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Nuclear Power Demonstration Closure Project

SOCIO-ECONOMIC ASSESSMENT TECHNICAL SUPPORTING DOCUMENT

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August 2017

Canadian Nuclear Laboratories | Laboratoires Nucléaires Canadiens

SOCIO-ECONOMIC REPORT - NPD CLOSURE PROJECT

NPD DECOMMISSIONING

64-509200-REPT-007

Revision 0

	CNL	LNC
☐ ACCEPTED AS NOTED	☒ ACCEPTED	☐ NOT ACCEPTED

Signature	Representing	Date
Meggan Vichorel	gen	2017/08/02

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SOCIO-ECONOMIC ASSESSMENT TECHNICAL SUPPORTING DOCUMENT

NPD Closure Project

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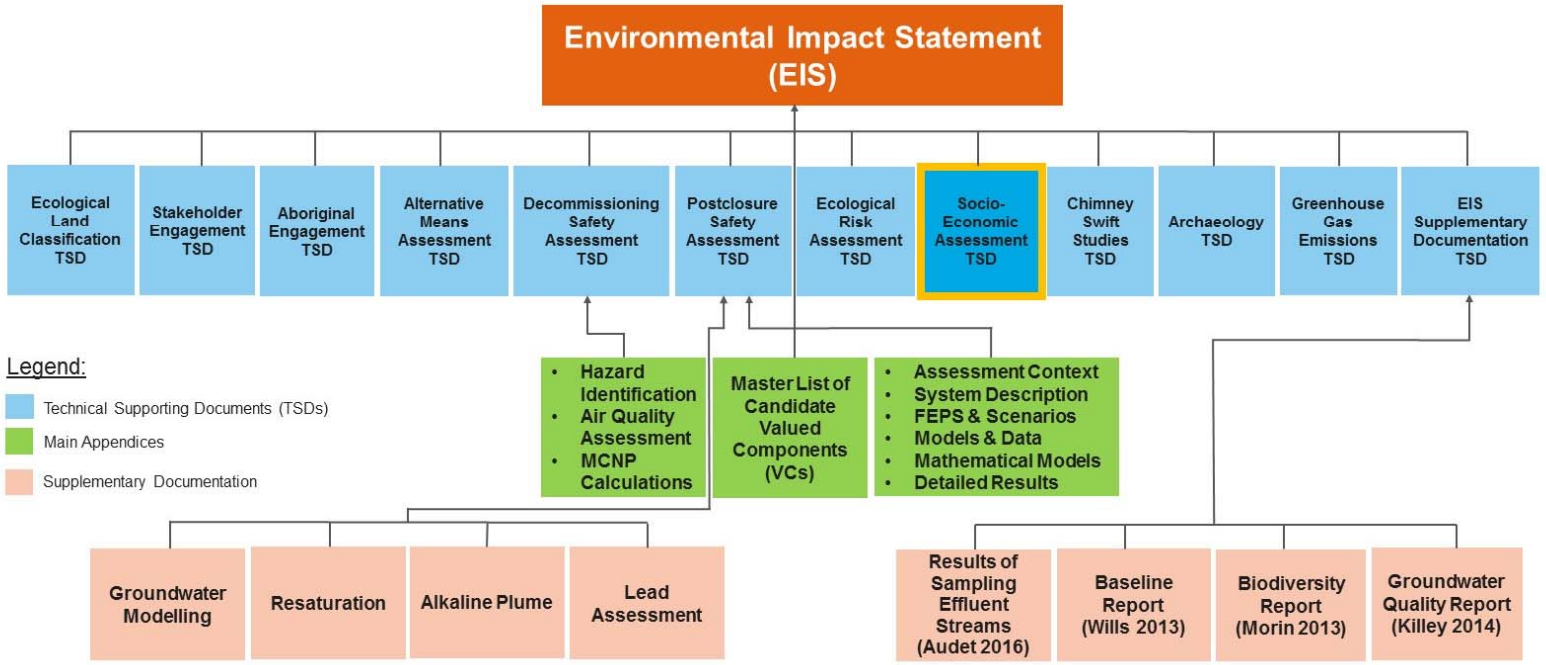
This Technical Supporting Document (TSD) has been prepared in support of the Nuclear Power Demonstration (NPD) Closure Project. The project qualifies as a Designated Project under the *Canadian Environmental Assessment Act (2012),* and therefore, an Environmental Impact Statement (EIS) has been prepared as part of the Environmental Assessment process.

The findings of this TSD have been summarized in the NPD Closure Project EIS (CNL Doc #64-509200-ENA-004). The following figure shows the various documents associated with the EIS, and their relationships.



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ACRONYMS AND ABBREVIATIONS

AECL	Atomic Energy of Canada Limited
CNL	Canadian Nuclear Laboratories
CNSC	Canadian Nuclear Safety Commission
CRL	Chalk River Laboratories
ha	hectare
km	kilometres
MOECC	Ministry of the Environment and Climate Change
MNDM	Ministry of Northern Development and Mines
MNR	Ministry of Natural Resources
MNRF	Ministry of Natural Resources and Forestry
MTO	Ministry of Transportation
NPD	Nuclear Power Demonstration
NPDNGS	Nuclear Power Demonstration Nuclear Generating Station
NGS	Nuclear Generating Station
NPDWF	Nuclear Power Demonstration Waste Facility
NRSA	North Renfrew Snowmobile Association
OPG	Ontario Power Generation
OVF	Ottawa Valley Forest
SCSA	Snow Country Snowmobile Association
SWS	Storage with Surveillance
sq	square
TOP	Trans Ontario Provincial
TSD	Technical Support Document
ZEC	Zone d'exploitation Controlee

1 INTRODUCTION

This Technical Support Document (TSD) addresses the socio-economic environment affected by the in-situ decommissioning of the Nuclear Power Demonstration Waste Facility (NPDWF) in Rolphton, Ontario. The TSD provides a general description of the Nuclear Power Demonstration (NPD) Closure Project ("the Project"), baseline conditions of the potentially affected socio-economic environment, potential effects from the proposed Project, and proposed mitigation measures. Additional environmental features are addressed in other technical support documents.

This TSD was prepared by Arcadis as a supporting document to the Environmental Impact Statement (EIS) prepared pursuant to the *Generic Guidelines for the Preparation of the Environmental Impact Statement* (CNSC 2016). The EIS report describes the proposed undertaking, and provides a summary of the overall baseline environmental setting and anticipated environmental effects, and provides recommended mitigation measures to minimize or obviate these effects.

This TSD is organized into five sections:

- Section 1.0 Introduction – this section;
- Section 2.0 Project Description – provides an overview, location and description of the Project;
- Section 3.0 Scope of Assessment – provides the rationale for the scope of socio-economic assessment;
- Section 4.0 Methodology – describes the temporal and spatial boundaries of the socio-economic assessment as well as the data sources used;
- Section 5.0 Description of the Existing Socio-Economic Environment – describes the baseline socio-economic environment and land use conditions in the study areas; and,
- Section 6.0 Impact Assessment and Mitigation – details the assessment of socio-economic and land use effects, presents mitigative measures to minimize or obviate these effects and delineates the net effects.

2 PROJECT DESCRIPTION

2.1 Project Overview

The NPD Nuclear Generating Station (NGS) was operated by Ontario Hydro from 1962 until 1987. Following permanent shutdown of the NPDNGS in 1987, the operating and compliance responsibilities were transferred from Ontario Hydro to Atomic Energy of Canada Limited (AECL), a federal crown corporation, and the facility was renamed the NPDWF. This Class I nuclear facility is presently in the Storage with Surveillance (SWS) phase of decommissioning.

The proponent of the project is Canadian Nuclear Laboratories (CNL). CNL is a private sector company that is contractually responsible for the management and operation of AECL's nuclear sites, facilities and assets, including the NPD site, and for the performance of AECL's waste and decommissioning responsibilities. CNL is proposing to carry out a designated project on land that is held in the name of AECL and is therefore, property of the Crown.

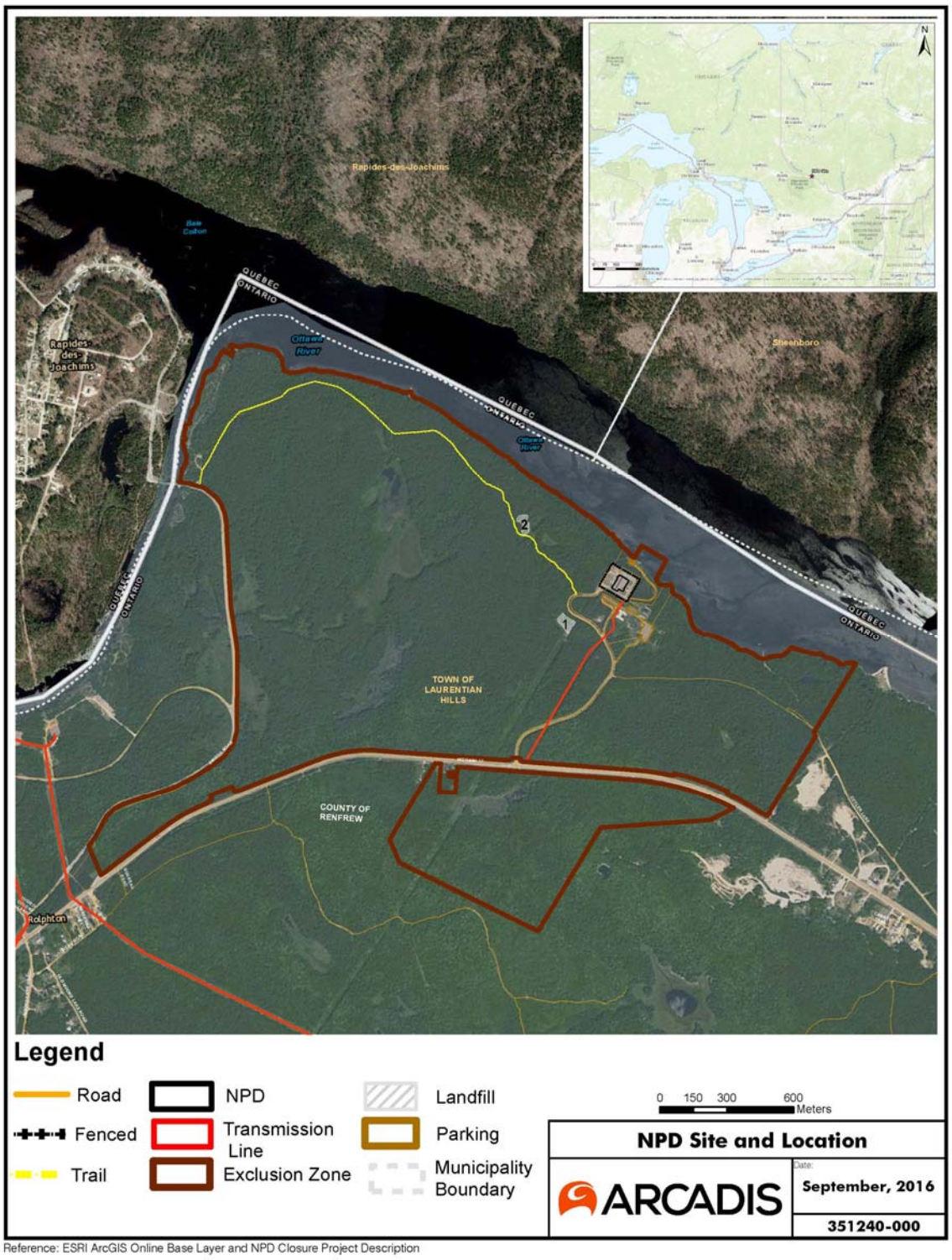
The purpose of the Project is to safely carry out the decommissioning of the NPDWF. The preferred approach to undertake the Project is through in-situ decommissioning.

2.2 Project Location

The NPD site is located in Rolphton Township, in the Town of Laurentian Hills in Renfrew County, Ontario, Canada (Figure 2-1). It is on the south bank of the Ottawa River approximately 25 kilometres (km) upstream of the Chalk River Laboratories (CRL) site, and approximately 200 km northwest of Ottawa. An approximate 1.65 hectare (ha) fenced area surrounds the existing building ("facility"), a guardhouse, septic tanks, structures and pad. A newly installed dry hydrant associated with the facility is located north of the fenced area at the Ottawa River. Primary access to the facility and surrounding buildings is via a paved road from provincial Highway 17.

Surrounding the fenced area is an approximate 380 ha Exclusion Zone (Figure 2-1) (See Image 1). To the northeast of the facility this zone generally abuts the Ottawa River. To the northwest and west of the facility the exclusion zone extends to the channel of the Ottawa River that separates Ontario from the village of Rapides-des-Joachims, Quebec, and then abuts County Road 635 (also known as "Swisha Road") from the access bridge to Rapides des Joachims southward toward Highway 17. South and southwest of the facility the Exclusion Zone parallels Highway 17, and also includes a portion of the lands to the south of Highway 17, immediately southward from the facility. The Exclusion Zone also includes lands to the southeast from the Ottawa River southward to Highway 17 and that end approximately halfway along an access road on the eastward boundary of the zone. From the facility, this access road is a maintained grass lane which eventually becomes Cutler Lane, a municipal gravel road that serves as access to both private and Crown property.

Figure 2-1. NPD Site and Location



Reference: ESRI ArcGIS Online Base Layer and NPD Closure Project Description

IMAGE 1 – NPD Site: aerial view facing northwest toward Rapides-des-Joachims (October 2015)

2.3 Project Description

The purpose of the Project is to safely carry out the decommissioning of the NPDWF. The decommissioning of the NPD facility will ensure a prompt reduction of Canadian legacy long-term liabilities and eliminate interim waste storage, while reducing worker risk and transport/waste handling risk, and allowing the release of non-impacted NPD property.

The NPDWF decommissioning has been proposed using an in-situ decommissioning approach (as described in the EIS) to isolate the contaminated systems and components inside the below-grade structure. The following activities are to be carried out under an amendment of the current decommissioning licence:

- all below-grade areas will be sealed by grouting;
- a grout and concrete batch mixing plant will be assembled on the NPD site to produce the required grout and concrete;
- above-grade structures will be removed, crushed and placed into the below-grade structure as backfill prior to final grouting;
- grouted area will then be capped with concrete and covered with an engineered barrier; and,
- the NPDWF area will be restored and prepared for long-term care and maintenance activities.

This Project intends to limit the shipment of waste off-site by entombing wastes within the below grade structure, such as the reactor systems, structures and components which will be grouted in place. All contaminated construction debris from the above-grade structures demolition will also be re-used as fill for below grade voids while clean, recyclable material will be separated and removed, where practicable. If any waste cannot be disposed onsite (i.e., if concrete encapsulation is deemed an unacceptable method) it will be transported offsite for storage at another CNL site if containing radiological inventory, or to a certified disposal or treatment location if conventional waste or if containing a designated substance.

The forms of waste and releases generated by the Project can be divided into two categories: existing waste (e.g., materials, such as concrete and stainless steel, in the reactor vault containing radiological and non-radiological contamination) and generated waste (e.g., worker protective equipment and discharge water from the wash out pit).

The Project will also generate emissions, including:

- dust (from demolition, equipment sizing and on-site trucking);
- noise (from machinery, demolition and vehicles);
- diesel emissions (from machinery and vehicles);
- water (from runoff, wash out pit discharges and equipment decontamination); and,
- contaminated air (displaced from the facility during grouting and emplacement).

Employment opportunities resulting from the Project are likely to be minimal. During peak activity periods of the Project, approximately twenty CNL staff and ten local contractors are expected to be on-site at any given time.

2.4 Project Schedule

The proposed Project phases and schedule are provided in Table 2-1.

Table 2-1. Project Phases and Schedule

Decommissioning Phase	Associated Activities	Duration
Decommissioning Execution	Assembly and operation of grout batch mixing plant	2019
	Grouting of below grade structures	2019
	Removal of above grade structures and use as backfill	2019
	Installation of concrete cap and engineered barrier	2019 - 2020
	Final site restoration	2019 - 2020
Institutional Controls	Long-term care and maintenance activities	2020 – 2120
Post-Institutional Controls	The NPD property belongs to AECL, a federal Crown corporation. Once CNL completes the decommissioning of the NPD reactor, AECL will look at the future of the lands. AECL will take into account consideration for stakeholder engagement, as appropriate, and the duty to consult with Aboriginal peoples.	>2120

3 SCOPE OF ASSESSMENT

In Section 9.5 of the *Generic Guidelines for the Preparation of the Environmental Impact Statement* it is stated:

> "The proponent will use the information in appendix A, section A.3.7, Socio-economic environment, of the CNSC's draft REGDOC-2.9.1, Environmental Protection: Environmental Policy, Assessments and Protection Measures, to assess the project's indirect socio-economic effects."

In section A.3.7 of the Canadian Nuclear Safety Commission's (CNSC), Environmental Protection: Environmental Policy, Assessments and Protection Measures. Reg-Doc 2.9.1 on socio-economic environment it is stated that:

> "The applicant should characterize the socio-economic environment and identify all indirect socio-economic effects. An indirect effect is a secondary environmental effect that occurs as a result of a change that a project may cause in the environment. Paragraph 5(2)(b) of CEAA 2012 refers to any change to the environment caused by the project on health and socio-economic conditions, physical and cultural heritage, or any structure, site or thing that is of historical, archaeological, paleontological or architectural significance. For additional guidance, refer to Technical Guidance for Assessing Physical and Cultural Heritage or any Structure, Site or Thing that is of Historical, Archeological, Paleontological or Architectural Significance under the Canadian Environment Assessment Act, 2012 [22]."

Socio-economic factors examined include those that are potentially affected by impact of the Project to the natural environment. Requirements specific to socio-economic conditions under Reg-Doc 2.9.1 will be addressed within this TSD. Health, physical and cultural heritage, and structures, sites or things of historical, archaeological, paleontological or architectural significance will be addressed elsewhere in the EIS.

4 METHODOLOGY

4.1 Temporal Boundaries

The following phases were identified for the Project and are defined as follows:

- Decommissioning Execution: the expected active decommissioning phase of the project. This is when workers are expected to be on-site, actively working on the facility;
- Institutional Controls: the monitoring period of the project. This is the timeframe where institutional controls are in effect, and there are a small number of workers e.g., monitoring the surrounding to ensure that there are no unexpected releases. It is assumed that institutional controls will be lost after 100 years;
- Post–Institutional Controls: this timeframe follows the expected cessation of Institutional Controls. This timeframe includes all long term effects of the facility.

Three timeframes have been identified for the analysis in the Alternatives Assessment report:

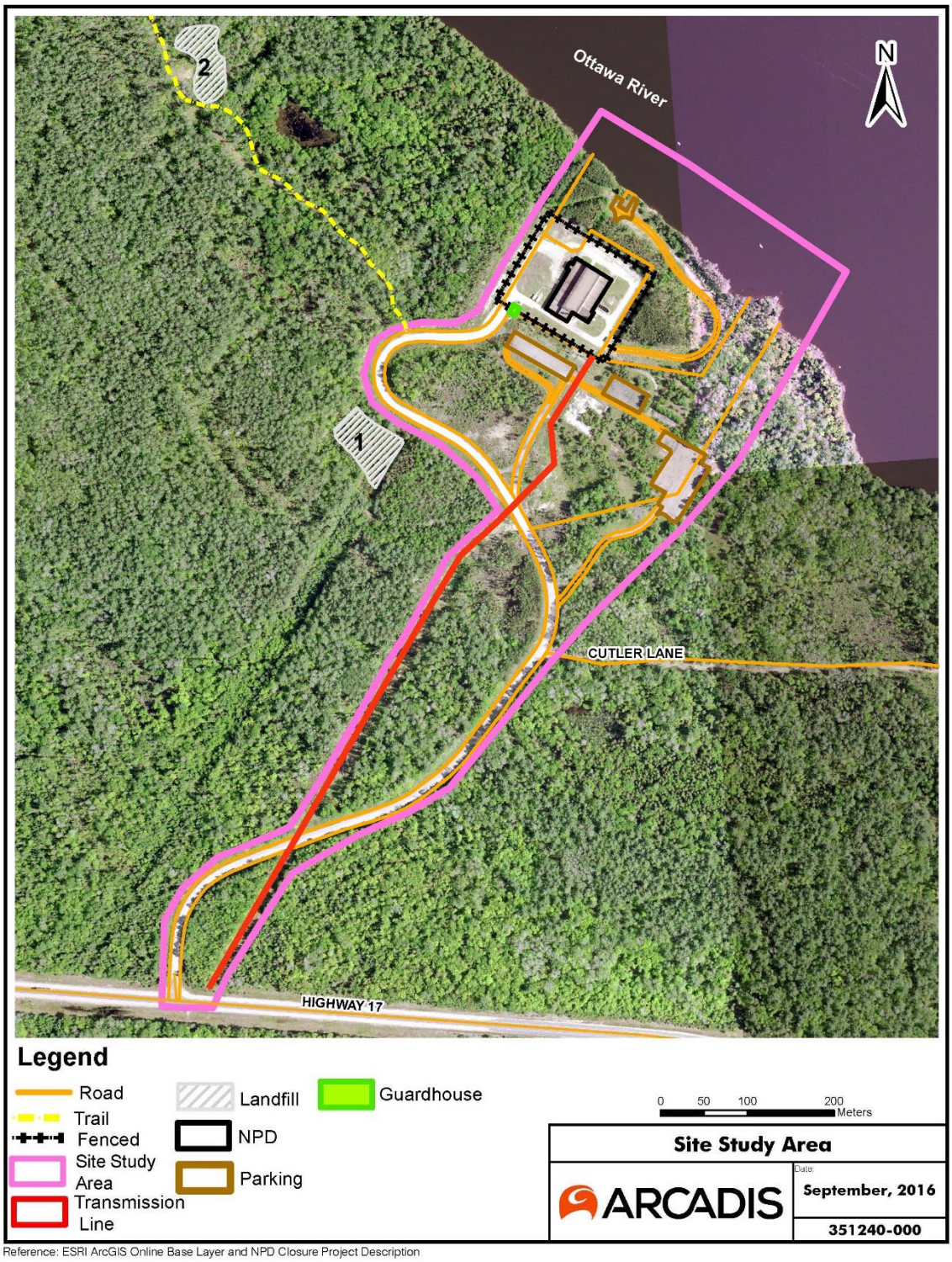
- 0-2 years – Decommissioning Execution;
- 2-100 years – Institutional Controls; and,
- >100 years – Post-Institutional Controls.

Temporal boundaries for the assessment of socio-economic features for the proposed undertaking address the Decommissioning Execution phase (0-2 years) and a twenty year planning period that aligns with the typical municipal official planning timeframe. Based on the existing municipal official plans and the general character of the adjacent communities and area, one would expect minimal change in the socio-economic conditions in the area for the next twenty years. However, beyond 20 years and throughout the Institutional Controls and Post-Institutional Controls phases it is very difficult to predict the future socio-economic environment. Experience in Ontario with respect to land use planning and development is that a reasonable assumption regarding land use can be made up to twenty years in advance. Generally, it is difficult to predict beyond 20 years owing to societal change.

4.2 Spatial Boundaries

The areas of socio-economic assessment were determined based on the potential for the Project to effect adjacent communities and their proximity to the facility. A Site Study Area (Figure 4-1) representing the anticipated area of physical disturbance from Project activities includes the immediate facility and its surrounding buildings within the fenced area (as described in Section 2.1.2), access roads, transmission line, and a slightly larger area surrounding this to account for potential laydown and storage areas. Beyond the Site Study Area, two study areas have been identified for the purposes of the socio-economic assessment: local and regional.

Figure 4-1. Site Study Area



Reference: ESRI ArcGIS Online Base Layer and NPD Closure Project Description

This TSD supports assessment of the socio-economic effects of the Project. In order to most accurately assess all potential interactions and effects, the spatial boundaries of the assessment may require adjustment should additional potential effects be identified through public consultation.

4.2.1 Local Study Area

The Local Study Area has been defined as the Site Study Area and a one km area beyond the Site Study Area (Figure 4-2). Within Ontario this area is limited to the Town of Laurentian Hills. Within Quebec borders this includes a small portion of the ZEC Rapides-des-Joachims where it abuts the opposite side of the Ottawa River from the Site Study Area.

4.2.2 Regional Study Area

The Regional Study Area has been defined as the Site Study Area and a five km area beyond the Site Study Area (Figure 4-3). Within Ontario this area includes a portion of both the Town of Laurentian Hills and the United Townships of Head, Clara and Maria. The Regional Study area also covers lands within Quebec. This includes the eastern portion of the island of Rapides-des-Joachims and two controlled harvesting zones (Zone d'exploitation Controlee (ZEC)) across the Ottawa River: ZEC Rapides-des-Joachims (the study area parts of which are situated within the municipalities of Rapides-des-Joachims and Sheenboro) and ZEC Saint-Patrice (the study area portion of which is situated within the municipality of Sheenboro).

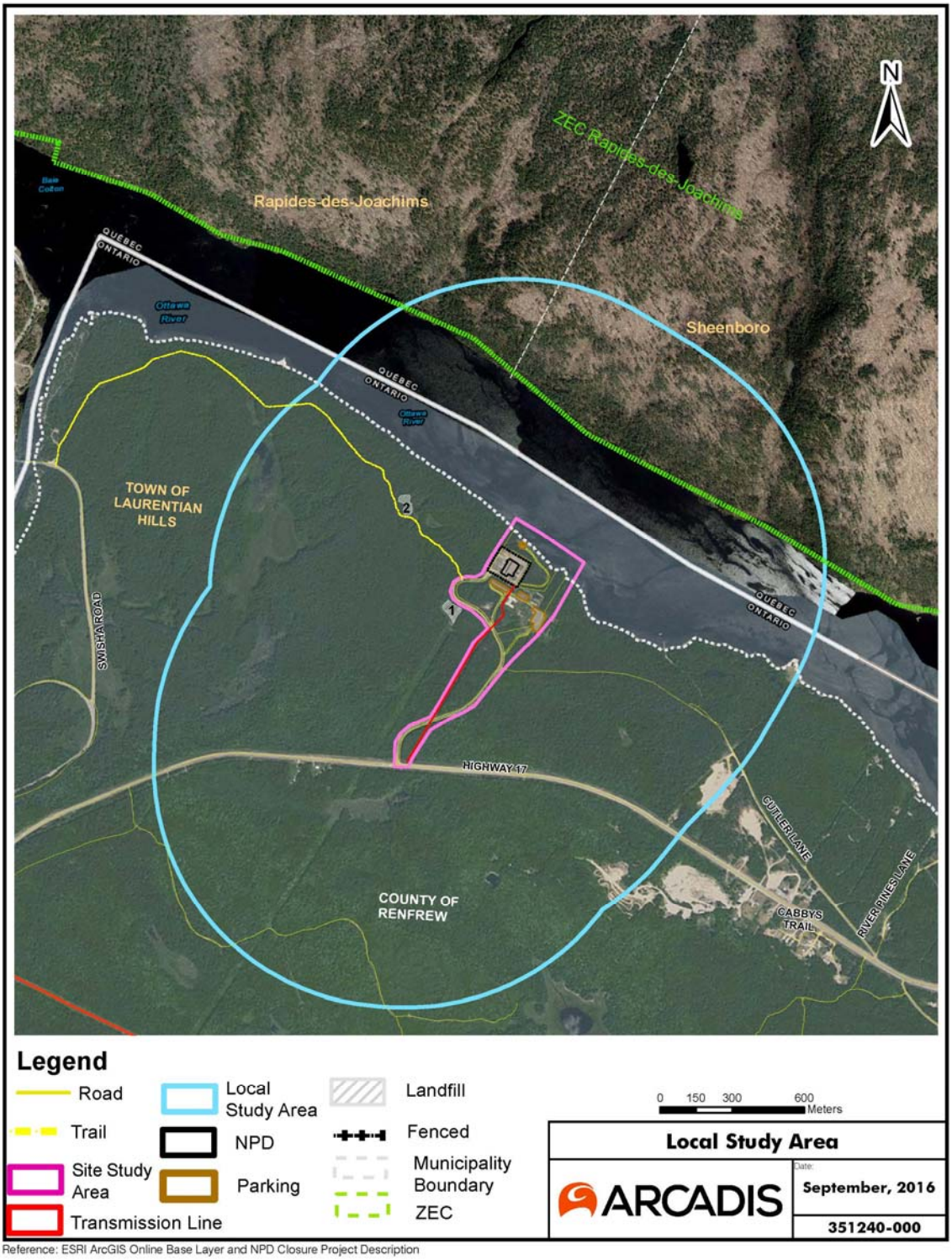
4.3 Data Collection and Sources

Socio-economic baseline data was collected through a variety of sources. These included Statistics Canada, Municipal corporations, planning documents, tourism boards, and provincial agencies.

Data was predominantly derived through desktop review of existing data. Sources of data included:

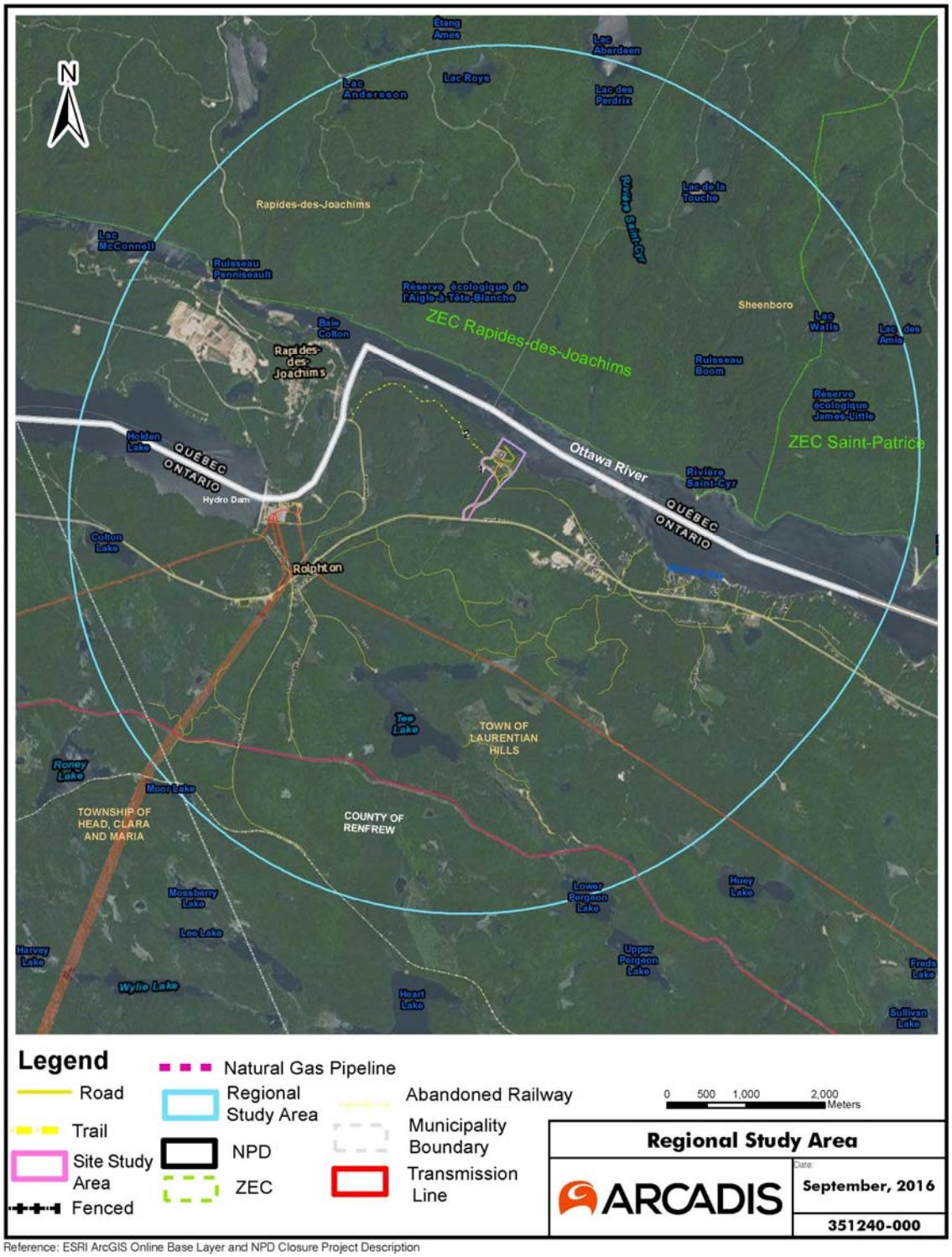
- Planning and land use documents (e.g., Official Plans, municipal zoning documents, forest management plans, provincial agency reports and ZEC profiles);
- Government databases (e.g., census profiles; MNRF Crown Land Use Policy Atlas);
- Interactive maps (e.g., ZEC and Ministry of Natural Resources and Forestry (MNRF) maps);
- Acts and regulations (e.g., regulations overseeing ZEC); and,
- Municipal and local websites (e.g. tourism association websites, campground and recreational websites).

Figure 4-2. Local Study Area



Reference: ESRI ArcGIS Online Base Layer and NPD Closure Project Description

Figure 4-3. Regional Study Area



Reference: ESRI ArcGIS Online Base Layer and NPD Closure Project Description

4.3.1 Mapping

Sources of data used in creating figures for the baseline study included:

- Datasets from the Land Information Ontario data warehouse, ESRI ArcGIS Online Base Layers and GeoWarehouse; and,
- Official Plans for Renfrew County, Town of Laurentian Hills, and Town of Deep River.

4.3.2 Interviews and Consultation

Portions of the data on the communities and human use of the land were collected through discussions with CNL, municipal officials and ZEC administrative staff. Municipalities consulted included: Renfrew County, the Town of Laurentian Hills, the United Townships of Head, Clara and Maria, and the Town of Deep River, in Renfrew County, Ontario, and with the municipality of Rapides-des-Joachims in Quebec. Additional information on the Rapides-des-Joachims community and use of ZEC lands was also obtained through discussion with ZEC administrative staff.

5 DESCRIPTION OF THE EXISTING SOCIO-ECONOMIC ENVIRONMENT

Baseline environmental conditions relevant to the proposed Project were evaluated for Regional and Local level Study Areas. Components of the existing environment (i.e., baseline conditions) are described for socio-economic conditions including: General Socio-Economic Characteristics; Land Uses and Designations; and, Human Uses of the Land.

5.1 General Socio-Economic Characteristics

The location and general socio-economic characteristics of population centres and economic base for communities within and surrounding the Site Study Area are described below.

5.1.1 Renfrew County

The Site Study Area falls entirely within Renfrew County in eastern Ontario at the northern end of County boundaries. Spanning an area of approximately 7,440 square (sq) km (Statistics Canada, 2011), Renfrew County comprises twelve townships (Admaston/Bromley; Bobbechere Valley; Brudenell, Lyndoch and Raglan; Greater Madawaska; Head, Clara and Maria; Horton; Killaloe-Hagarty-Richards; Laurentian Valley; McNab/Braeside; Madawaska Valley; North Algona Wilberforce; Whitewater Region) and five towns (Arnprior; Deep River; Laurentian Hills; Petawawa; Renfrew). Renfrew County has an estimated population of 86,966 in 2011, a 4 percent increase from the 2006 population of 83,615. The majority of growth in the County is anticipated to occur within urban areas, with the five towns accounting for nearly half the County total population in 2011 (Baird, Alistair, 2016; Renfrew County, 2013). Approximately 150 km northwest of Ottawa, the independent City of Pembroke is located within Renfrew County borders along the Ottawa River and has an estimated population of 14,360 in 2011, an 3.1 increase from the 2006 population of 13,930 (Statistics Canada, 2011). The City is the largest commercial and service centre between North Bay and Ottawa, and development activities are closely linked to those occurring within the neighbouring County (City of Pembroke, 2014). The County and City have a combined median age of 43.9 (Statistics Canada, 2011).

Key employers within the County include Garrison Petawawa, CNL, Renfrew County District School Board and the County itself. Economic activities generally include forestry, resource mining, agriculture, retail, service, manufacturing and government activities, with some high-tech industry expanding in to the area more recently also (Renfrew County 2016a and 2016b).

5.1.2 Town of Laurentian Hills

The Town of Laurentian Hills is a lower tier municipality. The Site Study Area is located within the Town boundaries. The Town spans an amalgamated area of the Townships of Rolph, Buchana, Wylie and McKay and the Village of Chalk River, covering an area of approximately 640 sq km. The Site Study Area is limited to its most northerly border. The Town has an estimated population of 2,811 in 2011.This has increased 8 percent from 2,789 in 2006 (Statistics Canada, 2011). The median age in 41.1. Chalk River

(approximately 1,500 (Batten, Sherry, 2016a)), Rolphton and Point Alexander comprise the settlement areas for the majority of residents, with some settlement also occurring along the periphery of the Town of Deep River and along the Highway 17 corridor (Town of Laurentian Hills, 2010).

Approximately 25 km downstream of the Site Study Area, CRL serves as the primary source of employment in the area (Batten, Sherry, 2016a; Town of Laurentian Hills, 2016). Garrison Petawawa provides another key source of employment to the Town. Within the municipality, Chalk River comprises the primary source of public services to the community. The Town shares a landfill on the border of Chalk River with Town of Deep River. Highway 17 serves as the primary transportation route through the Town (Batten, Sherry, 2016a; Town of Laurentian Hills, 2016) (See Image 2).

IMAGE 2 – Highway 17: approaching Town of Laurentian Hills placard heading southeastward (August 2016)

5.1.3 United Townships of Head, Clara and Maria

To the west of the Site Study Area is the United Townships of Head, Clara and Maria which intersect the Regional Study Area. The Townships span approximately 730 sq km and are situated at the northernmost boundary of Renfrew County and include four small hamlets along the Ottawa River: Mackey, Stonecliffe, Bissett Creek, Deux-Rivières (Townships of Head, Clara and Maria, 2016). Approximately 85 to 90 percent of the Townships is Crown land. The estimated population of the Townships is 235 in 2011, a 3.1 increase from 228 in 2006. The median age in is 55.8 (Statistics Canada, 2011). The Townships include five key campgrounds (including Driftwood Provincial Park) that provide a source of tourism and recreation in the area. Logging has typically been the primary industry in the Townships with activities managed by the Algonquin Forestry Authority and two key family-owned operations operating with seasonal hires. The Townships rely heavily on public and commercial services provided through other communities such as the Town of Deep River (Gibson, Jim, 2016; Townships of Head, Clara and Maria, 2016).

5.1.4 Deep River

The Town of Deep River is situated approximately 17 km southwest of the Site Study Area, along the Ottawa River, spanning an area of about 51 sq km. The Town does not directly intersect the Site Study Area, Local Study Area or Regional Study Area. Deep River was included due to the heavy reliance of the surrounding communities on its economic, social and health related services and provides a more comprehensive understanding of the community interactions across municipal boundaries.

The estimated population in Deep River is 4,193 in 2011. This has decreased by 5 percent from 4,216 in 2006. The median age is 47.5 (Statistics Canada, 2011). While it is not situated within the Regional Study Area, the Town provides for the majority of public health, service and commercial resources of the communities surrounding the Site Study Area and as such is included here. Deep River is the hub of the surrounding communities providing: medical services (hospital, doctors, dental), schools (k-12), shopping, sports activities (arena, hockey, and Olympic size swimming pool), recreation (marina, boating, beaches, boating, snowmobiling, and cross-country skiing), community services (seniors, adults, and youth programs), weekly newspaper, library, and the arts (symphony, live theatre, art exhibits, potters guild etc.) (Lougheed, Joan, 2016; Town of Deep River, 2012 and 2016).

The Town was originally established as a residential community for employees and their families of what was to become the Chalk River Nuclear Laboratories (now the CRL of CNL) and houses many CNL and Garrison Petawawa employees. Deep River is almost entirely dependent on Garrison Petawawa, CNL, and local commercial business for employment. Over 2,700 people were employed with CNL in 2011 and Garrison Petawawa personnel have become an increasingly important source of new residents for the community. Many former CNL employees have chosen to stay and 33 percent of the population are seniors (Lougheed, Joan, 2016; Town of Deep River, 2016). According to the municipality, the Town has been static for some time with little growth occurring and economic activities such as logging surrounding the area have been on the decline. The original closure of the NPDNGS in the 1980's had a large impact on the economy and community in Deep River (Town of Deep River, 2016) and CNL activities continue to have a strong influence on the community (Lougheed, Joan, 2016).

5.1.5 Rapides-des-Joachims

The nearest population centre to the Site Study Area is Rapides-des-Joachims, in Aberdeen Township, Pontiac County, Quebec. The village of Rapides-des-Joachims (also known as "Swisha") occupies an island in the Ottawa River, just beyond the Quebec border to the west of the Site Study Area. The approximate 2.5 km by 5.5 km island comprises a portion of the municipality of Rapides-des-Joachims, shared with the ZEC Rapides-des-Joachims which is located immediately to the north of the island abutting the Ottawa River (discussed further below). The island is connected to Ontario via an interprovincial bridge and County Road 635 which intersects at Highway 17 near the hamlet of Rolphton. Another bridge on the north side of the island crosses to mainland Quebec and also serves as an entrance to the remainder of the municipality (e.g. within ZEC Rapides-des-Joachims). Two dams are located at either end of the island: a Hydro Dam (Des Joachims Generating Station, operated by Ontario Power Generation (OPG)) at the southeastern end which connects between the island and Ontario, and McConnell Lake Control Dam at the western end connecting between the island and mainland Quebec (Gibson, James, 2016; Rapides des Joachims, 2016).

The population across the municipality of Rapides des Joachims is 131 in 2011, a 23.8 percent decrease from 2006. The decrease in population may be attributed to a limited influx of permanent residents and an aging community (the median age of the community is 47.8 in 2011 (Statistics Canada, 2011)). The municipality relies heavily upon surrounding communities (particularly Deep River) for public services (e.g. schools, shopping, banking, police, etc.) as it is geographically isolated from Quebec communities beyond its ZEC. Approximately ten residents are employed by CNL. Other sources of employment are found in Deep River and Pembroke. Several residents were employed by the Commonwealth Plywood at the local mill which has been closed for several years now with the downturn in the logging industry (Gibson, James, 2016).

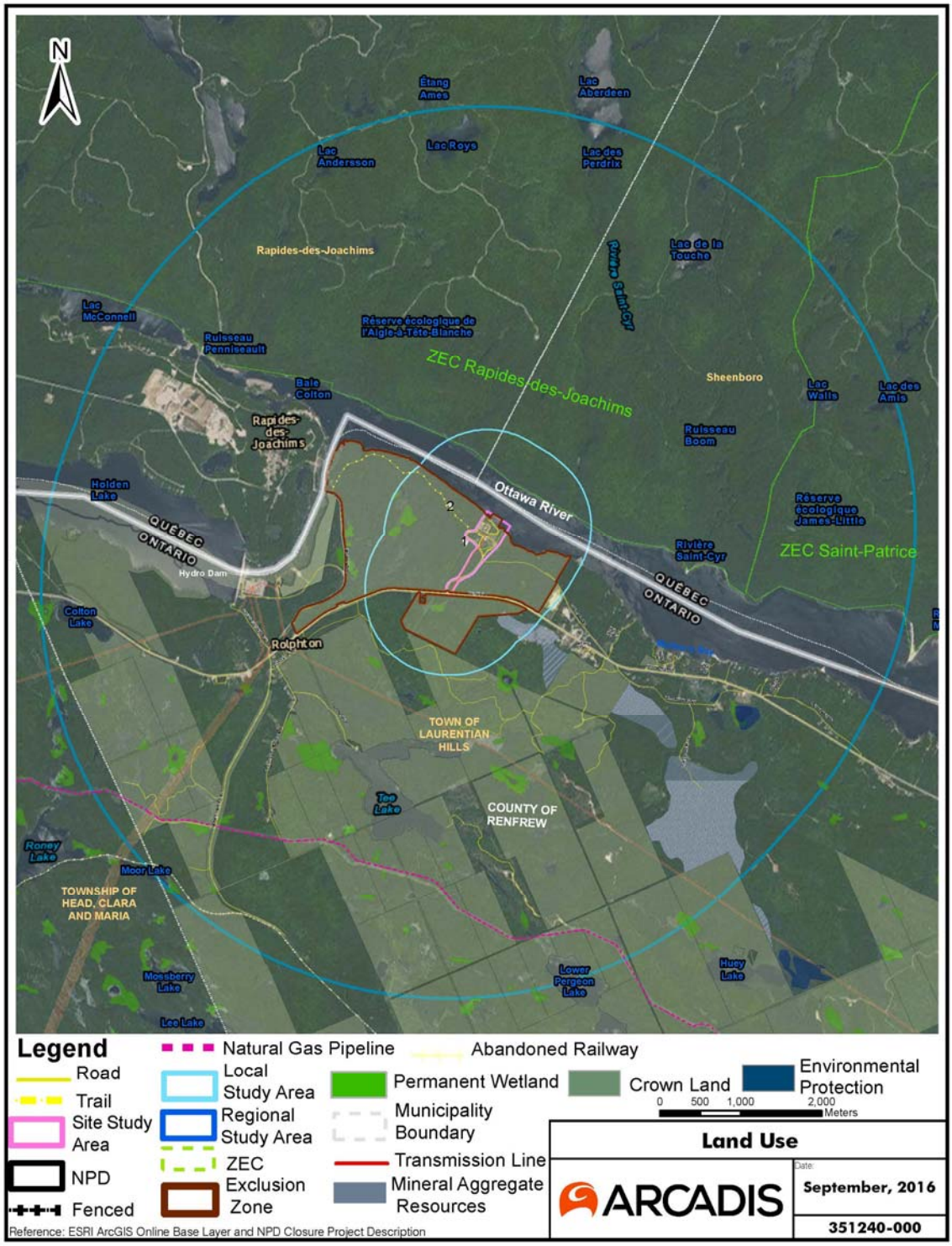
5.2 Land Uses and Designations

5.2.1 Site and Local Study Area

A limited number of land uses occur within the Site and Local Study Area. The majority of the area is comprised predominantly of Federal Crown land. The Site Study Area and Exclusion Zone are situated entirely on Federal owned Crown land within property attributed to AECL, a federal Crown corporation (Figure 5-1). As well, a few privately owned properties intersect the Local Study Area, and are attributed largely to residential properties, with a few areas of aggregate extraction, occurring along the Highway 17 corridor.

Municipal planning documents permit the following land uses within the Ontario portion of the Local Study Area: Crown Land, Rural Land, Lakes and Rivers, Permanent Wetland, Mineral Aggregate Resources, Hydro Line, Provincial Highway (i.e. Highway 17), Municipal Maintained Road (i.e. Cutler Lane).

Figure 5-1. Land Use



According to the Town of Laurentian Hills Zoning By-Law (2012), the land use intent of this area includes three types of area:

1. Rural (RU) comprises a mixture of land uses appropriate to rural areas including low density residence, farms and forestry. This designation regulates the use of land or the use, erection or alteration of any building/structure. Permitted uses include: Agriculture; Camp; Cemetery; Commercial Greenhouse; Dwellings (duplex, seasonal, semi- and single-detached); Equestrian Establishment (minimum 2 ha lot area); Farm Produce Outlet; Forestry uses; Group Homes (with restriction); Log Hauling Operation; Marine Facility; Park; Parking Area; Portable Asphalt/Concrete Plant; Private Club; Public Service use (with restriction); Public Utility (with restriction); Wayside Quarry; Wayside Pit; Accessory Dwellings; Bed and Breakfasts; Home Industry (with restriction); Home Occupation (with restriction); and, Sleep Cabin (with restriction).

2. Mineral Aggregate Resources Pit (EMP) recognizes/regulates the extraction of sand and gravel and associated extractive industrial manufacturing and processing uses. It generally restricts the use, erecting or alteration of any building/structure in the EMP zone. Permitted uses include: Accessory uses, Buildings or Structures (with restriction) (e.g. crushing and screening facilities, stock piles, asphalt and concrete plants, administration facilities, weigh stations, security kiosk etc.); Agriculture use (not including buildings and structures); Camp in Mineral Aggregate Resources Reserve (EMR) Zones, Conservation use; Existing Residential Building and Accessory uses; Farm Produce Outlet; Forestry use (not including buildings and structures); Outdoor Recreation uses (not including buildings and structures); Pit within EMP Zone; Portable Asphalt/Concrete Plant in EMP and Mineral Aggregate Resources Quarry (EMQ) Zones; any activities associated with the progressive rehabilitation of the lands in EMP and EMQ Zones; Public Utility (with restriction); Quarry in EMQ Zones; Wayside Pit; and, Wayside Quarry.

3. Environmental Protection (EP) Zone regulates development in areas subject to natural hazards and/or have environments sensitive to development (i.e. floodplain, steep or slippery slopes, and wetlands). It generally restricts the use or erection of any building or structure in the EP. Permitted Uses include: Accessory uses, Buildings or Structures; Conservation use; Forestry use; Existing Dwelling; Existing Agricultural Use; Outdoor Recreational uses (active and passive); and Structures for flood or erosion control or slope stabilization.

The By-Law also stipulates that Crown lands are not subject to the provisions of the By-Law or the Town's Zoning Schedules. As such, the land use intent identified above for the Local Study Area only apply to non-Crown land areas.

The Ottawa River intersects the Local Study Area and across the river within Quebec the area includes forested public lands situated within the ZEC Rapides-des-Joachims (Figure 5-1). The ZEC is a controlled exploitation area intended to manage and preserve wildlife located within its borders. It is used predominantly as a hunting and fishing location. Access to the ZEC is limited to seasonal time periods (generally May through October) and registration and access fees are compulsory. Specific guidelines and quotas are applied to hunting and fishing of species within the territory and are enforced upon entry and

exit from the territory. Additional permitted uses include trapping, camping, hiking, boating and snowmobiling (Rivet, Lucy, 2016; Réseau ZEC, 2016).

5.2.2 Regional Study Area

The majority of the Regional Study Area intersects an area of Provincial Crown land-use designation known as "Multiple Natural Resource Use" (Figure 5-1). According to the Ministry of Natural Resources (MNR) Pembroke District Land Use Guidelines (1983) for this designation, the Land Use Intent of this area is:

> "*Within this area, resource management will be directed to multiple use management. Standard management practices combined with the concept of sequential use will enable MNR to take full advantage of the potential of the natural resource.*
>
> *Management of this area is also governed by the general policies contained in the Pembroke District Land Use Guidelines (1983)."*

Permitted activities in this Crown land use designation vary widely. Permitted activities include: Aggregate Extraction; Bait Fishing; Commercial Fishing; Commercial Fur Harvesting; Commercial Hydro Development; Commercial Power Generation Development; Commercial Timber Harvest; Existing Commercial Tourism (Services and/or Facilities); Mineral Exploration and Development; Peat Extraction; Wild Rice Harvesting; Existing and New Road Development and Maintenance; Crown Land Recreation; Hunting; Existing and New Road Use (public); and, Sport Fishing. Non-permitted activities include: Cottaging Crown Land Disposition (as no new Crown cottage lots are permitted); and, Existing Crown Land Disposition, Seasonal Recreation Camp. As well, no new hunt camps are permitted with respect to Hunting activities. Crown Land Disposition is a potentially permitted activity, although this is subject to MNRF planning and approval policies and procedures and significant restrictions on land disposition on designated trout lakes exist.

Also within the Regional Study Area and situated on the Ottawa River shoreline, immediately across from the island of Rapides-des-Joachims southern shore, a 'Recommended Provincial Park' (Ottawa River Provincial Park) would span an area of 10,359 ha westward from the OPG hydro dam at Rolphton. This area is recognized for several scenic and recreational values, including stands of white pine reflecting the areas logging history and a proposed Ottawa to New Liskard recreational boating route. Lakes designated for lake trout management are situated within this area (MNRF, 2016). The Regional Study Area intersects the southeasterly portion or this recommended park.

Several additional land use designations are identified within the Regional Study Area, including those outlined above in Section 5.2.1. A large portion of the Ontario land use is attributed to Provincial Crown land. Other municipal land use designations include Environmental Protection, Inactive Waste Disposal (i.e. southwest of Rolphton), Contaminated Site (i.e. southwest of Rolphton), and Hamlet Settlement Area (i.e. Rolphton). Additional features include Crown Road, Private Lane and Natural Gas Pipeline (i.e. TransCanada high pressure pipeline).

The Town of Laurentian Hills Zoning By-Law, identifies land use intent for the Regional Study Area to include the following zones:

- Residential
  - Residential One (R1)
  - Limited Service Residential (LSR)
  - Mobile Home Park Residential (MHP)
- Commercial
  - General Commercial (GC)
  - Recreational Commercial (RC)
- Industrial
  - Mineral Aggregate Resources Reserve (EMR)
  - Mineral Aggregate Resources Pit (EMP)
  - Waste Disposal (DMW)
- Institutional and Open Space
  - Open Space (OS)
  - Community Facility (CF)
- Other
  - Rural (RU)
  - Environmental Protection (EP)

Within Ontario, Rural (RU) accounts for the dominant land use within the area. Other permitted activities are distributed sparsely across the land base. As noted in Section 5.2.1, the land use intent identified within the By-Law only apply to non-Crown land areas.

Within Quebec, in addition to ZEC Rapides-des-Joachims, the Regional Study Area also intersects ZEC Saint-Patrice (at its most south westerly border) across the Ottawa River and the eastern portion of the island of Rapides-Des-Joachims (Figure 5-1).

5.3 Human Uses of the Land

The presence of large areas of Crown land within the area present numerous opportunities for activities such as forestry, hunting, fishing recreation and tourism. Nearly half of the land area of Renfrew County is Provincial and Federal Crown land. The Provincial Crown land is dominated by resource uses such as forestry, mineral exploration, fishing and hunting, etc. and is open to the public. The Federal Crown land is reserved for the specific uses Garrison Petawawa and CNL, of which are Restricted Access Crown Land. Numerous lakes, river systems and other natural features provide opportunities for recreational and tourist activities. As well, a large stretch of the County's border abuts Algonquin Provincial Park in the west and northwest and the Ottawa River along its full northeast extent providing further access to extensive tracts of recreational opportunity beyond County limits (Renfrew County, 2016a).

The Town of Laurentian Hills is comprised predominantly of Crown and 'Other' Federal Lands with a smaller area allocated to privately owned property (Renfrew County, 2016b). Crown lands are distributed across the north and south of the Town of Laurentian Hills and are generally used for recreational uses including:

fishing, hunting, cross-country skiing, swimming, boating, and snowmobiling (Batten, Sherry, 2016a; Town of Laurentian Hills, 2016). Key features that traverse the area are the Temiskawawa Waterway and Pembroke/North Bay Trans Ontario Provincial (TOP) snowmobile Trails (Town of Laurentian Hills, 2016). The Trans Canada Energy East pipeline also traverses the Regional Study Area. Other Federal lands are designated for use by the Petawawa Military Reserve, given its proximity to the Canadian Forces Garrison Petawawa in Petawawa. Predominant resources in the Town include managed forest and agricultural land (livestock) (Batten, Sherry, 2016a).

ZEC Rapides-des-Joachims includes the remainder of the municipality of Rapides-des-Joachims. As noted above in Section 5.2.1, ZEC are controlled zones set aside by the Quebec government for the purposes of developing, harvesting and conserving wildlife and wildlife species. They are also used for recreational purposes by local municipal residents. The vast majority of the ZEC are Quebec public land similar to Crown land in Ontario.

The study area portion of ZEC Saint-Patrice is immediately to the east of ZEC Rapides-des-Joachims within the municipality of Sheenboro, Pontiac County and accounts only for a small area of the ZEC at the ZEC's most southwesterly corner. The ZEC is managed similarly to Rapides-des-Joachims.

5.3.1 Forestry

5.3.1.1 Site and Local Study Area

While the majority of the Site and Local Study Area is forested, it is comprised largely of federal Crown land including an Exclusion Zone which effectively prohibits the use of land for public and commercial activities (including forestry). The small portion of the land beyond the Exclusion Zone and within the Local Study Area is owned privately.

Within Ontario, forest harvesting occurs on both the private and Crown land and there are various forest industry mills in eastern Ontario that receive logs and mill various products (e.g. lumber, board, etc.). Forest harvesting on Crown land occurs according to the *Crown Forest Sustainability Act* and is laid out in a ten year (2011-2021) Forest Management Plan for the Ottawa Valley Forest (OVF). The OVF management unit aligns with the municipal borders of Renfrew County. Private land harvest occurs as landowners decide.

Within Renfrew County fifty-one separate tracts of land are owned and managed by the County itself, spanning a combined total area of approximately 6,200 ha (Renfrew County, 2016b). None of these tracts are located within the Local Study Areas. Consistent with Renfrew County Forest Management Plan mapping (Renfrew County, 2006) there is no forest harvesting identified within the Local Study Area (OVF and MNRF, 2011), beyond what private land forestry might occur.

Several features associated with forests are attributed to the Local Study Area. These include: Deer Wintering Area (across the entire area); Moose Aquatic Feeding Area; and Bear Management Area (across the entire area). (MNRF, 2010a and 2010c).

5.3.1.2 Regional Study Area

The Regional Study Area is also comprised predominantly of forested area some of which is on both private and Crown land.

Mapping also suggest the Regional Study Area intersects with locations of existing and new primary and branch road construction over the ten year term of the current OVF Forest Management Plan.

None of the Renfrew County owned tracts of forested land as described in Section 5.3.1.1 intersect the Regional Study Area.

Non-timber use of forest including trapping, baitfish harvesting, bear management areas and recreational uses are discussed below.

5.3.2 Trapping

5.3.2.1 Site and Local Study Area

The vast majority of lands within the Ontario portion of the Site and Local Study Area are Federal lands owned by AECL. The remaining lands are in private tenure. Provincial trap lines are based on Provincial Crown land. One designated Trap Line Areas intersects a small portion of the Local Study Area (MRNF, 2010b), beyond the Exclusion Zone, where trapping may occur. It is possible that a landowner may trap on the private land adjacent to the Federal lands owned by AECL. Some trapping may occur in the small portion of ZEC Rapides-des-Joachims that falls within the Local Study Area.

5.3.2.2 Regional Study Area

Approximately fifty registered trap lines are present on Crown land within the OVF area. For about six months of the year, an average of two people work each trap line area (OVF, 2011b). Two designated Trap Line Areas intersect the Regional Study Area (MRNF, 2010b) although trapping is limited and generally includes beaver (Batten, Sherry, 2016a). A downturn in the demand for fur has had a negative impact on the trapping industry here and beaver populations have been on the rise. In the 2009 trapping season, approximately 2,122 beavers were harvested. Further, trappers in the OVF have noted some of the implication of forest management on trapping, based on changes to furbearing habitat and the lack of harvest to the shore adjacent to beaver ponds, and the loss of martin and martin habitat. (OVF, 2011b).

Within the ZEC territories trapping is common and generally includes species such as beaver, lynx, wolf, and raccoon (Rivet, Lucy, 2016; Réseau ZEC, 2016).

5.3.3 Hunting

5.3.3.1 Site and Local Study Area

The vast majority of lands within the Ontario portion of the Site and Local Study Area are Federal lands owned by AECL. The remaining lands are in private tenure. Therefore there is no Provincial Crown land

upon which to undertake hunting. It is possible that one of the private landowners may hunt on their property. The entire Local Study Area is identified as Deer Wintering Area and Bear Management Area (MNRF, 2010a and 2010c).

The small portion of ZEC Rapides-des-Joachims situated within the Local Study Area may have some seasonal hunting activity.

5.3.3.2 Regional Study Area

The majority of hunting within the Regional Study Area within Ontario occurs on Crown land and species generally include deer and moose (Batten, Sherry, 2016a). A large portion of the Regional Study Area is identified as Deer Wintering Area (MNRF, 2010c). While deer move across both public and private lands, typically more deer hunting in the OVF occurs on Crown land. Within Renfrew County in 2005, approximately 12,348 of the deer hunters were residents and approximately 100 came from beyond the municipality.

Moose Aquatic Feeding Area is also present. Tagging and an increase in the number of moose in the OVF has resulted in an increase in moose hunting since 2005. One of three identified moose hunting areas in the OVF occurs within the northern portion of Renfrew County (part of Wildlife Management Unit 48) and intersects the Regional Study Area (MNRF, 2007; OVF, 2011b). In 2009, moose hunters in the OVF comprised approximately 1,206 residents of Renfrew County and 11 tag holders from tourist outfitter camps which are established on private lands but that hunt on Crown land (OVF, 2011b).

One of the 18 Bear Hunting Areas within the OVF intersects much of the Regional Study Area. Such areas include an area of Crown land which is licensed to a tourist operator for bear hunting services, with an average of two people working up to two months annually. Local residents comprised 1,201 bear hunters in 2009 and are generally increasing in number over the last five years. Dropping in number over the past five years, 157 tourists hunted through tourist outfitters. Similar to moose hunting establishments, bear hunting outfitters conduct activities on Crown land despite being established on private land (OVF, 2011b).

Raptor and Heron Nesting sites are also present within the Regional Study Area (MNRF, 2010c).

Seasonal hunting within the two ZEC territories that intersect the Regional Study Area is permitted. Modes of hunting generally include: firearm, bow, or crossbow. The primary species hunted are moose, bear and deer, although other species include moose, Virginia deer, black bear, ruffed grouse, and hare (Rivet, Lucy, 2016; Réseau ZEC, 2016). In ZEC Saint-Patrice, species generally include moose, Virginia deer, Black bear, ruffed grouse, hare, and wild turkey (Réseau ZEC, 2016). Information on hunting, transport of carcasses through the region and regulations are provided on the ZEC websites for visitors. Wildlife protection officers are present on site within the ZECs to monitor and regulate hunting activities (Réseau ZEC, 2016).

5.3.4 Fishing

5.3.4.1 Site and Local Study Area

Sport and subsistence fishing is feasible within the Ottawa River, particularly along the near and far shorelines. The Ottawa River provides a significant draw for boaters and anglers (OVF, 2011b). There is no commercial fishing in the Site or Local Study Area.

5.3.4.2 Regional Study Area

Commercial fishing is also absent within the Regional Study Area. Most recreational fishing occurs along the Ottawa River (Batten, Sherry, 2016a)). A larger expanse of the Ottawa River accommodates greater opportunities for sport and subsistence fishing, particularly with proximity to the Island of Rapides-des-Joachims. A spawning ground is present along the length of the island's north side from its eastern tip to the McConnel Control Dam. Popular fish include: Walleye, Catfish, Pike and Sturgeon. Recreational fishing includes locals, cottagers and tourists (Gibson, James, 2016). Several waterbodies are present within the Regional Study Area that provide potential for sport fishing as many of the coldwater lakes in Renfrew County are annually stocked with brook trout, lake trout, rainbow trout, brown trout and splake (OVF, 2011b).

Numerous lakes and rivers provide fishing opportunities within the ZEC territories although fishing is closely monitored and regulated. The ZEC websites provide information on species stocking of lakes, historical catches, and information on planning, rules and regulations (Réseau ZEC, 2016). Typical fish species within ZEC Rapides-des-Joachims include bass, pike, whitefish, walleye, muskellunge, brook trout, perch, lake trout, and splake. In ZEC Saint-Patrice fish species generally include bass, pike, whitefish, walleye, brook trout, Atlantic salmon, perch, lake trout, and splake (Réseau ZEC, 2016).

5.3.5 Recreation and Tourism

5.3.5.1 Site and Local Study Area

Tourism

Within Ontario, there are no formal tourism operations in the Site or Local Study Area. Tourists visiting the ZEC territories come from across Ontario and beyond. ZEC Rapides-Des-Joachim estimates thousands of visitors annually (Rivet, Lucy, 2016).

Trails

There are no designated hiking or snowmobile trails present on the Ontario side of the Site or Local Study Area. Hiking is feasible within ZEC Rapides-des-Joachims, although this portion of the ZEC is steep and could be difficult to access despite numerous trails throughout.

Boating

No official boat launches are situated within the Site or Local Study Area. An unofficial boat launch exists off Cutler Lane which was previously used by local residents. However access to the launch has been restricted by CNL. Boating can occur within the portion of the Ottawa River that falls within this area between Ontario and Quebec. The presence of watercourses for recreational canoeing within the small area of ZEC Rapides-des-Joachims is extremely limited with one small portion of a watercourse included in the area (ZEC Rapides-des-Joachims, 2016).

5.3.5.2 Regional Study Area

Tourism

Tourism in the Regional Study Area is largely resource based (e.g. hunting, fishing and recreation) and comprised largely of drive-in resource use with tourism activities occurring predominantly on private land (OVF, 2011a). Rapides-des-Joachims is working toward boosting its economic profile and attracting more residents and tourists within its borders. Initiatives include (Gibson, James, 2016):

- Developing the municipally operated McConnell campground through expansion of sites and increasing amperage to accommodate a trend of larger trailers. Only a few of the sites at this camp still use tents.
- By adding new docks that can accommodate overnight parking, boat traffic should increase, particularly with the draw of the nearby Dumoine River in ZEC Dumoine to the west of ZEC. Rapides-des-Joachims. The Dumoine River is popularly known for its multi-day canoeing trips.
- Working toward increased control over the land use on the island to better facilitate redevelopment of the area, and increasing boutiques and local crafts operations, thus drawing in more permanent and seasonal residents, driving development further. Redevelopment of the area would assist in marketing the island as the 'gateway' to the Dumoine River.

Trails

The Town of Laurentian Hills contains trails used for hiking and several ATV and snowmobile trails maintained by local associations, some of which intersect the Regional Study Area such as the Pembroke/North Bay TOP snowmobile trail that forms a portion of the Round Algonquin Park snowmobile trail loop (SCSA, 2016; NRSA, 2016). There is also the possibility of future use of a discontinued stretch of Canadian Pacific (CP) Railway system that crosses the Town and several other municipalities (comprising about 218 km across Renfrew County) traveling from Smiths Falls to Mattawa. The County of Renfrew has acquired the corridor which could provide an attractive source of hiking, snowmobiling and cross-country skiing (Renfrew County, 2016b; Batten, Sherry, 2016b). This abandoned railway corridor, named the Ottawa Valley Recreational Trail, intersects the Regional Study Area and could serve as a tourist draw to the area.

Boating

There are no official boat launches in the Town of Laurentian Hills (Batten, Sherry, 2016a). There are two launches on the Island of Rapides-des-Joachims: one on the south side near the Hydro Dam, and the other

across from the municipal office on the north east end of the island (See Image 3). Free daily docking is provided by the municipality of Rapides-des-Joachims. A private operation also offers boat transport across the island as a means of navigating the Hydro Dam and McConnell Control Dam (Gibson, James, 2016; Rivet, Lucy, 2016). There are three boat launches in the Townships of Head, Clara and Maria, although none are located within the Regional Study Area. Boating generally occurs around the campground sites although an approximate 69 km stretch of the Ottawa River is available for boating between the Hydro Dam at Rapides-des-Joachims and at Mattawa. Canoe traffic also occurs down the Dumoine River in Quebec which reaches the Ottawa River across from the Townships of Head, Clara and Maria (Gibson, Jim, 2016). While it is located outside the Regional Study Area, a boat launch in Deep River also serves as a resource for boating along the Ottawa River.

IMAGE 3 - Boat launch: southeast side of Rapides-des-Joachims facing eastward along Ottawa River (August 2016)

5.3.6 Aggregates and Minerals

5.3.6.1 Site and Local Study Area

Aggregates

Gravel and sand are used for commercial purposes as well as for construction and maintenance of forest access roads within the County (OVF, 2011a). A portion of a Ministry of Transportation (MTO) aggregate pit is situated within the Local Study Area. The pit occupies a MTO permitted area of 4.6 ha and is located north of Highway 17 near Cutler Lane, along the edge of the 1 km boundary. Access to the pit is available from Highway 17. The site has unlimited annual extraction (MNRF, 2016).

The Local Study Area also intersects a privately operated Class A licence pit and quarry occupying a 25 ha area. The majority of the site is situated south of the MTO pit and on the south side of Highway 17. A portion of this site is adjacent to the MTO pit although the majority is situated to the south of Highway 17, with access from the highway. Extraction at this site is permitted to a maximum of 60,000 tons annually (MNRF, 2016).

Minerals

There are no active mine claims within the Site or Local Study Area (MNDM, 2016).

5.3.6.2 Regional Study Area

Aggregates

In addition to the two sites identified above, the Regional Study Area includes a third site southeast of Rolphton. This privately operated pit with a Class B licenced area of 16.5 ha is located west of Tee Lake and along the east side of Old Moore Lake Road. Extraction at this site is permitted to a maximum of 20,000 tons annually (MNRF, 2016).

Minerals

There are active mine claims within the Regional Study Area, however they represent a very small portion of the Study Area and are located on the western edge of the area boundary within Township of Head, Clara and Maria (MNDM, 2016).

5.3.7 Residences

5.3.7.1 Site and Local Study Area

Fewer than ten residential properties fall within the Site or Local Study Area (Figure 4-1 above). Given the size of the exclusion zone, these are located along the extremities of the area but generally situated along Highway 17 and Cutler Lane (See Image 4).

IMAGE 4 - Cutler Lane: from Highway 17 facing northwest (August 2016)

5.3.7.2 Regional Study Area

Numerous properties are identified within the Regional Study Area (Figure 4-2 above). Residential properties generally cluster in areas following the Highway 17 corridor, and in the village of Rapides-des Joachims whose residential area is concentrated on the eastern side of the island (See Image 5). Some cottages appear on the waterfront of the island, while others are scattered along the south side of the Ottawa River.

IMAGE 5 - Island Residences: Rapides-des Joachims facing northward (August 2016)

5.3.8 Other Land Use (within 5 km of Site Study Area)

Two inactive landfills are located within the Site Study Area. According to CNL, both are located in two former gravel pits. Landfill 1 situated along the main access road to the station southwest of the guardhouse was used for conventional purposes such as office waste and has a certificate of approval (A413107) from the Ontario MOECC acknowledging its closure. Landfill 2 was located northwest of the facility as a lay down area during construction of the original facility.

Within the Regional Study Area is the OPG's Des Joachims Generating Station. The hydro dam is situated at the southeast end of the Rapides-des Joachims and has a generating capacity of 429 megawatts. It is the largest of OPG's developments along the Ottawa River (OPG, 2016) (See Image 6).

IMAGE 6 – Hydro Dam - OPG's Des Joachims Generating Station from Rapides-des Joachims (August 2016)

6 IMPACT ASSESSMENT AND MITIGATION

6.1 Introduction

As noted in Section 3, this TSD identifies and examines indirect effects that may occur as a result of a change in the environment caused by the Project on socio-economic conditions. This assessment can occur following identification of direct effects of the Project on the environment. Only those socio-economic factors potentially affected by impact of the Project to the natural environment are included.

The evaluation includes assessment of effects associated with Decommissioning Execution phase as identified in Section 4.1. This section also identifies potential mitigation measures and likely adverse residual effects following mitigation, if any.

6.2 Potential Indirect Socio-Economic Effects

Potential indirect socio-economic effects will be examined through three timeframes as identified in Section 4.1: Decommissioning Execution; Institutional Controls; and, Post-Institutional Controls.

Spatial effects for each of the components of the environment are presented in terms of Local and Regional Study Areas including the Exclusion Zone which is a further subdivision of the local study area. The rationale for specifically discussing the Exclusion Zone is that no non-CNL activities are permitted within this area.

6.2.1 Land Use

6.2.1.1 Project Environment Interactions

Impacts to land use may occur as a result of interaction with Decommissioning Execution, Institutional Controls and Post-Institutional Controls phases.

6.2.1.2 Indirect Effects Assessment and Proposed Mitigation Measures

Within the Site and Local Study Area the proposed Project will not result in any formal provincial or municipal land use changes in the Decommissioning Execution phase. During Institutional Controls and Post-Institutional Controls phases, the proposed Project may allow for redesignation of the Federal Crown lands for some other purpose.

Within the Regional Study Area the proposed Project will not result in any formal provincial or municipal land use changes throughout all three phases.

6.2.1.3 Residual Effects

There are no anticipated residual effects of the proposed Project on land use.

6.2.2 Forestry

6.2.2.1 Project Environment Interactions

Impacts to forestry may occur as a result of interaction with Decommissioning Execution, Institutional Controls and Post-Institutional Controls phases.

6.2.2.2 Indirect Effects Assessment and Proposed Mitigation Measures

The proposed Project does not involve any harvest of Crown land forest resources.

In the Site and Local Study Area there is no Provincial Crown land however there is private land which may be harvested.

In the Regional Study Area there is Provincial Crown land that is eligible for harvest at the appropriate maturity intervals. There may also be private land where harvest occurs in the future. However, the proposed Project will not have any impact on Crown or private land forestry. In the Institutional Controls and Post-Institutional Controls phases forest resources within the Site Study Area may become available for forestry activities. This may be a minor positive effect.

6.2.2.3 Residual Effects

There are no residual effects of the Project on forestry or forestry resources.

6.2.3 Trapping

6.2.3.1 Project Environment Interactions

Impacts to trapping may occur as a result of interaction with Decommissioning Execution, Institutional Controls and Post-Institutional Controls phases.

6.2.3.2 Indirect Effects Assessment and Proposed Mitigation Measures

Within the Site and Local Study Area, no trapping will occur on Federal lands as they comprise the Exclusion Zone. In this area, there are limited areas of Provincial Crown lands beyond the Exclusion Zone and one designated Provincial trap line area. Landowners on private lands adjacent to Federal lands may trap and some trapping may occur within ZEC Rapides-des-Joachims.

Two Provincially designated Trap Line Areas intersect the Regional Study Area. As well, private land owners within the Regional Study Area may trap on their properties. Trapping may also occur within ZEC Rapides-des-Joachims.

The proposed Project will not affect the ability of any of the above trappers to continue to practice trapping. Trapping is dependent upon fur bearer species being available and therefore their related habitat that supports them. There is no proposed harvesting of habitat. There is no loss of habitat as a result of the

Project and in fact there may be a slight gain in habitat in the Institutional Controls and Post-Institutional Control phases.

As per the terrestrial environment section of the EIS, there are no predicted effects on wildlife and therefore more specifically for fur bearing species. Therefore, there is no mortality expected and no loss of fur bearer population.

Standard construction mitigation measures being applied (such as timing of construction) will help to minimize nuisance effects on trappers.

6.2.3.3 Residual Effects

As the Project does not impede on trapping and there is no change to habitat and no direct impact on fur bearer mortality, there are no residual effects.

6.2.4 Hunting

6.2.4.1 Project Environment Interactions

Impacts to hunting may occur as a result of interaction with Decommissioning Execution, Institutional Controls and Post-Institutional Controls phases.

6.2.4.2 Indirect Effects Assessment and Proposed Mitigation Measures

Within the Site and Local Study Area, no hunting will occur on Federal lands as they comprise the Exclusion Zone. In this area, there are no Provincial Crown lands available for hunting. Landowners on private lands adjacent to Federal lands may hunt or hunters can obtain landowner permission to hunt on private lands subject to Ontario Provincial hunting regulations. Some hunting may occur within ZEC Rapides-des-Joachims.

Provincial Crown land exists throughout the Regional Study Area and therefore hunting may occur according to Provincial hunting regulations. Landowners on private lands adjacent to Federal lands may hunt or hunters can obtain landowner permission to hunt on private lands subject to Ontario Provincial hunting regulations. Some hunting may occur within ZEC Rapides-des-Joachims.

The proposed Project will not affect the ability of any of the above hunters to continue to practice hunting. Hunting is dependent upon desired species being available and therefore their related habitat that supports them. There is no loss of habitat as a result of the Project and in fact there may be a slight gain in habitat in the Institutional Controls and Post-Institutional Controls phases.

As per the terrestrial environment section of the EIS, there is no predicted effect on wildlife. Therefore, there is no mortality expected and no loss of population with respect to desired species.

Standard construction mitigation measures being applied (such as timing of construction) will help to minimize nuisance effects on hunters.

6.2.4.3 Residual Effects

As the Project does not impede on hunting and there is no change to habitat and no direct impact on desired species, there are no residual effects.

6.2.5 Fishing

6.2.5.1 Project Environment Interactions

Impacts to fishing may occur as a result of interaction with Decommissioning Execution, Institutional Controls and Post-Institutional Controls phases.

6.2.5.2 Indirect Effects Assessment and Proposed Mitigation Measures

Sport and subsistence fishing occur within the Local Study Area along the Ottawa River.

Within the Regional Study Area fishing occurs along a larger expanse of the Ottawa River as well as a few inland waterbodies and watercourses (e.g. Tee Lake and several other smaller waterbodies) both within Ontario and Quebec.

The proposed Project will not affect the ability of any of the above anglers to continue to fish.

During the Decommissioning Execution and Institutional Controls phases no effects are predicted on the aquatic environment (see aquatic assessment section of the EIS) and therefore no impact on fishing is anticipated.

As per the aquatic assessment Section of the EIS, during the Post-Institutional Controls phase, as the facility has water slowly leaching in, and subsequently leach out, it will gradually release chemical and radioactive contaminants to the surface water environment. The contaminant levels are expected to be low due to processes such as sorption, dispersion and radioactive decay. These contaminants will have a negligible effect on aquatic biota as shown in the Postclosure Safety Assessment.

Standard construction mitigation measures being applied (such as timing of construction) will help to minimize nuisance effects on anglers.

6.2.5.3 Residual Effects

As the Project does not impede on fishing during the Decommissioning Execution and Institutional Controls phases, there is no change to fishing during these periods.

Similarly, during the Post-Institutional Controls phase, there is no change to fishing and fishing potential.

6.2.6 Tourism and Recreation

6.2.6.1 Project Environment Interactions

Impacts to tourism and recreational activities (e.g. trail use and boating) may occur as a result of interaction with Decommissioning Execution, Institutional Controls and Post-Institutional Controls phases.

6.2.6.2 Indirect Effects Assessment and Proposed Mitigation Measures

Within the Ontario portion of the Site and Local Study Area, there are no formal tourism operations or public trails. Tourism and trail use occurs within ZEC Rapides-des-Joachims. Boating and recreational canoeing can occur within the Ottawa River and within the limited area of the ZEC Rapides-des-Joachims that intersects this area.

Tourism operations, trails and boat launches occur within the Regional Study Area. The Project will not result in the curtailment of any of these tourism or recreation activities.

During the Decommissioning Execution phase of the Project nuisance effects such as noise or truck traffic may have a minor qualitative effect on these activities within the Site, Local and Regional Study Areas. There may be a temporary visual impact from construction activities, particularly along the Ottawa River if the natural buffer that exists on the river now is decreased. It is recommended that the buffer be retained during the Decommissioning Execution phase. During site restoration, the natural buffer may require some maintenance and/or improvement.

Impacts from noise associated with Project activities during the Decommissioning Execution phase may have a negative effect on tourism and recreational activities. Standard construction mitigation measures being applied (such as timing of construction) will help to minimize nuisance effects on tourists and recreationalists.

During the Institutional Controls and Post-Institutional Controls phases no negative effects are predicted with naturalization of the facility location and as nuisance effects will be less than current conditions. The existing ventilation stack located within the NPD Site will be retained as habitat for Chimney Swifts. This could potentially become an attraction for bird watchers to the site.

6.2.6.3 Residual Effects

During the Institutional Controls and Post-Institutional Controls phases, there may be some attraction for bird watchers to the site. Otherwise, no residual effects are predicted with naturalization of the facility location and as nuisance effects will be less than current conditions.

6.2.7 Aggregates

6.2.7.1 Project Environment Interactions

Impacts to aggregate resources may occur as a result of interaction with Decommissioning Execution, Institutional Controls and Post-Institutional Controls phases.

6.2.7.2 Indirect Effects Assessment and Proposed Mitigation Measures

Two aggregate operations intersect the Local Study Area. An additional operation is present within the Regional Study Area.

Approximately 16,112 tonnes of fine aggregate material and 19,646 tonnes of coarse aggregate material will be required during the Decommissioning Execution phase of the Project. This will likely result in a minor depletion of existing reserves should aggregate be source locally. Aggregate material will be sourced on the open market. The proponent will not be licensing any aggregate facilities themselves.

6.2.7.3 Residual Effects

There will be a minor loss of material during construction of the Project in the Decommissioning Execution phase. During the Closure and Post-Institutional Controls phases of the Project no residual effects are anticipated for aggregate resources.

6.2.8 Minerals

6.2.8.1 Project Environment Interactions

The proposed Project does not impact mineral exploration and development during the Decommissioning Execution, Institutional Controls and Post-Institutional Controls phases.

6.2.8.2 Indirect Effects Assessment and Proposed Mitigation Measures

There are no effects predicted on mineral exploration and development within the Site, Local and Regional Study Areas during any of the phases because the proposed Project does not result in any changes to land ownership or planning. It is possible during the Post-Institutional phase some of the current Federally owned lands may be made available for mineral exploration.

6.2.8.3 Residual Effects

As the Project does not impede mining or mineral exploration, there are no residual effects predicted.

6.2.9 Residences

6.2.9.1 Project Environment Interactions

Impacts to residents may occur as a result of interaction with Decommissioning Execution, Institutional Controls and Post-Institutional Controls phases.

6.2.9.2 Indirect Effects Assessment and Proposed Mitigation Measures

There are approximately ten residences within the Local Study Area. As well there are several hundred within the Regional Study Area.

During the Decommissioning Execution phase of the Project residents in the Local Study Area may be impacted by nuisance effects associated with construction (e.g. noise, dust, traffic, etc.).

There will be negligible effects on air and water resulting in no human health effects, as per the DecomSA and the PostSA.

Based on existing uses, during Institutional Controls and Post-Institutional Controls phases of the Project nuisance effects on residents is expected to be comparable or less than existing operations. If during the Post-Institutional Controls phase of the Project alternative land uses are identified, these uses may or may not produce effects on local residents.

Within the Local and Regional Study Areas, the transportation/haul route will be limited to Highway 17 and the NPD site access road from the highway. Hours of construction activity should be restricted to between 7 A.M. to 7 P.M. and limited to Monday through Saturday with the overall objective of minimizing impacts on Local and Regional residents. This should be subject to further discussion with the local municipality. Special or emergency circumstances allowing.

Periodic communication updates on Project construction activities to local residents is recommended, including: construction schedule, activities, dedicated contact person for inquiries and emergencies etc.

6.2.9.3 Residual Effects

During the Decommissioning Execution phase of the Project there will be minor nuisance effects that should largely be mitigated by a variety of general and specific construction mitigation measures.

During Institutional Controls and Post-Institutional Controls phases of the Project, no residual effects are anticipated.

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