will be to Lake Ontario, as is currently the case. To pre-empt environmental effects, in-design mitigation measures will be incorporated into the DNNP design, such as designing and implementing stormwater management facilities to optimize opportunities to recharge surface water to the groundwater. As such, changes in groundwater flow as a result of the DNNP are not considered to represent an adverse effect in the Geological and Hydrogeological Environment.

EA follow-up activities include monitoring groundwater flow on-site during site preparation, construction and operation of the DNNP under activities P-GH-1, C-GH-1 and O-GH-1 to confirm the effectiveness of the mitigation measures (i.e., the Stormwater Management Plan as part of D-P-3.4, dewatering mitigation measures during construction). The existing scope of the DN site groundwater monitoring program will be expanded to monitor transitions in groundwater flows as a result of grade changes during site preparation and construction (GOC response to JRP rec. 19). The design of the grade changes shall guide the determination of required monitoring locations, frequency of monitoring, and required duration of the program for the period of transition to stable conditions following the completion of

construction and initial period of operation. As previously indicated in the groundwater quality sub-component, follow-up monitoring in the operation phase will continue until stable flow conditions have been established, which will be determined as a result of the EA follow-up program and is assumed to be two years (D-P-12.6). Baseline monitoring conducted under the DN site groundwater monitoring program will be increased to semi-annual at the start of the site preparation phase under activity B-GH-1 to be consistent with D-P-12.6.

Quarterly baseflow measurements in Darlington Creek were conducted as part of the environmental studies conducted in 2019 to support DNNP licence renewal (Ecometrix 2022a), fulfilling follow-up activity B-GH-3. Four of these stations, SF1, SF2, SF3 and SF4, are the same as those measured in 2008. A fifth station, SF5, was added in 2019 to allow for comparison to flows that will be measured during the construction phase when this tributary (known as Tributary E) may convey surface runoff from the site (Ecometrix 2022a). Additional baseflow estimates at Darlington Creek will be conducted on a quarterly basis under follow-up activity C-GH-3 at the end of the construction phase to confirm the ongoing validity of assumptions used in the EA and continuing absence of residual adverse effects passed through to other environment components.

During operation, OPG will conduct groundwater flow modelling to support the assessment of effects, incorporating post-development physical flow characteristics, as part of a commitment made in the EIS and under D-P-12.6 (OPG 2023a). The flow modelling will be extended to appropriate model boundaries which may extend beyond the site boundaries. Updated flow modelling will be completed after one year of operation (when four rounds of quarterly monitoring data are available) and will be repeated after five years. This commitment is the basis for activity O-GH-4.

4.6 Land Use Environment Follow-Up

4.6.1 Background

The Land Use Environment was comprised of two environmental sub-components, outlined in Table 4-6. Two VECs (land use planning and visual aesthetics) were selected in the EIS for each of the sub-components, respectively (Land Use and Landscape and Visual Setting) to represent features or aspects of the Land Use Environment that could be affected by the project. No residual adverse effects were attributed to the land use planning regime in the local study area in Chapter 5 of the EIS (OPG 2009a). Residual adverse effects on visual aesthetics were identified related to changes in the quality of existing views of the DN site throughout the operating life of the DNNP as a result of natural draft cooling structures and the associated plumes released from either natural draft or mechanical draft cooling towers (OPG 2009a). The residual adverse effects associated with cooling towers was also considered as part of the Socio-Economic Environment. No follow-up monitoring was identified during the EA process for the landscape and visual setting sub-component; however, Public Attitude Research (PAR) conducted to monitor for negative change in the character of communities (e.g. due to the presence of cooling towers) will be included as part of the Socio-Economic Environment follow-up program (OPG 2009a). Socio-Economic Environment follow-up is outside the scope of the EMEAF and will be completed as part of D-P-17 (Communications,

Consultation and Stakeholder Relations Program/Plan). Regardless, there is no plan to implement the cooling tower option for the DNNP.

Table 4-6: Land Use Environment Follow-Up Summary

Sub-Component	Sub-Component Description	EA Conclusion	Follow-Up Activity Description	Activity Details (Appendix A)
Land Use	Existing uses of land and policies, regulatory controls and patterns associated with those uses.	No residual adverse effects are predicted on sensitive land uses in proximity to the DN site, considering the implementation of mitigation measures.	Monitor land use policy in proximity to the DN site.	B-LU-1 P-LU-1 C-LU-1
			Confirm projected population data in affected communities.	P-LU-2 C-LU-2
Landscape and Visual Setting	Landscapes, viewsheds, views and vistas of relevance to the DNNP.	Changes in the quality of existing views of the DN site represents a minor adverse effect of the DNNP.*	None.	None
* The residual adverse effect is diminished now because there is no plan to implement the cooling tower option for the DNNP.				

OPG's EMEAF commitments for the land use environmental component are documented in commitment number D-P-12.7 of the DNNP Commitments Report (OPG 2023a). The details (scope, schedule, and work activities) of the Land Use EA follow-up activities are provided in Appendix F.

4.6.2 Land Use

The EIS predicted that increased intensity of activities on the DN site is likely to result in changes to land use and development patterns that would transpire otherwise. As the intensity of use increases on the DNNP site, the EIS predicted that the existing and proposed sensitive land uses surrounding the site will likely transition to employment and industrial uses. In practice, the basis for any future land use changes will be consistent with the Clarington and Durham Official Plans. For emergency planning purposes, this will result in a change to the land use and development patterns than would otherwise exist.

As part of the additional mitigation measures identified through the EA process, OPG will continue to monitor land use activity in proximity to the DNNP site and consult with the Municipality of Clarington and the Regional Municipality of Durham on proposed land use changes and effects on implementation of emergency plans (OPG 2023a). OPG will also actively engage in Envision Durham municipal comprehensive review process as it relates to policy changes related to nuclear power generation and population and employment forecasts. On May 17, 2023, Durham Regional Council adopted the recommended new Durham Regional Official Plan and was sent to the Province's Ministry of Municipal Affairs and Housing for approval. The new Official Plan includes a set of policies to ensure land use compatibility between major facilities, including electricity generating stations, and sensitive

land uses. Specifically, Policy 5.5.34 requires area municipalities to protect the Automatic Action Zones from encroachment by sensitive land uses to the greatest extent possible. In addition, the new Official Plan provides population and employment forecasts to 2051 in each of the area municipalities within the Region. OPG will continue monitoring planning developments near its facilities and participate as required (OPG 2023a).

This follow-up activity will be conducted prior to site preparation to establish baseline conditions and will continue throughout the site preparation and construction phases. This activity will also continue throughout the life of the facility as part of current practices but will be carried out outside of the DNNP EA follow-up program. This follow-up activity is described under activity numbers B-LU-1, P-LU-1, and C-LU-1 in Appendix F.

Since 2011, OPG has been actively monitoring development applications made within 10 km of the Darlington Nuclear site, consistent with the Land Use Assessment Zone, and publishing an annual summary report (OPG 2019). The focus of the monitoring and reporting is to determine whether there are any proposed land uses that would be of concern from the perspective of sensitive land uses locating within the vicinity of the Darlington Nuclear Generating Station (OPG 2019). There have been no changes that would alter the conclusions reached previously in 2009 with respect to project impacts, specifically considering land use structure and impacts on sensitive land uses in proximity to the DN site (OPG 2019). OPG will continue this monitoring as part of B-LU-1 prior to site preparation.

OPG will confirm the projected population within the regional and local study areas, as defined in the Land Use Existing Environmental Conditions TSD (MMM 2009c), at the end of the site preparation and construction activities to ensure that emergency response planning is consistent with the projections (OPG 2023a). This follow-up activity is described under activity numbers P-LU-2 and C-LU-2 in Appendix F.

For the Land Use component, follow-up program activities are expected to be discontinued at the end of the construction phase after the projected population has been confirmed. OPG will continue monitoring planning developments near its facilities outside of the DNNP EA follow-up program.

4.7 Traffic and Transportation Environment Follow-Up

4.7.1 Background

The Traffic and Transportation Environment was comprised of two environmental sub-components that were considered potentially susceptible to effects of the DNNP (Transportation System Operations and Transportation System Safety), shown on Table 4-7. Each of the sub-components was also identified as a VEC. No residual adverse effects on transportation system operations or transportation system safety were identified in Chapter 5 of the EIS for the Traffic and Transportation Environment component (OPG 2009a).

Table 4-7: Traffic and Transportation Environment Follow-Up Summary

Sub-Component	Sub-Component Description	EA Conclusion	Follow-Up Activity Description	Activity Details (Appendix G)
Transportation System Operations	Operational efficiency and adequacy of all modes of transportation (i.e., road, rail, marine) relative to demand.	No likely adverse effects on rail and marine transportation system operations. No residual adverse effects on road system operations considering the implementation of mitigation measures (transportation system improvements and Traffic Management Plan).	None.	None
Transportation System Safety	Safety-related conditions associated with all modes of transportation (road, rail and marine).	No residual adverse effects on road safety considering the implementation of mitigation measures (transportation system improvements and Traffic Management Plan).	Monitor traffic conditions, such as traffic volumes and collision data.	B-TT-1 P-TT-1 C-TT-1 O-TT-1
		No residual adverse effects on boating safety (i.e., small watercraft) from an increased prohibitive zone.	If once-through cooling is selected, develop (and subsequently undertaken) a follow-up program to verify EIS predictions and if required, an adaptive management program.	P-TT-2 C-TT-2 O-TT-2

OPG's EMEAF commitments for the traffic and transportation environmental component are documented in commitment number D-P-12.8 of the DNNP Commitments Report (OPG 2023a). The details (scope, schedule, and work activities) of the Traffic and Transportation EA follow-up activities are provided in Appendix G.

4.7.2 Transportation System Safety (Roads)

As documented in the Traffic and Transportation Environment Assessment of Environmental Effects TSD (MMM 2009b), likely effects on the road transportation system safety will largely be as a result of increased traffic to the existing roadways and contribute to ongoing degradation of the roads system. To pre-empt possible environmental effects, appropriate planning and design features will be incorporated into the DNNP, based on industry practice and OPG experience. In addition, in-design mitigation, including a Traffic Management Plan (defined under D-P-10.1) will be implemented, with the objective of reducing disruption and maintaining safe traffic conditions. The EIS identified truck traffic impacts from movement of

soil to and from the site as a contributor to physical degradation of roads; however, the current SMR plan does not require significant amounts of soil movement off-site. Therefore, the Traffic Management Plan focuses on the monitoring of traffic conditions rather than physical road conditions.

As part of D-P-12.8 OPG has committed to undertake a pre-project road condition assessment as a baseline for considering incremental project-related degradation, followed with periodic inspections of road conditions to document changes relative to baseline during construction (OPG 2023a). Based on the latest Traffic Management Plan and in discussion with government stakeholders (i.e. CNSC, Transport Canada, Municipality of Clarington, Regional Municipality of Durham, Ministry of Transportation and Ministry of Energy), a physical pre-project road condition assessment is not required, considering that the Project will not have any off-site soil movement as part of construction activities; however, baseline traffic conditions will be documented, and traffic conditions including traffic volume and collision data will be monitored. These follow-up activities are described under activity numbers B-TT-1, P-TT-1, C-TT-1 and O-TT-1 of Appendix G. The follow-up objectives for transportation system safety (roads) will be achieved in the operation phase after the completion of O-TT-1.

4.7.3 Transportation System Safety (Marine)

The marine environment around the DN site is not considered a particularly high-risk area for navigation due to the minimal traffic permitted through this area for security and safety reasons. A key risk to navigation is the impacts of buoyancy that may be created by the existing DNGS outfall. However, an existing prohibitive zone has been established around the DN site, which further restrains vessels from navigating in this area, thus greatly reducing incidents related to this phenomenon. The current prohibitive zone is approximately 1,400 metres wide and extends approximately 2,000 metres into the lake. An increased prohibitive zone may be established as the result of the DNNP.

For the once-through condensing cooling system, OPG will work with Transport Canada to develop a follow-up program to verify the accuracy of the prediction of no residual adverse effects to boating safety from the establishment of an increased prohibition zone prior to construction. OPG will also develop an adaptive management program, if required, to mitigate potential effects to small watercraft. Should an adaptive management program be required, the program may be developed with support and expertise from Transport Canada (OPG 2023a). The follow-up program and adaptive management program is described as activity number P-TT-2 and listed in the site preparation phase, although it could also be completed prior to site preparation.

If required, the follow-up program and adaptive management program will be conducted during the construction and operation phases (C-TT-2 and O-TT-2) and will be designed to confirm the EA prediction of no residual adverse effects on boating safety.

4.8 Health – Human and Non-Human Biota Follow-Up

4.8.1 Background

The Health component was comprised of Health – Human and Health – Non-Human Biota. The subcomponents and associated VECs that are potentially susceptible to effects of the DNNP, are summarized in Table 4-8.

The Health – Human component was comprised of the following two environmental sub-components:

- Health and Well-Being of the General Public; and
- Health and Safety of Workers.

No residual adverse effects were identified in Chapter 5 of the EIS for Health – Human; however, since a proposed nuclear facility is of public interest in terms of radiation dose, doses to workers and the general public were considered further in the EIS in the cumulative effects assessment (OPG 2009a).

The Health – Non-Human Biota environmental component consisted of both radiological and non-radiological effects on aquatic and terrestrial (i.e., non-human) biota.

The EA identified effects to surface water, sediment, soil, groundwater, and air quality from radioactive or non-radioactive (chemical) releases as pathways for effects on non-human biota in the Aquatic and Terrestrial Environments. The receptors selected for assessment of effects on non-human biota were representative of the VECs selected for the Aquatic and Terrestrial Environmental components, and included: birds, mammals, insects, invertebrates, amphibians, reptiles, terrestrial vegetation, aquatic macrophytes, benthos and fish.

No residual adverse effects were identified in Chapter 5 of the EIS for the Health - Non-Human Biota component (OPG 2009a). However, EA follow-up activities will be conducted to confirm the effectiveness of the mitigation measures, validate the assumptions made in the EA, and to verify that there are no residual adverse effects.

Table 4-8: Health – Human and Non-Human Biota Follow-Up Summary

Sub-Component	**Sub-Component Description**	**EA Conclusion**	**Follow-Up Activity Description**	**Activity Details** (Appendix H)
Health – Human and Non-Human Biota	• Human Biota (includes members of the public). • Non-Human Biota (includes birds, mammals, soil invertebrates, amphibians, reptiles	No adverse effects to the radiological and non-radiological environment, considering the mitigation measures identified for the Surface Water, Atmospheric, and Geology and Hydrogeology	Review and update the Ecological Risk Assessment and Human Health Risk Assessment when reactor technology has been chosen, predicted effluent releases from the DNNP are known, and chemical	P-H+NHB-1 P-H+NHB-2

Sub-Component	Sub-Component Description	EA Conclusion	Follow-Up Activity Description	Activity Details (Appendix H)
	and terrestrial vegetation, aquatic plants, benthic invertebrates and fish).	components of the environment.	emissions have been evaluated.	
			Develop a comprehensive assessment of hazardous substance releases and the required management practices for hazardous chemicals on site, when reactor technology has been chosen.	P-H+NHB-3
			Update the Ecological Risk Assessment and Human Health Risk Assessment if monitoring from other environmental components suggest changes that may lead to effects on human or non-human biota	C-H+NHB-1 C-H+NHB-2 O-H+NHB-1 O-H+NHB-2
			If cooling towers are chosen, conduct an Ecological Risk Assessment on the blow down pond.	O-H+NHB-3 [a]

[a] Activity no longer required, see details in Appendix H.

OPG's EMEAF commitments for the Health – Human and Non-Human biota environmental component are documented in commitment number D-P-12.9 of the DNNP Commitments Report (OPG 2023a). The commitments, and any baseline studies completed to date, inform the details (scope, schedule, and work activities) of the Health – Human and Non-Human Biota EA follow-up activities, which are outlined in Appendix H.

4.8.2 Health – Human and Non-Human Biota (Radiological and Non-Radiological)

As documented in the Ecological Risk Assessment of Effects on Non-Human Biota TSD (SENES 2009c), the DNNP is not expected to result in changes to the radiological and non-radiological environment that would represent a residual adverse environmental effect on the ecological receptors identified for the non-human biota component of the environment, considering the mitigation measures identified for the Atmospheric, Surface Water, and Geology and Hydrogeology components of the environment.

The commitment in D-P-12.9 indicates that once the reactor technology is selected, OPG will need to conduct a detailed assessment of predicted effluent releases from the facility. As indicated in Section 1.2, OPG has selected the BWRX-300 SMR technology for the DNNP. The detailed assessment of predicted effluent releases is to include, but not be limited to, effluent quantity, concentration, points of release, and a description of effluent treatment, including demonstration that the chosen option has been designed to achieve best available treatment technology and techniques economically achievable. This is discussed further in Appendix H under activity P-H+NHB-1. OPG will also need to develop a comprehensive assessment of hazardous substances that will be released (P-H+NHB-2).

Although the specific chemical releases for the DNNP are currently being identified, the Ecological Risk Assessment did consider the most likely chemical releases (SENES 2009c)[2]. Once details of the chemicals are available, OPG will ensure that the Ecological Risk Assessment and Human Health Risk Assessment are reviewed and updated as appropriate to confirm the EIS conclusions. This is discussed further in Appendix H under activity P-H+NHB-3.

If EA follow-up activities conducted for other environmental components (Surface Water, Atmospheric, and Geology and Hydrogeology) suggest changes or conditions that may lead to effects on non-human biota (radiological or non-radiological), the Ecological Risk Assessment will be updated, including the identification of mitigation measures or other actions that may be appropriate to address such effects. This is discussed further in Appendix H under activity C-H+NHB-1 and C-H+NHB-1.

If EA follow-up activities conducted for other environmental components (Surface Water, Atmospheric, and Geology and Hydrogeology) suggest changes or conditions that may lead to effects on human health, the Human Health Risk Assessment will be updated, including the identification of mitigation measures or other actions that may be appropriate to address such effects. This is discussed further in Appendix H under activity C-H+NHB-2 and C-H+NHB-2. While these activities are not directly identified in commitment D-P-12.9, review and update of the Human Health Risk Assessment is part of the requirements of CSA N288.6.

4.8.2.1 Follow-up Activities No Longer Required under Health – Human and Non-Human Biota

The DNNP Commitments Report (OPG 2023a) identifies under D-P-12.9 a commitment, if cooling towers are chosen for the DNNP, to conduct conduct an Ecological Risk Assessment on the blow down pond if there is a risk that wildlife will use or drink from the pond. Since the BWRX-300 plans to utilize a once-through cooling system this commitment and associated activity (O-H+NHB-3) is no longer required.

[2] As indicated in the response to Information Requests 203, 240, 246 and 250.

5.0 RISKS AND RISK MANAGEMENT

5.1 Risk Management

Prior to the execution of each monitoring scope, the risks of the activities and the suitable mitigation will be further defined to ensure worker safety and environmental protection. In addition, adaptive management will continue to be involved in the Project. If the effects are confirmed to be different from the predicted effects, additional investigation will be undertaken to understand whether the effect is associated with the Project, and if so, additional mitigation measures will be identified and implemented.

5.2 Continuous Improvement

Corrective actions may be required in the event that monitoring cannot be implemented as developed, or if there is a non-conformance during the monitoring. Program performance and acceptance criteria as well as program change control are outlined in N-PROC-OP-0025.

6.0 RECORD KEEPING AND REPORTING

6.1 Annual Reporting of Environmental Monitoring Results

Results of the findings of the EMEAF program will be summarized in an annual report prepared for and submitted to the CNSC, as required by the Licence Conditions Handbook.

Other reporting related to the EMEAF has occurred since the PRSL licence was issued. In 2018, OPG submitted a mid-term report which reported on the licensed activities carried out and status of commitments that had been initiated, including commitments under D-P-12 (OPG 2023a). Additionally, as part of the PRSL licence renewal, a Licence Renewal Activity Report was prepared in 2019 for Land Use (OPG 2019) and 2020 for the Environment (Ecometrix 2020), which also included information on the status of monitoring commitments that have been initiated or carried out to support completion of commitments under D-P-12.

The annual report that includes findings of the EMEAF program will be prepared in accordance with CSA N288.4 and will include, as applicable:

- Monitoring results;
- Monitoring methodology;
- A summary and assessment of the field and laboratory Quality Assurance / Quality Control results, including any non-conformances;
- A summary of any non-conformances and subsequent corrective actions;
- A summary of any adaptive management measures that were implemented or are planned to be implemented; and

- A summary of the completion status of environmental monitoring activities under D-P-12.

7.0 REVIEW PROCESS AND COMMUNICATING RESULTS

As a follow-up monitoring requirement in the Commitments Report (D-P-12.1) and as required in the LCH, this EMEAF Plan was submitted to the CNSC for review and acceptance prior to commencement of PRSL licensed activities (OPG 2023a), as discussed in Section 1.7.2.

Results of the EMEAF activities will be communicated through annual report submission to the CNSC.

8.0 ROLES AND RESPONSIBILITIES

OPG

- Consult with relevant stakeholders and engage with identified Indigenous Nations and communities on the elements of the EMEAF Plan;
- Submit EMEAF Plan to the CNSC;
- Ensure elements as described in the final follow-up program are implemented; and
- Communicate results, as required.

CNSC

- Provide oversight for the implementation of the EMEAF Plan to ensure it meets its objectives and scope.

Other Regulators and Public

- Provide feedback on elements of the EMEAF Plan as requested by OPG.

9.0 ABBREVIATIONS AND ACRONYMS

AAQC – Ontario Ambient Air Quality Standards
CAAQS – Canadian Ambient Air Quality Standards
CEAA – *Canadian Environmental Assessment Act*
CSA – Canadian Standards Association
CLOCA – Central Lake Ontario Conservation Authority
CNSC – Canadian Nuclear Safety Commission
DFO – Fisheries and Oceans Canada
DN – Darlington Nuclear
DNGS – Darlington Nuclear Generating Station
DNNP – Darlington New Nuclear Project
EA – Environmental Assessment

ECA – Environmental Compliance Approval
ECCC – Environment and Climate Change Canada
EIS – Environmental Impact Statement
ELC – Ecological Land Classification
EMEAF – Environmental Monitoring and Environmental Assessment Follow-up
EMO – Emergency Management Ontario
EMP – Environmental Monitoring Program
EMPP – Environmental Management and Protection Plan
EMS – Environmental Management System
GOC – Government of Canada
HC – Health Canada
ISO – International Organization for Standardization
JRP – Joint Review Panel
LCH – Licence Conditions Handbook
LSA – Local Study Area
MECP – Ministry of the Environment, Conservation and Parks
MNRF – Ministry of Natural Resources and Forestry
MTO – Ministry of Transportation
NRC – Natural Resources Canada
NSS-DWMF – Nuclear Sustainability Services – Darlington Waste Management Facility
OPG – Ontario Power Generation
PAH – Polycyclic Aromatic Hydrocarbon
PRSL – Power Reactor Site Preparation Licence
REMP – Radiological Environmental Monitoring Program
RWAP – Round Whitefish Action Plan
SMR – Small Modular Reactor
SSA – Site Study Area
TC – Transport Canada
TOC – Total Organic Carbon
TSD – Technical Support Document
TSP – Total Suspended Particulate
VEC – Valued Ecosystem Component
VOC – Volatile Organic Compound

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Appendix A: Environmental Monitoring and Environmental Assessment Follow-up – Atmospheric Environment

Appendix A: Baseline and Environmental Assessment Follow-Up Activities – Atmospheric Environment (D-P-12.2)										
Activity Number	**Environmental Sub-Component**	**Activity Description**	**EA Conclusion**	**Objective(s)**	**Scope**	**EA Effects Threshold Criteria**	**Follow-Up Endpoint**	**Relationship to Other Activities, Programs and Standards**	**Stakeholders**	**Related Commitments Report Deliverables**
Prior to Site Preparation / Baseline										
B-AE-1	Air Quality	Conduct baseline measurements on air contaminants, including Total Suspended Particulate (TSP), PM_{10} and $PM_{2.5}$, PAHs (benzo(a)pyrene), VOCs (acrolein), NO_2 and SO_2. Develop a follow-up and adaptive management program for air contaminants.	*No residual adverse effects on air quality are predicted considering the implementation of mitigation measures.*	Collect baseline data for use in follow-up monitoring; and develop a follow-up and adaptive management program for air contaminants.	**Duration:** Immediately prior to site preparation for a minimum of 1 year. **Parameters:** TSP, PM_{10}, $PM_{2.5}$, PAHs (benzo(a)pyrene), VOCs (acrolein), NO_2 and SO_2 **Frequency:** Continuous and semi-continuous monitoring. **Location:** East and West Air Quality Monitoring Stations.	N/A[a]	N/A[a]	**Related Follow-Up Activities:** P-AE-1, C-AE-1, O-AE-1 **Related Programs and Standards:** OPG nuisance effects (dust and noise) mitigation measures under the EMPP (D-P-3.2)	CNSC, HC, MECP, ECCC, Municipality of Clarington, Regional Municipality of Durham (Municipalities)	D-P-12.2 GOC response to JRP rec. 8 **Other:** none
B-AE-2	Noise	Measure baseline noise levels.	*No residual adverse effects on noise are predicted considering the implementation of mitigation measures.*	Collect baseline data for use in follow-up monitoring.	**Duration:** Immediately prior to site preparation. **Parameters:** Noise levels. **Frequency:** Campaign based (7 days, 2-3 times per year) **Location:** Strategic locations at or outside of the DNNP, near sensitive socio-economic receptors.	N/A[a]	N/A[a]	**Related Activities:** P-AE-2, C-AE-2, O-AE-2 **Related Programs and Standards:** OPG nuisance effects (dust and noise) mitigation measures under the EMPP (D-P-3.2)	CNSC, HC, MECP, municipalities	Not specifically listed in D-P-12.2 **Other:** GOC Response to JRP rec. 9 D-P-3.2
Site Preparation										
P-AE-1	Air Quality	Measure air contaminants, including Total Suspended Particulate (TSP), PM_{10} and $PM_{2.5}$, PAHs (benzo(a)pyrene), VOCs (acrolein), NO_2 and SO_2, during site preparation.	*No residual adverse effects on air quality are predicted considering the implementation of mitigation measures.*	To confirm the effectiveness of the Dust Management Plan (nuisance effects mitigation measures under the EMPP) and to verify EIS predictions of no residual adverse effects.	**Duration:** Throughout the site preparation phase. **Parameters:** TSP, PM_{10}, $PM_{2.5}$, PAHs (benzo(a)pyrene), VOCs (acrolein), NO_2 and SO_2 **Frequency:** Continuous and Semi-Continuous Monitoring. **Location:** Similar to baseline (B-AE-1), where appropriate. Locations within the Local Study Area (LSA) will be monitored as part of existing stations (i.e., Durham-York Energy Centre, St. Marys and MECP Stations).	CCME CAAQS MECP AAQC Comparison to baseline measurements and EIS predictions.	Operation phase (O-AE-1)	**Related Activities:** B-AE-1, C-AE-1, O-AE-1 **Related Programs and Standards:** OPG nuisance effects (dust and noise) mitigation measures under the EMPP (D-P-3.2)	CNSC, HC, MECP, ECCC, municipalities	D-P-12.2 GOC response to JRP rec. 8 and 56 **Other:** D-P-3.2
P-AE-2	Noise	Measure noise levels during	*No residual adverse effects on*	To confirm the effectiveness of the	**Duration:** During expected periods of elevated	NPC-300	Operation	**Related Activities:**	CNSC, HC, MOE,	D-P-12.2

Appendix A: Baseline and Environmental Assessment Follow-Up Activities – Atmospheric Environment (D-P-12.2)

Activity Number	Environmental Sub-Component	Activity Description	EA Conclusion	Objective(s)	Scope	EA Effects Threshold Criteria	Follow-Up Endpoint	Relationship to Other Activities, Programs and Standards	Stakeholders	Related Commitments Report Deliverables
		site preparation.	*noise are predicted considering the implementation of mitigation measures.*	Noise Management Plan (nuisance effects mitigation measures under the EMPP) and to verify EIS predictions of no residual adverse effects.	construction activity in site preparation. **Parameters:** Noise levels. **Frequency:** Campaign based (7 days, 2-3 times per year at differing seasons) during peak periods. **Location:** Strategic locations at or outside of the DNNP, near sensitive socio-economic receptors.	Clarington By-Law 2007-071 HC Guidance: Noise Comparisons to baseline measurements.	phase (O-AE-2)	B-AE-2, C-AE-2, O-AE-2 **Related Programs and Standards:** OPG nuisance effects (dust and noise) mitigation measures under the EMPP (D-P-3.2)	municipalities	**Other:** D-P-3.2 GOC response to JRP rec. 9
Construction										
C-AE-1	Air Quality	Measure air contaminants, including Total Suspended Particulate (TSP), PM_{10} and $PM_{2.5}$, PAHs (benzo(a)pyrene), VOCs (acrolein), NO_2 and SO_2, during construction.	*No residual adverse effects on air quality are predicted considering the implementation of mitigation measures.*	To confirm the effectiveness of the Dust Management Plan (nuisance effects mitigation measures under the EMPP) and to verify EIS predictions of no residual adverse effects.	**Duration:** Throughout the construction phase **Parameters:** TSP, PM_{10}, $PM_{2.5}$, PAHs (benzo(a)pyrene), VOCs (acrolein), NO_2 and SO_2 **Frequency:** Continuous and Semi-Continuous Monitoring. **Location:** Similar to baseline (B-AE-1), where appropriate. Locations within the LSA will be monitored as part of existing stations (i.e., Durham-York Energy Centre, St. Marys and MECP Stations).	CCME CAAQS MECP AAQC Comparison to baseline measurements and EIS predictions.	Operation phase (O-AE-1)	**Related Activities:** B-AE-1, P-AE-1, O-AE-1 **Related Programs and Standards:** OPG nuisance effects (dust and noise) mitigation measures under the EMPP (D-P-3.2). ECA under s. 9(1) of the EPA for construction activity air emissions	CNSC, HC, MECP, ECCC, municipalities	D-P-12.2 GOC response to JRP rec. 8 and 56 **Other:** D-P-3.2
C-AE-2	Noise	Measure noise levels during construction.	*No residual adverse effects on noise are predicted considering the implementation of mitigation measures.*	To confirm the effectiveness of the Noise Management Plan (nuisance effects mitigation measures under the EMPP) and to verify EIS predictions of no residual adverse effects.	**Duration:** During expected periods of elevated construction activity. **Parameters:** Noise levels. **Frequency:** Campaign based (7 days, 2-3 times per year) during peak periods. **Location:** Strategic locations at or outside of the DNNP, near sensitive socio-economic receptors.	NPC-300 Clarington By-Law 2007-071 HC Guidance: Noise. Comparisons to baseline measurements.	Operation phase (O-AE-2)	**Related Activities:** B-AE-2, P-AE-2, O-AE-2 **Related Programs and Standards:** OPG nuisance effects (dust and noise) mitigation measures under the EMPP ECA under s. 9(1) of the EPA for construction activity (noise)	CNSC, HC, MOE, municipalities	D-P-12.2 **Other:** D-P-3.2 GOC response to JRP rec. 9
Operation										
O-AE-1	Air Quality	Measure air contaminants, including Total Suspended Particulate (TSP), PM_{10} and	*No residual adverse effects on air quality are*	To verify EIS predictions of no residual adverse	**Duration:** During operation phase for a minimum of 1 year (once fully operational).	CCME CAAQS MECP AAQC Comparison to	Upon completion of activity once EA	**Related Activities:** B-AE-1, P-AE-1, C-AE-1 **Related Programs and**	CNSC, HC, MECP, ECCC, municipalities	D-P-12.2 GOC response to JRP rec. 8 and 56

Appendix A: Baseline and Environmental Assessment Follow-Up Activities – Atmospheric Environment (D-P-12.2)

Activity Number	Environmental Sub-Component	Activity Description	EA Conclusion	Objective(s)	Scope	EA Effects Threshold Criteria	Follow-Up Endpoint	Relationship to Other Activities, Programs and Standards	Stakeholders	Related Commitments Report Deliverables
		$PM_{2.5}$, PAHs (benzo(a)pyrene), VOCs (acrolein), NO_2 and SO_2, during operation.	*predicted considering the implementation of mitigation measures.*	effects.	**Parameters:** TSP, PM_{10}, $PM_{2.5}$, PAHs (benzo(a)pyrene), VOCs (acrolein), NO_2 and SO_2 **Frequency:** Continuous and Semi-Continuous Monitoring. **Location:** Similar to baseline (B-AE-1), where appropriate. Locations within the LSA will be monitored as part of existing stations (i.e. Durham-York Energy Centre, St. Marys and MECP Stations).	baseline measurements and EIS predictions.	objectives have been met.	**Standards:** OPG nuisance effects (dust and noise) mitigation measures under the EMPP ECA under s. 9(1) of the EPA for construction activity air emissions		**Other:** D-P-3.2
O-AE-2	Noise	Measure noise levels during operation.	*No residual adverse effects on noise are predicted considering the implementation of mitigation measures.*	To verify EIS predictions of no residual adverse effects.	**Duration:** During operation phase for a minimum of 1 year (once fully operational). **Parameters:** Noise levels. **Frequency:** Campaign based (7 days, 2-3 times per year) during peak periods. **Location:** Strategic locations at or outside of the DNNP, near sensitive socio-economic receptors.	NPC-300 Clarington By-Law 2007-071 HC Guidance: Noise. Comparisons to baseline measurements.	Upon completion of activity once EA objectives have been met.	**Related Activities:** B-AE-2, P-AE-2, C-AE-2 **Related Programs and Standards:** OPG nuisance effects (dust and noise) mitigation measures under the EMPP ECA under s. 9(1) of the EPA for construction activity (noise)	CNSC, HC, MOE, municipalities	D-P-12.2 **Other:** D-P-3.2 GOC response to JRP rec. 9

Notes
a – Not applicable to baseline.
CCME CAAQS = Canadian Ambient Air Quality Standards.
MECP AAQC = Ontario's Ambient Air Quality Criteria.
NPC-300 = Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning (NPC-300) ("Class 1 Area" Limits) (MECP, 2013).
Clarington By-Law 2007-071 = The Corporation of the Municipality of Clarington By-Law 2007-071.
HC Guidance: Noise = Health Canada Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise (HC, 2017).

Appendix B: Environmental Monitoring and Environmental Assessment Follow-up – Surface Water Environment

Appendix B: Environmental Monitoring and Environmental Assessment Follow-up – Surface Water Environment										
Activity Number	**Environmental Sub-Component**	**Activity Description**	**EA Conclusion**	**EA Follow-Up Objective(s)**	**Scope**	**EA Effects Threshold Criteria**	**Follow-Up Endpoint**	**Relationship to Other Activities, Programs and Standards**	**Stakeholders**	**Related Commitments Report Deliverables**
Prior to Site Preparation / Baseline										
B-SWE-1	Site Drainage and Water Quality	Collect and analyze baseline samples of the lake water and sediment in a comprehensive number of shoreline and offshore locations in the site study area prior to, in-water works, lake infill construction activities and bluff removal. **(Note: Lake infill is not currently planned for the DNNP; however, this activity is applicable to other project activities associated with in-water works.**	*No residual adverse effects on site drainage and water quality are predicted considering the implementation of mitigation measures.*	Provide additional baseline data for comparison against future follow-up monitoring results (and potential effects) on lake water and sediment quality from in water works including lake infill construction activities.	**Duration:** Studies conducted prior to site preparation activities in the following years; 2011, 2012 and 2019. **Parameters:** Conventional and Radiological. **Frequency:** Quarterly water samples, annual sediment samples. **Location:** Shoreline and offshore locations in the site study area.	N/A[a]	N/A	**Related Follow-Up Activities:** P-SWE-1 (not required), C-SWE-1, O-SWE-1 **Related Programs and Standards:** Water and Sediment Quality Monitoring Program (requirement of DFO Authorization under the *Fisheries Act*)	CNSC, ECCC, DFO, MECP	D-P-12.3 GOC Response to JRP Rec. 13 **Other:** none
B-SWE-2	Site Drainage and Water Quality	Collect and analyze baseline samples of the lake water and sediment within the future embayment area prior to site preparation. **(Note: Since lake infill is not currently planned for the DNNP, this activity is not required; but has already been completed.)**	*No residual adverse effects on site drainage and water quality are predicted considering the implementation of mitigation measures.*	Provide additional baseline data for comparison against future follow-up monitoring results (and potential effects) on the future embayment area from site preparation and lake infill.	**Duration:** Studies conducted prior to site preparation activities in the following years; 2011, 2012 and 2019. **Parameters:** Conventional and Radiological. **Frequency:** Quarterly water samples, annual sediment samples. **Location:** The future embayment area created between lake infill and St. Marys Cement.	N/A[a]	N/A	**Related Follow-Up Activities:** P-SWE-2, C-SWE-2 (not required), O-SWE-2 (not required) **Related Programs and Standards:** Water and Sediment Quality Monitoring Program (requirement of DFO Authorization under the *Fisheries Act*)	CNSC, DFO, ECCC	D-P-12.3 GOC Response to JRP Rec. 12 **Other:** none
B-SWE-3	Lake Circulation and Shoreline Processes	Undertake baseline lake current, wave and temperature measurements adjacent to the shoreline prior to lake infill construction activities. **(Note: Lake infill is not currently planned for the DNNP, however, this activity is applicable to other project activities associated with in-water works).**	*No residual effects on lake circulation and shoreline processes are predicted.*	Provide additional baseline data to facilitate an assessment (conducted by a coastal engineer) of the effects on shoreline processes and near neighbouring riparian landowners from lake infill when design details are known.	**Duration:** Studies conducted prior to site preparation activities in the following years; 2011/2012 and 2017/2018. **Parameters:** Water velocity, wave energy, temperature. **Frequency:** Several months. **Location:** Adjacent to the shoreline.	N/A	N/A	**Related Follow-Up Activities:** P-SWE-3 (not required), P-SWE-4 **Related Programs and Standards:** None	CNSC, DFO, ECCC	D-P-12.3 **Other:** none

Appendix B: Environmental Monitoring and Environmental Assessment Follow-up – Surface Water Environment

Activity Number	Environmental Sub-Component	Activity Description	EA Conclusion	EA Follow-Up Objective(s)	Scope	EA Effects Threshold Criteria	Follow-Up Endpoint	Relationship to Other Activities, Programs and Standards	Stakeholders	Related Commitments Report Deliverables
Site Preparation										
P-SWE-1	Site Drainage and Water Quality	Collect and analyze samples of lake water and sediment for a comprehensive number of shoreline and offshore locations in the site study area during lake infill construction and bluff removal activities. **(Note: Since lake infill is not currently planned for the DNNP, this activity is not required).**	*No residual adverse effects on water quality are predicted considering the implementation of mitigation measures.*	Confirm the effectiveness of the lake infill design, mitigation measures and the erosion and sediment control plans. Verify EIS predictions of no residual adverse effects on lake water and silt and sediment transport considering the implementation of mitigation measures.	**Duration:** During lake infill construction and bluff removal activities. **Parameters:** Conventional and Radiological. **Frequency:** Variable (to consider parameters and criteria). **Location:** Sampling locations will be similar to baseline sampling receiving waters program for DNNP (B-SWE-1), which is composed of both shoreline and offshore locations in the site study area.	PWQO ODWS CEQG PSQG Comparison to baseline conditions and predicted effects. Fill Quality and Good Management Practices for Shore Infilling in Ontario (MOE 2011b).	Operation Phase, upon completion of O-SWE-1.	**Related Follow-Up Activities:** B-SWE-1, C-SWE-1, O-SWE-1 Conducted in conjunction with Aquatic Environment Activity P-AQ-2 (Not required). **Related Programs and Standards:** Water and Sediment Quality Monitoring Program (requirement of DFO Authorization under the *Fisheries Act*)	CNSC, ECCC, DFO, MECP	D-P-12.3 GOC Response to JRP Rec. 13 **Other:** D-P-3.5
P-SWE-2	Site Drainage and Water Quality	Collect and analyze samples of the lake water and sediment within the embayment area beginning post construction of the lake infill. **(Note: Since lake infill is not currently planned for the DNNP, this activity is not required.)**	*No residual adverse effects on water quality are predicted considering the implementation of mitigation measures.*	Provide additional baseline data for comparison against future follow-up monitoring results (and potential effects) on the embayment area in subsequent phases of the DNNP. Confirm the effectiveness of the lake infill design, mitigation measures and the erosion and sediment control plans. Verify EIS predictions of no residual adverse effects on lake water quality, silt and sediment transport, including drinking water and recreational water quality from potential nuisance algae growth or creation of thermal barrier in the embayment area, considering the implementation of mitigation measures.	**Duration:** Beginning post construction of the lake infill during site preparation phase. **Parameters:** Conventional and Radiological. **Frequency:** Variable (to consider parameters and criteria). **Location:** The embayment area created between lake infill and St. Marys Cement and will be similar to baseline sampling locations.	PWQO ODWS CEQG PSQG Comparison to baseline conditions and predicted effects.	Operation Phase, upon completion of O-SWE-2	**Related Follow-Up Activities:** B-SWE-2, C-SWE-2 (not required), O-SWE-2 (not required) **Related Programs and Standards:** Water and Sediment Quality Monitoring Program (requirement of DFO Authorization under the *Fisheries Act*)	CNSC, DFO, ECCC	D-P-12.3 GOC Response to JRP Rec. 12 **Other:** none

Appendix B: Environmental Monitoring and Environmental Assessment Follow-up – Surface Water Environment										
Activity Number	**Environmental Sub-Component**	**Activity Description**	**EA Conclusion**	**EA Follow-Up Objective(s)**	**Scope**	**EA Effects Threshold Criteria**	**Follow-Up Endpoint**	**Relationship to Other Activities, Programs and Standards**	**Stakeholders**	**Related Commitments Report Deliverables**
P-SWE-3	Lake Circulation and Shoreline Processes	Undertake lake current, wave and temperature measurements adjacent to the shoreline beginning post construction of the lake infill. **(Note: Lake infill is not currently planned for the DNNP and at this time sufficient data is determined as available to complete P-SWE-4; therefore this activity is not required.)**	*No residual adverse effects on water quality are predicted considering the implementation of mitigation measures.*	Confirm the effectiveness of the lake infill design and mitigation measures. Verify EIS predictions of no adverse effects on near neighbouring riparian landowners, lake circulation and shoreline processes considering the implementation of mitigation measures.	**Duration**: Post construction of shoreline works during site preparation phase. **Parameters:** Water velocity, wave energy, temperature. **Frequency:** Variable (to consider parameters and criteria). **Location:** Site Study Area and Local Study Area.	Comparison to baseline conditions and predicted effects. Coastal engineer's assessment (B-SWE-3).	Upon completion of activity once EA follow-up objectives are met.	**Related Follow-Up Activities:** B-SWE-3, P-SWE-4 **Related Programs and Standards:** None identified	CNSC, MNRF, ECCC	D-P-12.3 **Other:** D-P-16.1
P-SWE-4	Lake Circulation and Shoreline Processes	The effects on near neighbouring riparian landowners, shore processes and aquatic resources as a result of the DNNP will be further assessed by a coastal engineer when a vendor is selected, and the detailed engineering design of the shoreline works is available.	*No residual effects on lake circulation and shoreline processes are predicted.*	To confirm assessment of no predicted effects on or near neighbouring riparian uses.	**Duration:** Prior to shoreline and in-water works, after design details are known. **Parameters:** Modeling (parameters specific to chosen model). **Frequency:** One-time. **Location:** Affected shoreline.	N/A	Upon completion of activity once EA follow-up objectives are met.	**Related Follow-Up Activities:** B-SWE-3, P-SWE-3 (not required) **Related Programs and Standards:** None	CNSC, DFO, ECCC	D-P-12.3 **Other:** none
Construction										
C-SWE-1	Site Drainage and Water Quality	Collect and analyze samples of lake water and sediment in a comprehensive number of shoreline and offshore locations in the site study area during construction activities. **(Note: Lake infill is not currently planned for the DNNP; however, this activity is applicable to other project activates associated with in-water works.)**	*No residual adverse effects on water quality are predicted considering the implementation of mitigation measures.*	Confirm the effectiveness of the in-water works designs, mitigation measures and the erosion and sediment control plans. Confirm that effects from effluent discharges are consistent with predictions made in the EIS and with those during the detailed design phase. Verify EIS predictions of no residual adverse effects on lake water quality, silt and sediment transport considering the implementation of mitigation measures.	**Duration:** During intake and discharge construction activities during construction phase. **Parameters:** Conventional and Radiological. **Frequency:** Variable (to consider parameters and criteria). **Location:** Sampling locations will be similar to baseline sampling receiving waters program for DNNP (B-SWE-1), which is comprised of both shoreline and offshore locations in the site study area.	PWQO ODWS CEQG PSQG Comparison to baseline conditions and predicted effects.	Upon completion of O-SWE-1	**Related Follow-Up Activities:** B-SWE-1, P-SWE-1 (not required), O-SWE-1 **Related Programs and Standards:** Water and Sediment Quality Monitoring Program (requirement of DFO Authorization under the *Fisheries Act*)	CNSC, DFO, ECCC, MECP	D-P-12.3 GOC Response to JRP Rec. 13 **Other:** D-P-3.5

Appendix B: Environmental Monitoring and Environmental Assessment Follow-up – Surface Water Environment

Activity Number	Environmental Sub-Component	Activity Description	EA Conclusion	EA Follow-Up Objective(s)	Scope	EA Effects Threshold Criteria	Follow-Up Endpoint	Relationship to Other Activities, Programs and Standards	Stakeholders	Related Commitments Report Deliverables
C-SWE-2	Site Drainage and Water Quality	Collect and analyze samples of the lake water and sediment within the embayment area during construction activities. **(Note: Lake infill is not currently planned for the DNNP, this activity is not required.)**	*No residual adverse effects on water quality are predicted considering the implementation of mitigation measures.*	Confirm the effectiveness of the in-water works designs, mitigation measures and the erosion and sediment control plans. Verify EIS predictions of no residual adverse effects on lake water quality, silt and sediment transport, including drinking water and recreational water quality from potential nuisance algae growth or creation of thermal barrier in the embayment area, considering the implementation of mitigation measures.	**Duration:** During construction phase. **Parameters:** Conventional and Radiological. **Frequency:** Variable (to consider parameters and criteria). **Location:** The embayment area created between lake infill and St. Marys Cement and will be similar to baseline sampling locations.	PWQO ODWS CEQG PSQG Comparison to baseline conditions and predicted effects.	Upon completion of O-SWE-2	**Related Follow-Up Activities:** B-SWE-2, P-SWE-2 (not required), O-SWE-2 (not required) Conducted in conjunction with Aquatic Environment Activity C-AQ-2 (not required). **Related Programs and Standards:** Water and Sediment Quality Monitoring Program (requirement of DFO Authorization under the *Fisheries Act*)	CNSC, DFO, ECCC	D-P-12.3 GOC Response to JRP Rec. 12 **Other:** none
C-SWE-3	Site Drainage and Water Quality Lake Water Temperature	If the once-through cooling system is chosen for the DNNP, conduct a comprehensive surface water risk assessment of the combined thermal and contaminant plume, and the physical displacement effect of altered lake currents as a hazardous pulse exposure to fish species whose larvae passively drift through the area (similar to Aquatic Environment C-AQ-1) prior to construction of once-through cooling system. **(Note: Study at DNGS has demonstrated that species that are entrained are broadcast spawners or multiple spawners, as such, the applicability and feasibility of part of this activity will be discussed further with the relevant stakeholders.)**	*No residual adverse effects on water quality are predicted considering the implementation of mitigation measures.*	Verify the EIS predictions of no residual adverse effects on Lake Ontario water quality and lake water temperature considering the implementation of mitigation measures.	**Duration:** Prior to construction. **Parameters:** Temperature, water velocity, wave energy, and others to be determined. **Frequency:** One-time risk assessment. **Location:** Site Study Area.	Comparison to baseline conditions and predicted effects [EIS (OPG 2009a), Section 5.3.5].	Upon completion of activity once EA objectives have been met.	**Related Follow-Up Activities:** O-SWE-5 Conducted in conjunction with Aquatic Environment activity C-AQ-1. **Related Programs and Standards:** None	CNSC, ECCC, DFO, MECP	D-P-12.3 GOC Response to JRP Rec. 35 **Other:** D-P-12.4 D-C-1.2

Appendix B: Environmental Monitoring and Environmental Assessment Follow-up – Surface Water Environment

Activity Number	Environmental Sub-Component	Activity Description	EA Conclusion	EA Follow-Up Objective(s)	Scope	EA Effects Threshold Criteria	Follow-Up Endpoint	Relationship to Other Activities, Programs and Standards	Stakeholders	Related Commitments Report Deliverables
Operation										
O-SWE-1	Site Drainage and Water Quality	Collect and analyze samples of lake water and sediment in a comprehensive number of shoreline and offshore locations in the site study area post construction. **(Note: Lake infill is not currently planned for the DNNP; however, this activity is applicable to other project activates associated with in-water works.)**	*No residual adverse effects on water quality are predicted considering the implementation of mitigation measures.*	Confirm the effectiveness of in-water works designs and mitigation measures. Verify EIS predictions of no residual adverse effects on lake water quality, silt and sediment transport considering the implementation of mitigation measures.	**Duration:** Post-construction phase (minimum 1 year). **Parameters:** Conventional and Radiological. **Frequency:** Variable (to consider parameters and criteria). **Location:** Sampling locations will be similar to baseline sampling receiving waters program for DNNP, which is comprised of both shoreline and offshore locations in the site study area.	PWQO ODWS CEQG PSQG Comparison to baseline conditions and predicted effects.	Upon completion of activity once EA objectives have been met.	**Related Follow-Up Activities:** B-SWE-1, P-SWE-1 (not required), C-SWE-1 **Related Programs and Standards:** Water and Sediment Quality Monitoring Program (requirement of DFO Authorization under the *Fisheries Act*)	CNSC, DFO, ECCC, MECP	D-P-12.3 GOC Response to JRP Rec. 13 **Other:** D-C-2.1 D-P-3.5
O-SWE-2	Site Drainage and Water Quality	Collect and analyze samples of the lake water and sediment within the embayment area. **(Note: Since lake infill is not currently planned for the DNNP, this activity is not required.)**	*No residual adverse effects on water quality are predicted considering the implementation of mitigation measures.*	Confirm the effectiveness of in-water works designs and mitigation measures. Verify EIS predictions of no residual adverse effects on lake water quality, silt and sediment transport, including drinking water and recreational water quality from potential nuisance algae growth or creation of thermal barrier in the embayment area, considering the implementation of mitigation measures.	**Duration:** Post-construction phase (minimum 1 year). **Parameters:** Conventional and Radiological. **Frequency:** Variable (to consider parameters and criteria). **Location:** The embayment area created between lake infill and St. Marys Cement and will be similar to baseline sampling locations.	PWQO ODWS CEQG PSQG Comparison to baseline conditions and predicted effects.	Upon completion of activity once EA objectives have been met.	**Related Follow-Up Activities:** B-SWE-2, P-SWE-2 (not required), C-SWE-2 (not required) **Related Programs and Standards:** Water and Sediment Quality Monitoring Program (requirement of DFO Authorization under the *Fisheries Act*)	CNSC, DFO, ECCC	D-P-12.3 GOC Response to JRP Rec. 12 **Other:** D-P-3.5

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Activity Number	Environmental Sub-Component	Activity Description	EA Conclusion	EA Follow-Up Objective(s)	Scope	EA Effects Threshold Criteria	Follow-Up Endpoint	Relationship to Other Activities, Programs and Standards	Stakeholders	Related Commitments Report Deliverables
O-SWE-3	Site Drainage and Water Quality	Collect and analyze samples of stormwater at the stormwater discharge points during operation.	*No residual adverse effects on water quality are predicted considering the implementation of mitigation measures.*	Confirm the effectiveness of the stormwater management plan. Verify EIS predictions of no residual adverse effects on lake water and sediment considering the implementation of mitigation measures.	**Duration:** Post-construction, minimum 1 year. **Parameters:** Conventional and Radiological. **Frequency:** Various, intent to capture range of discharge events. **Location:** Stormwater sampling at stormwater discharge points.	Typical storm water runoff quality data. Toxicity testing criteria (*Daphnia magna* and Rainbow Trout acute lethality toxicity test). Stormwater Management Planning & Design Manual (MOE 2003c).	Upon completion of activity once EA objectives have been met.	**Related Follow-Up Activities:** None **Related Programs and Standards:** None	CNSC, MECP, ECCC	D-P-12.3 GOC Response to JRP Rec. 16 **Other:** none
O-SWE-4	Lake Circulation and Shoreline Processes	For the once-through cooling option, monitor performance of new intake (e.g., velocities and associated effects on substrates current deflection) and new discharge structure (discharge velocities and associated effects on substrates and current deflection; thermal plumes) during commissioning.	*No residual adverse effects on water quality are predicted considering the implementation of mitigation measures.*	Confirm the effectiveness of once-through cooling system intake and discharge designs and mitigation measures. Verify EIS predictions of no residual adverse effects on lake circulation and shoreline processes considering the once-through condenser cooling system design and the implementation of mitigation measures.	**Duration:** During plant commissioning activities (assumed to be 2 years). **Parameters:** Water velocity, wave energy, temperature and others to be determined. **Frequency:** Variable (to consider parameters and criteria). **Location:** Vicinity of cooling water intake and discharge (precise locations to be determined based on design).	Comparison to design requirements. Comparison to predicted effects.	Upon completion of activity once EA objectives have been met.	**Related Follow-Up Activities:** None **Related Programs and Standards:** None	CNSC, DFO, MECP	D-P-12.3 **Other:** D-C-1.2 GOC Response to JRP Rec. 32 GOC Response to JRP Rec. 34 GOC Response to JRP Rec. 37 GOC Response to JRP Rec. 40

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Activity Number	Environmental Sub-Component	Activity Description	EA Conclusion	EA Follow-Up Objective(s)	Scope	EA Effects Threshold Criteria	Follow-Up Endpoint	Relationship to Other Activities, Programs and Standards	Stakeholders	Related Commitments Report Deliverables
O-SWE-5	Lake Water Temperature	If the once-through condenser cooling option technology is selected for the DNNP, periodically monitor lake water temperatures near the surface and at the bottom during commissioning.	*No residual adverse effects on water quality are predicted considering the implementation of mitigation measures.*	Confirm the effectiveness of once-through cooling system intake and discharge designs and mitigation measures. Verify EIS predictions of no residual adverse effects on lake water temperatures considering the design and the implementation of mitigation measures. Verify the performance of the intake and discharge structures (similar to Aquatic Environment – aquatic habitat and biota – EA follow-up during the operation phase).	**Duration:** During plant commissioning activities (assumed to be 2 years). **Parameters:** Temperature. **Frequency:** Continuous. **Location:** Vicinity of cooling water intake and discharge structures (precise locations to be determined based on design).	PWQO CEQG Comparison to predicted effects.	Upon completion of activity once EA objectives have been met.	**Related Follow-Up Activities:** C-SWE-3 Conducted in conjunction with the Aquatic Environment Activity O-AQ-3 **Related Programs and Standards:** None	ECCC, DFO, CNSC, MECP	D-P-12.3 **Other:** D-C-1.2 GOC Response to JRP Rec. 32 GOC Response to JRP Rec. 34 GOC Response to JRP Rec. 37 GOC Response to JRP Rec. 40

Notes
a – not applicable to baseline activities.
PWQO = MECP Provincial Water Quality Objectives (MOEE 1994).
ODWS = MECP Ontario Drinking Water Standards (MOE 2003b).
CEQG = CCME Canadian Environmental Quality Guidelines (CCME 2006).
PSQG = MECP Provincial Sediment Quality Guidelines (MOE 2008).

Appendix C: Environmental Monitoring and Environmental Assessment Follow-up – Aquatic Environment

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Activity Number	**Environmental Sub-Component**	**Activity Description**	**EA Conclusion**	**EA Follow-Up Objective**	**Scope**	**EA Effects Threshold Criteria**	**Follow-Up Endpoint**	**Relationship to Other Activities, Programs and Standards**	**Stakeholders**	**Related Commitments Report Deliverables**
Prior to Site Preparation / Baseline										
B-AQ-1	Aquatic Habitat and Biota	Undertake adult fish community surveys in the site study area and reference locations.	*No residual adverse effects are predicted on aquatic habitat and biota considering the implementation of mitigation measures, which include a Fish Habitat Compensation Plan.*	Provide additional baseline data for comparison against future follow-up monitoring results and potential effects from condenser cooling water operations (impingement, entrainment and thermal discharge) on the aquatic habitat and biota. Verify the findings on fish spatial distribution and relatively high native fish species abundance in the embayment area, such as white sucker and round whitefish.	**Duration:** Multiple studies conducted prior to site preparation activities in the years following the EA (2010, 2011, 2019). Specific studies conducted are presented in DNNP – Site Preparation Licence Renewal Activity Report – Environment (Ecometrix 2020). **Parameters:** adult, juvenile and bait fish. **Frequency:** Variable depending on study, see DNNP – Site Preparation Licence Renewal Activity Report – Environment (Ecometrix 2020). **Location:** Two reference locations (Thickson Point and Bond Head) and multiple nearshore and offshore locations within the site study area.	N/A[a]	N/A	**Related Follow-Up Activities**: P-AQ-1, P-AQ-2 (not required), P-AQ-4, C-AQ-1, C-AQ-2 (not required), C-AQ-3, C-AQ-4, O-AQ-1, O-QA-2 **Related Programs and Standards:** None	CNSC, DFO, ECCC, MNRF	D-P-12.4 GOC Response to JRP Rec. 28 GOC Response to JRP Rec. 40 **Other:** None

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Activity Number	**Environmental Sub-Component**	**Activity Description**	**EA Conclusion**	**EA Follow-Up Objective**	**Scope**	**EA Effects Threshold Criteria**	**Follow-Up Endpoint**	**Relationship to Other Activities, Programs and Standards**	**Stakeholders**	**Related Commitments Report Deliverables**
B-AQ-2	Aquatic Biota	Conduct impingement and entrainment sampling at DNGS.	*No significant residual adverse effects are predicted on Aquatic Biota associated with cooling water discharges considering the implementation of mitigation measures.*	Provide additional baseline data for comparison against future follow-up monitoring results and potential effects from condenser cooling water operations (impingement, entrainment and thermal discharge) on the aquatic habitat and biota.	**Duration:** Studies conducted prior to site preparation activities in the following years: 2010/2011 for impingement and 2015/2016 for entrainment. Historical impingement sampling was conducted in 2006-07 and historical entrainment sampling was conducted in 2004 and 2006. **Parameters:** impingement: adult fish; entrainment: benthic invertebrates, fish eggs, larval fish. **Frequency:** Variable depending on study, see DNNP – Site Preparation Licence Renewal Activity Report – Environment (Ecometrix 2022a). **Location:** DNGS.	N/A[a]	N/A	**Related Follow-Up Activities**: O-AQ-4 **Related Programs and Standards:** None	CNSC, DFO, ECCC, MNRF	D-P-12.4 GOC Response to JRP Rec. 30 **Other:** None

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Activity Number	Environmental Sub-Component	Activity Description	EA Conclusion	EA Follow-Up Objective	Scope	EA Effects Threshold Criteria	Follow-Up Endpoint	Relationship to Other Activities, Programs and Standards	Stakeholders	Related Commitments Report Deliverables
Site Preparation										
P-AQ-1	Aquatic Habitat and Biota	Determine the total area of permanent aquatic effects from the following: the thermal plume + 2°C above ambient temperature, the mixing zone and surface plume contaminants, physical displacements from altered lake currents, and infill and construction losses and modifications. Incorporate any identified permanent aquatic effects into a cumulative effects assessment that includes the effects of impingement and entrainment and climate change. The cumulative effects assessment will also consider overall potential effect upon Round Whitefish populations. **(Note: Lake infill is not currently planned for the DNNP; however, this activity is applicable to other project activities associated with in-water works.)**	*No residual adverse effects are predicted on aquatic habitat and biota considering the implementation of mitigation measures, which include a Fish Habitat Compensation Plan.*	Provide information to properly scale mitigation and to scope follow-up monitoring. Verify EIS predictions of no residual adverse effects on aquatic habitat from lake infill construction activities considering the implementation of mitigation measures.	**Duration**: Prior to construction activities. **Parameters:** To be determined. **Frequency:** Variable (to consider parameters and criteria). **Location:** Local Study Area.	Comparison to baseline conditions and predicted effects.	Operation phase following O-AQ-2.	**Related Follow-Up Activities**: B-AQ-1, C-AQ-2 (not required), O-AQ-2 **Related Programs and Standards:** Fisheries Act Authorization (DFO)	CNSC, DFO, ECCC, MNRF	D-P-12.4 D-C-1.2 D-P-15.1 (only for commitments to be tracked under D-P-12.4, as identified in OPG 2023a) GOC Response to JRP Rec. 37 **Other:** None
P-AQ-2	Aquatic Biota	Consistent with the DFO authorization under the *Fisheries Act*, monitor fish and other aquatic biota in the infill area, and determine losses associated with lake infill construction activities. **(Note: Since lake infill is not currently planned for the DNNP, this activity is not required.)**	*No residual adverse effects are predicted on aquatic habitat and biota considering the implementation of mitigation measures, which include a Fish Habitat Compensation Plan.*	Confirm the effectiveness of the lake infill design, mitigation measures and the erosion and sediment control plans. Verify EIS predictions of no residual adverse effects on fish losses considering the implementation of mitigation measures, which include a Fish Habitat Compensation Plan.	**Duration:** During lake infill construction and bluff removal activities. **Parameters:** Conventional and radiological for sediment and water. Incidental observation of fish. **Frequency:** Variable (to consider parameters and criteria). **Location:** Sampling locations will be similar to baseline sampling receiving waters program for DNNP (B-AQ-1), which is composed of both shoreline and offshore site study areas.	Fish and Fish Habitat Protection Policy Statement (DFO 2019a). Comparison to predicted effects.	End of Construction.	**Related Follow-Up Activities:** With the exception of fish, this activity is conducted in conjunction with the Surface Water Environment activity P-SWE-1. **Related Programs and Standards:** Fisheries Act Authorization (DFO)	CNSC, DFO	D-P-12.4 **Other:** D-P-12.3 D-P-14.1 D-P-16.1

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Activity Number	Environmental Sub-Component	Activity Description	EA Conclusion	EA Follow-Up Objective	Scope	EA Effects Threshold Criteria	Follow-Up Endpoint	Relationship to Other Activities, Programs and Standards	Stakeholders	Related Commitments Report Deliverables
Construction										
C-AQ-1	Aquatic Biota	If the once-through cooling system is chosen for the DNNP, conduct a comprehensive surface water risk assessment to include the surface combined thermal and contaminant plume; and the physical displacement effect of altered lake currents as a hazardous pulse exposure to fish species whose larvae passively drift through the area such as lake herring, lake whitefish, emerald shiner and yellow perch (similar to Surface Water Environment C-SWE-3) when detailed design and location of the once-through cooling system are known. **(Note: Study at DNGS has demonstrated that species that are entrained are broadcast spawners or multiple spawners, as such, the applicability and feasibility of part of this activity will be discussed further with the relevant stakeholders.)**	*No significant residual adverse effects are predicted on Aquatic Biota associated with cooling water discharges considering the implementation of mitigation measures.*	Confirm the effectiveness of the once-through cooling system discharge design and mitigation measures. Verify the EIS predictions of no residual adverse effects on fish losses considering the implementation of mitigation measures, which include a Fish Habitat Compensation Plan. Prior to construction, enhanced resolution thermal plume modeling is to be conducted by OPG, taking into account possible future climate change effects. EC is committed to reviewing the information provided by OPG and will rely on DFO authorization for a HADD associated with the intake or outfall to ensure that OPG undertakes this modelling. DFO will work with EC, and CNSC to incorporate the results from the thermal plume modeling into the determination of the appropriate location for the intake and discharge structures to mitigate adverse effects. DFO will ensure implementation through conditions of a Fisheries Act authorization. [GOC Response to JRP Rec. 34]	**Duration:** Prior to construction of the once-through cooling system. **Parameters:** Various aquatic biota TBD. **Frequency:** One-time risk assessment. **Location:** Site Study Area.	Comparison to baseline conditions and predicted effects. Follow-up scoping workshop to be held if the risk assessment identifies a potential hazard.	Upon completion of activity once EA follow-up objectives have been met.	**Related Follow-Up Activities:** With the exception of fish, this activity is conducted in conjunction with the Surface Water Environment activity C-SWE-3. **Related Programs and Standards:** Fisheries Act Authorization (DFO)	CNSC, DFO, ECCC, MNRF	D-P-12.4 GOC Response to JRP Rec. 34 GOC Response to JRP Rec. 35 **Other:** D-P-12.3

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Activity Number	Environmental Sub-Component	Activity Description	EA Conclusion	EA Follow-Up Objective	Scope	EA Effects Threshold Criteria	Follow-Up Endpoint	Relationship to Other Activities, Programs and Standards	Stakeholders	Related Commitments Report Deliverables
C-AQ-2	Aquatic Habitat and Biota	Consistent with DFO authorization under the *Fisheries Act*, monitor silt and sediment transport as it relates to aquatic biota and habitat as a result of construction activities associated with infill and partial bluffs. **(Note: Since lake infill is not currently planned for the DNNP, this activity is not required.)**	*No residual adverse effects are predicted on aquatic habitat and biota considering the implementation of mitigation measures, which include a Fish Habitat Compensation Plan.*	Confirm the effectiveness of the lake infill design, mitigation measures and the erosion and sediment control plans.	**Duration:** During construction phase. **Parameters:** Conventional and radiological for sediment and water. **Frequency:** Variable (to consider parameters and criteria). **Location:** The embayment area created between lake infill and St. Marys Cement and will be similar to baseline sampling locations.	Fish and Fish Habitat Protection Policy Statement (DFO 2019a). Comparison to predicted effects.	Upon completion of activity once EA follow-up objectives have been met.	**Related Follow-Up Activities:** O-AQ-2 Conducted in conjunction with the Surface Water Environment activity C-SWE-2. **Related Programs and Standards:** Fisheries Act Authorization (DFO)	CNSC, DFO, ECCC, MNRF	D-P-12.4 **Other:** D-P-12.3
C-AQ-3	Aquatic Biota	Develop an impingement and entrainment sampling program as a condition of authorization for DNNP operations under the Fisheries Act from DFO.	*No significant residual adverse effects are predicted on Aquatic Biota considering the implementation of mitigation measures.*	OPG to conduct an impingement and entrainment follow-up program at the existing Darlington Nuclear Generating Station and the Project site to confirm the prediction of adverse effects, including cumulative effects, and the effectiveness of mitigation.	**Duration:** During construction phase. **Parameters:** Impingement adult/juvenile fish; Entrainment: benthic invertebrates, fish eggs, larval fish. **Frequency:** N/A **Location:** DNGS and DNNP.	Refer to O-AQ-4.	Upon completion of activity once EA follow-up objectives have been met.	**Related Follow-Up Activities:** B-AQ-2 O-AQ-4 **Related Programs and Standards:** Fisheries Act Authorization (DFO)	CNSC, DFO, ECCC, MNRF	D-P-12.4 D-C-1.2 D-P-15.1 (only for commitments to be tracked under D-P-12.4, as identified in OPG 2023a) GOC Response to JRP Rec. 30 **Other:** None
C-AQ-4	Aquatic Biota	Develop an Adaptive Management System for the algae hazard to the cooling water intake at DNNP. **(Note: This is an operational issue not an issue to the receiving/surrounding environment.)**	N/A.	To inform the establishment of an Adaptive Management System for the algal hazard to the cooling water intake at DNNP. Technical expectations for the DNNP includes a model based hazard monitoring system to define threshold levels of algal biomass that would trigger more intense monitoring leading into the proposed contingency measures.	**Duration:** Prior to operation phase. **Parameters:** Algal biomass. **Frequency:** Seasonal. **Location:** DNNP intake.	N/A	Upon completion of activity once EA follow-up objectives have been met.	**Related Follow-Up Activities**: None **Related Programs and Standards:** None	CNSC, DFO	D-P-12.4 D-C-1.2 GOC Response to JRP Rec. 40 **Other:** None

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Activity Number	Environmental Sub-Component	Activity Description	EA Conclusion	EA Follow-Up Objective	Scope	EA Effects Threshold Criteria	Follow-Up Endpoint	Relationship to Other Activities, Programs and Standards	Stakeholders	Related Commitments Report Deliverables
Operation										
O-AQ-1	Aquatic Biota	Undertake adult fish community surveys in the site study area and reference locations. **(Note: Baseline fish community monitoring is typically not conducted on an ongoing basis at other nuclear facilities during operation.)** In the event that a once-through condenser cooling system is chosen for the Project, during operation, OPG is to undertake adult fish monitoring of large-bodied and small-bodied fish. **(Note: Effectiveness of mitigation measures and thermal plume studies being addressed in O-AQ-3 and O-AQ-4, as such, the applicability of this activity will be discussed further with the relevant stakeholders.)**	*No residual adverse effects are predicted on aquatic habitat and biota considering the implementation of mitigation measures, which include a Fish Habitat Compensation Plan.*	Continue conducting adult fish community surveys in the site study area and reference locations on an ongoing basis. Verify the findings on fish spatial distribution and relatively high native fish species abundance in the embayment area, such as white sucker and round whitefish. Confirm the effectiveness of mitigation measures and verify the predictions of no adverse thermal and physical diffuser jet effects to large and small bodied adult fish community.	**Duration:** During operation phase. **Parameters:** adult, juvenile and bait fish. **Frequency:** Ongoing basis, TBD. **Location:** Similar to baseline monitoring locations (as appropriate) including the embayment area.	Comparison to baseline conditions.	Upon completion of activity once EA follow-up objectives have been met.	**Related Follow-Up Activities:** B-AQ-1 **Related Programs and Standards:** None	CNSC, DFO, ECCC, MNRF	D-P-12.4 GOC Response to JRP Rec. 28 GOC Response to JRP Rec. 36 **Other:** None

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Activity Number	Environmental Sub-Component	Activity Description	EA Conclusion	EA Follow-Up Objective	Scope	EA Effects Threshold Criteria	Follow-Up Endpoint	Relationship to Other Activities, Programs and Standards	Stakeholders	Related Commitments Report Deliverables
O-AQ-2	Aquatic Habitat and Biota	Consistent with the DFO authorization under the *Fisheries Act*, monitor post-construction conditions to confirm success of habitat restoration and compensation plans.	*No residual adverse effects are predicted on aquatic habitat and biota considering the implementation of mitigation measures, which include a Fish Habitat Compensation Plan.*	Confirm the effectiveness of mitigation measures. Verify EIS predictions of no residual adverse effects on aquatic habitat and biota, especially impingement and entrainment effects at DNGS and the DNNP station, considering the implementation of mitigation measures, which include a Fish Habitat Compensation Plan.	**Duration:** Full year monitoring on a stratified random study design (if station operation allows). May be phased in as units are brought on line and condenser cooling water flow is ramped up. **Parameters:** Various aquatic habitat and biota TBD. **Frequency:** May be repeated at intervals of 5 or 10 years, depending on level of concern. **Location:** Site Study Area.	Fish and Fish Habitat Protection Policy Statement (DFO 2019a). Policy for Applying Measures to Offset Adverse Effects on Fish and Fish Habitat under the Fisheries Act (DFO 2019b). Comparison to baseline conditions and predicted effects.	Upon completion of activity once EA follow-up objectives have been met.	**Related Follow-Up Activities:** P-AQ-1, C-AQ-2 (not required). **Related Programs and Standards:** Fisheries Act Authorization (DFO) Fish Habitat Compensation Plan (D-P-14.1)	CNSC, DFO	D-P-12.4 **Other:** D-P-14.1
O-AQ-3	Aquatic Habitat and Biota	For the once-through lake water cooling option, periodically monitor data on cooling water discharge temperature and plume characteristics interpreted in relation to fish habitat and susceptibility of VEC species, to verify EIS predictions (similar to Surface Water Environment O-SWE-5 lake water temperature program). Evaluate potential cumulative effects from the thermal loading and contaminant plume of the discharge structures of the existing DNGS.	*No significant residual adverse effects are predicted on Aquatic Biota associated with cooling water discharges considering the implementation of mitigation measures.*	Confirm the effectiveness of once-through lake water cooling design and mitigation measures. Verify the predictions from thermal effects and effects from cooling water discharge. Verify EIS predictions of no residual adverse effects on aquatic habitat and aquatic biota associated with cooling water discharges considering the implementation of mitigation measures.	**Duration:** Full year monitoring on a stratified random study design (if station operation allows). May be phased in as units are brought on line and condenser cooling water flow is ramped up. **Parameters:** Specific VECs TBD. **Frequency:** Ongoing. **Location:** Site Study Area.	Aquatic biota population conservation Comparison to baseline conditions and predicted effects.	Upon completion of activity once EA follow-up objectives have been met.	**Related Follow-Up Activities:** Conducted in conjunction with the Surface Water Environment activity O-SWE-5. **Related Programs and Standards:** Fisheries Act Authorization (DFO)	CNSC, DFO, ECCC	D-P-12.4 GOC Response to JRP Rec. 61 **Other:** None

Appendix C: Environmental Monitoring and Environmental Assessment Follow-up – Aquatic Environment

Activity Number	Environmental Sub-Component	Activity Description	EA Conclusion	EA Follow-Up Objective	Scope	EA Effects Threshold Criteria	Follow-Up Endpoint	Relationship to Other Activities, Programs and Standards	Stakeholders	Related Commitments Report Deliverables
O-AQ-4	Aquatic Biota	Conduct impingement and entrainment sampling at DNGS and the DNNP site.	*No residual adverse effects are predicted on Aquatic Biota considering the implementation of mitigation measures.*	OPG to conduct an impingement and entrainment follow-up program at the existing Darlington Nuclear Generating Station and the Project site to confirm the prediction of adverse effects, including cumulative effects, and the effectiveness of mitigation. For future entrainment sampling for round whitefish, a statistical probability analysis will be needed to determine if unbiased and precise sample results can be produced. DFO will work with the CNSC and OPG to develop an impingement and entrainment study on the existing Darlington Nuclear Generating Station and at the proposed Project site to confirm predicted adverse effects and will further ensure implementation through its regulatory process and conditions of authorization under the Fisheries Act. [GOC Response to JRP Rec. 33; OPG Letter, CD# NK054-CORR-00531-00190] **(Note: Fish (including Round Whitefish) entrainment and impingement studies have been developed with DFO, CNSC, and OPG and implemented at DNGS. Further, CSA N288.9 guidance now exists for impingement and entrainment sampling at nuclear power plants. As such, this EA follow-up objective is complete.)**	**Duration:** Similar to baseline studies conducted prior to site preparation activities in the following years: 2010/2011 (for impingement) and 2015/2016 (for entrainment) (See B-AQ-2). Sampling program developed as part of C-AQ-3. **Parameters:** Impingement adult/juvenile fish; Entrainment: benthic invertebrates, fish eggs, larval fish. **Frequency:** Variable depending on study, see DNNP – Site Preparation Licence Renewal Activity Report – Environment (Ecometrix 2020). **Location:** DNGS and DNNP.	Comparison to Baseline DNGS I&E studies (B-AQ-2).	Upon completion of activity once EA follow-up objectives have been met.	**Related Follow-Up Activities:** B-AQ-2 C-AQ-3 **Related Programs and Standards:** Fisheries Act Authorization (DFO)	CNSC, DFO, ECCC, MRNF	D-P-12.4 GOC Response to JRP Rec. 33 **Other:** None

Notes
a – not applicable to baseline activities.

Appendix D: Environmental Monitoring and Environmental Assessment Follow-up – Terrestrial Environment

Appendix D: Environmental Monitoring and Environmental Assessment Follow-up – Terrestrial Environment (D-P-12.5)										
Activity Number	**Environmental Sub-Component**	**Activity Description**	**EA Conclusion**	**EA Follow-Up Objective**	**Scope**	**EA Effects Threshold Criteria**	**Follow-Up Endpoint**	**Relationship to Other Activities, Programs and Standards**	**Stakeholders**	**Related Commitments Report Deliverables**
Prior to Site Preparation / Baseline										
B-TE-1	Bird Communities and Species	Conduct bank swallow burrow and colony surveys along selected areas of Lake Ontario north shoreline and reference locations, to determine trends in the data since 2007 (i.e., is population increasing, decreasing or is there natural variation?) prior to site preparation.	*Loss of nesting habitat on the DN site for Bank Swallows is identified as a residual adverse effect of the Project, although not significant due to the implementation of mitigation measures which includes development of artificial habitat.*	Provide additional baseline data for comparison against future follow-up monitoring results and potential effects of the DNNP on the bank swallow colonies.	**Duration:** Occupancy and productivity studies were undertaken by Beacon in 2011. Long-term monitoring of bank swallow colonies (burrow and colony counts) has continued annually since 2007 and in the reference area since 2013 (Beacon 2019). **Parameters:** Burrow and colony counts. **Frequency:** Annual/Seasonal. **Location:** Bank Swallow Evaluation Area (along north shore of Lake Ontario between the mouths of Oshawa Creek and Wilmot Creek) and at reference (benchmark) locations (Bond Head Bluffs).	N/A[a]	N/A[a]	**Related Follow-Up Activities:** B-TE-2, P-TE-1, C-TE-1, O-TE-1 **Related Programs and Standards:** None	CNSC, ECCC (CWS), MNRF, CLOCA, MECP	D-P-12.5 **Other:** GOC Response to JRP Rec. 27
B-TE-2	Bird Communities and Species	Develop a Bank Swallow mitigation plan for implementation during Site Preparation and Construction and verify the implementation of the plan. Design and monitor the effectiveness of Bank Swallow Artificial Nest Habitat structures (Pilot Project).	*Loss of nesting habitat on the DN site for Bank Swallows is identified as a residual adverse effect of the Project, although not significant due to the implementation of mitigation measures which includes development of artificial habitat.*	Provide information to support the determination of effective bank swallow mitigation options based on reasonable estimates of actual burrow loss. Support the implementation of adaptive management measures to address previously unanticipated adverse environmental effects.	**Duration:** April – August. **Frequency:** Seasonal. **Parameters:** Burrow occupancy and other parameters as defined in the MECP Safe Harbour Stewardship Agreement. **Location:** Darlington Nuclear Site and possibly off-site.	N/A[a]	N/A[a]	**Related Follow-Up Activities:** B-TE-1, P-TE-1, C-TE-1, O-TE-1 **Related Programs and Standards:** Safe Harbour Stewardship Agreement	CNSC, ECCC (CWS), MNRF, CLOCA, MECP	D-P-12.5 **Other:** GOC Response to JRP Rec. 27

Appendix D: Environmental Monitoring and Environmental Assessment Follow-up – Terrestrial Environment (D-P-12.5)

Activity Number	Environmental Sub-Component	Activity Description	EA Conclusion	EA Follow-Up Objective	Scope	EA Effects Threshold Criteria	Follow-Up Endpoint	Relationship to Other Activities, Programs and Standards	Stakeholders	Related Commitments Report Deliverables
B-TE-3	Vegetation Communities and Species	Prior to site preparation, conduct ecological land classification mapping of the vegetation communities at the DN site (including DNNP lands).	*Loss of terrestrial habitat (Cultural Meadow and Thicket, wetland ecosystems, and wildlife corridor), used by breeding birds, amphibians, and butterflies is predicted. Residual effects are not significant due to implementation of mitigation measures which includes replanting.*	Provide additional baseline data for comparison against future follow-up monitoring results and potential effects of the DNNP on vegetation communities and species given progressive restoration activities.	**Duration:** Part of DN Biodiversity Program. **Parameters:** ELC mapping. **Frequency:** Every 5 years. **Location:** Site Study Area.	N/A[a]	N/A[a]	**Related Follow-Up Activities:** P-TE-2, C-TE-2, O-TE-2 **Related Programs and Standards:** DN Biodiversity Program	CNSC, ECCC (CWS), MNRF, CLOCA, MECP	D-P-12.5 **Other:** None
B-TE-4	Bird Communities and Species	Conduct Species at Risk surveys (e.g., Bobolink, Least Bittern) on the DNNP site prior to site preparation.	*Residual adverse effects are not significant.*	Provide additional baseline data for comparison against future follow-up monitoring results and potential effects of the DNNP against bird communities and species. Provide information to facilitate an assessment of any changes in the numbers and locations of selected species over the years since 2007. Confirm the presence of Least Bittern. Provide site and species specific information on Bobolink.	**Duration:** Part of DN Biodiversity Program **Parameters:** Types and counts of species. **Frequency:** Annual. **Location:** Site Study Area.	N/A[a]	N/A[a]	**Related Follow-Up Activities:** O-TE-4 **Related Programs and Standards:** DN Biodiversity Program	CNSC, ECCC, MECP, MNRF	D-P-12.5 **Other:** GOC Response to JRP Rec. 25

Appendix D: Environmental Monitoring and Environmental Assessment Follow-up – Terrestrial Environment (D-P-12.5)

Activity Number	Environmental Sub-Component	Activity Description	EA Conclusion	EA Follow-Up Objective	Scope	EA Effects Threshold Criteria	Follow-Up Endpoint	Relationship to Other Activities, Programs and Standards	Stakeholders	Related Commitments Report Deliverables
B-TE-5	Insects Amphibians and Reptiles Mammal Communities and Species	If justified, conduct insect, amphibian, reptile and mammal surveys prior to site preparation.	*No residual adverse effect for amphibian and reptiles and mammals. Loss of habitat for insects, but residual effects are not significant due to implementation of mitigation measures.*	Provide additional baseline data for comparison against future follow-up monitoring results and potential effects of the DNNP on insects, amphibians, reptiles, and mammals with a focus on species at risk.	**Duration:** Part of DN Biodiversity Program. **Parameters:** Types and counts of species. **Frequency:** Annual. **Location:** Site Study Area.	N/A[a]	N/A[a]	**Related Follow-Up Activities:** O-TE-2, O-TE-4 **Related Programs and Standards:** DN Biodiversity Program	CNSC, ECCC, MECP, MNRF, CLOCA	D-P-12.5 **Other:** GOC Response to JRP Rec. 22
Site Preparation										
P-TE-1	Bird Communities and Species	Monitor Bank Swallow colonies periodically throughout site preparation. Undertake adaptive management approach (Design and monitor the effectiveness of Bank Swallow Artificial Nest Habitat structures (Pilot Project)).	*Loss of nesting habitat on the DN site for Bank Swallows is identified as a residual adverse effect of the Project, although not significant due to the implementation of mitigation measures which includes development of artificial habitat.*	Verify EIS predictions of a minor residual adverse effect (not significant) on bank swallow colonies from the DNNP considering the implementation of mitigation measures. Confirm the effectiveness of the Bank Swallow mitigation measures and plans.	**Duration:** Throughout site preparation phase. **Parameters:** burrow and colony counts (for existing habitat). Burrow occupancy, nest success/productivity and other parameters as defined in the MECP Safe Harbour Stewardship Agreement (for artificial habitat). **Frequency:** Annual monitoring events. **Location:** Site Study Area/ Local Study Area.	Potentially Significant Wildlife Habitat Technical Guide (Appendix G) (Ontario MNR, 2000). Comparison to baseline conditions and predicted effects.	End of Site Preparation phase.	**Related Follow-Up Activities:** B-TE-1, B-TE-2, C-TE-1, O-TE-1 **Related Programs and Standards:** Safe Harbour Stewardship Agreement	CNSC, ECCC (CWS), MNRF, CLOCA, MECP	D-P-12.5 **Other:** GOC Response to JRP Rec. 27

Appendix D: Environmental Monitoring and Environmental Assessment Follow-up – Terrestrial Environment (D-P-12.5)

Activity Number	Environmental Sub-Component	Activity Description	EA Conclusion	EA Follow-Up Objective	Scope	EA Effects Threshold Criteria	Follow-Up Endpoint	Relationship to Other Activities, Programs and Standards	Stakeholders	Related Commitments Report Deliverables
P-TE-2	Vegetation Communities and Species Insects Amphibians and Reptiles Bird Communities and Species Mammal Communities and Species	Monitor conditions of terrestrial habitat (Cultural Meadow and Thicket, wetland ecosystems, and wildlife corridor), and use of habitat by breeding birds, amphibians, and butterflies, and mammals, and collect field data prior to and throughout site preparation. Amphibian surveys will incorporate the Draft Western Chorus Frog Detection Protocol for Ontario.	*Loss of terrestrial habitat (Cultural Meadow and Thicket, wetland ecosystems, and wildlife corridor), used by breeding birds, amphibians, and butterflies is predicted. Residual effects are not significant due to implementation of mitigation measures which includes replanting.*	Verify EIS predictions of a minor residual adverse effect (not significant) on loss of terrestrial habitat (Cultural Meadow and Thicket, wetland ecosystems, and wildlife corridor), used by breeding birds, amphibians, and butterflies considering the implementation of mitigation measures. Provide information to support planning and design of restoration plans.	**Duration:** Part of DN Biodiversity Program. Amphibian surveys incorporating the Draft Western Chorus Frog Detection Protocol to be conducted for a minimum of 2 years. **Parameters:** ELC mapping, types and counts of species. **Frequency:** ELC mapping once during site-preparation, and annual surveys of breeding birds, amphibians, butterflies, and mammals. **Location:** Site Study Area.	Comparison to baseline conditions and predicted effects. Migratory Birds Convention Act (1994). Ecological Land Classification mapping. Significant Wildlife Habitat Guidelines. Provincial Community Ranks. COSEWIC[2] Species at Risk Act.	End of Site Preparation phase.	**Related Follow-Up Activities:** B-TE-3, B-TE-4, C-TE-2, O-TE-2 **Related Programs and Standards:** DN Biodiversity Program	CNSC, ECCC (CWS), MECP, MNRF, CLOCA	D-P-12.5 **Other:** D-P-3.1 D-P-3.7
P-TE-3	Mammal Communities and Species	Periodically conduct wildlife mortality surveys. (i.e., mammal road mortality surveys) during site preparation.	*No residual adverse effects.*	Verify EIS predictions of no adverse effects due to road mortality. Confirm ongoing validity of the assumption that mammals present at the DN site are unlikely to be affected as a result of road mortality at a measurable level.	**Duration:** Throughout site preparation phase. **Parameters:** Counts. **Frequency:** Estimated total of 20 monitoring events annually (removal study conducted to calibrate). **Location:** Local Study Area.	Comparison to baseline conditions and predicted effects.	End of site preparation phase.	**Related Follow-Up Activities:** C-TE-3 **Related Programs and Standards:** DN EMP	CNSC, ECCC (CWS), MNRF, CLOCA, MECP	D-P-12.5 **Other:** GOC Response to JRP Rec. 23

Appendix D: Environmental Monitoring and Environmental Assessment Follow-up – Terrestrial Environment (D-P-12.5)

Activity Number	Environmental Sub-Component	Activity Description	EA Conclusion	EA Follow-Up Objective	Scope	EA Effects Threshold Criteria	Follow-Up Endpoint	Relationship to Other Activities, Programs and Standards	Stakeholders	Related Commitments Report Deliverables
Construction										
C-TE-1	Bird Communities and Species	Monitor Bank Swallow colonies periodically throughout construction activities. Undertake adaptive management approach (Design and monitor the effectiveness of Bank Swallow Artificial Nest Habitat structures (Pilot Project)).	*Loss of nesting habitat on the DN site for Bank Swallows is identified as a residual adverse effect of the Project, although not significant due to the implementation of mitigation measures which includes development of artificial habitat.*	Confirm the effectiveness of the Bank Swallow mitigation measures and plans. Verify EIS predictions of a minor residual adverse effect (not significant) on bank swallow colonies from the DNNP considering the implementation of mitigation measures.	**Duration:** Throughout the construction phase. **Parameters:** Burrow and colony counts (for existing habitat). Burrow occupancy, nest success/productivity and other parameters as defined in the MECP Safe Harbour Stewardship Agreement (for artificial habitat). **Frequency:** Annual monitoring events. **Location:** Site Study Area/ Local Study Area.	Potentially Significant Wildlife Habitat Technical Guide (Appendix G) (Ontario MNR, 2000). Comparison to existing conditions and predicted effects.	End of Construction phase.	**Related Follow-Up Activities:** B-TE-1, B-TE-2, P-TE-1, O-TE-1 **Related Programs and Standards:** Safe Harbour Stewardship Agreement	CNSC, ECCC (CWS), MNRF, CLOCA, MECP	D-P-12.5 **Other:** D-P-3.8
C-TE-2	Vegetation Communities and Species Insects Amphibians and Reptiles Bird Communities and Species Mammal Communities and Species	Monitor conditions of terrestrial habitat (Cultural Meadow and Thicket, wetland ecosystems, and wildlife corridor), and use of habitat by breeding birds, amphibians, and butterflies, and mammals, and collect field data prior to and throughout construction activities.	*Loss of terrestrial habitat (Cultural Meadow and Thicket, wetland ecosystems, and wildlife corridor), used by breeding birds, amphibians, and butterflies is predicted. Residual effects are not significant due to implementation of mitigation measures which includes replanting.*	Provide information to support planning and design of restoration plans. Verify EIS predictions of a minor residual adverse effect (not significant) on loss of terrestrial habitat (Cultural Meadow and Thicket, wetland ecosystems, and wildlife corridor), used by breeding birds, amphibians, and butterflies considering the implementation of mitigation measures.	**Duration**: Part of DN Biodiversity Program. **Parameters:** ELC mapping, types and counts of species. **Frequency** ELC mapping once during construction (approximately once every 5 years consistent with existing schedule), and annual surveys of breeding birds, amphibians, butterflies, and mammals. **Location**: Site Study Area.	Comparison to baseline conditions and predicted effects. Migratory Birds Convention Act (1994). Ecological Land Classification mapping. Significant Wildlife Habitat Guidelines. Provincial Community Ranks. COSEWIC[2]. Species at Risk Act.	End of Construction phase.	**Related Follow-Up Activities:** B-TE-3, B-TE-4, P-TE-2, O-TE-2 **Related Programs and Standards:** DN Biodiversity Program	CNSC, ECCC (CWS), MECP, MNRF, CLOCA	D-P-12.5 **Other:** D-P-3.7

Appendix D: Environmental Monitoring and Environmental Assessment Follow-up – Terrestrial Environment (D-P-12.5)

Activity Number	Environmental Sub-Component	Activity Description	EA Conclusion	EA Follow-Up Objective	Scope	EA Effects Threshold Criteria	Follow-Up Endpoint	Relationship to Other Activities, Programs and Standards	Stakeholders	Related Commitments Report Deliverables
C-TE-3	Mammal Communities and Species	Periodically conduct wildlife mortality surveys. (i.e., mammal road mortality surveys) during construction.	*No residual adverse effects.*	Confirm ongoing validity of the assumption that mammals present at the DN site are unlikely to be affected as a result of road mortality at a measurable level. Verify EIS predictions of no significant residual adverse effects from the DNNP.	**Duration:** Throughout construction phase. **Parameters:** Counts. **Frequency:** Estimated total of 20 monitoring events annually (removal study conducted to calibrate). **Location:** Local Study Area.	Comparison to baseline conditions and predicted effects.	Completion of study at the end of construction phase.	**Related Follow-Up Activities:** P-TE-3 **Related Programs and Standards:** DN EMP	CNSC, ECCC (CWS), MNRF, CLOCA, MECP	D-P-12.5 **Other:** GOC Response to JRP Rec. 23
Operation										
O-TE-1	Bird Communities and Species	Monitor Bank Swallow colonies periodically throughout operation. Undertake adaptive management approach (as needed).	*Loss of nesting habitat on the DN site for Bank Swallows is identified as a residual adverse effect of the Project, although not significant due to the implementation of mitigation measures which includes development of artificial habitat.*	Confirm the effectiveness of the Bank Swallow mitigation measures and plans. Verify EIS predictions of a minor residual adverse effect (not significant) on bank swallow colonies from the DNNP considering the implementation of mitigation measures.	**Duration:** Throughout operation phase. **Parameters:** Burrow and colony counts. **Frequency:** Annual monitoring events. **Location:** Site Study Area/ Local Study Area.	Potentially Significant Wildlife Habitat Technical Guide (Appendix G) (Ontario MNR, 2000). Comparison to baseline conditions and predicted effects.	Once effectiveness of mitigation measures has been demonstrated (after 5 years of operation) – bank swallow colonies at alternate location demonstrated.	**Related Follow-Up Activities:** B-TE-1, B-TE-2, P-TE-1, C-TE-1 **Related Programs and Standards:** None	CNSC, ECCC (CWS), MNRF, CLOCA, MECP	D-P-12.5 **Other:** D-P-3.8

Appendix D: Environmental Monitoring and Environmental Assessment Follow-up – Terrestrial Environment (D-P-12.5)

Activity Number	Environmental Sub-Component	Activity Description	EA Conclusion	EA Follow-Up Objective	Scope	EA Effects Threshold Criteria	Follow-Up Endpoint	Relationship to Other Activities, Programs and Standards	Stakeholders	Related Commitments Report Deliverables
O-TE-2	Vegetation Communities and Species Bird Communities and Species Insects Amphibians and Reptiles Mammal Communities and Species	Monitor conditions of terrestrial habitat, after restoration activities post construction are complete and collect field data on use of habitat by breeding birds, amphibians, butterflies, and mammals.	*Loss of terrestrial habitat (Cultural Meadow and Thicket, wetland ecosystems, and wildlife corridor), used by breeding birds, amphibians, and butterflies is predicted. Residual effects are not significant due to implementation of mitigation measures which includes replanting.*	Confirm the effectiveness of the terrestrial environment mitigation measures and plans (habitat restoration). Verify EIS predictions of a minor residual adverse effect (not significant) on loss of terrestrial habitat (Cultural Meadow and Thicket, wetland ecosystems, and wildlife corridor), used by breeding birds, amphibians, and butterflies considering the implementation of mitigation measures.	**Duration:** Multi-year post-construction monitoring (assumed 5 years). **Parameters:** ELC mapping, Types and counts of species. **Frequency:** As-required field data collection, with possible multi-season involvement depending on issues. For example, ELC mapping once during site-preparation, and annual surveys of breeding birds, amphibians, and butterflies. **Location:** Site Study Area.	Comparison to baseline conditions and predicted effects. Migratory Birds Convention Act (1994). Ecological Land Classification mapping. Significant Wildlife Habitat Guidelines. Provincial Community Ranks. COSEWIC[2]. Species at Risk Act.	At completion of study after 5 years of operation and confirmation of habitat restoration.	**Related Follow-Up Activities:** B-TE-3, P-TE-2, C-TE-2 **Related Programs and Standards:** DN Biodiversity Program	CNSC, ECCC (CWS), MNRF, CLOCA, MECP	D-P-12.5 **Other:** D-P-3.7
O-TE-3	Bird Communities and Species	Should cooling towers be chosen for the condenser cooling, monitor bird communities (migrant songbirds, breeding birds), their habitats, and bird collision impacts. **(Note: Cooling towers are no longer applicable based on plans for DNNP to utilize a once-through cooling system, and so this activity is not required.**)	*Bird strike mortalities associated only with the operation of cooling towers, assuming cooling towers are selected. Residual adverse effects are not significant.*	None recommended due to current DNNP plans to utilize a once-through cooling system.	N/A	N/A	N/A	N/A	N/A	D-P-12.5

Appendix D: Environmental Monitoring and Environmental Assessment Follow-up – Terrestrial Environment (D-P-12.5)

Activity Number	Environmental Sub-Component	Activity Description	EA Conclusion	EA Follow-Up Objective	Scope	EA Effects Threshold Criteria	Follow-Up Endpoint	Relationship to Other Activities, Programs and Standards	Stakeholders	Related Commitments Report Deliverables
O-TE-4	Insects Amphibians and Reptiles Mammal Communities and Species Bird Communities and Species	Conduct insect, amphibian, reptile and mammal surveys post construction with a focus on species at risk. Conduct Species at Risk surveys (Bobolink, Least Bittern) for birds.	*No residual adverse effect for amphibian and reptiles and mammals.* *Loss of habitat for insects and birds, but residual adverse effects are not significant due to implementation of mitigation measures.*	Confirm the effectiveness of the terrestrial environment mitigation measures and plans (habitat restoration). Verify the conclusions of the Ecological Risk Assessment. Verify EIS predictions of a minor residual adverse effect (not significant) on loss of terrestrial habitat (Cultural Meadow and Thicket, wetland ecosystems, and wildlife corridor), used by breeding birds, amphibians, butterflies, and mammals considering the implementation of mitigation measures.	**Duration:** Multi-year post-construction monitoring (assumed 5 years). **Parameters:** Types and counts of species. **Frequency:** As-required field data collection, with possible multi-season involvement depending on issues. **Location:** Site Study Area.	Comparison to baseline conditions and predicted effects.	After 5 years of operation, and based on conclusions of Ecological Risk Assessment of continued no residual adverse effect.	**Related Follow-Up Activities:** B-TE-4, B-TE-5 **Related Programs and Standards:** DN Biodiversity Program	CNSC, ECCC, MECP, MNRF, CLOCA	D-P-12.5 **Other:** GOC Response to JRP Rec. 22 D-P-3.7

a – Not applicable to baseline activities.
ECCC – Environment and Climate Change Canada.
CWS – Canadian Wildlife Services.
CLOCA – Central Lake Ontario Conservation Authority.
MECP – Ministry of Environment, Conservation and Parks.
MNRF – Ministry of Natural Resources and Forestry.

Appendix E: Environmental Monitoring and Environmental Assessment Follow-up – Geological and Hydrogeological Environment

Appendix E: Environmental Monitoring and Environmental Assessment Follow-up – Geological and Hydrogeological Environment										
Activity Number	**Environmental Sub-Component**	**Activity Description**	**EA Conclusion**	**EA Follow-Up Objective**	**Scope**	**EA Effects Threshold Criteria**	**Follow-Up Endpoint**	**Relationship to Other Activities, Programs and Standards**	**Stakeholders**	**Related Commitments Report Deliverables**
Prior to Site Preparation / Baseline										
B-GH-1	Groundwater Flow Groundwater Quality	Conduct baseline measurements on groundwater levels (and groundwater quality) at existing DNNP monitoring well nests within the DNGS annual groundwater monitoring program and additional locations, as needed.	*No residual adverse effects are predicted on groundwater flow from the DNNP considering the implementation of mitigation measures.*	Provide additional baseline data for comparison against future follow-up monitoring results and potential effects of the DNNP on groundwater flow.	**Duration:** Prior to site preparation phase. **Parameters:** Groundwater levels, Groundwater quality. **Frequency:** Annually. **Location:** Site Study Area.	N/A[a]	During operation phase (completion of O-GH-1).	**Related Follow-Up Activities:** P-GH-1, C-GH-1, O-GH-1 **Related Programs and Standards:** None identified	CNSC, NRC, MECP, Durham Region	D-P-12.6 **Other:** GOC Response to JRP Rec. 19
B-GH-2	Soil Quality	Conduct baseline soil quality characterization to support the soil quality follow-up program prior to site preparation.	*No residual adverse effects to soil quality are predicted from the DNNP considering the implementation of mitigation measures.*	Provide baseline data for comparison against future follow-up monitoring results and potential effects of the DNNP on soil quality. Identify nature and extent of potential soil contamination.	**Duration:** Prior to site preparation phase. **Parameters:** Radiological (tritium, C-14, beta-gamma emitters) and Non-Radiological (metals and inorganics, PHCs, PAHs, VOCs, TOC), depending on location.[b] **Frequency:** One-Time. **Location:** Potentially impacted areas identified on the DNNP lands, 2009 baseline locations, and additional locations across the DNNP site study area.	N/A[a]	During operation phase (completion of O-GH-2).	**Related Follow-Up Activities:** P-GH-2, C-GH-2, O-GH-2 **Related Programs and Standards:** Comprehensive soil characterization to support the Hazardous Waste Management Plan (D-P-3.6, GOC response to JRP rec. 2) and baseline soil quality as part of the Site Geotechnical Investigation (D-P-9.1, GOC response to JRP rec.10). Data collected will serve as baseline for the follow-up program as needed.	CNSC, ECCC	D-P-12.6 GOC Response to JRP Rec. 2 **Other:** D-P-3.6 D-P-9.1 GOC Response to JRP Rec. 10 GOC Response to JRP Rec. 2
B-GH-3	Groundwater Flow (Darlington Creek)	Conduct baseflow estimates at Darlington Creek.	*No residual adverse effects are predicted on groundwater flow from the DNNP considering the implementation of mitigation measures.*	Provide additional data on baseflow estimates for comparison against future follow-up monitoring results and potential effects of the DNNP on baseflow into Darlington Creek.	**Duration:** Prior to site preparation phase. **Parameters:** Base flow, stream discharge measurements. **Frequency:** Quarterly flow monitoring. **Location:** Darlington Creek at minimum of 3 locations adjacent to the DNNP site.[b]	N/A[a]	At the end of construction phase (C-GH-3).	**Related Follow-Up Activities:** C-GH-3 **Related Programs and Standards:** None identified	CNSC, DFO	D-P-12.6 **Other:** none

Appendix E: Environmental Monitoring and Environmental Assessment Follow-up – Geological and Hydrogeological Environment

Activity Number	Environmental Sub-Component	Activity Description	EA Conclusion	EA Follow-Up Objective	Scope	EA Effects Threshold Criteria	Follow-Up Endpoint	Relationship to Other Activities, Programs and Standards	Stakeholders	Related Commitments Report Deliverables
Site Preparation										
P-GH-1	Groundwater Flow Groundwater Quality	Monitor groundwater flow (and groundwater quality), particularly flow transitions that may arise from grade changes during site preparation.	*No residual adverse effects on groundwater flow and groundwater quality from the DNNP considering the implementation of mitigation measures.*	Confirm the effectiveness of the Stormwater Management Plan and verify EIS predictions of no residual adverse effects to groundwater quality considering the implementation of mitigation measures.	**Duration:** During site preparation phase. **Parameters:** Groundwater levels. Groundwater quality parameters to be determined.[b] **Frequency:** Two monitoring events per year. **Location:** Site Study Area.	Ontario EPA, Part XV.1, Table 3/9 ODWS Comparison to baseline conditions and predicted effects.	During operation phase (completion of O-GH-1).	**Related Follow-Up Activities:** B-GH-1, C-GH-1, O-GH-1 **Related Programs and Standards:** Stormwater Management Plan (D-P-3.4). OPG Contaminated Lands and Groundwater Management (N-PROC-0044)	CNSC, NRC, MECP, Durham Region	D-P-12.6 GOC Response to JRP Rec. 19 **Other:** D-P-3.4
P-GH-2	Soil Quality	Monitor soil quality during site preparation.	*No residual adverse effects to soil quality are predicted from the DNNP considering the implementation of mitigation measures.*	Confirm the effectiveness of the Hazardous Waste Management Plan. Verify EIS predictions of no residual adverse effects on soil quality from the DNNP considering the implementation of mitigation measures.	**Duration**: During site preparation phase. **Parameters:** To be confirmed at the start of the program and will be based on potential contaminants of concern. **Frequency**: Monitoring frequency and locations to be confirmed when site layout is selected and will be based on potential risk areas. **Location**: Site Study Area.	Ontario EPA, Part XV.1, Table 3/9 Comparison to baseline conditions and predicted effects.	During operation phase (completion of O-GH-2)	**Related Follow-Up Activities:** B-GH-2, C-GH-2, O-GH-2 **Related Programs and Standards:** Hazardous Waste Management Plan (D-P-3.6)	CNSC, ECCC	D-P-12.6 GOC Response to JRP Rec. 11 **Other:** D-P-3.6
P-GH-3	Groundwater Quality	Prior to construction, conduct an assessment of the ingress and transport of contaminants in groundwater on site that are expected during successive phases of the project. The assessment is to include consideration of the impact of wet and dry deposition of all contaminants of potential concern and gaseous emissions on groundwater quality.	*No residual adverse effects on groundwater quality are predicted from the DNNP considering the implementation of mitigation measures.*	To inform future updates to the EMP in the LSA. Related to O-GH-3.	**Duration:** As part of the Licence to Construct Application. **Parameters:** N/A **Frequency:** One-Time. **Location:** Site Study Area and Local Study Area (if applicable).	N/A	Upon completion of activity.	**Related Follow-Up Activities:** O-GH-3 **Related Programs and Standards:** In support of the Licence to Construct Application; Non-Radiological Effluent Management Program (D-C-2.1) ; Radiological Effluent Management Program (D-C-4.1) ; Radiological Air Emissions Program (D-C-5.1) ; Non-Radiological Air Emissions Program (D-C-5.2) ;	CNSC, NRC, ECCC	D-P-12.6 GOC Response to JRP Rec. 17 **Other:** D-C-2.1 D-C-4.1 D-C-5.1 D-C-5.2 D-C-6.1 GOC Response to JRP Rec. 18

Appendix E: Environmental Monitoring and Environmental Assessment Follow-up – Geological and Hydrogeological Environment

Activity Number	Environmental Sub-Component	Activity Description	EA Conclusion	EA Follow-Up Objective	Scope	EA Effects Threshold Criteria	Follow-Up Endpoint	Relationship to Other Activities, Programs and Standards	Stakeholders	Related Commitments Report Deliverables
								Radiological Environmental Management Program (D-C-6.1)		
Construction										
C-GH-1	Groundwater Flow Groundwater Quality	Monitor groundwater flow (and groundwater quality), particularly flow transitions that may arise from grade changes during construction.	*No residual adverse effects on groundwater flow and groundwater quality are predicted from the DNNP considering the implementation of mitigation measures.*	Confirm the effectiveness of the Stormwater Management Plan and verify EIS predictions of no residual adverse effects on groundwater quality from the DNNP considering the implementation of mitigation measures. Confirm the effectiveness of mitigation measures associated with dewatering.	**Duration**: During construction phase. **Parameters:** Groundwater levels. Groundwater quality parameters to be determined.[b] **Frequency**: Two monitoring events per year. **Location**: Site Study Area.	Ontario EPA, Part XV.1, Table 3/9 ODWS Comparison to baseline conditions and predicted effects.	During operation phase (completion of O-GH-1).	**Related Follow-Up Activities:** B-GH-1, P-GH-1, O-GH-1 **Related Programs and Standards:** Stormwater Management Plan (D-P-3.4). OPG Contaminated Lands and Groundwater Management (N-PROC-0044)	CNSC, NRC, MECP, Durham Region	D-P-12.6 GOC Response to JRP Rec. 19 **Other:** D-P-3.4
C-GH-2	Soil Quality	Monitor soil quality during construction.	*No residual adverse effects to soil quality are predicted from the DNNP considering the implementation of mitigation measures.*	Confirm the effectiveness of the Hazardous Waste Management Plan. Verify EIS predictions of no residual adverse effects on soil quality from the DNNP considering the implementation of mitigation measures.	**Duration**: During construction phase. **Parameters:** To be confirmed at the start of the program and will be based on potential contaminants of concern. **Frequency**: Monitoring frequency and locations to be confirmed when site layout is selected and will be based on potential risk areas. **Location**: Site Study Area.	Ontario EPA, Part XV.I, Table 3/9 Comparison to baseline conditions and predicted effects.	During operation phase (completion of O-GH-2).	**Related Follow-Up Activities:** B-GH-2, P-GH-2, O-GH-2 **Related Programs and Standards:** Hazardous Waste Management Plan (D-P-3.6)	CNSC, ECCC	D-P-12.6 GOC Response to JRP Rec. 11 **Other:** D-P-3.6
C-GH-3	Groundwater Flow (Darlington Creek)	Conduct baseflow estimates at Darlington Creek at the completion of construction.	*No residual adverse effects are predicted on groundwater flow from the DNNP considering the implementation of mitigation measures.*	Confirm the effectiveness of the Stormwater Management Plan and mitigation measures. Verify EIS predictions of no residual effects on baseflow into Darlington Creek and on groundwater considering the implementation of mitigation measures.	**Duration**: At the end of construction phase. **Parameters:** Base flow, stream discharge measurements. **Frequency**: Quarterly flow monitoring. **Location**: Darlington Creek at minimum of 3 locations adjacent to the DNNP site.	Comparison to baseline conditions and predicted effects.	Program is complete upon completion of activity if the EA follow-up objectives have been met.	**Related Follow-Up Activities:** B-GH-3 **Related Programs and Standards:** Stormwater Management Plan (D-P-3.4)	CNSC, MECP	D-P-12.6 **Other:** D-P-3.4
Operation										
O-GH-1	Groundwater Flow	Monitor groundwater flow (and groundwater quality), post	*No residual adverse effects*	Confirm the effectiveness of the Stormwater Management Plan	**Duration:** During plant commissioning activities (assumed	Ontario EPA, Part XV.I,	Program is complete	**Related Follow-Up Activities:**	CNSC, NRC, MECP, Durham	D-P-12.6 GOC Response

Appendix E: Environmental Monitoring and Environmental Assessment Follow-up – Geological and Hydrogeological Environment

Activity Number	Environmental Sub-Component	Activity Description	EA Conclusion	EA Follow-Up Objective	Scope	EA Effects Threshold Criteria	Follow-Up Endpoint	Relationship to Other Activities, Programs and Standards	Stakeholders	Related Commitments Report Deliverables
		construction.	*on groundwater flow and groundwater quality are predicted from the DNNP considering the96mplementation of mitigation measures.*	and verify EIS predictions of no residual adverse effects on groundwater quality considering the implementation of mitigation measures.	to be 2 years), or until stable flow conditions are reached. **Parameters:** Groundwater levels. Groundwater quality parameters to be determined. [b] **Frequency:** Quarterly sampling events during commissioning. **Location:** Site Study Area at a minimum of 3 locations adjacent to the DNNP site.	Table 3/9 ODWS Comparison to baseline conditions and predicted effects.	upon completion of activity if the EA follow-up objectives have been met.	B-GH-1, P-GH-1, C-GH-1, O-GH-4 **Related Programs and Standards:** Stormwater Management Plan (D-P-3.4). OPG Contaminated Lands and Groundwater Management (N-PROC-0044)	Region	to JRP Rec. 19 **Other:** D-P-3.4
O-GH-2	Soil Quality	Monitor soil quality during operation.	*No residual adverse effects to soil quality are predicted from the DNNP considering the implementation of mitigation measures.*	Confirm the effectiveness of the Hazardous Waste Management Plan. Verify EIS predictions of no residual adverse effects on soil quality from the DNNP considering the implementation of mitigation measures.	**Duration**: Multi-year post-operation monitoring (assumed up to 5 years). **Parameters:** To be confirmed at the start of the program and will be based on potential contaminants of concern. **Frequency**: Monitoring frequency and locations to be confirmed when site layout is selected and will be based on potential risk areas. **Location**: Site Study Area.	Ontario EPA, Part XV.I, Table 3/9 Comparison to baseline conditions and predicted effects.	Program is complete upon completion of activity if the EA follow-up objectives have been met.	**Related Follow-Up Activities:** B-GH-2, P-GH-2, C-GH-2 **Related Programs and Standards:** Hazardous Waste Management Plan (D-P-3.6)	CNSC, ECCC, MECP	D-P-12.6 GOC Response to JRP Rec. 11 **Other:** D-P-3.6
O-GH-3	Groundwater Quality	Monitor groundwater quality, particularly for radionuclides, on- and off-site given atmospheric deposition is the primary source of tritium – as part of the EMP.	*No residual adverse effects on groundwater quality are predicted from the DNNP considering the implementation of mitigation measures.*	Verify EIS predictions of no residual adverse effects on groundwater quality from the DNNP, particularly tritium, considering the implementation of mitigation measures.	**Duration:** Operation Phase, up to 5 years as part of EA follow-up. **Parameters:** Tritium, other parameters as deemed applicable based on CSA N288.7 compliant groundwater monitoring program. **Frequency:** As required by the EMP (i.e., monthly). **Location:** Site Study Area and Local Study Area.	PWQO Comparison to baseline conditions and predicted effects.	Five years after Operation phase begins (monitoring to continue under the EMP thereafter).	**Related Follow-Up Activities:** P-GH-3 **Related Programs and Standards:** Activity to be completed as part of the EMP (D-C-6.1) at off-site locations and part of the DNGS GWMP at on-site locations. Results will be reported under those programs as well as under follow-up monitoring for the duration of the activity.	CNSC, ECCC, Durham Region	D-P-12.6 **Other:** D-C-6.1
O-GH-4	Groundwater Flow	Conduct groundwater flow modelling to support the assessment of effects, incorporating post-development physical flow characteristics.	*No residual adverse effects on groundwater flow are predicted from the DNNP*	Confirm EIS predictions post-construction of on-site groundwater regime.	**Duration:** Early life of operation and maintenance phase. **Parameters:** N/A **Frequency:** Update groundwater	Comparison to baseline conditions and predicted effects.	Upon completion of activity (6+ years post-operation) if the EA follow-	**Related Follow-Up Activities:** O-GH-1 **Related Programs and Standards:** None identified.	CNSC, MECP	D-P-12.6 **Other:** none

Appendix E: Environmental Monitoring and Environmental Assessment Follow-up – Geological and Hydrogeological Environment

Activity Number	Environmental Sub-Component	Activity Description	EA Conclusion	EA Follow-Up Objective	Scope	EA Effects Threshold Criteria	Follow-Up Endpoint	Relationship to Other Activities, Programs and Standards	Stakeholders	Related Commitments Report Deliverables
		Enhanced groundwater flow and contaminant transport modelling to be conducted for the assessment, extending to appropriate model boundaries which may not necessarily be site boundaries.	*considering the implementation of mitigation measures.*		flow modelling following at least 1 year of quarterly monitoring data. Repeat after 5 years. **Location:** Site Study Area and Local Study Area (if applicable).		up objectives have been met.			

Notes
a – Not applicable to baseline activities.
B – Additional detail can be found in the preliminary work scoping table (Appendix I).
Ontario EPA, Part XV.I, Table 3/9 = Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (MOE 2011a) Table 3 or Table 9 standards in a Non-Potable Condition.
PWQO = Provincial Water Quality Objectives (MOEE 1994).
ODWS = Ontario Drinking Water Standards. ODWS are used for comparison purposes where EPA Part XV.1 Standards are not available. They should be used in recognition that the project site is not used for drinking water. (MOE 2003b).

Appendix F: Environmental Monitoring and Environmental Assessment Follow-up – Land Use

Appendix F: Environmental Monitoring and Environmental Assessment Follow-up – Land Use										
Activity Number	**Environmental Sub-Component**	**Activity Description**	**EA Conclusion**	**EA Follow-Up Objective**	**Scope**	**EA Effects Threshold Criteria**	**Follow-Up Endpoint**	**Relationship to Other Activities, Programs and Standards**	**Stakeholders**	**Related Commitments Report Deliverables**
Prior to Site Preparation / Baseline										
B-LU-1	Land Use	Monitor land use activity in proximity to the DNNP site. Consult with the Municipality of Clarington and Regional Municipality of Durham on proposed land use changes and effects on implementation of emergency response plans. Monitor planning developments near OPG facilities and participate as required.	*No residual adverse effects are predicted on sensitive land uses in proximity to the DN site, considering the implementation of mitigation measures.*	Collect baseline data for use in follow-up monitoring.	**Duration:** Prior to site preparation phase. **Parameters:** N/A **Frequency:** Ongoing. **Location:** Local Study Area.[c]	N/A[a]	End of construction phase (C-LU-1).[d]	**Related Follow-Up Activities:** P-LU-1, C-LU-1 **Related Programs and Standards:** Stakeholder communications and consultation program (D-P-17.1). See note d	CNSC, Municipality of Clarington, Regional Municipality of Durham (Municipalities)	D-P-12.7 **Other:** D-P-17.1 GOC Response to JRP Rec. 41[b] GOC Response to JRP Rec. 43[b]
Site Preparation										
P-LU-1	Land Use	Monitor land use activity in proximity to the DNNP site. Consult with the Municipality of Clarington and Regional Municipality of Durham on proposed land use changes and effects on implementation of emergency response plans. Monitor planning developments near OPG facilities and participate as required. Actively engage in Envision Durham municipal comprehensive review process as it relates to policy changes related to nuclear power generation and population and employment forecasts.	*No residual adverse effects are predicted on sensitive land uses in proximity to the DN site, considering the implementation of mitigation measures.*	Confirm the effectiveness of the mitigation measures and verify EIS predictions of no residual adverse effects, considering the implementation of mitigation measures.	**Duration:** Throughout site preparation phase. **Parameters:** N/A **Frequency:** Ongoing. **Location:** Local Study Area.[c]	Comparison to predicted effects. Professional judgement.	End of construction phase (C-LU-1).[d]	**Related Follow-Up Activities:** B-LU-1, C-LU-1 **Related Programs and Standards:** Stakeholder communications and consultation program (D-P-17.1) See note d	CNSC, Municipalities	D-P-12.7 **Other:** D-P-17.1 GOC Response to JRP Rec. 41[b] GOC Response to JRP Rec. 43[b]
P-LU-2	Land Use	Confirm projected population data in the affected communities is accurate and up-to-date, at the end of the site preparation phase.	*No residual adverse effects are predicted on sensitive land uses in proximity to the DN site, considering the implementation of mitigation measures.*	Confirm the EA assumptions regarding DNNP project population and distribution of land uses. Provide information to support effective emergency response planning relative to the DNNP and ensure the emergency response plan is consistent with projections.	**Duration:** At completion of site preparation phase. **Parameters:** Population size. **Frequency:** One-time event. **Location:** Regional and Local Study Areas.[c]	Comparison to predicted effects. Professional judgement.	Upon completion of activity once EA objectives have been met.	**Related Follow-Up Activities:** C-LU-2 **Related Programs and Standards:** Stakeholder communications and consultation program (D-P-17.1)	CNSC, Emergency Management Ontario (EMO), Municipalities	D-P-12.7 **Other:** D-P-17.1 GOC Response to JRP Rec. 43[b]

Appendix F: Environmental Monitoring and Environmental Assessment Follow-up – Land Use

Activity Number	Environmental Sub-Component	Activity Description	EA Conclusion	EA Follow-Up Objective	Scope	EA Effects Threshold Criteria	Follow-Up Endpoint	Relationship to Other Activities, Programs and Standards	Stakeholders	Related Commitments Report Deliverables
Construction										
C-LU-1	Land Use	Monitor land use activity in proximity to the DNNP site. Consult with the Municipality of Clarington and Regional Municipality of Durham on proposed land use changes and effects on implementation of emergency response plans. Monitor planning developments near OPG facilities and participate as required. Actively engage in Envision Durham municipal comprehensive review process as it relates to policy changes related to nuclear power generation and population and employment forecasts.	*No residual adverse effects are predicted on sensitive land uses in proximity to the DN site, considering the implementation of mitigation measures.*	Confirm the effectiveness of the mitigation measures and verify EIS predictions of no residual adverse effects, considering the implementation of mitigation measures.	**Duration:** Throughout construction phase. **Parameters:** N/A **Frequency:** Ongoing. **Location:** Local Study Area.[c]	Comparison to predicted effects. Professional judgement.	Upon completion of activity once EA objectives have been met.	**Related Follow-Up Activities:** B-LU-1, P-LU-1 **Related Programs and Standards:** Stakeholder communications and consultation program (D-P-17.1) See note d	CNSC, Municipalities	D-P-12.7 **Other:** D-P-17.1 GOC Response to JRP Rec. 41[b] GOC Response to JRP Rec. 43[b]
C-LU-2	Land Use	Confirm projected population data in the affected communities is accurate and up-to-date, at the end of the construction phase.	*No residual adverse effects are predicted on sensitive land uses in proximity to the DN site, considering the implementation of mitigation measures.*	Confirm the EA assumptions regarding DNNP project population and distribution of land uses. Provide information to support effective emergency response planning relative to the DNNP and ensure the emergency response plan is consistent with projections.	**Duration:** At completion of construction phase. **Parameters:** Population size. **Frequency:** One-time event. **Location:** Regional and Local Study Areas.[c]	Comparison to predicted effects. Professional judgement.	Upon completion of activity once EA objectives have been met.	**Related Follow-Up Activities:** P-LU-2 **Related Programs and Standards:** Stakeholder communications and consultation program (D-P-17.1)	CNSC, EMO, Municipalities	D-P-12.7 **Other:** D-P-17.1 GOC Response to JRP Rec. 43[b]
Operation										
None	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes
a – Not applicable to baseline activities.
b – The GOC response to JRP Recommendations #41 and #43 (GOC 2012) are not listed in the commitments report, but are identified because they refer to CNSC's actions related to this activity.
c – As defined for the Land Use Environment in the EIS (OPG 2009a).
d – Land use monitoring will continue outside the follow-up program throughout the life of the facility following C-LU-1.
N/A = not applicable.

Appendix G: Environmental Monitoring and Environmental Assessment Follow-up – Traffic and Transportation Environment

Appendix G: Environmental Monitoring and Environmental Assessment Follow-up – Traffic and Transportation Environment										
Activity Number	**Environmental Sub-Component**	**Activity Description**	**EA Conclusion**	**EA Follow-Up Objective**	**Scope**	**EA Effects Threshold Criteria**	**Follow-Up Endpoint**	**Relationship to Other Activities, Programs and Standards**	**Stakeholders**	**Related Commitments Report Deliverables**
Prior to Site Preparation / Baseline										
B-TT-1	Transportation System Safety (Road)	As part of the Traffic Management Plan, undertake a pre-Project road condition assessment as a baseline for considering incremental Project-related degradation. **Current plans for the DNNP do not require significant movement of soil offsite, therefore a Physical Pre-Project Road Condition Assessment is not required. Traffic safety will be the focus of the monitoring instead of physical road degradation. Traffic conditions such as traffic volumes and collision data will be monitored.**	*No residual adverse effects on traffic safety and road degradation from the DNNP considering the implementation of mitigation measures.*	Provide baseline data for comparison against future follow-up monitoring results and potential effects of the DNNP on road conditions and for evaluating roadway degradation.	**Duration:** Prior to site preparation phase. **Parameters:** Defined in the Traffic Management Plan. **Frequency:** Annual event. **Locations:** Key roadways in LSA subject to truck traffic associated with the DNNP.	N/A[a]	During the construction phase after completion of C-TT-1.	**Related Follow-Up Activities:** P-TT-1, C-TT-1, O-TT-1 **Related Programs and Standards:** Traffic Management Plan (D-P-10.1)	CNSC, Municipalities	D-P-12.8 **Other:** D-P-10.1[b] GOC Response to JRP Rec. 47[b]
Site Preparation										
P-TT-1	Transportation System Safety (Road)	As part of the Traffic Management Plan, undertake periodic inspections of road conditions to document changes relative to baseline during site preparation.	*No residual adverse effects on traffic safety and road degradation from the DNNP considering the implementation of mitigation measures.*	Confirm the effectiveness of the Traffic Management Plan and mitigation measures (and undertakings between the appropriate parties to facilitate improvements respecting traffic safety). Verify EIS predictions of no residual adverse effects considering the implementation of mitigation measures.	**Duration:** During site preparation phase. **Parameters:** Similar to baseline (B-TT-1). **Frequency:** Annual event. **Locations:** Key roadways in LSA subject to truck traffic associated with the DNNP.	Comparisons to baseline (background conditions) and predicted effects. Professional judgement.	During the construction phase after completion of C-TT-1.	**Related Follow-Up Activities:** B-TT-1, C-TT-1, O-TT-1 **Related Programs and Standards:** Traffic Management Plan (D-P-10.1)	CNSC, Municipalities	D-P-12.8 **Other:** D-P-10.1[b] GOC Response to JRP Rec. 47[b]
P-TT-2	Transportation System Safety (Marine)	Should the once-through condenser cooling system be chosen for the DNNP and an increased prohibitive zone be considered, develop a follow-up program to verify EIS predictions. If required, an adaptive management program to mitigate potential effects to	*No residual adverse effect on boating safety (i.e., small watercraft) from an increased prohibitive zone considering the implementation*	Verify EIS predictions of no residual adverse effect on boating safety (i.e., small watercraft) from an increased prohibitive zone considering the implementation of mitigation measures.	**Duration:** Prior to construction (may be completed during the site preparation or prior to site preparation phases). **Parameters:** To be defined in future program development.[c] **Frequency:** One-time event.	To be developed.	During operation phase after completion of O-TT-2.	**Related Follow-Up Activities:** C-TT-2, O-TT-2 **Related Programs and Standards:** None identified	Transport Canada	D-P-12.8 GOC Response to JRP Rec. 51 **Other:** none

Appendix G: Environmental Monitoring and Environmental Assessment Follow-up – Traffic and Transportation Environment

Activity Number	Environmental Sub-Component	Activity Description	EA Conclusion	EA Follow-Up Objective	Scope	EA Effects Threshold Criteria	Follow-Up Endpoint	Relationship to Other Activities, Programs and Standards	Stakeholders	Related Commitments Report Deliverables
		small watercraft.	*of mitigation measures.*		**Locations:** Existing and proposed waterways prohibited zone in Lake Ontario adjacent to the site.					
Construction										
C-TT-1	Transportation System Safety (Road)	Undertake periodic inspections of road conditions to document changes relative to baseline during construction.	*No residual adverse effects on traffic safety and road degradation from the DNNP considering the implementation of mitigation measures.*	Confirm the effectiveness of the Traffic Management Plan and mitigation measures (and undertakings between the appropriate parties to facilitate improvements respecting traffic safety). Verify EIS predictions of no residual adverse considering the implementation of mitigation measures.	**Duration**: During construction phase. **Parameters:** Similar to baseline (B-TT-1). **Frequency**: Annual event. **Locations**: Key roadways in LSA subject to truck traffic associated with the DNNP.	Comparisons to baseline (background conditions) and predicted effects. Professional judgement.	Upon completion of activity once EA objectives have been met.	**Related Follow-Up Activities:** B-TT-1, P-TT-1, O-TT-1 **Related Programs and Standards:** Traffic Management Plan (D-P-10.1)	CNSC, Municipalities	D-P-12.8 **Other:** D-P-10.1[b] GOC Response to JRP Rec. 47[b]
C-TT-2	Transportation System Safety (Marine)	Should the once-through condenser cooling system be chosen for the DNNP and an increased prohibitive zone be considered, conduct follow-up monitoring and implement an adaptive management program to mitigate potential effects to small watercraft.	*No residual adverse effect on boating safety (i.e., small watercraft) from an increased prohibitive zone considering the implementation of mitigation measures.*	Verify EIS predictions of no residual adverse effect on boating safety (i.e., small watercraft) from an increased prohibitive zone considering the implementation of mitigation measures.	**Duration:** During the construction phase. **Parameters:** To be defined in future program development.[c] **Frequency:** To be determined. **Locations:** Existing and proposed waterways prohibited zone in Lake Ontario adjacent to the site.	To be developed.	During operation phase after completion of O-TT-2.	**Related Follow-Up Activities:** P-TT-2, O-TT-2 **Related Programs and Standards:** None identified	Transport Canada	D-P-12.8 GOC Response to JRP Rec. 51 **Other:** none
Operation										
O-TT-1	Transportation System Safety (Road)	Undertake an inspection of road conditions to document changes relative to baseline at the beginning of operation.	*No residual adverse effects on traffic safety and road degradation from the DNNP considering the implementation of mitigation measures.*	Confirm the effectiveness of the Traffic Management Plan and mitigation measures (and undertakings between the appropriate parties to facilitate improvements respecting traffic safety). Verify EIS predictions of no residual adverse effects considering the implementation of mitigation measures.	**Duration:** Beginning of operation phase. **Parameters:** Similar to baseline (B-TT-1). **Frequency:** One-time event. **Locations:** Key roadways in LSA subject to truck traffic associated with the DNNP.	Comparisons to baseline (background conditions) and predicted effects. Professional judgement.	Upon completion of activity once EA objectives have been met.	**Related Follow-Up Activities:** B-TT-1, P-TT-1, C-TT-1 **Related Programs and Standards:** Traffic Management Plan (D-P-10.1)	CNSC, Municipalities	D-P-12.8 **Other:** D-P-10.1[b] GOC Response to JRP Rec. 47[b]
O-TT-2	Transportation System Safety	Should the once-through condenser cooling system be	*No residual adverse effect on*	Verify EIS predictions of no residual adverse effect on	**Duration:** During the operation phase.	To be developed.	Upon completion of	**Related Follow-Up**	Transport Canada	D-P-12.8

Appendix G: Environmental Monitoring and Environmental Assessment Follow-up – Traffic and Transportation Environment

Activity Number	Environmental Sub-Component	Activity Description	EA Conclusion	EA Follow-Up Objective	Scope	EA Effects Threshold Criteria	Follow-Up Endpoint	Relationship to Other Activities, Programs and Standards	Stakeholders	Related Commitments Report Deliverables
	(Marine)	chosen for the DNNP and an increased prohibitive zone be considered, conduct follow-up monitoring and implement an adaptive management program to mitigate potential effects to small watercraft.	*boating safety (i.e., small watercraft) from an increased prohibitive zone considering the implementation of mitigation measures.*	boating safety (i.e., small watercraft) from an increased prohibitive zone considering the implementation of mitigation measures.	**Parameters:** To be defined in future program development.[c] **Frequency:** To be determined. **Locations:** Existing and proposed waterways prohibited zone in Lake Ontario adjacent to the site.		activity once EA objectives have been met.	**Activities:** P-TT-2, C-TT-2 **Related Programs and Standards:** None identified		GOC Response to JRP Rec. 51 **Other:** none

Notes
a – Not applicable to baseline activities.
b – Not directly related to the follow-up activity requirement but related to the Traffic Management Plan.
c – Additional detail can be found in the preliminary work scoping table (Appendix I).

Appendix H: Environmental Monitoring and Environmental Assessment Follow-up – Health – Human and Non-Human Biota

Appendix H: Environmental Monitoring and Environmental Assessment Follow-up – Health – Human and Non-Human Biota										
Activity Number	**Environmental Sub-Component**	**Activity Description**	**EA Conclusion**	**EA Follow-Up Objective**	**Scope**	**EA Effects Threshold Criteria**	**Follow-Up Endpoint**	**Relationship to Other Activities, Programs and Standards**	**Stakeholders**	**Related Commitments Report Deliverables**
Prior to Site Preparation / Baseline										
None										
Site Preparation										
P-H+NHB-1	Non-Human Biota Human Health	Following the selection of a reactor technology, conduct a detailed assessment of predicted effluent releases from the DNNP. The assessment is to include, but not be limited to, effluent quantity, concentration, points of release and a description of effluent treatment, including demonstration that the chosen option has been designed to achieve best available treatment technology and techniques economically achievable. Conduct a risk assessment (e.g., Predictive Effects Assessment) on the proposed residual releases to determine whether additional mitigation measures may be necessary. Any identified risks or areas requiring further study are to be included in the EMEAF program or the EMP.	*No adverse effects to the radiological and non-radiological environment, considering the mitigation measures identified for the Surface Water, Atmospheric, and Geology and Hydrogeology components of the environment.*	Provide information to help confirm the effectiveness of the mitigation measures. Verify EIS predictions of no residual adverse effects (radiological and non-radiological effects) from the DNNP on non-human biota and human health considering the implementation of mitigation measures.	**Duration:** During detailed design phase and prior to construction phase. **Parameters:** effluent quality (radionuclides and non-radionuclides), effluent quantity. **Frequency**: Once. **Location:** Site Study Area (non-human biota), Site Study Area and Local Study Area (human health).	Screening of parameters for inclusion in ERA. Concentration/dose below Toxicity Reference Value or dose benchmark/limit. Comparison to baseline conditions in DN ERA and predicted effects in EA (SENES 2009c).	Completion of assessment and determination if additional mitigation measures are needed.	**Related Follow-Up Activities:** P-H+NHB-3 **Related Programs and Standards:** CSA N288.5-11 CSA N288.6-22 Health Canada's Guidance for Evaluating Human Health Impacts in Environmental Assessment	CNSC, ECCC, DFO, HC, Durham Region	**D-P-12.9** **GOC Response to JRP Rec. 14**
P-H+NHB-2	Non-Human Biota Human Health	Following the selection of a reactor technology, develop a comprehensive assessment of hazardous substance releases and the required management practices for hazardous chemicals on site, in	*No adverse effects to the radiological and non-radiological environment, considering the mitigation measures*	Provide information to help confirm the effectiveness of the mitigation measures. Verify EIS predictions of no residual adverse effects (radiological and non-radiological effects) from	**Duration:** During detailed design phase and prior to construction phase. **Parameters:** hazardous substances (to be determined). **Frequency**: Updated with each	Screening of parameters for inclusion in ERA. Concentration/dose below Toxicity Reference Value or dose benchmark/limit.	Completion of assessment.	**Related Follow-Up Activities:** None **Related Programs and Standards:** CSA N288.5-11	CNSC, ECCC	**D-P-12.9** **GOC Response to JRP Rec. 26**

Appendix H: Environmental Monitoring and Environmental Assessment Follow-up – Health – Human and Non-Human Biota

Activity Number	Environmental Sub-Component	Activity Description	EA Conclusion	EA Follow-Up Objective	Scope	EA Effects Threshold Criteria	Follow-Up Endpoint	Relationship to Other Activities, Programs and Standards	Stakeholders	Related Commitments Report Deliverables
		accordance with the Canadian Environmental Protection Act.	*identified for the Surface Water, Atmospheric, and Geology and Hydrogeology components of the environment.*	the DNNP on non-human biota and human health considering the implementation of mitigation measures.	licence renewal. **Location:** Site Study Area (non-human biota), Site Study Area and Local Study Area (human health).	Comparison to baseline conditions in DN ERA (Ecometrix 2022b) and predicted effects in EA (SENES 2009c).				
P-H+NHB-3	Non-Human Biota Human Health	Review and update the Ecological Risk Assessment and the Human Health Risk Assessment, as appropriate, when a reactor technology has been chosen and the chemical emissions have been evaluated during the detailed design process as concentrations are known. Any identified risks or areas requiring further study are to be included in the EMEAF program or the EMP.	*No adverse effects to the radiological and non-radiological environment, considering the mitigation measures identified for the Surface Water, Atmospheric, and Geology and Hydrogeology components of the environment.*	Confirm the effectiveness of the mitigation measures. Verify EIS predictions of no residual adverse effects (radiological and non-radiological effects) from the DNNP on non-human biota and human health considering the implementation of mitigation measures.	**Duration:** During the detailed design phase and prior to construction phase. **Parameters:** hazardous substances emissions (to be determined); Hazard Quotient, Incremental Cancer Lifetime Risk. **Frequency**: Once. **Location:** Site Study Area (non-human biota), Site Study Area and Local Study Area (human health).	Screening of parameters for inclusion in ERA. Concentration/dose below Toxicity Reference Value or dose benchmark/limit. Comparison to baseline conditions in DN ERA (Ecometrix 2022b) and predicted effects in EA (SENES 2009c).	Completion of assessment and determination if additional mitigation measures are needed.	**Related Follow-Up Activities:** P-H+NHB-1 **Related Programs and Standards:** CSA N288.5-11 CSA N288.6-22 Health Canada's Guidance for Evaluating Human Health Impacts in Environmental Assessment	CNSC, ECCC, DFO, HC, Durham Region	**D-P-12.9** **Other:** **GOC Response to JRP Rec. 14** **GOC Response to JRP Rec. 26**
Construction										
C-H+NHB-1	Non-Human Biota	If follow-up and monitoring programs conducted for other environmental components suggest changes or conditions that may lead to effects on non-human biota, review and update the Ecological Risk Assessment, including the identification of mitigation measures or other actions that may be appropriate to address such effects. Any identified risks or areas requiring further study are to be included in the EMEAF or the EMP.	*No adverse effects to the radiological and non-radiological environment, considering the mitigation measures identified for the Surface Water, Atmospheric, and Geology and Hydrogeology components of the environment.*	Confirm the effectiveness of mitigation measures. Verify EIS predictions of no residual adverse effects (radiological and non-radiological effects) from the DNNP on non-human biota considering the implementation of mitigation measures.	**Duration:** During construction phase. **Parameters:** Concentrations in water, air, soil, groundwater; Radiation Dose, Hazard Quotient. **Frequency**: Updated with each licence renewal or every 5 years. **Location:** Site Study Area.	Screening of parameters for inclusion in EcoRA. Concentration/dose below Toxicity Reference Value or dose benchmark. Comparison to baseline conditions in DN ERA (Ecometrix 2022b) and predicted effects in EA (SENES 2009c).	Ongoing as part of ERA review and update requirements for N288.6.	**Related Follow-Up Activities:** O-H+NHB-1 **Related Programs and Standards:** CSA N288.6-22 Health Canada's Guidance for Evaluating Human Health Impacts in Environmental Assessment	CNSC, ECCC, DFO	**D-P-12.9** **Other:** **D-C-2.1**
C-H+NHB-2	Human Health	If follow-up and monitoring programs conducted for other environmental components suggest	*No adverse effects to the radiological and non-radiological*	Confirm the effectiveness of mitigation measures. Verify EIS predictions of no	**Duration:** During construction phase or every 5 years. **Parameters:** Concentrations in	Screening of parameters for inclusion in HHRA. Concentration/dose below	Ongoing as part of ERA review and update.	**Related Follow-Up Activities:** O-H+NHB-2	CNSC, HC, Durham Region	**None**

Appendix H: Environmental Monitoring and Environmental Assessment Follow-up – Health – Human and Non-Human Biota

Activity Number	Environmental Sub-Component	Activity Description	EA Conclusion	EA Follow-Up Objective	Scope	EA Effects Threshold Criteria	Follow-Up Endpoint	Relationship to Other Activities, Programs and Standards	Stakeholders	Related Commitments Report Deliverables
		changes or conditions that may lead to effects on human health, review and update the Human Health Risk Assessment, including the identification of mitigation measures or other actions that may be appropriate to address such effects. Any identified risks or areas requiring further study are to be included in the EMEAF or the EMP.	*environment, considering the mitigation measures identified for the Surface Water, Atmospheric, and Geology and Hydrogeology components of the environment.*	residual adverse effects (radiological and non-radiological effects) from the DNNP on human health considering the implementation of mitigation measures.	water, air, soil, groundwater; Radiation Dose, Hazard Quotient, Incremental Cancer Lifetime Risk. **Frequency**: Updated with each licence renewal. **Location:** Site Study Area, Local Study Area.	Toxicity Reference Value or dose limit. Comparison to baseline conditions in DN ERA (Ecometrix 2022b) and predicted effects in EA (SENES 2009c).	requirements for N288.6.	**Related Programs and Standards:** CSA N288.6-22 Health Canada's Guidance for Evaluating Human Health Impacts in Environmental Assessment		
Operation										
O-H+NHB-1	Non-Human Biota	If follow-up and monitoring programs conducted for other environmental components suggest changes or conditions that may lead to effects on non-human biota, review and update the Ecological Risk Assessment, including the identification of mitigation measures or other actions that may be appropriate to address such effects. Any identified risks or areas requiring further study are to be included in the EMEAF or the EMP.	*No adverse effects to the radiological and non-radiological environment, considering the mitigation measures identified for the Surface Water, Atmospheric, and Geology and Hydrogeology components of the environment.*	Confirm the effectiveness of mitigation measures. Verify EIS predictions of no residual adverse effects (radiological and non-radiological effects) from the DNNP on non-human biota considering the implementation of mitigation measures.	**Duration:** During operation phase. **Parameters:** Concentrations in water, air, soil, groundwater; Radiation Dose, Hazard Quotient. **Frequency**: Updated with each licence renewal or every 5 years. **Location:** Site Study Area.	Screening of parameters for inclusion in EcoRA. Concentration/dose below Toxicity Reference Value or dose benchmark. Comparison to baseline conditions in DN ERA (Ecometrix 2022b) and predicted effects in EA (SENES 2009c).	Ongoing as part of ERA review and update requirements for N288.6.	**Related Follow-Up Activities:** C-H+NHB-1 **Related Programs and Standards:** CSA N288.6-22 Health Canada's Guidance for Evaluating Human Health Impacts in Environmental Assessment	CNSC, ECC	**D-P-12.9** **Other:** **D-C-6**
O-H+NHB-2	Human Health	If follow-up and monitoring programs conducted for other environmental components suggest changes or conditions that may lead to effects on human health, review and update the Human Health Risk Assessment, including the identification of mitigation measures or other	*No adverse effects to the radiological and non-radiological environment, considering the mitigation measures identified for the Surface Water, Atmospheric, and*	Confirm the effectiveness of mitigation measures. Verify EIS predictions of no residual adverse effects (radiological and non-radiological effects) from the DNNP on human health considering the implementation of mitigation measures.	**Duration:** During operation phase. **Parameters:** Concentrations in water, air, soil, groundwater; Radiation Dose, Hazard Quotient, Incremental Cancer Lifetime Risk. **Frequency**: Updated with each licence renewal or every 5.	Screening of parameters for inclusion in HHRA. Concentration/dose below Toxicity Reference Value or dose limit. Comparison to baseline conditions in DN ERA (Ecometrix 2022b) and	Ongoing as part of ERA review and update requirements for N288.6	**Related Follow-Up Activities:** C-H+NHB-2 **Related Programs and Standards:** CSA N288.6-22 Health Canada's Guidance for Evaluating Human Health Impacts in Environmental Assessment	CNSC, HC, Durham Region	**None**

Appendix H: Environmental Monitoring and Environmental Assessment Follow-up – Health – Human and Non-Human Biota

Activity Number	Environmental Sub-Component	Activity Description	EA Conclusion	EA Follow-Up Objective	Scope	EA Effects Threshold Criteria	Follow-Up Endpoint	Relationship to Other Activities, Programs and Standards	Stakeholders	Related Commitments Report Deliverables
		actions that may be appropriate to address such effects. Any identified risks or areas requiring further study are to be included in the EMEAF or the EMP.	*Geology and Hydrogeology components of the environment.*		years. **Location:** Site Study Area, Local Study Area.	predicted effects in EA (SENES 2009c).				
O-H+NHB-3	Non-Human Biota	If cooling towers are chosen for the DNNP, conduct an Ecological Risk Assessment on the blow down pond if there is a risk that wildlife will use or drink from the pond. **(Not applicable based on plans to utilize a once-through cooling system.)**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A = not applicable.

Appendix I: Preliminary Work Scoping to Support Methodology Report Development

Atmospheric Environment

Activity Number	EMEAF Activity Description	Work Activities for Discussion
B-AE-1 P-AE-1 C-AE-1 O-AE-1	Measure air contaminants, such as Total Suspended Particulate (TSP), PM_{10} and $PM_{2.5}$, PAH (benzo(a)pyrene), VOCs (Acrolein), NO_2, SO_2 Total Suspended Particulate (TSP), PM_{10} and $PM_{2.5}$, (and include Acrolein, NO_2, SO_2) for baseline measurements immediately prior to site preparation (B-AE-1), during site preparation (P-AE-1) construction (C-AE-1), and operation (O-AE-1).	Mobilize, Install and Commission continuous and semi-continuous air quality monitors (or equivalent). • Establish sampling methods/instrumentation, siting criteria, program framework (schedule, data quality, training, records) and QA/QC requirements; • Select monitoring locations; • Prepare selected monitoring locations (i.e., power supply); • Deliver air monitoring shelters/samplers (i.e., TSP, PM10 and PM2.5, PAH (benzo(a)pyrene), VOCs (Acrolein), NO2, SO2) at each location (as applicable); • Connect to power supply (if applicable); and • Calibrate and test equipment. Ongoing Monitoring • Submit samples to laboratory for analysis; • Review results on an ongoing basis; • Check results against EA threshold criteria to identify need to implement new or modify existing mitigation measures to avoid or eliminate adverse effects; and • Perform scheduled maintenance. Compilation, Assembly and Monitoring Data • Compile data; and • Complete data analysis/interpretation, including quality assurance and quality control. Preparation and Submission of Reports • Prepare interim reports (quarterly) to document trends, comparisons with off-site locations, identify changes, and key challenges to facilitate decision-making; and • Prepare annual air quality monitoring report. Submit the assessment of the results (P-AE-1, C-AE-1 and O-AE-1), including conclusions and recommendations, in the annual EA Follow-up Program Report. • Provide input to annual EA Follow-up Program Report; and • Review the monitoring scope as part of the adaptive management framework and provide any recommendations for program revisions as part of the annual EA Follow-up Program Report.
B-AE-2 P-AE-2 C-AE-2 O-AE-2	Measure noise levels immediately prior to site preparation for baseline (B-AE-2), during site preparation (P-AE-2), construction (C-AE-2), and operation (O-AE-2).	Mobilize, Install, Monitor and Collect Equipment • Establish sampling methods, siting criteria, program framework (schedule, data quality, training, records) and QA/QC requirements; • Select monitoring locations; • Configure and site noise meters; • Commission noise meters 2-3 times per year (campaign basis) at sensitive receptors (e.g. Socio-Economic Receptors: R15 – Nearest Resident (west); R17 – Nearest Resident (north); and R20 – Nearest Resident (east)) for continuous sound level sampling (at least 7 days) if possible (OPG 2009a). Other suitable locations may be selected to meet the intent of the monitoring objectives; and • Collect noise meters at the end of each sampling period. Compilation, Assembly and Modelling of Data • Compile data; • Complete data analysis/interpretation, including quality assurance and quality control; and • Check results against EA threshold criteria to identify need to implement new or modify existing mitigation measures to avoid or eliminate adverse effects. Preparation and Submission of Reports • Prepare reports; • Provide input to annual EA Follow-up Program Report; and • Review the monitoring scope as part of the adaptive management framework, and provide any recommendations for program revisions as part of the annual EA Follow-up Program Report.

Surface Water Environment

Activity Number	EMEAF Activity Description	Work Activities for Discussion
B-SWE-1	Collect and analyze baseline samples of the lake water and sediment in a comprehensive number of shoreline and offshore locations in the site study area prior to, in water works, lake infill construction activities and bluff removal. **(Note: Lake infill is not currently planned for the DNNP; however, this activity is applicable to other project activities associated with in-water works.)**	N/A – Baseline activities have been completed.
B-SWE-2	Collect and analyze baseline samples of the lake water and sediment within the future embayment area prior to site preparation. **(Note: Since lake infill is not currently planned for the DNNP, this activity is not required but has already been completed.)**	
B-SWE-3	Undertake baseline lake current, wave and temperature measurements adjacent to the shoreline prior to lake infill construction activities. **(Note: Lake infill is not currently planned for the DNNP, however, this activity is applicable to other project activities associated with in-water works.)**	N/A – Baseline activities have been completed.
P-SWE-1 C-SWE-1 O-SWE-1	Collect and analyze samples of lake water and sediment for a comprehensive number of shoreline and offshore locations in the site study area before and during lake infill construction and bluff removal activities (P-SWE-1), construction activities (C-SWE-1), and post-construction (O-SWE-1). **(Note: Lake infill is not currently planned for the DNNP, therefore activity P-SWE-1 is not required. However, C-SWE-1 and O-SWE-1 are applicable to other project activities associated with in-water works and are required.)**	Review Recommendations from previous sampling (in subsequent phases) • Determine appropriate sample locations and frequency of sampling; • Determine appropriate sample parameters; and • Review Operating Plant Experience (OPEX). Mobilization for sampling events • Arrange for pre-charged sample bottles to be provided by analytical lab (in ice chests with ice packs); and • Secure resources, such as calibrate and commission field equipment, boat, truck for sample transport. Conduct lake water quality sampling (including sediment) in Lake Ontario • Collect lake water and sediment samples (frequency and parameters to be determined); and • Perform analysis of collected samples (water quality analysis similar to previous existing conditions). Analysis of samples will be available within a specific time period. Compilation, Assembly and Modelling of Data • Compile data; • Perform quality assurance and quality control measures on raw data; • Input results into model, where appropriate (i.e. sediment transport); • Confirm baseline Lake Ontario conditions (water quality); • Confirm the absence of residual adverse effects (site drainage i.e., stormwater) from site preparation activities; • Check results against EA threshold criteria to identify need to implement new or modify existing mitigation measures to avoid or eliminate adverse effects; and • Prepare a report to document the methodology and results. Submission of Results • Review the monitoring scope as part of the adaptive management framework, and provide any recommendations for program revisions as part of the annual EA Follow-up Program Report; and • Submit the assessment of the results, including conclusions and recommendations plus sampling parameters and locations for future sampling campaigns in the annual EA Follow-up Program Report.
P-SWE-2 C-SWE-2 O-SWE-2	Collect and analyze samples of the lake water and sediment within the embayment area beginning pre- and during construction of the lake infill (P-SWE-2), during construction (C-SWE-2), and post-construction (O-SWE-2). **(Note: Since lake infill is not currently planned for the DNNP, this activity is not required.)**	
O-SWE-3	Collect and analyze samples of stormwater at the stormwater discharge points during operation (O-SWE-3).	Establish toxicity testing criteria, test methodology, and test frequency for stormwater. Review recommendations from previous sampling (in subsequent phases) • Determine appropriate sample locations and frequency of sampling;

Activity Number	EMEAF Activity Description	Work Activities for Discussion
		• Determine appropriate sample parameters; and • Review Operating Plant Experience (during O-SWE-3). Mobilization for sampling events • Arrange for pre-charged sample bottles to be provided by analytical lab (in ice chests with ice packs); and • Secure resources, such as calibrate and commission field equipment, boat, truck for sample transport. Conduct stormwater discharge sampling in Lake Ontario • Collect samples from the sample locations during approximately two warm water and two cold water Lake Ontario conditions at stormwater discharge points; and • Perform analysis of collected samples (water quality analysis similar to previous existing conditions). Analysis of samples will be available within a specific time period. Compilation, Assembly and Modelling of Data • Compile data; • Perform quality assurance and quality control measures on raw data; • Input results into model, where appropriate (i.e. sediment transport); • Confirm baseline Lake Ontario conditions (water quality); • Confirm the absence of residual adverse effects (site drainage i.e., stormwater) from site preparation activities; and • Check results against EA threshold criteria to identify need to implement new or modify existing mitigation measures to avoid or eliminate adverse effects; and • Prepare a report to document the methodology and results. Submission of Results • Submit the assessment of the results, including conclusions and recommendations plus sampling parameters and locations for future sampling campaigns, in the annual EA Follow-up Program Report.
P-SWE-3	Undertake lake current, wave and temperature measurements adjacent to the shoreline beginning post construction of the lake infill. **(Note: Lake infill is not currently planned for the DNNP, and at this time sufficient data is determined as available to complete P-SWE-4; therefore this activity is not required.)**	Mobilize and Conduct Sampling • Mobilize equipment for sampling; • Using Acoustic Doppler Current Profilers to collect data during site preparation, after shoreline works are completed, for lake currents, waves, and temperature data in the site study area (SSA) and LSA throughout various conditions on Lake Ontario; and • Demobilize sampling equipment; Compilation of Data • Compile data and update the assessment of the effects on near neighbouring riparian landowners, and shore processes, when detailed design is available, to confirm the effects to lake circulation and shoreline processes. Information collected from P-SWE-1 (i.e., sediment and turbidity) will also be considered in the assessment. Submission of Results • Submit the assessment of the results, including conclusions and recommendations, in the annual EA Follow-up Program Report.
P-SWE-4	The effects on near neighbouring riparian landowners, shore processes and aquatic resources as a result of the DNNP will be further assessed by a coastal engineer when a vendor is selected and the detailed engineering design of the shoreline works is available.	Lake circulation and erosion modeling to be conducted.

C-SWE-3	If the once-through cooling system is chosen for the DNNP, conduct a comprehensive surface water risk assessment of the combined thermal and contaminant plume (considering the surface area and vertical extent of the plume), and the physical displacement effect of altered lake currents (similar to Aquatic Environment C-AQ-1) prior to construction of once-through cooling system.
	(Note: Study at DNGS has demonstrated that species that are entrained are broadcast spawners or multiple spawners, as such, the applicability and feasibility of part of this activity will be discussed further with the relevant
		Complete Surface Water Risk Assessment
		• Prior to construction, complete a surface water risk assessment when detailed design is available, which will include:
		  ○ The surface combined thermal and contaminant plume, which considers the surface area and vertical extent of the plume; and
		  ○ The physical displacement effect of altered lake currents as a hazardous pulse exposure to fish species whose larvae passively drift through the area.
		Submission of Results
		• Submit the assessment of the results, including conclusions and recommendations, in the annual EA Follow-up Program Report; and
		• The surface water risk assessment will be updated, as recommended.
		Follow-Up Scoping
		• If the surface water risk assessment predicts a potential hazard, a follow-up monitoring scoping workshop will be convened by CNSC with ECCC, DFO and any other relevant parties, to develop an action plan.

Activity Number	EMEAF Activity Description	Work Activities for Discussion
	stakeholders.)	
O-SWE-4	If the once-through condenser cooling option technology is selected for the DNNP, monitor performance of new intake (e.g., velocities, flow rates and associated effects on substrates, current deflection) and new discharge structures (discharge velocities and associated effects on substrates and current deflection; thermal plumes) during commissioning.	Finalize Sampling Program Conduct Sampling Program • Mobilize equipment for sampling; and • Conduct sampling in Lake Ontario to monitor the performance of the intake and discharge structures. Compilation of Data • Compile and analyze data. Analysis, Reporting, Submission of Results • Confirm discharge velocities and associated effects on substrates and local lake water circulation; thermal plumes to verify the absence of residual adverse effects during the operation phase; • Check results against EA threshold criteria to identify need to implement new or modify existing mitigation measures to avoid or eliminate adverse effects; • Submit the assessment of the results, including conclusions and recommendations, in an annual EA Follow-up Program Report, as required; and • Review the monitoring scope as part of the adaptive management framework, and provide any recommendations for program revisions as part of the annual EA Follow-up Program Report.
O-SWE-5	If the once-through condenser cooling option technology is selected for the DNNP, periodically monitor lake water temperatures near the surface and at the bottom during commissioning.	Finalize Sampling Program Conduct Sampling Program • Mobilize equipment for sampling; and • Conduct sampling in Lake Ontario to monitor the lake water temperatures to verify the performance of the intake and discharge structures. Compilation of Data • Compile and analyze data. Analysis, Reporting, Submission of Results • Confirm lake water temperature effects from the DNNP to verify the absence of residual adverse effects during the operation phase; and • Submit the assessment of the results, including conclusions and recommendations, in an annual EA Follow-up Program Report, as required (see Section 6.0).

Aquatic Environment

Activity Number	EMEAF Activity Description	Work Activities for Discussion
B-AQ-1	Undertake adult fish community surveys in the site study area and reference locations.	N/A – Baseline activities have been completed.
B-AQ-2	Conduct impingement and entrainment sampling at DNGS.	N/A – Baseline activities have been completed.

P-AQ-1	Determine the total area of permanent aquatic effects from the following: the thermal plume + 2°C above ambient temperature, the mixing zone and surface plume contaminants, physical displacements from altered lake currents, and infill and construction losses and modifications.
	
	Incorporate any identified permanent aquatic effects into a cumulative effects assessment that includes the effects of impingement and entrainment and climate change. The cumulative effects assessment will also consider overall potential effects upon Round Whitefish populations.
	(Note: Lake infill is not currently planned for the DNNP; however, this activity is applicable to other project activities associated with in-water works.)
		Complete Assessment of Aquatic Habitat
		• Complete an assessment of the aquatic habitat to be affected by the DNNP, when a vendor has been selected and detailed design available, to confirm the aquatic habitat effects associated with the DNNP and verify EIS predictions;
		• The permanent aquatic effects will be determined from the following:
		  ○ The thermal plume + 2°C above ambient temperature;
		  ○ The mixing zone and surface plume contaminants;
		  ○ Physical displacements from altered lake currents; and
		  ○ Infill and construction losses and modifications.
		• Include a cumulative effects assessment including the effects of impingement and entrainment and climate change.
		Prepare and Submit Results
		• Submit the assessment of the results, including conclusions and recommendations, in the annual EA Follow-up Program Report.

P-AQ-2	Consistent with the DFO authorization under the *Fisheries Act*, monitor fish and other aquatic biota in the infill area, and determine losses associated with lake infill construction activities. **(Note: Since lake infill is not currently planned for the DNNP, this activity is not required.)**	Monitoring Plan Development • Develop monitoring program. Conduct Monitoring • Monitor fish and other aquatic biota in and adjacent to the infill area. Compile and Analyze Data • Compile and analyze monitoring data; and • Compare against baseline data and determine losses. Prepare and Submit Results • Submit the assessment of the results, including conclusions and recommendations, in an annual EA Follow-up Program Report, as required.

C-AQ-1	If the once-through cooling system is chosen for the DNNP, conduct a comprehensive surface water risk assessment to confirm the physical displacement effect of altered lake currents as a hazardous pulse exposure to fish species whose larvae passively drift through the area, such as lake herring, lake whitefish, emerald shiner and yellow perch (similar to Surface Water Environment C-SWE-3) when detailed design and location of the once-through cooling system are known.
	(Note: Study at DNGS has demonstrated that species that are entrained are broadcast spawners or multiple spawners, as such, the applicability and feasibility of part of this activity will be discussed further with the relevant stakeholders.)
		Complete Surface Water Risk Assessment
		• Complete a surface water risk assessment which includes:
		  ○ The surface combined thermal and contaminant plume;
		  ○ The physical displacement effect of altered lake currents as a hazardous pulse exposure to fish species whose larvae passively drift through the area to confirm the aquatic effects to aquatic habitat and biota; and
		  ○ The cumulative effect of thermal discharge from PNGS, DNGS, DNNP need to be considered.
		Prepare and Submit Results
		• Submit the assessment of the results, including conclusions and recommendations, in the annual EA Follow-up Program Report.
		Follow-Up Scoping Workshop
		• Follow-up scoping workshop to be held if the risk assessment identifies a potential hazard with Environment Canada, Fisheries and Oceans Canada and any other relevant authorities to develop an action plan.

C-AQ-2	Consistent with the DFO authorization under the *Fisheries Act*, monitor silt and sediment transport as it relates to aquatic biota and habitat as a result of construction activities associated with infill and partial bluffs. **(Note: Since lake infill is not currently planned for the DNNP, this activity is not required.)**	See Surface Water Environment table above, activities: P-SWE-2, C-SWE-2 and O-SWE-2.

Activity Number	EMEAF Activity Description	Work Activities for Discussion
C-AQ-3 O-AQ-4	Develop an impingement and entrainment sampling program as a condition of authorization for DNNP operations under the Fisheries Act from DFO (C-AQ-3). Conduct impingement and entrainment sampling at existing DNGS and the DNNP site (O-AQ-4).	Sampling Program Development • Develop an impingement and entrainment sampling program to be included in the application for DFO Authorization for DNNP operation phase (C-AQ-3). Conduct Monitoring • Conduct Impingement and Entrainment studies at DNGS and DNNP (O-AQ-4). Of note, the most recent DNGS impingement (2010-11) and entrainment (2015-16) studies addressed regulator concerns regarding sampling design inadequacies, including for entrainment of Round Whitefish.
C-AQ-4	Develop an Adaptive Management System for the algae hazard to the cooling water intake at DNNP. **(Note: This is an operational issue not an issue to the receiving/surrounding environment.)**	Adaptive Management Plan should include model to predict extreme algal events and triggers to initiate actions.
O-AQ-1	Undertake adult fish community surveys in the site study area and reference locations. **(Note: baseline fish community monitoring is typically not conducted on an ongoing basis at other nuclear facilities during operation).** In the event that a once-through condenser cooling system is chosen for the Project, during operation, OPG is to undertake adult fish monitoring of large-bodied and small-bodied fish. **(Note: Effectiveness of mitigation measures and thermal plume studies being addressed in O-AQ-3 and O-AQ-4, as such, the applicability of this activity will be discussed further with the relevant stakeholders.)**	Monitoring Plan Development • Develop and finalize sampling plan (consistent with past baseline adult fish community studies (i.e., 2019, 2011, 2010, 2009). Conduct Monitoring • Mobilize equipment for sampling; and • Collect additional seasonal baseline adult fish community data in the SSA; Compile and Analyze Data • Compile data and analyze data; and • Confirm/update baseline conditions. Prepare and Submit Results • Submit the assessment of the results, including conclusions and recommendations, in the annual EA Follow-up Program Report. Implement adaptive management strategy to address changes, as necessary.
O-AQ-2	Consistent with the DFO authorization under the *Fisheries Act*, monitor post-construction conditions to confirm success of habitat restoration and compensation plans.	Monitoring Plan Development • Develop post-construction monitoring program. Conduct Monitoring • Monitor aquatic habitat conditions. Compile and Analyze Data • Compile and analyze monitoring data; • Confirm the absence of residual adverse effects and success of habitat restoration and compensation plans; and • Identify need to implement new or modify existing mitigation measures to avoid or eliminate adverse effects. Prepare and Submit Results • Submit the assessment of the results, including conclusions and recommendations, in an annual EA Follow-up Program Report, as required; and • Review the monitoring scope as part of the adaptive management framework, and provide any recommendations for program revisions as part of the annual EA Follow-up Program Report. Implement adaptive management plans to address potential issues, as necessary.
O-AQ-3	For the once-through lake water cooling option, periodically monitor data on cooling water discharge temperature and plume characteristics interpreted in relation to fish habitat and susceptibility of VEC species, to verify EIS predictions (similar to Surface Water Environment O-SWE-5 lake water temperature program). Evaluate potential cumulative effects from the thermal loading and contaminant plume of the discharge structures of the existing DNGS.	Compile and Analyze Data • Review, analyze, and interpret monitoring results of the lake water temperatures from O-SWE-5 to verify the effects associated with the aquatic habitat from the operation of the intake and discharge structures for the DNNP; and • Cumulative effects of thermal loading should likely include climate change, as well as, PNGS, DNGS and DNNP.

Terrestrial Environment

Activity Number	EMEAF Activity Description	Work Activities for Discussion
B-TE-1	Conduct Bank Swallow burrow and colony surveys along selected areas of Lake Ontario north shoreline and reference locations, to determine trends in the data since 2007 (i.e., is population increasing, decreasing or is there natural variation?) prior to site preparation.	N/A – Baseline activities have been completed.
B-TE-2	Develop a Bank Swallow mitigation plan for implementation during Site Preparation and Construction, and verify the implementation of the plan. Design and monitor the effectiveness of Bank Swallow Artificial Nest Habitat structures (Pilot Project)..	N/A – Baseline activities have been completed.
B-TE-3	If justified, prior to site preparation, conduct ecological land classification mapping of the vegetation communities at the DN site (including DNNP lands).	N/A – Baseline activities have been completed.
B-TE-4	Conduct Species at Risk surveys (e.g., Bobolink, Least Bittern) on the DNNP site prior to site preparation.	N/A – Baseline activities have been completed.
B-TE-5	If justified, conduct insect, amphibian, reptile and mammal surveys prior to site preparation.	N/A – Baseline activities have been completed.
P-TE-1 C-TE-1 O-TE-1	Monitor Bank Swallow colonies periodically throughout site preparation, construction, and operation activities. Undertake adaptive management approach.	Monitoring Plan Development • Develop a Bank Swallow colony monitoring program; and • Design Bank Swallow Artificial Nest Habitat structures (Pilot Structure). Conduct Monitoring • Monitor Bank Swallow colony conditions within the SSA and LSA; and • Monitor the effectiveness of Bank Swallow Artificial Nest Habitat structures (Pilot Structure). Compile and Analyze Data • Compile and analyze monitoring data; • Confirm the absence of significant residual adverse effect; and • Check results against EA threshold criteria to identify need to implement new or modify existing mitigation measures to avoid or eliminate adverse effects. Prepare and Submit Report • Review the monitoring scope as part of the adaptive management framework, and provide any recommendations for program revisions as part of the annual EA Follow-up Program Report; • Submit the assessment of the results and associated conclusions and recommendations including future monitoring programs (i.e. C-TE-1, O-TE-1), in the annual EA Follow-up Program Report; and • Implement adaptive management approach, as necessary, to address changes.
P-TE-2 C-TE-2 O-TE-2	Monitor conditions of terrestrial habitat (Cultural Meadow and Thicket, wetland ecosystems, and wildlife corridor), and use of habitat, by breeding birds, amphibians, and butterflies, and mammals, and collect field data prior to and throughout site preparation, construction, and operation activities.	Monitoring Plan Development • Develop monitoring program. Conduct Monitoring • Monitor Terrestrial Environment conditions (i.e., Vegetation Communities and Species) within the SSA; • Monitor use of habitat by breeding birds, amphibians, butterflies, and mammals; and • The amphibian surveys (for at least P-TE-2) will also incorporate the Draft Western Chorus Frog Detection Protocol for Ontario. Compile and Analyze Data • Compile and analyze monitoring data; and • Confirm the absence of residual adverse effects and success of habitat restoration. Prepare and Submit Report • Submit the assessment of the results and associated conclusions and recommendations including future monitoring programs (i.e. C-TE-2, O-TE-2), in the

Activity Number	EMEAF Activity Description	Work Activities for Discussion
		annual EA Follow-up Program Report.
P-TE-3 C-TE-3	Periodically conduct wildlife mortality surveys (i.e., mammal road mortality surveys) during site preparation, construction.	Conduct early morning (dawn) surveys to search for wildlife mortalities • Walk and drive around the SSA (including pedestrian walkways and builds as they are developed) searching for potential wildlife mortalities; • Conduct approximately 20 sweeps per year: five during the peak spring migration period; five during the summer; five during the fall and five during the winter; • Obtain input from DNNP personnel on observations of wildlife mortalities; and • Identify the wildlife and species, when possible; the mortality numbers; the date; and record location on an aerial photograph. Compile and analyze data • Confirm ongoing validity of assumptions regarding road mortality used in the EA and continuing absence of adverse effects (mammals). Prepare and Submit Report • Submit the assessment of the results and associated conclusions and recommendations including future monitoring (i.e. C-TE-3, O-TE-3), in the annual EA Follow-up Program Report.
O-TE-3	Should cooling towers be chosen for the condenser cooling, monitor bird communities (migrant songbirds, breeding birds), their habitats, and bird collision impacts **(Note: Cooling towers are no longer applicable due to the decision to utilize a once-through cooling system, and so this activity is not required.)**	Not applicable
O-TE-4	Conduct insect, amphibian, reptile and mammal surveys post construction with a focus on species at risk. Conduct Species at Risk surveys (Bobolink, Least Bittern) for birds.	Monitoring Plan Development • Develop post-construction monitoring program; and • Annual surveys of applicable species at risk birds are based on MNRF Survey Methodology under the Endangered Species Act, 2007: *Dolichonyx oryzivorus* (Bobolink) (2011) or the Marsh Monitoring Protocols. Conduct Monitoring • Monitor Terrestrial Environment conditions (Insects, Amphibians, Reptiles, and Mammals) within the SSA; and • Conduct species at risk surveys. Compile and Analyze Data • Compile and analyze monitoring data; • Confirm the absence of residual adverse effects and success of habitat restoration; and • Verify the ERA conclusions. Prepare and Submit Report • Submit the assessment of the results, including conclusions and recommendations, in an annual EA Follow-up Program Report, as required.

Geological and Hydrogeological Environment

Activity Number	EMEAF Activity Description	Work Activities for Discussion
B-GH-1	Conduct baseline measurements on groundwater levels (and groundwater quality) at existing DNNP monitoring well nests within the DNGS annual groundwater monitoring program and additional locations, as needed.	N/A – Baseline activities have been completed.
B-GH-2	Conduct baseline soil quality characterization prior to site preparation.	N/A – Baseline activities have been completed.
B-GH-3	Conduct baseflow estimates at Darlington Creek.	N/A – Baseline activities have been completed.
P-GH-1 C-GH-1 O-GH-1	Monitor groundwater flow (and groundwater quality), particularly flow transitions that may arise from grade changes during site preparation (P-GH-1) and construction (C-GH-1). The monitoring shall continue during the period of transition to stable conditions following completion of construction and the initial period of operation.	Develop/Update Monitoring Plan • Review groundwater quality and flow sampling baseline or program results from the previous DNNP phase, including findings and recommendations; • Develop groundwater quality and flow sampling program including the selection of appropriate sample locations, frequency of sampling, and sampling parameters. The design of grade changes will guide the determination of required monitoring location, frequency, and duration of the program for the period of transition to stable conditions following the completion of construction and initial period of operation (GOC response to JRP rec. 19); and • Sample locations should be reviewed prior to each phase to ensure that they are appropriate to the activities that will be occurring. Monitoring wells which occur within the construction zone may require relocation or replacement. Conduct Sampling • Mobilize equipment for sampling events; • Conduct groundwater sampling and groundwater flow measurements; and • Perform analysis of collected samples, if appropriate. Data Compilation and Analysis • Compile, assemble and model data, if appropriate; • Confirm baseline conditions and effects of the DNNP on groundwater quality and flow to verify the absence of residual adverse effects during the applicable phase (i.e. site preparation or construction); and • Confirm the return to stable conditions following completion of construction and the initial period of operation. Prepare and Submit Report • Submit the assessment of the results, including conclusions and recommendations, in the annual EA Follow-up Program Report.
P-GH-2 C-GH-2 O-GH-2	Monitor soil quality during site preparation (P-GH-2), construction (C-GH-2), and operation (O-GH-2).	Develop/Update Monitoring Plan • Review the soil quality sampling program baseline or program results from the previous DNNP phase, including findings and recommendations; and • Develop groundwater soil quality sampling program including the selection of appropriate sample locations, frequency of sampling, and sampling parameters. Conduct Sampling • Mobilize equipment for sampling events; • Conduct soil quality sampling; and • Perform analysis of collected samples. Data Compilation and Analysis • Compile, assemble and model data, if appropriate; and • Verify the absence of residual adverse effects to soil quality, during the applicable phase (i.e., site preparation or construction). Prepare and Submit Report • Submit the assessment of the results, including conclusions and recommendations, in the annual EA Follow-up Program Report.

Activity Number	EMEAF Activity Description	Work Activities for Discussion

P-GH-3	Prior to construction, conduct an assessment of the ingress and transport of contaminants in groundwater on site that are expected during successive phases of the project. The assessment is to include consideration of the impact of wet and dry deposition of all contaminants of potential concern and gaseous emissions on groundwater quality.	Conduct Groundwater Flow and Contaminant Transport Modelling
		• Conduct enhanced groundwater flow and contaminant transport modelling, extending to appropriate model boundaries, which may not necessarily be site boundaries;
		• Collect model inputs, including:
		  ○ Review of predicted radiological and non-radiological air emissions as part of the Radiological Air Emissions Program (OPG Commitment D-C-5.1) and the Non-Radiological Air Emissions Program (OPG Commitment D-C-5.2); and
		  ○ Review results of the detailed assessment of predicted radiological and non-radiological effluent releases from the DNNP as part of the Non-Radiological Effluent Management Program (OPG Commitment D-C-2.1) and Radiological Effluent Management Program (D-C-4.1). The assessment would include effluent quality, concentration, points of release, a description of effluent treatment.
		• Assessment will consider the effects of future dewatering and expansion activities at the St. Marys Cement quarry; and
		• Analyze model results and provide recommendations to update the Radiological Environmental Monitoring Program to include relevant residential and private groundwater well quality data in the LSA that are not captured by the current program; considering potential critical groups based on current or future use of groundwater.
		Prepare and Submit Report
		• Submit the assessment of the results, including conclusions and recommendations in an annual EA Follow-Up Program Report.

C-GH-3	Conduct baseflow estimates at Darlington Creek at the completion of construction.	Develop/Update Monitoring Plan • Confirm sampling locations, based on site layout and detailed design. Conduct Monitoring • Mobilize equipment for sampling; and • Conduct sampling in Darlington Creek to confirm baseflow at the end of the construction phase. Data Compilation and Analysis • Compile and analyze data; and • Confirm Darlington Creek baseflow to verify the absence of residual adverse effects from site preparation/construction phase activities associated with the DNNP. Prepare and Submit Report • Submit the assessment of the results, including conclusions and recommendations, will be submitted in the annual EA Follow-up Program Report.
O-GH-1	Monitor groundwater flow (and groundwater quality), post-construction.	Develop/Update Monitoring Plan • Review the P-GH-1, C-GH-1 and C-GH-3 groundwater quality and flow sampling program, including findings and recommendations; and • Develop appropriate groundwater flow and quality sampling program, including sample locations, frequency of sampling, and appropriate sample parameters for post construction groundwater quality and flow monitoring. Conduct Monitoring • Mobilize equipment for sampling events; and • Conduct groundwater sampling and groundwater flow measurements. Data Compilation and Analysis • Perform analysis of collected samples, if appropriate; • Compile, assemble and model data, if appropriate; and • Confirm associated effects of groundwater quality and flow to verify the absence of residual adverse effects from operation phase activities. Prepare and Submit Report • Submit the assessment of the results, including conclusions and recommendations, in an annual EA Follow-up Program Report, as required.
O-GH-3	Monitor groundwater quality, particularly for radionuclides, on- and off-site given atmospheric deposition is the primary source of tritium – as part of the EMP.	Conduct Monitoring • Conduct on-site groundwater sampling as part of the DNGS GWMP and off-site groundwater sampling as part of the EMP. Prepare and Submit Report • Submit the assessment of the results, including conclusions and recommendations, in an annual EA Follow-up Program Report, as required.

Activity Number	EMEAF Activity Description	Work Activities for Discussion
O-GH-4	Conduct groundwater flow monitoring to support the assessment of effects, incorporating post-development physical flow characteristics.	• Enhanced groundwater flow and contaminant transport modelling to be conducted for the assessment, extending to appropriate model boundaries which may not necessarily be site boundaries; and • Scope of work to be determined at the appropriate stage in the DNNP.

Land Use Environment

Activity Number	EMEAF Activity Description	Work Activities for Discussion
B-LU-1 P-LU-1 C-LU-1	Monitor land use activity in proximity to the DNNP site. Consult with the Municipality of Clarington and Regional Municipality of Durham on proposed land use changes and effects on implementation of emergency response plans. Monitor planning developments near OPG facilities and participate as required. Actively engage in Envision Durham municipal comprehensive review process as it relates to policy changes related to nuclear power generation and population and employment forecasts.	Monitor Land Use Activity • Monitor public meeting outcomes, planning staff recommendations and Council decisions in regard to ongoing applications; • Review public meeting outcomes; • Review planning staff recommendations; • Confirm policy initiatives and modifications by following-up with planning staff from each of the municipalities Reviewing Official Plans and Zoning By-laws; • Maintain collected data and update as new development initiatives become known; and • Confirm the effectiveness of the mitigation measures and the continuing absence of residual adverse effects to Land Use. Prepare and Submit Report • Submit the assessment of the results, including conclusions and recommendations, in the annual EA Follow-up Program Report (in the site preparation and construction phases).
P-LU-2 C-LU-2	Confirm projected population data in the affected communities is accurate and up-to-date, at the end of the site preparation phase (P-LU-2) and construction phase (C-LU-2).	Review Population Data • Confirm projected population by reviewing potential updates to the Region's Growing Durham Study (Final Recommended Growth Scenario – RMD, 2008) and the recommended Regional Official Plan Amendment (ROPA) No. 128, May 19, 2009 (RMD, 2009) which formed the basis for the Growth Scenarios (2006-2031, and 2031-2056) presented in the Land Use Assessment of Environmental Effects TSD (MMM 2009d). Prepare and Submit Report • Submit the assessment of the results, including conclusions and recommendations, in the annual EA Follow-up Program Report.

Traffic and Transportation Environment

Activity Number	EMEAF Activity Description	Work Activities for Discussion
B-TT-1	As part of the Traffic Management Plan, undertake a pre-Project road condition assessment as a baseline for considering incremental Project-related degradation. **Current plans for the DNNP do not require significant movement of soil, therefore a physical pre-project Road Condition Assessment is not required. Traffic safety will be the focus of the monitoring instead of physical road degradation. Traffic conditions such as traffic volumes and collision data will be monitored.**	N/A – Baseline activities have been completed.
P-TT-1 C-TT-1 O-TT-1	As part of the Traffic Management Plan, undertake periodic inspections of road conditions to document changes relative to baseline during site preparation (P-TT-1) and construction (C-TT-1). Complete a one-time inspection of road conditions at the beginning of operation (O-TT-1).	Review Existing Data and Conduct Road Condition Inspection • Review existing or potential problem areas with Municipality of Clarington, Region of Durham, and Ministry of Transportation (MTO) staff; • Conduct a driving survey, supplemented with periodic stops at key locations to take measurements, photos, etc.; • Confirm the adequacy of existing signage in terms of traffic control, speed signs, pedestrian crossings; • Review traffic volumes, traffic operations, and travel mode splits for DNNP staff and contractors; • Review collision history data and analyze patterns; and • Update potential problem areas on map of LSA. Prepare and Submit Report • During the site preparation and construction phases, submit the assessment of the results, including conclusions and recommendations, in the annual EA Follow-up Program Report; and • During operations, submit the assessment of the results, including conclusions and recommendations, in the annual EA Follow-Up Program Report, as required. Road data required to complete the reviews will be developed through the Traffic Management Working Group which includes the Region of Durham, Municipality of Clarington, and MTO.

P-TT-2
C-TT-2
O-TT-2
	Should the once-through condenser cooling system be chosen for the DNNP and an increased prohibitive zone be considered, develop a follow-up program to verify EIS predictions. If required, an adaptive management program to mitigate potential effects to small watercraft. (P-TT-2).
	
	Implementation of the follow-up program and adaptive management program during the construction and operations phases (C-TT-2 and O-TT-2).
		Develop Follow-Up Program
		• Engage Transport Canada to develop the details of the follow-up program, if the once-through condenser cooling system is chosen for the DNNP;
		Marine Safety Assessment
		• Complete an assessment of marine safety (i.e. small watercraft) associated with the once-through condenser cooling system, when detailed design is available, to confirm the EIS prediction of no residual adverse effects to effects to boat safety from the establishment of an increased prohibited zone. The assessment shall include consideration of:
		  ○ Vessel Operation Restriction Regulation (2008) under the Canada Shipping Act (2001);
		  ○ Interference with shipping routes (volume, routing); and
		  ○ Safety (accident/ incident rates and severity);
		• Submit the assessment of the results, including conclusions and recommendations, in the annual EA Follow-up Program Report.
		Adaptive Management Program
		• Develop an adaptive management program to mitigate potential effects to small watercraft, if an adaptive management program is required, with support and expertise from Transport Canada.

Health - Human and Non-Human Biota

The detailed task work activities for Health – Human and Non-Human Biota will be developed when details of the lake infill, condenser cooling water technology, intake and diffuser are known; and detailed design of the SMR are known.

Appendix J: DNNP Commitments Concordance Table

The following table lists OPG's commitments under D-P-12: Environmental Monitoring and Environmental Assessment Follow-Up from the DNNP Commitments Report (NK054-REP-01210-00078-R009, OPG 2023a). The purpose of the table is to identify the appropriate sections or activity numbers within the EMEAF Plan which have been included to satisfy each commitment.

Commitment #	Commitment Text	EMEAF Plan Reference
D-P-12.1 Environmental Monitoring and Environmental Assessment Follow-Up	After the EA follow-up program is finalized, it will be submitted to the CNSC for review and acceptance. Following acceptance, OPG will then be responsible for ensuring the elements as described in the final follow-up program are implemented. Funding for the EA follow-up program will also be the responsibility of OPG. [EIS Section 11.2; EIS IR 160]	Section 7.0
	Refinement of the program will be carried out through a consultative process that will consider the review of this EIS and related licence submissions and it will culminate with details of the scope of each follow-up program element. As they may be relevant in each specific follow-up program element, details of adaptive management actions will also be included. [EIS Section 11.2 and Table 11.6-1; EIS IR 160; EIS IR 161]	Section 3.2 (Stakeholders sub-heading) Section 1.5.3 (Adaptive Management)
	Adaptive management will be inherent in the design and implementation of the EA follow-up and monitoring programs. Therefore, within the follow-up monitoring program, an assessment of the effects on the embayment would be undertaken if there are indications of potential adverse effects. Results of the monitoring would be evaluated to confirm the EIS conclusions. [EIS IR 246]	Section 1.5.3 (Adaptive Management) Section 4.2.2 (Adaptive management planning if there are indications of potential adverse effects on the embayment.)
	Specific adaptive management elements will be confirmed with the CNSC at each licensing step in the Project. [EIS Section 2.9.2; EIS IR 146]	Section 1.5.3 (Adaptive Management)
	The Environmental follow-up and monitoring program will be incorporated into site preparation phase environmental monitoring programs (as applicable to site preparation activities), to ensure these activities and mitigation measures conform with the outcome of the EA. [LTPSA, Sections 4.2 and Section 4.5]	Activities to be completed in the site preparation phase are prefaced with the letter "P". Those activities do conform with the outcome of the EA.
D-P-12.1(a) Environmental Impact Statement Review	Once the specific technology is selected and design information is available, OPG will comprehensively review the EIS to ensure that the results of the EIS remain valid. If this review indicates either a gap or a condition not bounded by the EIS, OPG will initiate corrective actions as necessary. This may include mitigation options. [EIS IR 240 Resubmission 2]	Section 1.8 (Validation of the EIS Results)
D-P-12.2 Atmospheric Environment – Methodology Reports	Measure Total Suspended Particulate (TSP), PM10 and PM2.5 during site preparation and construction activities to periodically confirm the effectiveness of the Dust Management Plan and verify EIS predictions. [EIS Table 11.6-2] • Duration: Throughout site preparation phase and throughout site construction phase; • Frequency: 24-hour sample collected on 6day cycle; and	Appendix A: B-AE-1 (associated baseline) P-AE-1 C-AE-1 In previous air quality assessments, acrolein was found to be the most restrictive contaminant for emissions from both fixed diesel engines and

Commitment #	Commitment Text	EMEAF Plan Reference
	• Location: Similar locations to baseline monitoring locations (where appropriate).	transportation sources. However, as a result of changes in air quality standards, the most restrictive contaminant is now benzo(a)pyrene (Ecometrix 2020).
	Measure noise levels during site preparation and construction activities to periodically confirm the effectiveness of the Noise Management Plan and verify EIS predictions. [EIS Table 11.6-2]	Appendix A: B-AE-2 (associated baseline) P-AE-2 C-AE-2 O-AE-2 (requested by ECCC)
	Prior to site preparation, OPG to develop a follow-up and adaptive management program for air contaminants (such as, Acrolein, NO2, SO2, SPM, PM2.5 and PM10). [GOC Response to JRP Rec. 8]	Appendix A: B-AE-1 (associated baseline) P-AE-1 C-AE-1 Section 4.1.2 (Description of follow-up monitoring and adaptive management approach).
	Over the life of the Project, OPG to conduct ambient air monitoring in the local study area on an ongoing basis to ensure that air quality remains at levels that are not likely to cause adverse effects to human health. [GOC Response to JRP Rec. 56]	Appendix A: P-AE-1 C-AE-1 O-AE-1 During the operation phase, air quality emissions will continue to be monitored under the EMP (N-PROC-OP-0025) and in accordance with any monitoring requirements to meet ECA conditions.
D-P-12.3 Surface Water Environment – Methodology Reports	A Follow-up and Monitoring program to be implemented to ensure that water and sediment quality in Lake Ontario is being adequately protected as in-water work is conducted. [OPG Letter, CD# NK054-CORR-00531-00190]	Appendix B: B-SWE-1 (associated baseline) B-SWE-2 (associated baseline) P-SWE-1 P-SWE-2 C-SWE-1 C-SWE-2 O-SWE-1 O-SWE-2
	Undertake post construction water quality sampling in Lake Ontario focused on verifying the effects of the project as predicted in the EIS. [EIS Table 11.6-2]	
	Sediment sampling to be undertaken in areas where in-water works may disturb sediments in order to identify if any contaminated sediments (i.e., in excess of sediment criteria) exist which may warrant additional protection measures. [OPG Letter, CD# NK054-CORR-00531-00190]	
	To verify the effects of the EIS, sample storm water discharges from the DNNP following a plan (with regard for parameters and frequency) appropriate for the facility. [EIS, Table 11.6-2] • Duration: Post-construction phase (minimum 1 year); • Frequency: Variable (to consider parameters and criteria); and • Location: Sampling locations will be similar to baseline sampling program plus additional sampling station in embayment area created between lake infill area and St. Marys.	Appendix B: O-SWE-3
	The effects on near neighbouring riparian landowners, shore processes, and aquatic resources as the result of the Project, will be further assessed by a coastal engineer when a vendor	Appendix B: B-SWE-3 P-SWE-3

Commitment #	Commitment Text	EMEAF Plan Reference
	is selected and the detailed engineering design of the shoreline works is available. It is expected that the coastal engineer's assessment will confirm OPG's assessment of no predicted effects on near neighbouring riparian uses. The effects of the project will also be confirmed through the Project's Follow-up and Monitoring Program. [EIS IR 204]	P-SWE-4
	The conclusions of the EA associated with the Surface Water Environment will be confirmed as noted in the preliminary EA Follow-up Monitoring Program on pages 11-8 to 11-9 (Table 11.6.2, Preliminary EA Follow-up Program Elements) of the EIS. [EIS IR 143]	Appendix B: O-SWE-1 O-SWE-2 O-SWE-3 O-SWE-4 O-SWE-5
	If the Cooling Tower option is to be considered as the preferred technology to be implemented for the Project, then OPG should further assess potential environmental and socio-economic effects downstream in the St. Lawrence River that arise from reduced Lake Ontario outflows. This assessment should be reviewed by relevant agencies, including EC. [OPG Letter, CD# NK054-CORR-00531-00190] (Note: Cooling tower option is not selected for DNNP [See D-C-1.1 and OPG Letter, CD# NK054-CORR-00531-00253])	This commitment is no longer applicable since cooling towers are no longer being considered.
	A Follow-up and Monitoring program to be developed in consultation with EC and other regulatory departments/agencies in order to validate the behaviour and predicted effects of the thermal plume. [Letter, CD# NK054-CORR-00531-00190]	Appendix B: C-SWE-3
	For the once-through cooling option, monitor performance of new intake (e.g., velocities and associated effects on substrates current deflection) and new discharge diffuser (discharge velocities and associated effects on substrates and current deflection; thermal plumes) during commissioning. [EIS Table 11.6-2]	Appendix B: O-SWE-4
	For the once-through cooling option, periodically monitor lake water temperatures near the surface and at the bottom to verify the performance of the intake and diffuser. [EIS Table 11.6-2]	Appendix B: O-SWE-5
	An adaptive management plan has been proposed to address potential issues associated with the proposed infill area including the entrance to Darlington Creek. For instance, the potential creation of nuisance algae growth conditions due to temperature increases or the creation of a thermal barrier at the east end of the proposed infill may require modification of the design to enhance circulation. The general lake infill area which includes an area near the Darlington Creek mouth will be monitored, and if nuisance algae conditions occur (or thermal barriers to fish migration), design modifications may be implemented where practicable. [EIS IR 262].	Section 4.2.2 Appendix B: O-SWE-1O-SWE-2
	A follow-up and monitoring program to ensure that the project will not impact negatively on drinking water and recreational water quality. [OPG Letter, CD# NK054-CORR-00531-00190]	Appendix B: B-SWE-1 (associated baseline) B-SWE-2 (associated baseline) P-SWE-1 P-SWE-2 C-SWE-1 C-SWE-2 O-SWE-1

Commitment #	Commitment Text	EMEAF Plan Reference
		O-SWE-2
	OPG to collect water and sediment quality data for any future embayment area that may be formed as a consequence of shoreline modifications in the vicinity of the outlet of Darlington Creek. This data should serve as the reference information for OPG's post-construction commitment to conduct water and sediment quality monitoring of the embayment area. [GOC Response to JRP Rec. 12]	Appendix B: P-SWE-1
	OPG to collect and assess water and sediment quality data for a comprehensive number of shoreline and offshore locations in the site study area prior to commencing in-water works. This data should be used to establish a reference for follow-up monitoring. [GOC Response to JRP Rec. 13]	Appendix B: B-SWE-1 P-SWE-1
	Prior to issuance of a Fisheries Act Authorization for in-water works, DFO requires OPG to have a water and sediment quality monitoring program for: • Any future embayment area [GOC Response to JRP Rec. 12]; • Shoreline and offshore locations [GOC Response to JRP Rec. 13]; and • In receiving waters [GOC Response to JRP Rec. 15]. This program is required to assess whether OPG continues to meet the intent of section 36 of the Fisheries Act.	Appendix B: B-SWE-1 (associated baseline) B-SWE-2 (associated baseline) P-SWE-1 P-SWE-2 C-SWE-1 C-SWE-2 O-SWE-1 O-SWE-2
	In the event that a once-through condenser cooling system is chosen for the project, prior to operation, OPG is to include the following in the surface water risk assessment: • The surface combined thermal and contaminant plume; and • The physical displacement effect of altered lake currents as a hazardous pulse exposure to fish species whose larvae passively drift through the area such as lake herring, lake whitefish, emerald shiner and yellow perch. If the risk assessment result predicts a potential hazard, then the CNSC shall convene a follow-up monitoring scoping workshop with EC, DFO and any other relevant authorities to develop an action plan. OPG to update a comprehensive surface water risk assessment as recommended, however an assessment of the combined thermal and contaminant plume should consider not only the surface area of the plume, but its vertical extent as well. [GOC Response to JRP Rec. 35]	Appendix B: C-SWE-3

D-P-12.4 Aquatic Environment - Methodology Reports	Consistent with the Authorization for Works or Undertakings Affecting Fish Habitat conditions: [OPG Letter, CD# NK054-CORR-00531-00190]
	• Monitor fish and other aquatic biota contained in the infill area and determine losses associated with infill construction:
	  ○ Duration: During infill Construction phase;
	  ○ Frequency: to be determined; and
	  ○ Location: Similar to baseline monitoring locations (as appropriate).
	• Monitor silt and sediment transport as it relates to aquatic biota and habitat as a result of construction activities associated with infill and partial bluffs.
		Appendix C:
		P-AQ-2 (related to P-SWE-1) – no longer required.
		C-AQ-2 (related to C-SWE-2)
		O-AQ-2

Commitment #	Commitment Text	EMEAF Plan Reference
	○ Duration: During construction phase; ○ Frequency: spring, summer, and fall; and ○ Location: Similar to baseline monitoring locations (as appropriate). • Document post-construction conditions to confirm success of habitat restoration and compensation plans. The monitoring program will be to the satisfaction of DFO.	
	As part of the detailed design of the lake infill, the potential effects on the Aquatic Habitat associated with shoreline processes will be considered and a plan developed to monitor these effects. [EIS, Section 5.4.4.2]	Appendix C: P-AQ-1
	An Adaptive Management Strategy will be implemented to address changes to the environment, associated with aquatic ecosystem over time. [EIS Section 5.4.5.2]	Appendix C: O-AQ-1 O-AQ-2
	For the once-through lake water cooling option, periodically monitor data on cooling water discharge temperature and plume characteristics interpreted in relation to fish habitat and susceptibility of Valued Ecosystem Components species post construction verification of the EIS conclusions. [EIS Table 11.6-2]	Appendix C: O-AQ-3
	OPG will establish an Adaptive Management System for the algae hazard to the cooling water intake at DNNP. Technical expectations for the DNNP includes a model-based hazard monitoring system to define threshold levels of algal biomass that would trigger more intense monitoring leading into the proposed contingency measures. [OPG Letter, CD# NK054-CORR-00531-00190]	Appendix C: C-AQ-4
	OPG to continue conducting adult fish community surveys in the site study area and reference locations on an ongoing basis. These surveys shall be used to confirm that the results of 2009 gillnetting and 1998 shoreline electrofishing reported by OPG, and the additional data collected in 2010 and 2011, are representative of existing conditions, taking into account natural year-to-year variability. [GOC Response to Rec. 28; OPG Letter, CD# NK054-CORR-00531-00190]	Appendix C: B-AQ-1 (baseline) O-AQ-1
	Specific attention should be paid to baseline gillnetting monitoring in spring to verify the findings on fish spatial distribution and relatively high native fish species abundance in the embayment area, such as white sucker and round whitefish. The shoreline electrofishing habitat use study is needed to establish the contemporary baseline for later use to test for effects of lake infill armouring, if employed, and the effectiveness of mitigation. [GOC Response to Rec. 28; OPG Letter, CD# NK054-CORR-00531-00190]	Appendix C: B-AQ-1 (baseline) O-AQ-1
	OPG to continue the research element of the proposed Round Whitefish Action Plan (RWAP) for the specific purpose of better defining the baseline condition, including the population structure, genome, and geographic distribution of the round whitefish population as a basis from which to develop testable predictions of effects, including cumulative effects. [GOC Response to JRP Rec. 29]	Section 4.3.2 This commitment is duplicated in D-P-15.1 and was addressed within D-P-15.1. The CNSC approved the closure of D-P-15.1. For further details see Section 4.3.2.

Commitment #	Commitment Text	EMEAF Plan Reference
	In the event that a once-through condenser cooling system is chosen for the Project, prior to the construction of in-water structures, OPG to conduct: • Additional impingement sampling at the existing Darlington Nuclear Generating Station to verify the 2007 results and deal with inter-year fish abundance variability and sample design inadequacies; and • Additional entrainment sampling at the existing Darlington Nuclear Generating Station to better establish the current conditions. [GOC Response to JRP Rec. 30; OPG Letter, CD# NK054-CORR-00531-00190] The program should be designed to guard against a detection limit bias by including in the analysis of entrainment losses those fish species whose larvae and eggs are captured in larval tow surveys for the seasonal period of the year in which they occur. A statistical optimization analysis will be needed to determine if there is a cost-effective entrainment survey design for round whitefish larvae. [GOC Response to Rec. 30; OPG Letter, CD# NK054-CORR-00531-00190]	Appendix C: B-AQ-2
	DFO will work with the CNSC, and the MNR to develop an impingement and entrainment sampling program. The Government of Canada would also like to note that authorization under the Fisheries Act will be required prior to any lake infill taking place and commits that DFO will work with OPG to ensure that the impingement and entrainment sampling program is developed and implemented as a condition of that authorization. [GOC Response to JRP Rec.30]	Appendix C: C-AQ-3 No lake infilling is planned. DFO has allowed OPG to obtain two separate DFO authorizations, one for construction phase (e.g. construction of intake/discharge) and one for operation phase (e.g. impingement and entrainment). C-AQ-3 would be completed during the construction phase to support the operation phase permit.
	OPG to conduct an impingement and entrainment follow-up program at the existing Darlington Nuclear Generating Station and the Project site to confirm the prediction of adverse effects, including cumulative effects, and the effectiveness of mitigation. For future entrainment sampling for round whitefish, a statistical probability analysis will be needed to determine if unbiased and precise sample results can be produced. DFO will work with the CNSC and OPG to develop an impingement and entrainment study on the existing Darlington Nuclear Generating Station and at the proposed Project site to confirm predicted adverse effects and will further ensure implementation through its regulatory process and conditions of authorization under the Fisheries Act. [GOC Response to JRP Rec. 33; OPG Letter, CD# NK054-CORR-00531-00190]	Appendix C: B-AQ-2 O-AQ-4
	Prior to construction, enhanced resolution thermal plume modeling is to be conducted by OPG, taking into account	Appendix C: C-AQ-1 (related to C-SWE-3)

Commitment #	Commitment Text	EMEAF Plan Reference
	possible future climate change effects. EC is committed to reviewing the information provided by OPG, and will rely on DFO authorization for a HADD associated with the intake or outfall to ensure that OPG undertakes this modelling. DFO will work with EC, and CNSC to incorporate the results from the thermal plume modeling into the determination of the appropriate location for the intake and diffuser structures to mitigate adverse effects. DFO will ensure implementation through conditions of a Fisheries Act authorization. [GOC Response to JRP Rec. 34]	
	In the event that a once-through condenser cooling system is chosen for the project, prior to operation, OPG is to include the following in the surface water risk assessment: • The surface combined thermal and contaminant plume; and • The physical displacement effect of altered lake currents as a hazardous pulse exposure to fish species whose larvae passively drift through the area, such as lake herring, lake whitefish, emerald shiner and yellow perch. If the risk assessment result predicts a potential hazard, then the CNSC shall convene a follow-up monitoring scoping workshop with EC, DFO and any other relevant authorities to develop an action plan. OPG to update a comprehensive surface water risk assessment as recommended, however an assessment of the combined thermal and contaminant plume should consider not only the surface area of the plume, but its vertical extent as well. [GOC Response to JRP Rec. 35]	Appendix C: C-AQ-1 (related to C-SWE-3)
	In the event that a once-through condenser cooling system is chosen for the Project, during operation, OPG is to undertake adult fish monitoring of large-bodied and small-bodied fish to confirm the effectiveness of mitigation measures and verify the predictions of no adverse thermal and physical diffuser jet effects. DFO is committed to working with OPG to develop their fish and fish habitat monitoring and follow-up program and ensuring implementation through conditions of authorization under the Fisheries Act. [GOC Response to JRP Rec. 36]	Appendix C: O-AQ-1
	Prior to construction, OPG to determine the total area of permanent aquatic effects from the following, to properly scale mitigation and scope follow-up monitoring: • t=The thermal plume + 2°C above ambient temperature; • The mixing zone and surface plume contaminants; • physical displacements from altered lake currents; and • Infill and construction losses and modifications. GOC would further support the inclusion of cumulative effects assessment in this assessment, including the effects of impingement and entrainment and climate change. DFO is committed to working with the CNSC and OPG to ensure that any permanent aquatic habitat effects are mitigated and appropriate habitat compensation is developed and implemented as a condition of any Fisheries Act authorization. [GOC Response to JRP Rec. 37]	Appendix C: P-AQ-1

Commitment #	Commitment Text	EMEAF Plan Reference
	Prior to construction, OPG will factor the algal hazard assessment into a more detailed biological evaluation of moving the intake and diffuser deeper offshore as part of planned siting studies and the cost-benefit analysis of the cooling system. [GOC Response to JRP Rec. 40]	N/A. This commitment is an input to intake design to address an operational issue, not an environmental impact issue, and it is not a follow-up monitoring activity. The design of the BWRX-300 has incorporated this commitment. This commitment is addressed in D-C-1.
	Prior to operation, OPG will establish an adaptive management program for algal hazard to the project cooling water system intake that includes the setup of thresholds for further actions.	Appendix C: C-AQ-4 This commitment is to address an operational issue, not an environmental impact issue, and it is not a follow-up monitoring activity. This commitment is addressed in D-C-1.
	During operation, OPG is to monitor aquatic habitat and biota for potential cumulative effects from the thermal loading and contaminant plume of the discharge structures of the existing Darlington Nuclear Generating Station and the Project. OPG will also be required to undertake an aquatic monitoring program as a condition of any Fisheries Act authorization. [GOC Response to Rec. 61]	Appendix C: O-AQ-3
D-P-15.1 Commitments addressed under D-P-12.4 (OPG 2023a; CNSC 2022)	The cumulative effects of habitat destruction arising from any lake infilling, the incidental destruction of habitat that may occur in the artificial embayment, mortality from entrainment and impingement, and effects resulting from climate change should be factored into the overall potential effect upon Round Whitefish populations in addition to thermal discharge effects. [OPG Letter, CD# NK054-CORR-00531-00190]	Appendix C: P-AQ-1 CNSC has approved the closure of D-P-15.1 and this remaining commitment will be tracked under D-C-1.2.
	DFO will work with the CNSC, and the MNR to develop an impingement and entrainment sampling program. The Government of Canada would also like to note that authorization under the Fisheries Act will be required prior to any lake infill taking place and commits that DFO will work with OPG to ensure that the impingement and entrainment sampling program is developed and implemented as a condition of that authorization. [GOC Response to JRP Rec.30]	Appendix C: C-AQ-3 CNSC has approved the closure of D-P-15.1 and this remaining commitment will be tracked under D-C-1.2. This commitment is duplicated under D-P-12.4.
D-P-12.5 Terrestrial Environment – Methodology Reports	Monitor conditions to confirm the EIS predictions of habitat restoration post construction. [EIS, Table 11.6-2]	Appendix D: P-TE-2 C-TE-2 O-TE-2
	OPG to undertake an adaptive management approach as part of a Follow-up and Monitoring Program for nesting Bank Swallows on site, involving creation of new banks of predetermined characteristics for the birds to nest in, monitoring the results in terms of numbers of successful nests created, and adapting the best design for the creation of additional sites. [OPG Letter, CD# NK054-CORR-00531-00190]	Appendix D: P-TE-1 C-TE-1 O-TE-1 The above activities address monitoring Bank Swallow colonies and undertaking adaptive management. B-TE-2 addresses development of new habitat.

Commitment #	Commitment Text	EMEAF Plan Reference
	Verify the results (of the bank swallow mitigation plan) predicted in the EIS during initial operation of the DNNP. [EIS, Table 11.6-2]	Appendix D: P-TE-1 O-TE-1
	Periodically conduct wildlife mortality studies during site preparation and construction. [EIS, Table 11.6-2] • Duration: Throughout site preparation phase and site construction phase; • Frequency: Estimated total of 20 monitoring events annual (removal study conducted to calibrate); and • Location: Local Study Area.	Appendix D: P-TE-3 C-TE-3 Note that part of the objective of monitoring bird strike mortality is to confirm the effectiveness of mitigation measures if large structures such as cooling towers are constructed. Since cooling towers are not planned based on the decision to utilize a once-through cooling system, bird monitoring is no longer applicable.
	Further site and species specific information pertaining to Bobolink will be required. [OPG Letter, CD# NK054-CORR-00531-00190]	Appendix D: B-TE-4
	OPG to develop a follow-up program to verify the effectiveness of mitigation measures for mammals. [OPG Letter, CD# NK054-CORR-00531-00190]	P-TE-2 O-TE-2 O-TE-4
	Further work to be done to determine whether proposed activities will have an effect on the Least Bittern. [OPG Letter, CD# NK054-CORR-00531-00190]	Appendix D: B-TE-4 regarding baseline work; However, since the EA, Least Bittern has not been documented as breeding at the DN site based on observations during the surveys conducted for the DN Biodiversity Program, this may no longer be applicable. O-TE-4
	OPG to develop a follow-up program for insects, amphibians and reptiles, and mammal species and communities as appropriate, with a focus for this follow-up program on species at risk and the use of this follow-up program to verify the conclusions of the Ecological Risk Assessment. [GOC Response to JRP Rec. 22]	Appendix D: B-TE-5 P-TE-2 O-TE-4
	OPG to collaborate with EC to develop a follow-up program for bird communities should natural draft cooling towers be chosen for the condenser cooling system, and include consideration of potential impacts from habitat disturbance, as well as from bird collision impacts, in the scope of that program. [GOC Response to JRP Rec. 23]	Appendix D: O-TE-3 Cooling towers are no longer applicable due to plans to utilize a once-through cooling system. This is no longer applicable.
	OPG to conduct more sampling to confirm the presence of Least Bittern before site preparation activities begin. [GOC Response to JRP Rec. 25]	Appendix D: B-TE-4 OPG has undertaken annual monitoring for Least Bittern which is documented in the annual Darlington Biodiversity Program reports. Since the EA, Least Bittern has not been documented as breeding at the DN site. There have been two recordings of Least Bittern on site which were identified as likely late migrants and

Commitment #	Commitment Text	EMEAF Plan Reference
		wandering non-breeding individuals. One Least Bittern was observed in Coot's Pond in 2012 and identified as a possible breeder. One Least Bittern was found dead in 2018 in the east end of the Protected Area.
D-P-12.6 Geological and Hydrogeological Environment – Methodology Reports	Monitor groundwater flow and quality to confirm EIS predictions [EIS, Table 11.6-2] • Duration: Prior to and throughout site preparation phase and throughout site construction phase. During plant commissioning activities (assumed to be 2 years); • Frequency: Two monitoring events per year prior to commissioning. During commissioning, quarterly sampling events; and • Location: Site Study Area.	Appendix E: B-GH-1 P-GH-1 C-GH-1 O-GH-1
	Confirm EIS predictions post construction of on-site groundwater regime. [EIS, Table 11.6-2] • Duration: Operation and Maintenance phase (early life period); • Frequency: Update groundwater flow modeling following at least 1 year of quarterly monitoring data. Repeat after 5 years; and • Location: Site Study Area.	Appendix E: O-GH-4
	Confirm base flow estimates in Darlington Creek at the beginning of the Operations phase. [EIS, Table 11.6-2] • Duration: Prior to site preparation phase (to confirm baseline conditions) and at completion of site construction phase; • Frequency: Quarterly flow monitoring; and • Location: Darlington Creek at minimum of 3 locations adjacent to the DN Site.	Appendix E: B-GH-3 C-GH-3
	OPG will continue to monitor groundwater quality, particularly for radionuclides, both on the Project site and at off-site locations (as a component of the REMP) given that atmospheric deposition is the primary source of tritium in groundwater. [OPG Letter, CD# NK054-CORR-00531-00190]	Appendix E: O-GH-3
	OPG to develop and implement a follow-up program for soil quality during all stages of the project. [GOC Response to JRP Rec.11]	Appendix E: B-GH-2 (associated baseline) P-GH-2 C-GH-2 O-GH-2
	OPG to provide an assessment of the ingress and transport of contaminants in groundwater on site during successive phases of the Project as part of the Construction Licence Application. This assessment shall include consideration of the impact of wet and dry deposition of all contaminants of potential concern and gaseous emissions on groundwater quality. OPG to conduct enhanced groundwater and contaminant transport modelling for the assessment. For clarity, GOC supports enhanced groundwater and contaminant transport modelling extending to appropriate model boundaries, which may not necessarily be site boundaries. [GOC Response to JRP Rec. 17]	Appendix E: P-GH-3
	OPG to expand the scope of the groundwater monitoring	Appendix E:

Commitment #	Commitment Text	EMEAF Plan Reference
	program to monitor transitions in groundwater flows that may arise as a consequence of grade changes during the site preparation and construction phases of the Project. The design of the grade changes should guide the determination of the required monitoring locations, frequency of monitoring and the required duration of the program for the period of transition to stable conditions following the completion of construction and the initial period of operation. [GOC Response to JRP Rec. 19]	B-GH-1 (associated baseline) P-GH-1 C-GH-1 O-GH-1
D-P-12.7 Land Use – Methodology Reports	OPG will continue to monitor land use activity in proximity to the DNNP site and consult with Municipality of Clarington and the Regional Municipality of Durham on proposed land use changes and effects on implementation of emergency plans. [EIS Section 5.8.5.2; Table 5.15-1; Table 11.6-2; EIS IR 54 Resubmission]	Appendix F: B-LU-1 (associated baseline) P-LU-1 C-LU-1
	Confirm projected population, at the end of the site preparation and construction activities, to ensure that emergency response plan is consistent with the projections. [EIS Table 11.6-2] • Location: At completion of site preparation phase and at completion of site construction phase; • Frequency: One-time event, two occurrences; and • Location: Regional and Local Study Areas.	Appendix F : P-LU-2 C-LU-2
	OPG will continue to monitor planning developments near its facilities and participate as required. [OPG 2009, Section 8.0]	Appendix F : P-LU-1 C-LU-1
D-P-12.8 Traffic and Transportation Environment – Methodology Reports	As part of the Traffic Management Plan, undertake a pre-Project road condition assessment as a baseline for considering incremental Project-related degradation. Follow with periodic inspections of road conditions to document changes relative to baseline during construction. [EIS Table 11.6-2] • Duration: Prior to and throughout site preparation phase and throughout site construction phase; • Frequency: Annual event; • Locations: Key roadways in Local Study Area; and subject to truck traffic associated with the Project.	Appendix G: B-TT-1 P-TT-1 C-TT-1 Current plans for the DNNP do not require significant movement of soil offsite, therefore a physical pre-Project road condition assessment is not required. Monitoring will focus on traffic conditions instead of physical degradation of roads. Further discussion is found in Section 4.7.2.
	As part of the Traffic Management Plan, at the beginning of the Operation and Maintenance phase, verify road safety as predicted in the Environmental Impact Statement. [EIS Table 11.6-2] • Duration: Beginning of operation and maintenance phase; • Frequency: One-time event; and • Locations: Key roadways in LSA subject to truck traffic associated with the Project.	Appendix G: O-TT-1
	The Traffic and Transportation Environment and EA follow-up program will align with the Traffic Management Plan (D-P-10.1) as needed.	Appendix G: B-TT-1 (associated baseline) P-TT-1 C-TT-1 O-TT-1
	In the event that a once-through condenser cooling system is chosen for the Project, prior to construction, TC will work with	Appendix G: P-TT-2

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	OPG to develop a follow-up program to verify the accuracy of the prediction of no significant adverse effects to boating safety from the establishment of an increased prohibitive zone. OPG must also develop an adaptive management program, if required, to mitigate potential effects to small watercraft. If an adaptive management program is required, TC can provide support and expertise to OPG in its development. [GOC Response to JRP Rec. 51]	C-TT-2 O-TT-2
D-P-12.9 Health – Human and Non-Human Biota – Methodology Reports	No residual adverse effects on non-human biota are predicted. However, if follow-up and monitoring programs conducted for other environmental components suggest changes or conditions that may lead to effects on non-human biota, the Ecological Risk Assessment will be updated, including the identification of mitigation measures or other actions that may be appropriate to address such effects. [EIS Table 11.6-2]	Appendix H: C-H+NHB-1 O-H+NHB-1 C-H+NHB-2 (Human Health) O-H+NHB-2 (Human Health) While Human Health Risk Assessment is not specifically identified in commitment D-P-12.9, it should be considered as well along with the Ecological Risk Assessment.
	A Follow-up and Monitoring program to be established to confirm the predictions that the Project will not result in significant ecological risk arising from conventional and radiological substances, and that the Radiological Environmental Monitoring Program be revised, in consultation with relevant government agencies, including EC. [OPG Letter, CD# NK054-CORR-00531-00190]	Appendix H: C-H+NHB-1 O-H+NHB-1
	The chemical emissions from the nuclear facility will be evaluated during the design process and, if necessary, the Ecological Risk Assessment and the Human Health Risk Assessment will be updated, and any identified risks or areas which require further study will be included in the Environmental Assessment Follow-up Monitoring program. [EIS IR 240 Resubmission 2]	Appendix H: P-H+NHB-3
	If the Cooling Tower option is adopted, an Ecological Risk Assessment to be conducted on the blowdown pond if there is a risk that wildlife will use or drink from the pond. [OPG Letter, CD# NK054-CORR-00531-00190] (Note: Cooling tower option was not selected for DNNP [See D-C-1.1 closure and OPG Letter, CD# NK054-CORR-00531-00253])	Appendix H: O-H+NHB-3: This is not applicable with the decision to utilize a once-through cooling system.
	OPG to conduct a detailed assessment of predicted effluent releases from the Project. The assessment should include but not be limited to effluent quantity, concentration, points of release and a description of effluent treatment, including demonstration that the chosen option has been designed to achieve best available treatment technology and techniques economically achievable. [GOC Response to JRP Rec. 14]	Appendix H: P-H+NHB-1
	OPG to develop a comprehensive assessment of hazardous substance releases and the required management practices for hazardous chemicals on site once a reactor technology has been chosen. [GOC Response to JRP Rec. 26]	Appendix H: P-H+NHB-2