



Canadian Nuclear  
Safety Commission

Commission canadienne  
de sûreté nucléaire

# *Methodology Used to Determine the Significance of Adverse Environmental Effects*

OPG's DGR for Low- and Intermediate-level  
Radioactive Waste

**REVISED**  
PMD 14-P1.2D

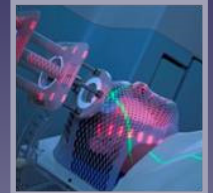
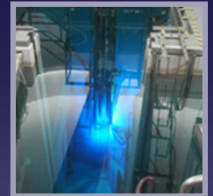
CNSC Staff Presentation  
Joint Review Panel Hearing

[nuclearsafety.gc.ca](http://nuclearsafety.gc.ca)

9-19 September 2014

e-Doc 4495075 PPT

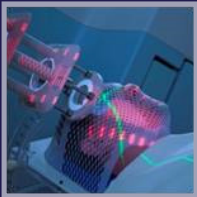
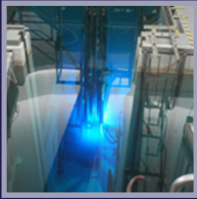
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# Presentation Overview

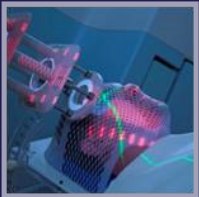
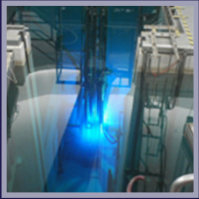
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- ✦ CNSC staff previous assessment
- ✦ Basis for CNSC staff review
- ✦ CNSC staff's significant adverse effects determination: Terrestrial Environment
- ✦ OPG's response to Information request EIS-12-510
- ✦ Impact on previous CNSC staff assessments

# CNSC Staff Previous Assessment

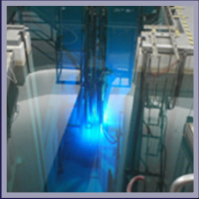
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- ✦ CNSC staff's initial assessment of the significance of residual adverse effects on the biophysical environment and on Aboriginal interests was provided in CNSC staff's PMD 13-P1.3
- ✦ CNSC staff's response to Joint Review Panel (JRP), undertaking # 53:
  - panel request for additional information on CNSC staff's evaluation of significance, including methodology and criteria used in the assessment
  - environmental aspects covered included hydrology and surface water, aquatic environment, terrestrial environment, human health (hazardous substances), and dose to non-human biota

# Basis for CNSC Staff's Assessment and Review

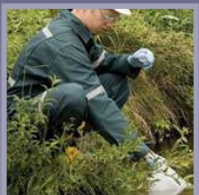
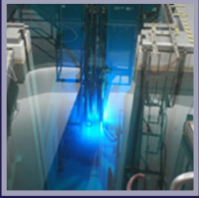
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- ❖ CNSC staff used a number of methods to determine significance, depending on the biophysical component being assessed
- ❖ CNSC staff did not rely solely on OPG's methods for determining significance
- ❖ Criteria used by CNSC staff as outlined in EIS Guidelines include:
  - magnitude, geographic extent, timing, duration, frequency, reversibility, ecological and social/cultural context, and probability of occurrence
- ❖ Weight of evidence approach – considering each significance criterion collectively

# *Basis for CNSC Staff Review (cont'd)*

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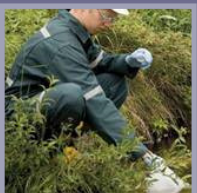
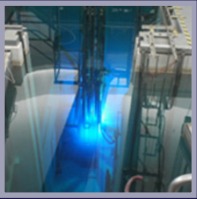
- ❖ CNSC staff's response to undertaking #53 provides a list of the documents, standards, guidance, and objectives used for significance determination:
  - these include regulatory documents, environmental standards, guidance and objectives published by federal, provincial or international agencies
- ❖ If applicable quantitative standards did not exist, then significance was determined using factors such as, but not limited to, ecological function and the presence of other unique features

# Summary of Residual Adverse Effects

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🍁 OPG identified eight residual adverse effects for the site preparation and construction as well as operations phases of the proposed DGR project for the following components of the biophysical environment:

- hydrology
- terrestrial environment
- aquatic environment
- noise and vibration
- atmospheric environment
- Aboriginal interests

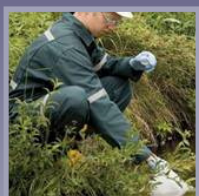
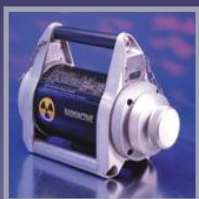
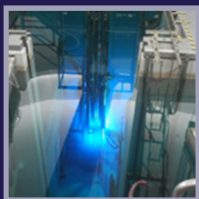


# Significant Effect Determination: Terrestrial Environment (1)

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## Summary of Residual Effect

- ❖ For the terrestrial environment, a residual adverse effect was predicted from the loss of eastern white cedar within the DGR footprint associated with clearing of 8.9 hectares of mixed woods forest during site preparation and construction
- ❖ The eastern white cedar was selected as a valued ecosystem component for the following reasons:
  - it is an abundant tree species in the local study area
  - it is slow-growing, and plays an important role in providing wildlife habitat
  - it is preferred by white-tailed deer as a food and shelter source in winter
  - as a conifer, it may be sensitive to changes in air quality



# Significant Effect Determination: Terrestrial Environment (2)

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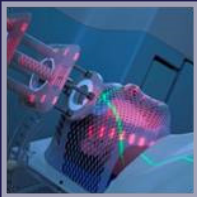
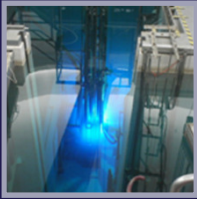
## EIS Significance Criteria

### ✦ Magnitude:

- definitive quantitative benchmarks for characterizing the magnitude of forest removal are not available

### ✦ Geographical Extent:

- site preparation activities will result in removal of 8.9 ha of mixed forest
- additional forest exists within the northeast, and southern part of the Site Study Area (SSA), the latter being the largest on-site woodland contiguous with the forest of Inverhuron Provincial Park
- removal of 11% of the mixed forest in the SSA
- 8.9 ha represents less than 1% of mixed forest in the local study area (LSA)



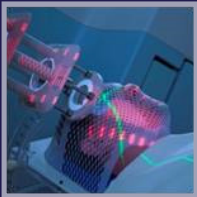
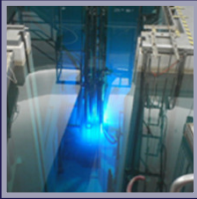


# Significant Effect Determination: Terrestrial Environment (3)

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## EIS Significance Criteria

- ✿ Timing, duration, and frequency:
  - effect will begin during site preparation and will be continuous throughout operations
- ✿ Probability of occurrence:
  - clearing will be required if DGR Project is approved
- ✿ Reversibility:
  - site rehabilitation will occur during decommissioning and OPG plans include regeneration of mixed forest.
  - given the duration of the Project, the effect was not considered reversible for the purpose of significance determination



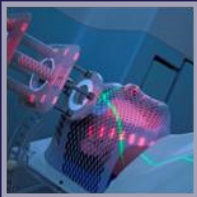
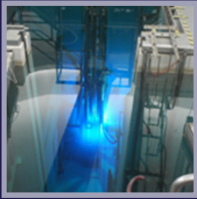
# Significant Effect Determination: Terrestrial Environment (4)

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## EIS Significance Criteria

### ✦ Ecological context:

- forest to be cleared does not contain features unique to the LSA
- limited ecological function due to small size, fragmentation and high level of disturbance
- habitat connectivity:
  - the fragmented forests are utilized occasionally by wildlife (wild turkey, white-tailed deer)
  - given the location of the DGR site, these forests do not function as important corridors for bird and wildlife movement



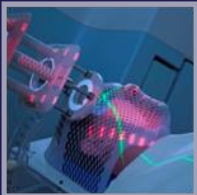
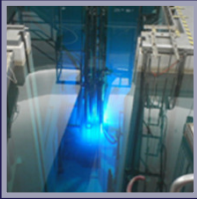
# Significant Effect Determination: Terrestrial Environment (5)

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## EIS Significance Criteria

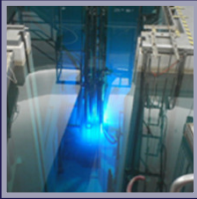
### 🍁 Ecological context (cont'd):

- sustainability of the local population of eastern white cedar:
  - the 8.9 ha forest area to be removed represents less than 1% of forest in LSA
  - not critical to sustainability in the LSA
  
- sustainability of birds and wildlife species utilizing the forest to be removed:
  - on-site forests are occupied by species which are tolerant of disturbance and fragmented habitat
  - due to the small size, the forest does not provide interior habitat for area-sensitive species.
  - removal of this low quality habitat will not have measurable impacts on local bird and wildlife populations in the LSA



# *Significant Effect Determination: Terrestrial Environment (6)*

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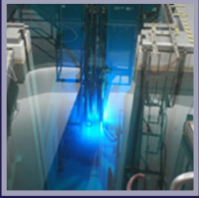


## 🍁 CNSC staff assessment:

Based on the CNSC staff's evaluation of significance of the residual adverse effect on the terrestrial environment, resulting from removal of 8.9 ha of fragmented mixed forest, the DGR project is not likely to result in significant adverse effect on the terrestrial environment, taking into account the implementation of mitigation measures.

# Summary of Information Request

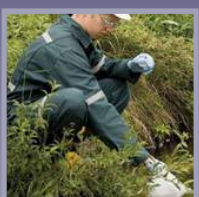
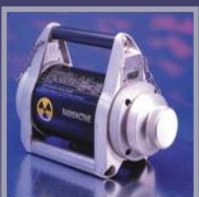
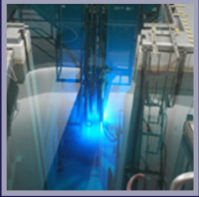
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- ❖ Information Request (IR) EIS-12-510 to provide detailed explanation of the determination of the significance of residual adverse effects on:
  - the biophysical environment
  - Aboriginal interests

# Sufficiency Review of IR EIS-12-510

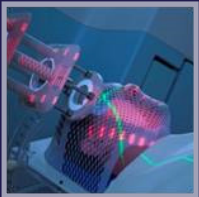
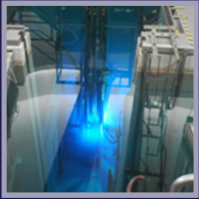
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- ❖ OPG's methodology outlined in their response to IR EIS-12-510 used a series of hypothesis statements for each residual effect and applied context-based reasoning to make a determination regarding each hypothesis
- ❖ Effects were characterized using EIS significance criteria
- ❖ Results of the significance determination using this approach did not differ from those presented in the EIS
- ❖ CNSC staff reviewed OPG methodology and concluded that the approach and reasoning are acceptable

# Impact on Previous CNSC Staff Assessments

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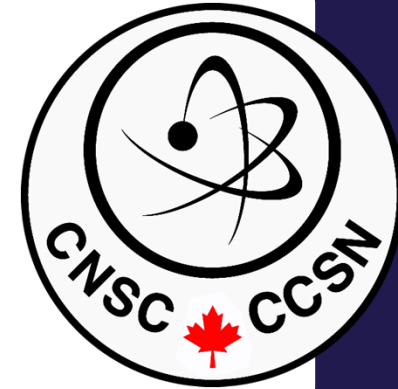
- ❖ Impact to PMD 13-P1.3 EIS:
  - no new information provided that changes CNSC staff conclusions for the review of the significance of adverse effects
  - CNSC staff's conclusions with respect to OPG's EIS submissions remain as presented in PMD 13-P1.3
  
- ❖ Impact to PMD 13-P1.2 licensing:
  - CNSC staff remain satisfied that OPG is qualified and will make adequate provisions to protect persons and the environment
  - CNSC staff's conclusions with respect to OPG's request for a Licence to Prepare a Site and Construct the DGR Project remain as presented in PMD 13-P1.2



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# Thank You!



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