



Date: 2026-08-12

**Reference from the
Nuclear Transparency Project**

**Référence du
Projet de transparence nucléaire**

In the matter of

À l'égard de

Ontario Power Generation

Ontario Power Generation

Application to refurbish Pickering Nuclear
Generating Station and to renew licences for
the Pickering Nuclear Generating Station and
Waste Management Facility

Demande concernant la réfection de la
centrale nucléaire de Pickering et le
renouvellement de ses permis pour la
centrale et l'installation de gestion des
déchets

**Commission Public Hearing
Part 2**

**Audience publique de la Commission
Partie 2**

October 2026

Octobre 2026

Pickering Nuclear Generating Station Refurbishment and Licence Renewal for Pickering Nuclear Generating Station and Pickering Waste Management Facility

Information Requests from NTP	Response
1. Because OPG compares the current Darlington DWI with Pickering's current surface water intake, we are interested in similarities and differences between Darlington's and Pickering's shoreline and lakebed ecology. Did OPG undertake any studies comparing the habitat and species presence for flora and fauna around the Darlington NGS shoreline and out to its cooling water intake with habitat and species presence for flora and fauna along the lakebed area that would be impacted by the construction of a new DWI for the Pickering NGS?	For both DNGS and PNGS refurbishment, monitoring programs were designed to characterize the existing aquatic environment (Ecometrix 2018, Ecometrix 2020, Ecometrix 2026). Comprehensive studies included aquatic habitat (substrate) assessment, fish communities, ichthyoplankton (egg and larval fish), benthic macroinvertebrate, macrozooplankton communities, and fish spawning studies. For ease, we've attached a short summary Table 1 at the end of this response table on the similarities and differences. Fish protection mitigation measures are proposed at the intake structure at PNGS such as coarse screening to minimize environmental impacts.
2. Did OPG perform any studies comparing projected costs for a new DWI lakebed intake for Pickering against projected costs of closed-cycle cooling systems?	The project did explore this option. The closed-cycle cooling (loop tunnel similar to DNNP) was explored as a business case option but was not the preferred option for DWI due to technical and financial parameters.
3. Has OPG employed, or considered the employment of, species-specific netting practices, underwater observation, or eDNA methods to monitor impingement in addition to current impingement monitoring methods employed at the Pickering NGS?	During the evaluation of options to mitigate the impacts to the aquatic environment from the taking of cooling water several technological methods were considered. The decision to proceed with the Fish Diversion System was recommended as it provided the best opportunity to meet the CNSC requirement to reduce fish impingement by 80 percent. This requirement was met in 2012.
4. Has OPG ever considered non-chemical methods for biofouling, mussel control, corrosion support, such as non-stick silicone coatings or electromagnetic treatments?	Yes — Ontario Hydro / OPG did consider non-chemical methods for mussel biofouling control, including ultrasonic deterrence, cavitation, non-stick coatings, UV light, self-cleaning filters, electromagnetic deterrence, gamma irradiation, and thermal shock. However, many of

	these methods were only partially successful, often providing localized protection or working only against specific mussel life stages. As a result, they were generally not considered as feasible or broadly implementable as the existing chlorination system, which remained the more effective treatment approach for large-scale station use.
5. There appear to be two pathways by which contaminated groundwater may reach Lake Ontario through PNGS-B infrastructure: first, from Units 5–8 (reactor-building foundation) flowing to the RLWMS then to monitored liquid effluent discharge to Lake Ontario; second, from unit 5/6 (groundwater) flowing into the area beneath IFB-B, toward TAB IAD sumps via TAB foundation-drain influence, and then the CCW (Condenser Cooling Water) intake duct which releases to the forebay and Lake Ontario. Is this correct? a. The first pathway appears to be monitored (e.g. radiological classification, accounting, possible hold-up, sampling, and discharge control), but the same does not appear to be true for the second pathway. Is this correct? b. Is there a numerical trigger for contaminant concentrations in groundwater for all pathways that would require the water to be held, resampled, redirected to RLWMS, reported, or otherwise controlled? If so, what would that threshold be? c. Does OPG have any contingency actions for water that is classified as “inactive drainage” but may receive tritium-impacted groundwater from a known million-Bq/L pathway?	Groundwater protection and monitoring and the effluent monitoring program at Pickering Nuclear Generating Station (PNGS) are in compliance with all regulatory requirements, including CSA N288.7 (Groundwater protection and monitoring programs for nuclear facilities and uranium mines and mills), CSA N288.5 (Effluent and emissions monitoring programs at nuclear facilities), CSA N288.8 (Establishing and implementing action levels for releases to the environment from nuclear facilities), and the MECP Environmental Compliance Approval (ECA). At PNGS, groundwater seepage is primarily captured in several sumps and routed to monitored discharge pathways to the lake. For example, some seepage is discharged through the Radioactive Liquid Waste Management System (RLWMS), which is a monitored pathway subject to strict regulatory requirements for pre-discharge sampling and analysis of both radioactive and non-radioactive substances. a. All drainage and seepage within the protected area are directed to the RLWMS for sampling and analysis prior to discharge to the lake. b. All discharges through the RLWMS require pre-discharge sampling and analysis.

d. Will OPG implement event-based monitoring for Unit 5/6 groundtubes, IFB-B groundtubes, TAB IAD sumps, CCW intake duct water, forebay, and final discharge during refurbishment?	c. All discharges, including those from inactive drainage systems, are sampled and analyzed in accordance with regulatory requirements. d. OPG's effluent monitoring program and groundwater protection and monitoring program cover all types of discharges in accordance with regulatory requirements, as described above.
6. Are OPG's proposed releases of tritium-contaminated groundwater into the Pickering NGS forebay a recent development? What is the rationale for this practice? a. Has OPG done any assessments of potential environmental impacts associated with resulting tritium loadings to the lake (including modelling how this tritium might move through lake currents and interact with aquatic biota)? While diluted, total tritium loadings would still be significant.	All discharges, including groundwater seepage, are routed through monitored pathways that are managed in accordance with all applicable regulatory requirements. a. OPG has a comprehensive Environmental Monitoring Program (EMP), which is compliant with CSA N288.4 (Environmental Monitoring Programs at Nuclear Facilities and Uranium Mines and Mills). The sampling program under the EMP includes samples from relevant media (water, sediment, etc.). The results of the EMP are published annually in a publicly accessible report.
7. Might there be activity stoppages or any slowing down of operations at the Pickering NGS that could affect the projected on-site flowrate of 2,050,000 m³/day for the once-through reactor cooling system? a. If so, has the effect of lower flow rates on dilution for released contaminated groundwater been taken into account? And how (again, if so)?	2,050,000 m³/day is the assumed minimum flowrate for the licensing period and flow is not anticipated to be lower than this. For consideration, the modeling that was conducted in previous assessments (2017 Safe Storage Predictive Effects Assessment, 2022 PEA Addendum) had assumed much lower flows and both of these also predicted that there would not be adverse effects to human nor ecological receptors.
8. We would like to better understand how refurbishment activities may overlap or intersect	

with ongoing Pickering NGS maintenance work, especially as it relates to releases to groundwater. Will refurbishment works include or affect ongoing maintenance?	Pickering Refurbishment activities will be planned and executed in coordination with ongoing station operations and maintenance activities.
a. We have learned from past meetings with OPG about a series of leaks to groundwater between 2015-2019 from valves, construction joints, around moderator rooms and adjacent areas. Will these areas be subject to refurbishment-related works?	Established environmental and operational controls will continue throughout the transition to refurbishment to protect groundwater and manage potential impact to groundwater. Where refurbishment activities interface with operating station systems, work planning processes will identify and manage potential conflicts in advance. Protection of the environment, nuclear safety, and regulatory compliance will continue to guide project execution, while the Pickering Nuclear site groundwater protection and monitoring program will remain in compliance with CSA N288.7. Some of the identified areas may be included within future refurbishment work scopes. Any work will be executed under established environmental protection and groundwater monitoring requirements.
b. We are still learning about current and ongoing leaks from Pickering's fuel bay. Does OPG plan to address this issue as part of its refurbishment activities?	Fuel Bay leakage (Irradiated Fuel Bay-B (IFB-B) and Auxiliary Irradiated Fuel Bay (AIFB)) is internal to the station and is contained. The leakage is through the bay's internal liner system into the designed interspace and is captured in interspace sumps. Bay water is retained within engineered containment and does not pose a risk of uncontrolled release to the environment. Nuclear safety is maintained through multiple layers of monitoring and controls. Bay level is continuously monitored (alarms, operator checks, procedural controls) to ensure the water shielding is maintained above the spent fuel. The issue does not pose a nuclear safety risk. The leaked water is pumped back to the bay in a closed loop. There is adequate pumping capacity as well as system redundancy, with only 1 pump required for each bay.

	Environmental protection is verified through monitoring. Quarterly groundwater sampling (including tritium as a key indicator) shows no adverse trends attributable to these bays. There is robust monitoring and regular reporting at oversight forums at the station level. OPG has an approved project to repair the liners. This Project includes comprehensive liner inspection (walls/floor), definition of repair scope, and execution of repairs coordinated with refurbishment/defuel constraints. Inspection work and repairs have been scheduled to occur during the upcoming licensing period.
9. OPG notes dismantling and refurbishment-related works will not significantly affect the movement (direction or flow rates) of groundwater below the Pickering NGS. Are there more detailed assessments of this than what is contained in the 2022 PEA or 2025 PERA?	The groundwater movement below the Pickering NGS is not expected to change significantly in direction or flow rate. Accordingly, the assessments reflected in the 2022 PEA and the 2025 PERA remain valid. The conclusion is based on the nature of the planned works and the absence of material changes to subsurface conditions that would be expected to alter the existing hydrogeologic conditions.

Table 1. Similarities and Differences in Fauna/Flora and Lakebed Ecology and Habitat between PNGS and DNGS.

Aquatic Component (Fauna/Flora and Lakebed Ecology and Habitat)	Similarities (PNGS/DNGS)	Differences (PNGS/DNGS)
Lakebed Ecology- Attached Algae (<i>Cladophora</i>) Macrophytes (aquatic plants)	Attached algae common throughout nearshore, mid-depth and deepwater areas including the proposed intake area. Few macrophytes due to exposed shoreline	Higher abundance of attached algae at PNGS (possibly due to nutrient loading from nearby water treatment facility)

Fish Community (nearshore, mid-depth, deepwater areas including proposed intake area)	Seasonal offshore-onshore-offshore movement of fish with varies with depth. Most fish species consistent of north shore environment of Lake Ontario (e.g. Alewife, Round Goby, various salmonids including Lake Trout).	Round Whitefish more common at PNGS than DNGS. Lake Whitefish also present at PNGS but not DNGS. Lake Sturgeon (one) also collected in deepwater at PNGS
Lakebed Ecology- Ichthyoplankton near bottom (fish eggs and larvae)	Dominated by species such as Alewife, Rainbow Smelt (DNGS), and Round Goby which are common to the north shore of Lake Ontario.	Lake Whitefish and Burbot larvae reported at PNGS but not at DNGS. Deepwater Sculpin observed at DNGS but not at PNGS
Lakebed Ecology - Benthic Invertebrates	Common community structure dominated by Quaggas and Zebra mussels	-
Water Column- Macrozooplankton	Common community structure dominated by Copepods and Cladocerans	-
Lakebed Habitat- Nearshore	No unique fish habitat- consistent of exposed north shore environment with wind and wave action. Silt/sandy substrate with cobbles, rocks and boulders which vary with depth	Higher concentrations of silt/sand deposits at shoreline at PNGS than at DNGS.

Lakebed Habitat- Mid-depth and Deepwater including proposed intake area	No unique fish habitat. Silt/sandy substrate with cobbles, rocks and boulders which vary with depth	At deeper depths (> 15m), appears to be higher concentration of cobble substrate at PNGS (south-east) than at DNGS.
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References

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